The University of Manchester
Manchester Business School

SSMEnetUK
Service Science Management and Engineering

Establishing SSME as a new academic discipline

A Blueprint for UK SSME Education

Draft Document for Comment

November 5th 2008

SSMEnetUK is an EPSRC funded network whose aim is to develop SSME research and education within the UK
www.ssmenetuk.org

Contents

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0. Introduction

The service sector is the fastest growing segment of the world economy with a complex set of challenges bringing together people, technologies, organisations and information. There is an urgent need for UK Higher Education to respond to the requirement of business and public sector organisations in their quest for service innovation and service excellence.

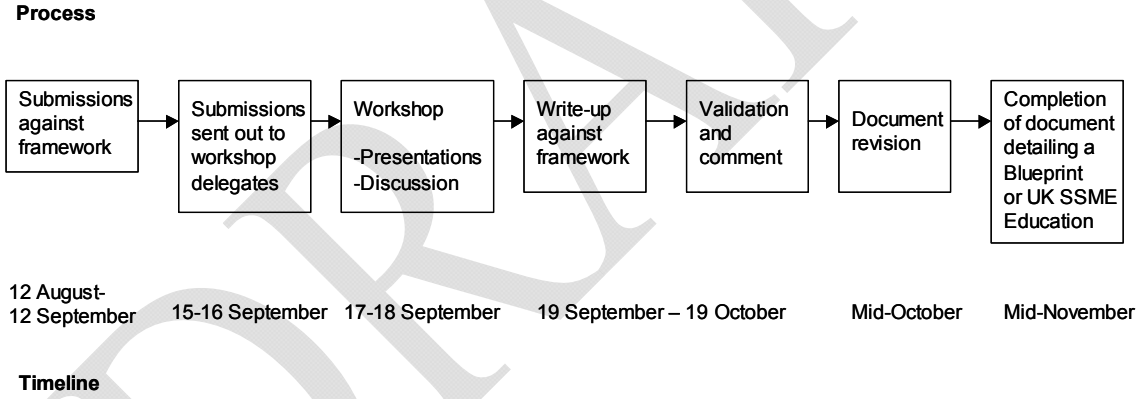
Purpose

The purpose of this document is to present the results of a consultation process involving members of the UK SSME network[1] and the wider academic and business community[2].

The document is structured against a seven point framework[3] which represents the key questions asked by university approval committees for new academic programmes. It is our intention to make the task of introducing new programmes easier for university professors by providing a collective view of the answers to these questions. It is not our intention to provide detailed curriculum design and content because beyond the core curriculum each university will respond to industry needs according to their specific areas of expertise.

Process Overview

The diagram below presents an overview of the process followed in producing this document.



The workshop delegates and contributors to date are listed in Appendix B, there were over 25 different universities represented from across the UK and visitors from South Africa, Slovenia, India, Netherlands, China and Denmark, delgates represented a healthy mix of subject areas including Business, Management, Sociology, Computer Science and Information Systems. Allan Mayo from BERR[4] presented a UK perspective on service and the company representatives have developed a complementary Requirements Document.

Framework

The framework consists of questions related to the rationale and target market for SSME education, resources available to educators, existing programmes, programme content and

[1] The website for the UK SSME network is www.ssmenetuk.org
[2] See Appendix B for the list of contributors
[3] See Appendix A
[4] See www.ssmenetuk.org/events for a copy of Allan Mayo's presentation

delivery, programme outcomes and graduate capabilities. The remainder of this document is structured against this framework.

1. Rationale for the development of SSME educational programmes

Services now account for more than 50 percent of the labour force in Brazil, Russia, Japan and Germany, as well as 75 percent of the labour force in the United States and the United Kingdom. Many services are among the most rapidly growing segment of the economy, especially 'knowledge intensive' business services (KIBS). IT services in particular have risen rapidly and the worldwide IT service industry is expected to increase in value from US$ 635 billion in 2005 to US$ 780 billion in 2008.

Developments in the service sector are raising new challenges for organisations:

- Many of today's services require the cooperation of people, organisations and technology. Delivering and innovating services involves an understanding of people's behaviour, the way they manage organisations and the role of technology in organisations.
- Many service firms are small; some are micro businesses. The Internet and other information technology have made it possible for companies to work together intensively, and in new ways, to form complex supply chains and service networks.
- Technologies have become a crucial part of services and service innovation; many services have become increasingly complex and dynamic due to cross-industry, cross-market and cross-county organisational activities and collaborations.

In order to respond to these developments there is clearly a need for service focused education that examines services as a complex ecosystem of interacting elements that include people, organisations and technology. IBM has proposed the multidisciplinary initiative 'Service Science, Management and Engineering' (SSME) (www.research.ibm.com/ssme/) to address the shortfall in service education. SSME is an attempt to leverage ideas from a number of existing academic disciplines – including computer science, cognitive science, economics, organizational behavior, human resources management, marketing, operations research, and others – and to address new challenges in the service sector collaboratively. The SSME agenda has two broad aims: (1) To equip the students with business, technology, and people skills required in a technology-based, services-led economy; (2) To research new theories, methods and technologies required for modern service operations and innovation.

In tandem with IBM's SSME initiative, other industrial leaders have also set up their own agenda. For example, HP has created the Centre for Systems and Services Sciences; Oracle is working with IBM in creating a joint industry consortium called the Service Research and Innovation Initiative; The NESSI (Networked European Software and Services Initiative) group in the European Union, comprising BT and HP and SMEs, has established a Services Sciences Working Group.

Throughout the SSME Thought Leadership Workshop (hosted by the Centre for Service Research, Manchester Business School, 17-18th September 2008) the need for SSME graduates was made explicit by industrialists. This document will explore the options available to education providers aiming to meet this need.

2. Target Market for SSME Education

At which level(s) within the National Qualifications Framework (see below) will SSME programmes be offered?

