

HP Position Statement on Education for Services Innovation

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Service industries are a dominant factor in the success or otherwise of modern economies. Services are not only the primary form of economic activity in the developed world but also the key driver of economic growth in developing countries. In such an environment, service innovation is key to the development and maintenance of competitive advantage of economies, and thus it is critical that educational systems support such innovation.

We at HP have multiple perspectives on what constitutes Services Innovation, each of which carries its own educational challenges. We present two perspectives in this position paper. Our first perspective is to view services not as a new science, but as complex interacting systems where an ability to specify, engineer and deliver such complex systems is a strategic advantage - both between and within economies. Another complementary perspective focuses on services that are delivered by organizations to other organizations, in addition to services that are consumed by individuals. Innovation in this context consists of creating information, process, analytic, and organizational models that enable innovative ways of creating, designing, composing, and delivering services, enabling economies of scale to co-exist with economies of skill and scope.

Service Innovation as Systems Innovation

The view of 'services as systems' comes from decisions that are made about where boundaries of responsibility and visibility are drawn within these complex systems. Treated as systems, services are amenable to many of the 'traditional' approaches to analysis and control that have been developed in disciplines as diverse as psychology, control engineering and operations research. This is not to trivialize the many problems of specifying, engineering and managing large groups of complex interacting sub-systems, but by recognizing them as such, we can begin to discuss these challenges within established scientific and engineering frameworks.

What makes these 'systems' so difficult to work with? We would suggest a number of interacting factors:

- an explosion in the number of complicated systems that are being constructed and managed across all modern economies;
- a demand for dynamic coupling of these many systems (for example social welfare, taxation, and healthcare management within the United Kingdom);

- increased integration of subsystems with very different properties and priorities (politically driven social policy with information systems structure for example);

With fewer such systems we might survive by relying on the (relatively few) natural polymaths that emerge from our educational systems – people who combine cultural sensitivity with an ability to abstract and analyze and then manage. Our education systems, both in Europe and the United States simply don't generate enough of these individuals. Worse still, an increasing tendency to specialize as a reaction to greater complexity, combined with a steady decline in many of the 'hard' technical skills makes it probable that without significant changes we will see fewer such individuals emerge.

Our challenge must be to encourage the development of demand, supported by curricula that pull students with the appropriate mathematical and communications skills through high school, and then equip them with both the social and technical skills necessary to become effective systems engineers and managers. This is not a job for industry or universities alone. To be consistent with the systems approach we advocate, it is necessary to innovate across the complete education lifecycle – without an integrated partnership between government, industry and the education and research communities our services will continue to disappoint.

Inter Organization Service Innovation

While there is a body of knowledge around many specific service industries, such as health care, financial services, airlines, legal services, and hospitality, the consumers of the service is typically an individual. However, a similar body of knowledge does not exist for services that are created and delivered by organizations to other organizations. For many such services, one of the key challenges is how to 'industrialize' them while balancing economies of scale with economies of scope and skill. In primary and manufacturing industries, innovation can be categorized into product innovation, process innovation and business model innovation. One needs specific technical knowledge to perform product innovation and to some extent process innovation. These often form the basis of specific disciplines that are taught in colleges/universities today. We suggest exploring the role and educational requirements of 'offering innovation', and process innovation in the services context, especially with regard to services that are created and delivered by organizations to other organizations.

Service-specific innovation, or offering innovation in Services, involves some combination of the development of new technology and the creative application of existing technologies in order to create novel service offerings that either superior to the alternatives or else open new markets. We believe this type of innovation is already a major focus of higher education today, especially in industries such as health care and financial services. However, some other vertical industries may be interesting to consider as well.

Information Technology (IT) is a horizontal technical discipline known to improve productivity in various primary and manufacturing industries in addition to some services industries. Recent research by Jack Triplett and Barry Bosworth suggests that IT has had a great impact in service-sector productivity improvements as well. That said, we do not believe that there is a deep understanding of how this impact worked, or whether there are systematic ways of innovating in this space. We have some sense of the role of information technology in improving personal productivity by lowering the cost of interaction, but the role of information technology in improving process productivity in conjunction with personal productivity in services enterprises is not clear and can represent a potential opportunity. The key challenge is to get a handle on key sources of 'unsystematic variance' that does not create value, and to determine whether the service is a skill-based service or a scale-based service. As the body of knowledge around the role of IT in services productivity emerges, IT education in universities must shift if it is to address these gaps.

Any services organization manages people, and other assets/resources (e.g., airplanes, hospitals, medical equipment, hotel properties, data centers, support centers, etc.), technology, and processes. When the recipient of the service is also an organization, the resulting eco-system that enables economic activity to occur smoothly need to be better understood. An additional complication is that the consumers of the service as well as the providers of the service including the people, assets, etc., can be located anywhere in the world. With close-to-ubiquitous information connectivity, we need to be able to locate service capabilities in the optimal locations and enable the dynamic matching of service 'demand' with 'supply'. Just as 'supply-chain management' became a discipline that is now routinely taught in various schools, we can foresee the need 'service network management' to become an analogous area with a body of knowledge and techniques that can form the basis of new fields of learning.