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A Service Science Perspective on Higher Education

Linking Service Productivity Theory and Higher Education Reform

Robert Lusch and Christopher Wu August 2012

Introduction

Policymakers are currently wrestling with fundamental but complex questions about the future of higher education, including how to hold colleges responsible for the billions of dollars in federal financial aid money they receive and how to encourage lower tuition to increase affordability for low- and middle-income families. Answering these questions requires a better understanding of how colleges operate and how we can measure their productivity and efficiency. Marketing and education experts Robert Lusch and Christopher Wu explain how thinking about college education as a service can begin to answer some of these questions.

Let's start with the basics and answer this question: What is a service and how important is service in society?

Standard economic theory holds that the economy is divided into three major industry sectors: extractive (primary); manufacturing (secondary); and services (tertiary). The extractive sector includes agriculture, mining, timber, and fisheries—basically the extraction of natural resources. The next major industry sector is manufacturing of both durable and nondurable goods for either the industrial, government, or consumer market. Manufacturing is called a secondary sector because it relies upon the primary production of the extractive sector for many of the raw material inputs.

The third or tertiary sector, services, although often thought of as an intangible output, is essentially, for national accounting purposes, viewed as a residual of the other two industry sectors—in essence, what is not extractive or manufacturing is services. It includes many public (government employees) and private organizations across many industries such as finance, insurance, transportation, wholesaling and retailing, health care, entertainment, professional services such as legal and architecture, and literally hundreds of others.

Employment in advanced economies and those with high average household income usually have more than 65 percent of their employment and gross domestic product, or GDP—the largest measure of growth in an economy—attributed to the tertiary or services sector, with some economies being as high as 80 percent. And while the world's poorest countries continue to rely heavily on employment in extractive industries, the services sector is growing rapidly in developing nations as well.[1]

Because of the rise in ascendance of the services sector, there has been an increased interest by industry, government, and academia on understanding the determinants of productivity in service industries as well as service innovation. During the agricultural and industrial revolutions, economists focused a lot of their research and innovation efforts on these sectors and services were largely ignored. This began to change, however, around 15 to 25 years ago. Arizona State University was at the forefront of this change with the establishment in 1985 of an academic center focused on services research (co-author Robert Lusch was one of the center's founding faculty members), which later became known as the Arizona State University W.P. Carey School of Business Center for Services Leadership[2].

Later in 1998, Roland Rust, the distinguished University Professor David Bruce Smith chair in marketing at the University of Maryland, launched the *Journal of Service Research,* which today is undoubtedly the leading scholarly journal in the world in service research. Shortly after 2000, efforts at IBM Corp. accelerated around understanding services and Paul Maglio and Jim Spohrer at the IBM Almaden Research Center[3] led up an effort to advance the research and teaching of service, which was identified as service science, management, and engineering, or SSME.

Following IBM's lead, in 2007 the University of California, Berkeley, developed a formal service science, management, and engineering program around information and service design.[4] In 2008 a special issue of the *IBM Systems Journal* was released with 14 articles from thought leaders across various disciplines that intersect with service science, management, and engineering. In March 2009, 104 participants, representing 68 institutions from 31 countries, gathered in Helsinki, Finland, for a program focused on the development of SSME. This seminal event resulted in the publication of "Making Service Mainstream: A White Paper Based on the 2009 Service Science Summit."[5] Today universities and countries around the world are accelerating their efforts to understand service and service systems.

An interesting development arising out of service science, management, and engineering is a broadened and more sophisticated view of service—one that moves beyond merely viewing services as a residual to the extractive and manufacturing industries. More broadly and abstractly, service is being viewed as the process of doing something for another person (or entity) that is beneficial. Think of it as the act of helping another. Services (plural) often refer to intangible units of output that a firm produces.

For a university, for example, that could be the number of credit hours of education produced or number of degrees awarded. In what has become known as service-dominant logic,[6] or S-D logic, service (singular) is the focus. Too many universities are overly focused on producing credit hours or degrees efficiently (units of output) rather than offering and providing a set of services—instruction, credentialing, career support, food services—that lead to these outputs (credit hours and degrees) as an end result. To explain this better, let us discuss the different ways a service can be provided.