	CPD/Exec MBA/post-experience Masters	UG	PGT(Masters)	PGR/DBA	MBA
Awareness	yes	yes	yes	yes	yes
Knowledge/understanding	yes	yes	yes	yes	yes
Practical project/experiential learning			yes	yes	
Workplace practice	yes				yes
Research and innovation				yes	

Foundation modules for doctoral students
M.Sc should be given priority
Exec/post experience most appropriate initially

- Initially Masters then UG, Undergraduates – awareness throughout the curriculum (in appropriate schools) rather than single elective module - theme

SSME modules could be adapted for all levels
Initially Masters in order to broaden the knowledge base of people who are already experts in a specifi discipline either through work experience or through UG
The target market – Masters level modular programmes for working students

1. to allow application of what is being learned within the working context
2. mode preferred by employers (sponsor students on day/block release rather than losing them for a year)

3. Resources available to educators

Based on the responses from the framework questions, a number of resources have been identified. These are based either on freely available teaching resources available from organisations such IBM, published material such as books and academic articles and finally, case studies.

On the basis of the input to the workshop and also our own investigation, we classify the resources into the following categories:

Publications (books, articles, reports etc)
Case studies
Course material

In terms of publications, there is a wealth of books and articles published in a wide range of topics related to services. There are also specific journals dedicated to SSME topics. A good source of information on resources is the SSME UK net web site (http://www.ssmenetuk.org) and the Service Research and Innovation Initiative (SRII) web site (http://thesrii.org).

A number of participants specified some web sites that also, provide useful published material in the form of industry reports. These web sites relate to sector-specific organisations such as the International Labour Organisation (ILO) (http://www.ilo.org), the Management of Accelerated Technology Insertion (MATI) (http://mati.ncms.org/), the Association for Services Management International (ASMI) (http://www.afsmi.org), the Institute for Operations Research and the Management Sciences (INFORMS) (http://www.informs.org/), the TrusTECH (http://www.trustech.org.uk/) and the NHS Institute (http://www.institute.nhs.uk/) in the National Health Service, the Institute for Healthcare Improvement (IHI) (http://www.ihi.org), the Organisation for Economic Co-operation and Development (OECD) (http://www.oecd.org), government organisations such as the Department for Business, Enterprise & Regulatory Reform (BERR) (http://www.berr.gov.uk/) or the Local Government Network (http://www.nlgn.org.uk).

In terms of case studies, there are various sites offering case studies that can be studied and used for education purposes. The IBM SSME site contains a number of case studies based on their consulting projects, innovation consultancy projects, information technology services and engineering projects. These are available from:

http://www-304.ibm.com/jct09002c/university/scholars/skills/ssme/casestudies.html

Another useful source of case studies that also contain useful teaching support materials are provided by ECCH which is a non-profit independent provider of training case studies material. Their web site is: http://www.ecch.com

Furthermore, a number of publishers provide case study materials suitable for SSME education.

In terms of course materials, there are relatively few sites that offer freely available course material for use in SSME education. The best and bigger resource is the IBM Academic Initiative which offers courseware materials on topics such as:

Introduction to Service Science, Management and Engineering (SSME)
Service Systems
Management of Services
Productivity and Innovation - the productivity paradox
Introduction to Methods
Services Sciences, Management and Engineering Challenges, Frameworks

The IBM materials are available from
http://www-304.ibm.com/jct09002c/university/scholars/skills/ssme/resources.html

These materials however, are focusing on IBM technologies and as a result, their use could be somehow restrictive.

4. Existing SSME Programmes

What types of taught SSME education programmes do you currently offer? What taught programmes are you aware of that are offered by others?

In this section, existing programmes are reviewed and discussed within the context of the SSME education context. In carrying out the review, we have looked at completed programmes, concentrations/pathways and individual course unit offerings that mention "service" in their title. This assumption for the offerings examined might be restrictive in some sense but we believe that it is an appropriate differentiator when examining different educational offerings.

In the following table, we summarise the offerings surveyed and provides an indication of their level according to the National Qualifications Framework, whether they are complete programmes, pathways or course units and the corresponding university and web site.

Breakdown of offerings to different levels (MSc, MBA, etc)

As we can see from the different offerings, the emphasis is on graduate programmes (MSc, MBA). There is a CPD/Exec set of offerings that deliver short programmes tailored to specific areas. The course units offered by IBM is the most comprehensive example of CPD-type of offerings whereas the Arizona State University's Services Leadership Institute is probably the most well known example of executive offerings.

Relationship of offerings to existing established disciplines

The majority of the programmes are offered as "extensions" to traditional disciplines such as business, engineering or computer science. Some programmes have a "discipline" perspective e.g., Carnegie Mellon and Exeter whereas other programmes simply build a body of knowledge on existing well-established disciplines through the addition of specific course units e.g., Technion and North Carolina (MSc).

Relationship of offerings to services lifecycle

It is interesting to discuss the structure of the different offerings in terms of the aspects of the service lifecycle that they address. Given the lack of a common agreed definition of "service lifecycle", we assume for simplicity reasons that the service lifecycle consists of the following: innovation, design, delivery, quality, marketing.

Existing SSME Curricula (incomplete)

	Institution	Web Link	Level	Title
1	University of California at Berkeley	http://isd.ischool.berkeley.edu/ http://www.ischool.berkeley.edu/programs/courses/290-iscpd	MSc course unit	Information and Service Design
2	Karlstads University	http://www.kau.se/education/program_detail.lasso?ID=PR1133	MSc	Master Programme with a Profile in Service Science
3	University of Sydney	http://www.cs.usyd.edu.au/~new5991/	MSc	Professional Services
4	University of Maryland	http://www.rhsmith.umd.edu/ces/ssme/	MBA	MBA Curriculum in Service
5	University of California at Santa Cruz	http://www.tim.ucsc.edu/node/29	MSc	SSME
6	University of Glasgow	http://www.gla.ac.uk/departments/csirn/	MSc	Complex Services Innovation Research Network (CSIRN)
7	Carnegie Mellon	http://www.servicemanagement.cs.cmu.edu	MSc	MSIT in IT Service Management
8	Arizona State University	http://wpcarey.asu.edu/mba/ft/mkt.cfm	MBA pathway	Strategic Marketing and Services Leadership
9	Arizona State University	http://wpcarey.asu.edu/csl/SLI-Home.cfm	Exec	Annual Services Leadership Institute
10	IBM	http://www-304.ibm.com/jct09002c/us/en/university/scholars/skills/ssme/	CPD	Service Science or Service Science, Management and Engineering
11	Singapore Management University	http://www.sis.smu.edu.sg/programme/2nd_majors/InfoSystems.asp#SSS	UG pathway	Service Science and Systems
12	Technion -Israel Institute of Technology	http://ie.technion.ac.il/serveng/	UG course unit	Service Engineering
13	University of Exeter	http://business-school.exeter.ac.uk/postgraduate/msc_ssm/	MSc	MSc Service Science and Management
14	University of Alberta	http://www.cs.ualberta.ca/~stroulia/660/Winter2008/outline.html	MSc course unit	Service Oriented Computing
15	North Carolina State University	http://networking.ncsu.edu/service.php	MSc pathway	MSc in Computer Networking
16	North Carolina State University	http://www.mgt.ncsu.edu/mba/concentrations/services-management-consulting/	MBA pathway	MBA Services Management and Consulting
17	Peking University	http://www.ss.pku.edu.cn/index.php?option=com_content&task=category&sectionid=22&id=233&Itemid=457	MSc	A Master of Software Engineering Program for Service Science and Engineering
18	Bahcesehir and Northeastern	http://www.bahcesehir.edu.tr/fenbilimleri/program/id/02		no english description

