

## Educating an Innovative Services Science Workforce

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### Abstract

Academic activities are major contributors to services innovation; however, there are significant challenges remaining. This paper describes identified needs for graduate and executive education programs in the area of service management and sourcing; focusing on the successful sourcing and provision of services.

### 1 Introduction

Services, and especially information-intensive services, are an increasing component of the global economy [Apte 2004]. World commercial services exports were valued at \$1,800 billion in 2003, while total outsourced IT services (excluding software) were about \$285 billion, of which offshored information technology (IT) and business process services were estimated to have been in the order of \$40 to \$45 billion in 2003 [WTO 2005]. The number of U.S. workers employed in the service sector has grown to approximately 8 out of 10 workers [Bretthauer 2004].

### 2 Educational challenges for services

A recent five-year study by the National Academy of Engineering (NAE) posited that integrated research and education at universities is a major contributor to innovation in the manufacturing and services industries through the flow of human resources [NAE 2003]. This report also emphasized that innovation and increased productivity in the services infrastructure have an enormous impact on productivity and performance in all other segments of the economy. However, it suggests that there has been inadequate focus and organization of the academic community with respect to meeting the needs of service businesses. The report identifies several major challenges to services industries that could be taken up by universities:

- the adaptation and application of systems and industrial engineering concepts, methodologies, and quality control processes to service functions and businesses,
- the integration of technological research and social science, management, and policy research, and
- the education and training of engineering and science graduates prepared to deal with management, policy, and social issues.

### 3 Educational Needs for IT-focused services

The IT Services Qualification Center (ITSqc) at Carnegie Mellon University is focused on the IT-enabled services (ITES) segment of the global market for services. ITSqc creates capability models and qualification methods to improve sourcing relationships and service management. Its research consortium includes organizations interested in the growth and development of this fast-growing segment as clients, service providers, advisors or consultants, and educators.

ITSqc has identified the need for graduate and executive education programs in the area of service management and sourcing. In course of its analysis of the global industry for ITES, the Center has defined organizational capabilities necessary for successful sourcing and provision of services. The eSourcing Capability Model for Service Providers (eSCM-SP) [Hyder 2004a, b] and the eSourcing Capability Model for Clients (eSCM-CL) [Hefley 2006] are best practice frameworks for developing and improving such capabilities. Executive education courses to introduce these models are available in several geographies and languages.

To better understand the graduate program needs, ITSqc conducted a needs analysis and hosted an international symposium on educational requirements [ITSqc 2004]. The topics identified were organized into twelve learning themes:

1. Managing customers and opportunities
2. Managing change and growth in business
3. Developing and improving organizational capabilities
4. Leveraging sourcing options for business advantage
5. Managing contracts and agreements
6. Managing knowledge
7. Design and development of service portfolios
8. Managing effectiveness and value in service delivery
8. Maintaining financial visibility, viability and control
10. Managing efficiency and responsiveness in service operations
11. Achieving control over assets and processes
12. Managing the service infrastructure

Each of these identified topics share several common characteristics:

- The topics directly relate to capabilities and processes that organizations would like to develop or enhance, rather than just focusing on tools or technologies.
- The capabilities and processes have a specific business context: the sourcing and provision of IT-enabled services. Organizations are interested in education with a direct impact on how they design, deliver, and support services, or on how they effectively and efficiently source IT-enabled services.
- The topics are spread across two intersecting planes. The first is the management of service management and sourcing lifecycles and value chains; while the second focuses on planning and execution at strategic, tactical and operational levels.
- Successfully teaching these topics requires a mix of learning from examples and experience, and learning from first principles.

### 4 Conclusion: A Call to Action

In examining the growth of the services industries, the current state of education and the identified educational needs, there is a need for curriculum and programs that address the problems, challenges, and issues of developing and deploying a workforce capable of innovating and providing leadership for the evolving services economy.

Carnegie Mellon University has taken leadership steps by inaugurating the first program to address these needs in the U.S. This program is offered as a Service Management concentration in our graduate Information Systems programs. Students in this concentration are currently completing coursework in IT program management, negotiations, contracts, service management, sourcing management, and process and capability improvement.

Carnegie Mellon is prepared to commit to a leadership role in a collaborative effort with other universities and thought leaders to create and make available a robust curriculum in services science, as we did with software engineering [Budgen 2003]. In that effort, a set of 25 curriculum

modules were created and widely disseminated to assist other faculty in developing their own courses in that topic. Additionally, the curriculum work served to support the emergence of a community in that emerging discipline, codify relevant knowledge, and motivate other related developments in the community. A similar effort focused on services science education could help to further stimulate service science education.

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