A service can be provided *directly* by doing something for the benefit of another person as in the case of a nurse or physician treating your illness or a restaurant chef preparing you a nutritious meal. Service, however, is also provided *indirectly* through a good. Thus a pharmaceutical drug provides health recovery service, while a pre-packaged nutritious meal that you can microwave provides nutrition service, and a textbook provides a knowledge-enhancing service.

In brief, service-dominant logic views goods as appliances or things you use to obtain a service. This may seem a bit extreme to the nonresearcher; however, in the global economy many manufacturing companies think of their offerings in this way. The American multinational conglomerate General Electric Inc., for example, measures the output of its airplane engine business in hours of thrust service for its airline industry customers and not just in terms of the number of turbines coming off the production line. For GE this is a competitive necessity as it allows for a far better understanding of how its customers actually use the manufactured good in the service delivery of their own businesses. In fact GE now focuses not on selling jet engines but on charging customers for hours of thrust service. Let's examine how this all fits in with approaching education as a service.

Higher education seen through a service science lens

This expanded view of business output allows for a much more holistic view of how, when, and where education actually happens and how individual student preferences and characteristics can drive the experience. No longer would we just view the teacher as the entity providing the service of education. The classroom and all of its tangible artifacts such as seating, lighting, and whiteboards are all part of the service provision. Thus the instruction itself combined with other supporting services (for example, tutoring, library assistance) constitute the *bundle of offerings that make up the service of education*. Thinking of education in these terms, a chair that is uncomfortable or a stifling hot and unventilated classroom can all become barriers to receiving the benefit of education. A chair can be viewed as a place to sit but it can also be viewed as a learning enhancement service.

For this reason, in service-dominant logic, all individuals and entities are viewed as resource integrators or service bundlers. The student in the classroom listening to a lecture is bundling many resources such as other students in the classroom, their notepad (elec-

tronic or otherwise), snacks they may be eating, pharmaceuticals they may have taken before or during class, and more. At first, expanding or extending the service of education to include students' health and nutrition circumstances may seem far-fetched, but the data on preschool and early childhood education are clear that investments in health care and healthy food for young children improve their learning outcomes.[7] Importantly, understanding the importance of investments in early childhood health care and nutrition integrated with education investments is essential to obtaining the higher-level cultural capital that education yields and that leads to a more productive workforce and, hence, economy.

At the very least, a service perspective provides us a means of holistically perceiving students' needs. Therefore, the value of a lecture is not something the instructor produces alone. The value of a lecture as service is always co-created with the students. Let's elaborate on this concept of value co-creation.

Value co-creation in a higher education setting

We need to begin by recognizing that any value that is partially dependent on the involvement of others is, by definition, a co-created value. And the increasingly specialized and differentiated division of labor in contemporary society creates more dependencies on others. Therefore much of the value that accrues from a service between multiple parties is co-created.

Let's consider the student-teacher relationship to illustrate this concept. A student and a teacher in the classroom are actually a part of a complex ecosystem[8] extending beyond the classroom and its tangible artifacts described earlier. Consider that the student had to either travel to class or go online and this involved a variety of appliances such as computers, the Internet, transport vehicles, and roadways to name a few. For working adult learners who seek to enroll in institutions of higher education, the data suggest that how they get to school from work is a very important factor in their ability to participate and persist in education experiences.

The needs of adult learners seen through this service perspective have clear implications for public policy from providing transportation services to decisions on where to locate new college campuses. Service-dominant logic provides an analytical framework for perceiving this issue as a key to successful service delivery.

Further, the student most likely had to purchase a book, pay tuition and fees, and obtain a loan or credit to pay these costs. For the professor to deliver a lecture, many other employees are behind the scenes such as administrative staff, IT specialists, janitors, and landscapers with each having to be compensated for their service. Service-dominant logic encourages an expanded view of the service, going beyond just the service provider and the beneficiary of the service (in this case a teacher and student) to be able to see the co-creative nature of value and service exchange as it is embedded in the education ecosystem.

To make this perspective even more realistic, it needs to be recognized that *the co-creative nature of value is dynamic and unfolds over time*. Unlike the "goods" conception of a degree (a definable and explicit valuable output), the service view of a degree recognizes the longitudinal and dynamic nature of the degree—affording knowledge, practices, and capabilities over the degree holder's life. Hence, the value of a degree is co-created by the use of the knowledge and skills the degree represents and that value is "time-released" over the lifetime of the degree holder.