	Universities			
19	Geneva Business School	http://www.hesge.ch/heg/doc/actu_master.pdf	MSc	no english description
20	Stevens Institute	http://howe.stevens.edu/index.php?id=14	MSc	MSc in Information Systems
21	University of California at Merced	http://ssha.ucmerced.edu/2.asp?uc=1&lvl2=77&lvl3=77&lvl4=87&contentid=124	UG	Services Science
22	Wright State University	http://knoesis.org/aboutus/courses/cs790-wi08/		Services Science
23	University of Manchester	http://www.servicesystems.org.uk/	MBA elective	Service Management
*	Ohio State University	http://fisher.osu.edu/centers/ims		
*	Politecnico di Milano	http://home.dei.polimi.it/pernici/PoliMI-SSME/		
*	San Jose State University	http://www.cob.sjsu.edu/ssme/		
*	Universidade do Porto	http://www.fe.up.pt/si_uk/CURSOS_GERAL.FORMVIEW?P_CUR_SIGLA=MESG		
*	Michigan Technological University	http://www.sse.mtu.edu/courses.html		

***still to be completed**

5. Programme Content

Do you think that all SSME programmes should have a core content that defines the field? If so what do you think should be included in the core?

Most contributors felt that if SSME is to be a discipline then there should be core content and in this section we present our assessment of what contributors said and what is needed.

Core Curriculum Content

The core content consists of three main components: the key concepts that all students of SSME need in order to

1. Key Concepts

Service as an activity and Service Dominant Logic
The focus of SSME is on service as an activity rather than simply on the service sector. Service activity occurs across all sectors of the economy and hence students need an understanding of the terms, service, service activity, service sector and service dominant logic.

The Service Environment
An understanding of the importance of service to the economy, the role of government in service provision and as receiver of services from business, the growth of business to business services, the movement towards the service ecosystem, the impact of globalisation and cultures on service provision.

Service Usage Cycle: Customer Experience
An appreciation of the customer experience when using a service, the end-to-end experience from the customer first hearing about the concept, to their first experience with the service, the stages they go through in terms of business process focussing also on interaction with people and technology, emotional experience and their evaluation of the service at the end point, and the impact of the customer experience on the likelihood of using the service again.

Service Design/Delivery: Designer Perspective
An understanding of the key stages in designing a new service either following a classic system design lifecycle or an iterative approach but including concept, analysis, user requirements, design, test, deliver, evaluate in use. The design cycle should also cover an appreciation of the role of modelling and simulation in the design process and the use of analytic and predictive techniques. The requirements stage should also cover how successful service delivery will be measured, including a range of measures such as performance, customer satisfaction, cost and quality.

Service Innovation
An appreciation of what is meant by service innovation taught mainly through discussion of a range of examples from different business sectors and service types such as business to business, business to consumer, government to citizen etc.

The Role of ICT in Service

An appreciation of the role of information and communication technologies in service usage, service design, service delivery and service innovation, an overview of key technology enablers such a Service Oriented Architecture, web 2.0, internet technologies.

2. Case Study/Practical Application

SSME is a multidisciplinary topic and hence requires the student to at least have an appreciation of the role the different disciplines have to play in service success. Ideally students should be exposed to some practical experience of a service within their workplace, or an interactive simulation of service, failing this a case study of a service activity should be conducted.

The service activity should be examined from the point of view of core service disciplines and the educator and students encouraged to ask and answer questions such as:

1. What is the context surrounding the service activity? Social, economic?
2. Who is involved in the delivery of the service? Describe the people, organizations, organizational units.
3. What are the main processes involved in the delivery of the service?
4. Who is the customer? Are they involved in the design or delivery of the service? For example through self-service?
5. Is the customer involved in co-creation of the service? How does the customer measure value?
6. How does the organisation generate revenue from the service activity?
7. What are the innovative aspects of the service? What is the potential for further innovation? For example through cost reduction, improved performance, greater customer satisfaction or getting ahead of competitors.
8. How is service performance measured and monitored?
9. Does the service ever fail? What measures are in place for recovery from failure? How does the organization know when failure has occurred?
10. To what extent are people a key part of the service delivery? What factors affect their capability to deliver?
11. What is the role of technology in the delivery of the service? How does the customer interact with technology? How does the service provider interact?

3. Research Methods

An appreciation of the research methods and techniques that lend themselves to a multidisciplinary investigation into a service problem such as use of case studies, real world examples, simulations (mathematical to virtual world), field trips to experience service first hand, workplace practice, work shadowing. The methods component would equip the students to evaluate which methods are most appropriate and how to conduct such investigations themselves.

6. Programme Delivery

What types of teaching methods should be employed to deliver SSME education? Are standard methods sufficient or is further innovation required?

Experiential learning was the preferred method used to deliver SSME education. There was general agreement that standard lecture-based approaches do not accommodate the multi-disciplinary nature of SSME. Conference delegates offered the following suggestions:

- experience based learning
- scenario planning
- seminars
- 'in-house' training for the business community
- case studies
- discussion forums
- summer projects in organisations

In delivering SSME education, the following were identified as key requirements:

- a shared understanding and vocabulary when drawing on different bodies of knowledge
- research led teaching
- heavy involvement from industry

The case study approach (discussed in Section 5) is experiential and will permit the examination of services from a range of different perspectives.

7. Programme Outcomes

In you opinion what are the key learning outcomes required of an SSME programme? (include understanding, skills, knowledge, personal and professional development, project skills; theory and practice)

The programme outcomes should be specified as Learning Outcomes against which the student learning can be assessed. To some extent this is covered in the 'Business Community Core Requirements: A framework for Service Science Curricula Document'. These requirements need to be translated into specific learning outcomes for a given programme.

8. Summary, the Gap and the Way Forward

Currently no Masters level programme with the title SSME is known to be running in the UK. Despite plans to mount programmes in Exeter and Westminster for 2008/2009 neither has actually recruited sufficient students to make the programme financially viable. Professional development programmes have been more successful, for example, BT's Masters module in Service Science, IBM Executive Education modules at Glasgow. An MBA Elective in Service Management is running at Manchester for the first time this semester and we are still seeking examples of other existing programmes within the UK. It is clear that despite the call to action of major companies and the interest shown by academics in the UK the movement towards inclusion of SSME or Service Science programmes within UK universities is extremely limited. A number of reasons for this were discussed and clearly further action is needed.

Possible reasons for the lack of UK SSME programmes:

1. The lack of recognition of the importance of studying service among prospective students
2. The use of SSME as a title: this has low recognition among students, other titles such as Service Design and Innovation which are more self explanatory may be more appropriate
3. The term 'Service' has traditionally been associated with the service sector, within SSME we are concerned with a wider definition of service as an activity which includes inter alia business to business and business to government services
4. The market for students has not yet been defined , there is embryonic activity in countries such as China, Japan, Malaysia etc where governments are beginning to take action but this has not yet filtered down to prospective international students
5. The market for UK Masters programme consists largely of international students. The percentage of UK/EU students attending Masters level programmes is very low mainly due to the lack of funding available for study.
6. The job opportunities for SSME graduates are not clear, though industry partners assure us there are lots of positions, the job titles and job roles have yet to be fully articulated.
7. Academic staff who are advocates of SSME within their university often find it difficult to convince other academics and senior administrators of the need for SSME or service oriented curricula.
8. At present there is no successful Masters course in the UK and hence there is no reference point for other universities to follow. There is no market leader.

Some pointers to the way forward:

1. Companies who advocate the need for SSME education need to give the universities more active support in convincing staff and students that they really do need the graduates:
    a. Provide active endorsement of programmes
    b. Provide a list of job roles and career opportunities

   c. Provide bursaries for students
   d. Continue to work with academics to develop the curriculum
   e. Widen the base of companies actively involved
2. Government agencies need to engage more widely with the education agenda:
   a. Support research in the area so that academics can develop research led curricula hand in hand with led requirements
   b. Provide bursaries for students
   c. Assist in the development of 'open source' curricula materials
   d. Assist at the interface between universities and business to facilitate business led curriculum
3. University academics need to continue to engage with business and government and with their own universities to develop genuinely multidisciplinary programmes and educational units, and to work together to help grow the field.

This document represents **work in progress** all comments are welcome directly to the authors in the first instance

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and from November 10th through www.ssmenetuk.org

Appendix A: Framework Questions

About the need for SSME education:

1. Rationale:

In your opinion what is the rationale for the development of SSME educational programmes?

2. Target Market:

At which level(s) within the National Qualifications Framework (see below) will SSME programmes be offered?

About existing resources and programmes:

3. Resources:

What types of resources are available to SSME educators? Please list any resources you are aware of.

4. Existing Programmes:

What types of taught SSME education programmes do you currently offer? What taught programmes are you aware of that are offered by others?

About content and delivery:

5. Programme Content:

Do you think that all SSME programmes should have a core content that defines the field? If so what do you think should be included in the core?

Do you think that SSME programmes should differ according to industry sector? If so why and in what way?

6. Programme Delivery:

What types of teaching methods should be employed to deliver SSME education? Are standard methods sufficient or is further innovation required?

About outcomes and graduate capabilities:

7. Programme Outcomes:

In you opinion what are the key learning outcomes required of an SSME programme? (for example, understanding, skills, knowledge, personal and professional development, project skills; theory and practice)

NATIONAL QUALIFICATIONS FRAMEWORK

1 Certificate	**C** level	Certificates of Higher Education
2 Intermediate	**I** level	Foundation degrees, ordinary (Bachelors) degrees, Diplomas of Higher Education and other higher diplomas
3 Honours	**H** level	Bachelors degrees with Honours, Graduate Certificates and Graduate Diplomas
4 Masters	**M** level	Masters degrees, Postgraduate Certificates and Postgraduate Diplomas
5 Doctoral	**D** level	Doctorates, PhD, DBA

Appendix B: Contributors

Establishing SSME as a new academic discipline:
Thought Leadership Workshop September 17th -18th 2008

Delegate List and Contributors

NAME	INSTITUTION
Eamonn Ambrose	University College Dublin
Steve Baron	University of Liverpool
Siebert Benade	University of Pretoria (South Africa)
Ray Bird	Godel Technologies Europe Ltd
Ruth Boaden	University of Manchester
Rosanna Chu	University of Manchester
Bob Clift	e-skills UK
Jeremy Cox	CustomerSat Inc.
Yvonne Crew	Centrica
Chris Cromack	IBM (UK) Ltd
Mal Davenport	University of Teesside
David Foster	Ministry of Defence, University of Exeter
Janet Francis	University of Staffordshire
Gary Graham	University of Manchester
Amy Grove	University of Warwick
Irena Grugulis	University of Bradford
Ben Hardy	Judge Institute, University of Cambridge
Marjan Hericko	University of Maribor, Slovenia
Alan Jones	University of Teesside
Barbara Jones	University of Manchester
Tobias Jung	University of Edinburgh
Radmilla Juric	University of Westminster
Kathy Keeling	University of Manchester
Jing Hua Li	Zhejiang Gongshang University
Charles Loving	IBM (UK) Ltd
Michael Lyons	BT
Linda Macaulay	University of Manchester
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Claire Moxham	University of Manchester
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Robert Paton	University of Glasgow
Nathan Proudlove	University of Manchester
Vidya Rajaram	University of Manchester
Karen Renaud	University of Glasgow
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Jonathan Throssell	Rolls-Royce plc
Chris Todd	University College London
Chris Tofts	Hewlett Packard Laboratories
Katherine Tyler	University of Westminster
Lorna Uden	University of Staffordshire
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Pete Ward	IBM (UK) Ltd
Ray Welland	University of Glasgow
Stephen Wood	University of Sheffield
Liping Zhao	University of Manchester