It is essential that higher education recognize that what the university produces on campus, in the classroom, or online and packages to create an output (a college degree) is only the starting point of a longer process that co-creates value. A recent example of the unbundling of the college degree is edX,[9] the free online course of study that is the joint effort of the Massachusetts Institute of Technology and Harvard University. edX will offer certificates of course completion but will not issue credits through either Harvard or MIT. edX is an attempt by MIT and Harvard to provide service to those who are unable to gain admission or pay for courses at either of these elite schools but who still want to acquire education, skills, and recognition from these renowned institutions. edX is likely to compete with community colleges for a specific segment of the higher education service market—the segment that offers targeted instruction and credentials, without the bells and whistles of "traditional college."

As edX becomes established it may offer value to students who would never have access to Harvard or MIT but who will benefit from lecture and instruction services provided by elite professors (such as the current course offering in integrated circuits and electronics).[10] We will discuss how service science performance metrics can assist higher education in this dynamic co-creation of value in the following section.

Developing a service mindset

When we mentioned that goods are appliances or things you use to obtain service, another way to view this is that customers "hire" products to get jobs done.[11] When you want clean clothes, you "hire" a washing machine and detergent to help you do your laundry. Likewise, you "hire" Zipcar to provide automobile transportation service. With this approach in mind, colleges need to ask themselves: What is the job that students need to get done? In answering that question we'll begin with the individual student and then expand outward to discuss the role of higher education in society at large.

As we discussed earlier, in an interdependent, specialized economy, every person uses and provides service. Therefore an individual needs to be able to develop talents that encapsulate knowledge and skills that they can then exchange in a market economy for the things they need for their survival and well-being. Therefore, the job to be done for students by colleges and universities is the development of a variety of marketable

talents in addition to preparing them for "life-long learning," which is a shorthand that recognizes the unpredictability of career paths and economies. And while this is the case, frequently young adults 18-to-22 years old (recognizing there is a wider age range and more diverse work experience in community colleges) do not have a clear idea of the purpose of their schooling.

Let us take a moment and expand on this thinking. When we provide service in a market economy, we obtain "service rights"—the rights or means to receive service from others through the exchange of wages or pay for that service. One way to look at the student's job to be done via higher education is the student's ability to translate knowledge into employable knowledge and skills that can be used for earning a living that in turn translates into obtaining service rights. In a larger societal sense, the job to be done by higher education vis-à-vis a student is economic growth and societal well-being.[12] Economic growth is easier to measure than the improvements in societal well-being; however, service science attempts to recognize both. For societal well-being there needs to be some means to support the public good or commonwealth. In a democratic society this means that informed and responsible citizens are needed and thus from a societal perspective one of the jobs to be done by universities is the development of these types of citizens.

By developing a service mindset, universities are more easily able to recognize the interactive nature of education in delivering the economic and societal well-being outcomes noted earlier. Each actor in the system (whether student or institution) must bring awareness of these outcomes and how a service journey would be co-created to deliver each with the particular actor/student in mind. The actor then develops a shared vision and plans to get that job done.

Drawing on notions of performance-based contracting, which is growing in popularity in service science and management practice, universities can begin by engaging students or other relevant stakeholders in a conversation about how they define the job they are trying to accomplish utilizing their college education. What they are likely to discover is that the typical metrics for higher education productivity (see the National Research Council's "Improving Measurement of Productivity in Higher Education" for a traditional discussion of graduation rates, completion-to-enrollment ratio, time to degree, cost per credit/degree, and student-faculty ratio)[13] do not address the "job to get done" perspective of the student and other stakeholders. This gets back to the old marketing adage: People don't want to buy a quarter-inch drill. They want a quarter-inch hole.

The product form is simply a medium to achieve a certain end or outcome, as such the college degree is a means to some job the student or stakeholders need accomplished. The challenge, therefore, will be defining meaningful post-degree completion objectives and collecting performance data on these objectives for colleges and universities in order to set up appropriate incentive structures for higher education.