Appendix C: Existing Programmes in Detail

UNIVERSITY OF CALIFORNIA AT BERKELEY

University:	**Berkeley University of California**
School/Department:	**School of Information**
Program Title:	**Information & Service Design (ISD)**
Level:	**MSc Course Unit**
Web link:	**http://isd.ischool.berkeley.edu/**
Description:	The ISD Clinic is a University-based information technology consultancy and instructional program providing project-based services to on-campus and off-campus organizations. It has the mission to give students real-world experience in the design, implementation, deployment, and evaluation of information systems. The Clinic is hosted at the School of Information but open to students from engineering, computer science, business and other disciplines. The Clinic's primary client base are organizations on the UC Berkeley campus, but the Clinic also works with industry partners, and nonprofit public interest organizations
Areas:	Atom Publishing Document Engineering E-books Geolocation Mobile Services Open Scholarly Services Web-based Publishing Web-based services XML Technologies XML and Modelling
Course Unit(s):	Document Engineering and Information Architecture Information Systems Clinic: Project Development Web-based Publishing Web-based Services

KARLSTADS UNIVERSITY

University:	**Karlstads**
School/Department:	**Social Sciences and Arts**
Program Title:	**Master Programme with a profile in Service Science**
Level:	**MSc**
Web link:	**http://www.kau.se/education/program_detail.lasso?id=PR1133**
Description:	This master's degree will give you a competitive edge in Sweden and abroad. The programme's international approach will prepare you for the challenges and expectations of a global market. Analyses of the labour market indicate that the new jobs are to be found in service-related areas. This programme is fairly unique in this area.
Areas:	Working Life Science Computer Science Business Administration Information Systems
Course Unit(s):	Advanced Course in the major subject Continued Advances Course in the major subject Common Skills including the Craft of Research, Scientific Methods and Professional Skills

	Service Science Master Thesis within the major subject

UNIVERSITY OF SYDNEY

University:	**Sydney**
School/Department:	**School of Information Technologies**
Program Title:	**INFO5991 IT Professional Services: Services Science, Management and Engineering**
Level:	**MSc**
Weblink:	**http://www.cs.usyd.edu.au/~new5991/**
Description:	This course is about Services Sciences, Management and Engineering (SSME) for postgraduate students in science, management, and engineering (and other disciplines as appropriate). SSME is the application of scientific, management, and engineering disciplines to tasks that one organization beneficially performs for and with another ("services"). SSME has the goal of making productivity, quality, performance, compliance, growth, and learning improvements more predictable in work-sharing and risk-sharing (co-production) relationships. SSME is the study of service systems, and it aims at improving service systems, particularly those involved in complex, IT-enabled, business-to-business services
Areas:	Introduction to services and services science management and engineering (SSME) Modelling and design of services Managing Services
Course Unit(s):	

UNIVERSITY OF MARYLAND

University:	**University of Maryland**
School/Department:	**Robert Smith School**
Program Title:	**MBA Curriculum in Service**
Level:	**MBA**
Web link:	**http://www.rhsmith.umd.edu/ces/ssme/**
Description:	Service Sciences, Management and Engineering (SSME) is an initiative geared towards the enhancement of services through the application of computer science, operations research industrial engineering, business strategy, management sciences, social and cognitive sciences, and legal sciences. At the Smith School, the Centre for Excellence in Service emphasizes the revenue side of service-providing methods by which companies can grow their businesses through better service. The Centre combines its research with the leading annual international service research conference, Frontiers in Service Conference, the leading international journal on service, Journal of Service Research, and a cutting-edge MBA curriculum, all of which put the Centre at the forefront of service science.
Areas:	
Course Unit(s):	Service Marketing, Customer Relationship Management Service Project, e-Service Management and Organisational Behaviour in the Telecommunications Industry Economics of Information Systems Information Systems Analysis and Design Security and Control of Information Systems

UNIVERSITY OF CALIFORNIA AT SANTA CRUZ

University:	**UC Santa Cruz**
School/Department:	
Program Title:	**Services Science Management & Engineering (SSME)**
Level:	**Graduate Certificate**
Web link:	**http://www.tim.ucsc.edu/node/29**
Description:	At UCSC, Services Science Management and Engineering (SSME) focuses on knowledge service design and delivery. We achieve this through integrating research, education and practice, partnering with Silicon Valley firms as our enterprise-level test beds. They describe a major initiative underway at the University of California Santa Cruz Silicon Valley Center in collaboration with IBM Services Science Management and Engineering (SSME) Research, and many of the major firms of the "Knowledge Economy" in Silicon Valley. This new thrust is developing innovative new graduate and undergraduate programs integrating knowledge services and business analytics. Their research with leading Silicon Valley firms indicates the need for a new curriculum that integrates traditional management science with engineering approaches (resource and risk management) with human-centric (cognitive, knowledge management) approaches including machine learning and data/text mining. They are developing their new program along these lines, and teaching new theory, which has been developed based on extensive field studies of various enterprises.
Areas:	Data and Business Analytics for Knowledge Service Systems Technology and New Product Development, including Distribution & Delivery and Market Response Evaluation Resource Management Information Retrieval and Knowledge Management Financial Engineering and Risk Management SSME Inter-disciplinary Involvement
Course Unit(s):	Knowledge Services & Data Analytics Data Mining eBusiness Technology & Strategy Electives: Management of Technology Services Engineering and Management Information Retrieval

UNIVERSITY OF GLASGOW

University:	**Glasgow**
School/Department:	**Faculty of Law, Business & Social Science**
Program Title:	**Complex Services Innovation Research Network**
Level:	**PG**
Web link:	**http://www.gla.ac.uk/departments/csirn/**
Description:	The Complex Services Innovation Research Network (CSIRN) examines how complex organizations can analyse current and future needs in developing, and driving, both effective and efficient service orientated supply chains. In particular, the CSIRN focuses on helping organizations to meet the following challenges: How to identify and develop a responsive and flexible service delivery organization for the future How to develop a responsive organization that can compete in a dynamic global market How to maintain effective performance through changing work practices How to maintain effective performance through changing labour and skills demographs How to identify the need for, and drive performance related knowledge creation and innovation How to Identifying and managing barriers to inter/intra organizational cooperation Through research, CSIRN is developing, in association with IBM and others, a set of tools which organizations can use in order to improve their service delivery supply chain performance. The aims of the network are furthered by ensuring that: Establishes a reputation for research in Service Science. Capitalises upon the potential of the developing partnership relationship. Builds the foundations that will enhance the research/practitioner interface. Produces graduates recognised as coming from a leading provider of Service Science research and teaching. The global interest in services innovation through the integration of multi-disciplinary research and practitioner interface is aligned with the University strategic vision. It is truly international and leading edge and offers research, commercial and graduating income streams.
Areas:	Knowledge Transfer within Complex Organisations Service Oriented Supply Chain Optimisation Process Innovation Virtual Organisations & Performance Innovation & Change Management The role of Technology in Driving Innovation Services Management T-skills

CARNEGIE MELLON UNIVERSITY

University:	**Carnegie Mellon**
School/Department:	**Computer Science**
Program Title:	**MSIT in IT Service Management**
Level:	**MSc**
Web link:	**http://www.servicemanagement.cs.cmu.edu/**
Description:	The MSIT in IT Service Management is an interdisciplinary degree program for experienced professionals who want to participate in a world-class program that brings together a vibrant, international student body and prepares students to deal with complex IT service management situations. Its duration is 14 months for full-time students, and approximately two calendar years for part-time students. The final two semesters for full-time students is devoted to an in-depth practical project where students apply all the skills mastered during these projects to a real-world problem. Often these projects are done in close collaboration with companies, giving students an inside perspective of how the technology is used in the field.
Area(s)	The curriculum focuses on four core areas: 1. IT, computing, and software engineering 2. behavioral and management sciences 3. quantitative methods 4. IT service management. These areas are intended to address concepts that not only provide a solid technological foundation, but also provide students with knowledge and skills to be able to effectively address systemic shortfalls in industrial IT service management implementations – organizational change management and governance.
Course Unit(s)	The courses for each area are as follows: • Bridge (immigration) courses for those students without IT background IT Fundamentals Networking and telecommunications Programming Algorithms, data structures, and databases Professional Communication • IT service management core courses that include Introduction to Service Science Managing Service Organizations Service Design Process and Capability Models Sourcing Management Service Innovation • Behavioral and management sciences courses that include Service Strategies Organizational Behavior Governance, Portfolio and Program Management Financial Management • Quantitative methods courses that include Statistical Thinking / Statistical Reasoning & Practice Capability Improvement for Service Organizations

ARIZONA STATE UNIVERSITY

University:	**Arizona State**
School/Department:	**W.P. Carey School of Business, Center for Services Leadership (CSL)**
Program Title:	**MBA Specialization Strategic Marketing and Services Leadership**
Level:	**MBA**
Web link:	**http://wpcarey.asu.edu/mba/ft/mkt.cfm**
Description:	The Strategic Marketing and Services Leadership (SMSL) specialization prepares graduates for challenging leadership positions in marketing management including services management, brand management, customer relationship management, e-commerce management, and a variety of other areas. Built upon a strong foundation that blends marketing strategy with services management, the Strategic Marketing and Services Leadership curriculum delivers distinctive knowledge and skills sought by firms across industries that are using service as a basis for competitive advantage. Emphasizing a customer focus as the centerpiece of the curriculum, the goal of the program is to create market-driven managers who deliver superior customer solutions and forge enduring and profitable customer relationships.
Area(s)	The curriculum focuses mainly on marketing topics and includes areas such as services marketing, marketing strategy, services project management and e-commerce marketing.
Course Unit(s)	The courses on offer are: Services Marketing and Management Strategic Projects Consumer Markets and Brand Strategies Applied Marketing Strategy Services Projects Management New Product and Service Development Business to Business Marketing E-Commerce Marketing Strategy In addition, the programme includes projects in Customer Relationship Measurement and Management.

ARIZONA STATE UNIVERSITY

University:	**Arizona State**
School/Department:	**W.P. Carey School of Business, Center for Services Leadership (CSL)**
Program Title:	**Annual Services Leadership Institute**
Level:	**Executive**
Web link:	**http://wpcarey.asu.edu/csl/SLI-Home.cfm**
Description:	The Services Leadership Institute is an annual executive program addressing the delivery of customer's true expectations and the ability to complete through service offerings. The program is limited to 55 seats and it is a popular programme attended by senior executives from a wide range of different companies and sectors. The Services Leadership Institute brings together academics (mainly from ASU) along with business leaders to discuss how to apply a proven process for service quality in an organization. It has two and half days duration and includes about ten sessions discussing both theory and practise aspects of services.
Area(s)	Topics from 2009 programme: People, Service, and Profit at Jyske Bank: A Scandinavian Transformation Marketing in the Post-Web 2.0 Era Deviant Leadership: How to Move a Company in a Different Direction Service Blueprinting: Building Services from the Customer's Point of View Excelling at Service(s) by Closing the Gaps Profitable Customer Management Competing Through People Service Failure Recovery: Restoring Confidence, Renewing Loyalty and Raising Revenues Leadership Through the Power of Persuasion
Course Unit(s)	N/A

IBM

University:	**IBM**
School/Department:	**Academic Initiative**
Program Title:	**Service Science or Service Science, Management and Engineering**
Level:	**CPD**
Web link:	**http://www-304.ibm.com/jct09002c/us/en/university/scholars/skills/ssme/**
Description:	IBM offers a range of educational materials to help educational institutions deliver IBM and open source products, technologies, and topics. These are available to academic initiative members only. Membership is open to faculty members and researcher professionals at accredited institutions of learning, all over the globe.
Area(s)	The areas covered by the IBM educational materials are: Data and Information Management High school IT Services Lotus Open source Power Systems: AIX Power Systems: IBM i Power Systems: Linux Project management Rational Service Oriented Architecture (SOA) Supply Chain System z Tivoli WebSphere
Course Unit(s)	Extensive range of course units (see web site for details)