We are always careful about suggesting for any industry or enterprise what customer- or stakeholder-defined value comprises and how to measure it. What we can emphatically state, however, is that it must reflect some measure beyond a measure around units of output (degrees, credit hours, and the like). In the spirit of getting you thinking about alternate measures, consider a measure of the percentage of graduates that are able to begin paying off educational loans six months after completion (this would exclude those whose loans are deferred because of further graduate or professional education). A longer-term measure may be the percentage of graduates who have incomes above the median income (adjusted for age) for the country. A noneconomic measure might be the percentage of graduates who believe they are properly employed and not underemployed, measured at 12 months, 48 months, and 96 months after graduation.

Guidance for university leadership

A service view of the university ecosystem recognizes the relational nature of exchange between students, faculty, staff, higher education institutions, government, and other related actors. Universities, therefore, need to develop *an architecture of participation where actors connect and collaborate through a shared vision*. For this to occur there must be a pervasive fabric of trust between the various actors comprising the university ecosystem. This means higher education leadership must develop a strategic approach to building and enhancing their institutions in a way that is much more focused on collaborating, sensing, responding, and learning from the journeys of students through education experiences as they accomplish the "jobs to get done" perspective.

Higher education institutions must be much more prepared with each student to articulate a sustainable shared vision. In a sense-and-respond world, speed drives decision making, making agility and resiliency critical determinants of success. There is little time for formal and time-consuming strategic planning when the world is changing quickly and often chaotically.[14] A university leadership team needs to develop meaningful collaborations with all stakeholders, develop the capability to sense shifts in stakeholder wants and needs, develop relatively rapid responses to improve service offerings, and learn from both mistakes and successes while celebrating accomplishments. In a service science framework, strategic and tactical distinctions become intermingled as real-time collaboration, sensing, responding, and learning continuously unfold. Strategy is no longer engineered but is more of an emergent property of the collaborating, sensing, responding, and learning enterprise.

In a university ecosystem *the network is the strategy*. The typical institution-based boundary of external environment and internal organization is recognized as a conceptual rather than "hard" boundary. The "internal" university infrastructure may be viewed as a talent marketplace—an economy of resources that can be exchanged. The "external" environment may provide collaborations that are mutually beneficial rather than purely competitive, but also where graduates must market their talents.

In other words, the actors (other colleges, government, alumni, prospective students, and faculty) that the university develops its relationships with result in a university ecosystem without a hard organizational boundary. Consequently, strategy will increasingly be about joint ventures and collaboration in a system of open innovation and co-creation of value. The example given of edX[15] represents an online example of elite co-creation (using MIT's online learning platform and joining with Harvard's *prestigious* brand). Unlike elite institutions, the less-selective colleges and universities, which serve close to 85 percent of all college students, need to recognize how they might leverage partners to co-create valuable education experiences with and for students.

Service logic changing higher education policy

A service perspective, in which students and higher education institutions co-create value, certainly encourages policy analysts and policymakers to consider several issues in the realm of higher education.

Firstly, if service is applying knowledge and skills for the benefit of another person or entity, then society needs an inventory of the knowledge and skills (talents) of its citizens. The industrial notion of labor forecasts for particular occupations may give way to ensembles of service that are not easily categorized by traditional job titles. This can be clearly seen in the fluid changes in information and communications technologies professions.[16] From a service perspective we may find the knowledge and skills of a master auto mechanic to be similar to those of a computer technician. Likewise the knowledge and skills of a market researcher could be comparable to those of a policy analyst. *In brief, what are the knowledge and skills the nation needs over the next few decades and where are the gaps*?

It is no longer sufficient to set higher education goals in terms of degrees and types of degrees produced—this is an overly output-based focus. The more important metric is the development of knowledge and skills that get bundled into a package that we call a degree. Recent work by the Georgetown Center on Education and the Workforce takes a fresh look at what skills underpin given credentials and what credentials are of more value than others.[17] This early work provides an opportunity to begin to unpack the knowledge and skills needed in the service-oriented global economy. Also the emphasis on T-shaped skills,[18] where a person has breadth across multiple disciplines but depth in a specific discipline, helps develop people who can better work in the cross-disciplinary collaborative teams that are increasingly a part of all organizations and work settings.