UNIVERSITY OF ALBERTA

University:	**Alberta**
School/Department:	**Computer Science**
Program Title:	**Service Oriented Computing**
Level:	**MSc**
Web link:	**http://www.cs.ualberta.ca/~stroulia/660/Winter2008/outline.html**
Description:	This course is about understanding the SOA architecture style, tracing its provenance through the evolution of software-architecture styles, getting experience with the methods and tools that support SOA development and examining the interplay between service-oriented computing and strategic business concerns. In this course, students get a theoretical background of software architecture, especially as it pertains to distributed and web-based systems, and practical experience designing and developing a realistic application using SOA standards and technologies. More specifically, in terms of theory, 1. review the software-architecture styles, as identified by the field circa 1996 2. focus on the architecture concerns of distributed information systems, with special attention to web-based systems and the elements of the REST and SOA styles; 3. examine in-depth the vision and the technologies around Web 2.0 and the Semantic Web; 4. review the new field of services science and we will examine the interplay of SOAs and strategic business concerns. In terms of practice, students gain experience with a variety of open-source tools supporting the development of SOA applications, including - but not limited to - Apache Axis and ActiveBPEL.
Area(s)	Services Definitions Economic concerns in SOA development Service Systems Fundamentals Service systems fundamentals The services-dominant logic Management of Services Productivity and Innovation - the productivity paradox Productivity and Innovation Methods
Course Unit(s)	N/A

NORTH CAROLINA STATE UNIVERSITY

University:	**North Carolina State University**
School/Department:	**College of Management**
Program Title:	**Services Management and Consulting**
Level:	**MBA**
Web link:	**http://www.mgt.ncsu.edu/mba/concentrations/services-management-consulting/**
Description:	This MBA pathway focuses on the co-production relationship that is critical in the services context. Service engagements must be designed and managed to meet the client's and provider's expectations, to achieve satisfactory returns and performance. The relationship management curriculum will provide essential tools and frameworks for effective customer analysis and engagement management.
Area(s)	N/A
Course Unit(s)	Services Management Organizational Culture Consulting, Marketing Research Project Management , Business Process Analysis and Design Supply Chain Relationships, Marketing Analytics Business Relationship Development, Product and Brand Management

NORTH CAROLINA STATE UNIVERSITY

University:	**NC State**
School/Department:	**Computer Science**
Program Title:	**Computer Networking**
Level:	**MSc**
Web link:	**http://networking.ncsu.edu/service.php**
Description:	Companies will be able to maintain their competitive edge by selling services, rather than just software and hardware equipment. The modern networking engineer should be aware of the technical and management aspects of services and should be capable of advancing and significantly contributing within such an environment. The Networking Services pathway provides the students with the necessary skills to understand the technical and management aspects of networking services.
Area(s)	N/A
Course Unit(s)	The programme consists of the following core units: Computer Networks Computer Performance Modeling Strategic Management Foundations Project Management , Organizational Culture Services Management and Marketing In addition, the students are offered options from: Operating System Principles, E-commerce Technology, Database Management Concepts and Systems, Internet Protocols, Information Systems Security, Multimedia Computing and Networks, Connection-Oriented Networks, Engineering Knowledge-Based Services, Storage System Fundamentals,

	Performance Evaluation of Computer Networks, Introduction to Wireless Networking, Service-Oriented Computing and Advanced Topics in Internet Protocols

UNIVERSITY OF EXETER

University:	**Exeter**
School/Department:	**Business School**
Program Title:	**MSc Service Science and Management**
Level:	**MSc**
Web link:	**http://business-school.exeter.ac.uk/postgraduate/msc_ssm/**
Description:	The MSc Service Science and Management is an innovative postgraduate programme, providing the opportunity to learn about a new business discipline that is increasingly in demand from large employers with complex service systems. This programme combines knowledge of the principles of management with an exploration of the new world of service science with the aim of producing highly effective managers for service-driven corporations. It aims to give students the ability use and develop management strategies in a service organization at an advanced level. Students will learn about the consumer experience in a modern service economy, and will gain awareness of the challenges involved in managing a globalised service organisation. The taught modules combine central ideas in marketing, operations management and the management of services with advanced knowledge of the services sector, such as creating value, customer relationship management technology and the management of demand, capacity and yield. Students can undertake either a dissertation in service science or a consulting practicum, or a project internship where students will work within a service company on a 10-week internship programme.
Area(s)	N/A
Course Unit(s)	Core units are: Services Marketing and Revenue Management Managing Operations Marketing Analysis and Research Process Information Management People and Organisations Advanced Seminars in Services E- Service Auditing a Service Readings in Services One option is chosen from: Consumption Markets and Culture Accounting for International Managers Principles of International Business

TECHNION -ISRAEL INSTITUTE OF TECHNOLOGY

University:	**Technion -Israel Institute of Technology**
School/Department:	**Industrial Engineering and Management**
Program Title:	**Service Networks**
Level:	**UG Course Unit**
Web link:	**http://ie.technion.ac.il/serveng/**
Description:	The subject of this course are Service Networks, specifically their Science, Engineering and Management. Service networks are models of telephone and Internet services, or banks and insurance, hospitals, airports, supermarkets, some transportation systems, and even more. (Course applications will emphasize telephone-based services.) The main theoretical framework for the course is Queueing Theory. However, the subject matter is highly multi-disciplinary, hence alternative frameworks (Statistics, Psychology, Marketing) will be useful as well. Empirical analysis involves real data from a call center that serves one of the Israeli banks. Practical analysis is based on the tool in 4CallCenters, that supports workforce management (Staffing).
Area(s)	Topics in the course unit include: Introduction to Service Engineering Measurements, Little's Law Measurements; Models - The Second Prerequisite Scaling and Dynamic Randomness; Poisson Processes Service Times Customer Patience G/G/1 and Multi-Server Service Stations ; Economies of Scale Skills-Based Routing (SBR) Queueing Networks
Course Unit(s)	N/A

SINGAPORE MANAGEMENT UNIVERSITY

University:	**Singapore Management**
School/Department:	**Information Systems**
Program Title:	**Service Science and Systems**
Level:	**UG pathway**
Web link:	**http://www.sis.smu.edu.sg/programme/2nd_majors/InfoSystems.asp #SSS**
Description:	This is a specialisation track of the Bachelor of Science (Information Systems Management) second major in Advanced Business Solutions. The aim of the specialisation is to encourage a collaboration between government, academia and industry to push the frontier of service innovation through education, research and talent development.
Area(s)	N/A
Course Unit(s)	Core units are: Computer as an Analysis Tool Enterprise Adaptive Decision Support

	War Gaming as a Business Tool Intelligent Agent Design and Application Plus options from IS and Business units

PEKING UNIVERSITY

University:	**Peking University**
School/Department:	**School of Software and Microelectronics**
Program Title:	**A Master of Software Engineering Program for Service Science and Engineering**
Level:	**MSc**
Web link:	**http://www.ss.pku.edu.cn/index.php?option=com_content&task=category&sectionid=22&id=233&Itemid=457**
Description:	Emphasis placed on learning the up-to-date service or application development, integration and provisioning skills as well as some fundamentals of software engineering such as software requirements engineering and quality assurance.
Area(s)	Introductory & General Data & Its Applications Enterprise Operations Application Development & Production SOA & Distributed Systems Domain-specific Topics
Course Unit(s)	Track: Service Solution Technologies Introduction to Service Science & Engineering Application Development & Production Platforms Data Warehouse & Its Applications Integrated Lab SOA & Distributed Systems Data Mining and CRM Software Requirements Engineering Track: Service Business Analysis Introduction to Service Science & Engineering Software Requirements Engineering Data Warehouse & Its Applications Project Management Enterprise Resource Planning & Integration Database Design & Implementation Data Mining and CRM Data Modeling & Decision Making Business Modeling

UNIVERSITY OF MANCHESTER

University:	**Manchester, England**
School/Department:	**Manchester Business School**
Program Title:	**Service Management**
Level:	**MBA Elective**
Web link:	
Description:	
Area(s)	
Course Unit(s)	

GENEVA BUSINESS SCHOOL

University:	**Geneva Business School**
School/Department:	
Program Title:	
Level:	
Web link:	
Description:	
Area(s)	
Course Unit(s)	

STEVENS INSTITUTE

University:	**Stevens Institute**
School/Department:	**School of Technology Management**
Program Title:	**MSc in Information Systems**
Level:	**MSc**
Web link:	**http://howe.stevens.edu/index.php?id=14**
Description:	Rapid advancements in technology, dynamic markets, and the changing global business environment have created increased demand for professionals who can lead, manage, and deliver information systems. This demand has been accelerated new competition, shorter product life cycles, outsourcing, and more complex and specialized international markets. Information systems professionals are required to lead and evolve information resources while partnering with corporate management. Organizations can ill afford IT professionals that are not effective at working closely with their business partners to identify innovative opportunities for leveraging IT for competitive advantage. Likewise, business people need to be more effective as they work closely with their IT partners. This program is designed for information systems professionals seeking to advance their careers in IT, for business professionals looking for ways to leverage their IT resources, and for academics that are preparing students for the challenges that await them. To meet the increasing need for professionals with the experience necessary to enable these important functions, Stevens offers a multitrack Master of Science program to help achieve your Information Technology career objectives.
Area(s)	
Course Unit(s)	Service Management Tracks: Business Process Management & Service Innovation IT Outsourcing IT Services Management Consulting Service Oriented Architecture Strategic Supply Chain Management Knowledge Management/Data Mining Systems Engineering

UNIVERSITY OF CALIFORNIA AT MERCED

University:	**University of California at Merced**
School/Department:	**School of Social Sciences, Humanities and Arts**
Program Title:	**Services Science**
Level:	**UG**
Web link:	**http://ssha.ucmerced.edu/2.asp?uc=1&lvl2=77&lvl3=77&lvl4=87&contentid=124**
Description:	The economies of most developed countries are dominated by services, as more than 75% of employment, gross domestic product, and many other macroeconomic measures attributable to the service sector. Even traditional manufacturing companies such as GE (70% services revenue) and IBM (50% services revenue) are adding high-values services to grow their businesses. Information services and business services are two of the fastest growing segments of the service economy. The rise of web services, service-oriented architectures, and self-service systems suggest a strong relationship between the emerging disciplines related to services and the more established discipline of computer science. Improving productivity in services often requires combining technical, social, and business innovations and effective combinations of these often develop naturally together. Cross-disciplinary knowledge and skills relevant to services now seem necessary for most college graduates. The minor in Services Science aims to provide these skills by drawing together cross-disciplinary courses to understand services from management, economics, engineering, and/or cognitive science perspectives. The minor comprises a specific course in services, several service-related courses taken outside the student's major area, and a project course in which student teams conduct research on aspects of the service sector.
Area(s)	
Course Unit(s)	

WRIGHT STATE UNIVERSITY

University:	**Wright State University**
School/Department:	**College of Engineering and Computer Science**
Program Title:	**Services Science**
Level:	**MSc**
Web link:	**http://knoesis.org/aboutus/courses/cs790-wi08/**
Description:	Kno.e.sis is a Center in the College of Engineering and Computer Science at Wright State University, founded as part of Ohio's Third Frontier program. Our cutting-edge research in the use of semantic and services science for data integration, analysis, and process management complements daytaOhio's mission to leverage innovation in data-intensive technologies for economic expansion. Kno.e.sis research focuses on realizing a knowledge society with semantics and services as key enablers. Our work leads to prototypes and their evaluation with the participation of academic and commercial partners, technology development and licensing followed by real-world deployment, and commercialization with our partner institution daytaOhio.
Area(s)	Service Science, Management, and Engineering (SSME), often referred to as Services Science, is emerging as a distinct field of study. It encompasses numerous areas relating to the increasing role of services in the world economy. In this course we will focus primarily on services computing, or the technical aspects of services science, and secondarily on the allied economic, business, and organizational aspects.
Course Unit(s)	The course will start with a rapid introduction to Web services and Web processes/workflows, including related technologies (WSDL, SOAP, UDDI) and then look at the emergence of semantic Web services (SWS) and processes (SWP), in which semantics is used to enhance design, annotation, publication, discovery, composition, and execution of services and processes. We will also cover the non-technical aspects that are key to the emerging service economy. This course is meant for advanced students with good backgrounds in programming. The course consists of a mix of lectures, seminar style discussions, exercises, a mid-term, and a small project (instead of final written exam).