Secondly, if a college education is not a solitary service but is instead *a dynamic, time-released value, co-creation process*, then how do we evaluate a university or higher education institution? Are we too focused on students rolling off the college and university production line and the cost of their education, versus focusing on the time-sequenced benefits as they dynamically unfold? What does this mean for outcome-based education, when the

real outcome occurs over decades? And how do we evaluate co-created value played out over a working life of 40 to 50 years? At the very least, policymakers, students, and family members need to consider measures of value that incorporate future returns.

The Center for American Progress's Quality/Value Index, introduced in the paper "Disrupting College: How Disruptive Innovation Can Deliver Quality and Affordability in Postsecondary Education,"[19] is an initial attempt to incorporate this type of "service-dominant" metric. One component of the Quality/Value Index is to divide the total cost of a college education by a student's earnings over a 10-year period. While such a metric necessitates consideration of exogenous factors, it begins to get at key issues in the co-creation of value in college education experienced over time.

Thirdly, how do we pay for higher education? The current model is that a college degree or credit hours are units of output that need to be priced and paid for or financed today. This is the way that GE used to sell jet engines but today they sell thrust service and airlines pay for thrust by the hour. It is the same model used by the car-sharing company Zipcar, where their customers pay for car service by the hour. Essentially these are performance-based contracts where the beneficiary pays for the performance of a service as it occurs.

So what is the analogy for financing higher education? Well, unlike a jet engine or the use of a car for an hour, the service provided by a university education is time-released over decades. Consequently, is it now possible to begin thinking of a system where a university offers, in lieu of tuition paid upfront, a "service-level agreement" binding contract requiring a graduate to pay a set percentage of his or her income for life to the university? Or how about a system where the government rebates to a university a percentage of the income taxes paid by its graduates if the university provided them a free or heavily subsidized education?

While these approaches are at present theoretical, in light of current higher education funding models, they take into consideration approaches to managing service performance from other sectors and as such provide a new way of thinking about higher education funding and accountability. In fact, initiatives such as the Student Achievement Initiative,[20] enacted in September 2007 by Washington's State Board for Community and Technical Colleges, are moving to performance-based funding by making higher education institutions responsible for students achieving key milestones along their education journeys as a prelude to completion (receiving a degree). If other states follow suit, we may begin to see a funding regime that much more closely fits a service paradigm.

Finally, what can be done to foster a resilient and adaptive education ecosystem? Specifically, how do we encourage collaborations between key service providers? Additionally, how do we move from proprietary systems to more "open-source" components for mutual and beneficial gain (value co-creation)?

Public policymakers and institution leaders are struggling with these issues at this very moment. As they search for answers, we suggest there are lessons to be learned from the health care industry. There is now a continuum of integrated delivery systems[21] from full integration—for example, Kaiser Permanente's closed system—to unbundling ownership of hospitals—as is being done at Seattle-based Group Health cooperative[22]—to Michigan's Grand Valley health plan,[23] where there is an analogy for these integrated health delivery systems to "rent" rather than "buy" their hospitals.

Higher education is also evolving through traditional online models such as the University of Phoenix and Western Governors University, in which virtual (online) higher education continues to grow, along with the rise of massive open online courses[24] such as Coursera,[25] edX,[26] and Udacity.[27] The possibility of unbundling the bricks-and-mortar brand of higher education from the online brand is analogous to how transportation services can enable greater access to a university education. Currently, a number of bricks-and-mortar universities have online brands that provide access at a lower cost (especially for special population segments such as military personnel and stay at home parents) by unbundling the classroom and residential experiences, while still providing credentials of completion (degrees and certifications). Moreover, massive online open courses, which are still in the formative stage in their business models, promise a scalable and lower-cost model of higher education. This approach may have its greatest growth in low-density population areas—for example, rural communities—where institutions are scarce, and in developing countries where Internet access continues to rise.

Conclusion

Dominant logics or set interpretations of how to succeed are hard to change. But in times of turbulence and upheaval, it is important to be receptive to changing frames of reference and alternate ways to be responsive to new logics. Higher education is experiencing one of these turbulent upheavals where it is difficult for university and college leaders to separate the noise from the signal. We suggest an increasingly audible and clear signal is emerging that provides a strong message: The "product" of education is a co-created learning service. The new logic that can guide thinking, strategy, and public policy in this era is service-dominant logic.

About the authors

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