Overview:

Science, Technology, Engineering and Mathematics (STEM) disciplines are already playing a critical role in the design of service offering in almost every sector of the service industry. A recent report published by The Royal Society of UK entitled “Hidden Wealth: Science in Service Sector Innovation” (see http://royalsociety.org/page.asp?id=8691) indicates that over 80% of the STEM graduates find jobs in the service sector and help to drive transformative innovations. Broadly speaking these high value service areas include financial, business, healthcare, environment, and education. Technology underlies many “transformative service innovations for business and society.” In the same report, there are 27 recommendations for STEM–driven service innovation with a focus on design to integrate across discipline silos. Real-world systems do not neatly conform to STEM or other discipline boundaries. The report concludes “there is a clear requirement for a genuinely new approach to multi-disciplinary education which is more focused on the characteristics of services and service systems. This need is only going to grow in future”.

In today’s world, quality of life depends directly on the quality of service from many complex, natural, business and societal systems. Unfortunately, service is often invisible (i.e., “Hidden Wealth”) until something goes wrong - such as a failure of the electricity grid or the financial system. Because of the growing economic significance of service to regional economics and the complexity of the underlying service systems, a greater focus on science-driven service innovation can lead to an increase in high quality jobs and improved competitiveness in the global economy.
and service systems design. **Service** is an act or series of acts in which providers and clients co-create value. A **service system** is a value co-creation configuration of people, organizations, technology, and information that provide benefits to customers. **Service science** is the (multi-disciplinary) discipline that systematically studies service (value co-creation) and service systems. Service science requires curricula, training, and research programs that are designed to teach individuals to apply scientific, engineering, and management disciplines that integrate elements of computer science, operations research, industrial engineering, business strategy, management sciences, and social and legal sciences, in order to encourage innovation in how organizations create value for customers and shareholders that could not be achieved through such disciplines working in isolation.

A call for more high-skill, high-value "Design" emphasis in the multidisciplinary training of a next generation workforce is strongly recommended to address an urgent need. Indeed, some have suggested that SSME should really be SSMED to demonstrate the importance of design. Real-world design experience is the best way to ensure both that students are engaged (e.g., NCM.org report on Challenge-Based Education) and that graduates are prepared to work well in teams with a focus on service system innovation:

Designing and managing these systems, and the problems they pose, will require the development of theories and tools to cope with the systems’ lack of predictability. This will involve integration of knowledge from social science, management science, economics, and STEM disciplines. Insights from studies of complex systems in other areas, such as biological ecosystems, may be particularly valuable in areas as distant as financial systems...Developing effective solutions to many of the major intractable social, economic and natural challenges facing society (e.g. low carbon futures, poverty and threats to public health) will frequently require extensive scientific research. But implementing these solutions will increasingly involve services organizations...In light of these challenges and opportunities; we believe it is necessary to increase the scale of cooperation between services and the academic research community (including the STEM communities) by developing common research agendas and building research communities.

Perhaps more difficult is how to address the lack of T-shaped people. It should be stressed that the concept of the ‘T-shaped professionals’ refers not simply to the equipping of STEM graduates with ‘business skills’ (e.g., CGS.org advocating for Professional Science Masters or PSM degrees) —it requires much more. Domain knowledge and technical knowledge of tools to model, simulate, analyze, optimize, and redesign real-world business and societal systems are needed. High-value, high-skill workforces can only be sustained by improving their IT (Information Technology) competence and refreshing their focus on high-demand areas for business and societal innovation. We believe it is inevitable that the demand for these types of graduates will increase in the future.

Industry’s growing need for service-oriented education, research and innovation has been well recognized for a number of years (e.g., US National Academy of Engineering 2004 report on impact of universities on industry innovation). As an example Xerox services lead engagement business, which helps large corporations to better manage their document-intensive processes and enterprise output management is a fast growing business. There are similar growth trends in service revenues and profits
from IBM, LM, EK, and some of the other NYS corporations. Globalization and increased competition have forced US industry to move up the value chain from low cost manufacturing to high value systems engineering and design with associated high end services and solutions. This begs for the need to build talent and infrastructure that better enables innovation in services, and we believe NYS has a unique opportunity to take a leadership role in service science research and innovation @ NYS.

**The Proposal:**

We propose that a **Center of Excellence for Service Innovation** be established in New York State to: 1) Motivate and incent research and education in high skill, high tech, high value service innovation among NY State’s institutions of higher education. Our goal is that this be “needs driven”, with emerging needs being communicated through the many stakeholders, followed by research and development to meet those needs 2) Expedite technology transfer of these research findings from the laboratory to application in industry and the University classroom, 3) Employ multidisciplinary education and training to enhance the capacity and development of next-generation of individuals and service offerings while maintaining the highest standards in STEM education.

The preferred structure of the Center would be based on the “Hub and Spoke” model allowing an entity and the physical presence for governance and coordination at the hub. The specific services science education and research would be carried out by the spokes at various locations.

**As an example**— Rochester Institute of Technology (see RIT President Destler’s letter to the Task Force membership) could serve as the hub: coordinating and promoting the service innovation activities throughout the entire enterprise. One spoke could include the major emphasis on financial services innovation at New York University (NYU). Their ongoing research and learning in financial services would be enhanced by connecting with the resources available through the rest of the Center, including collaboration partners, joint grant opportunities and additional sources of information. Their results would be disseminated and have greater impact by being communicated both from NYU, the Center hub at RIT and at other spoke sites.

The hub-and-spoke model allows individual partners to focus on specific elements within the broad subject of Service Innovation, allowing spoke sites to enhance their individual reputation along with that
of the Center. In addition, this model allows for closer coupling of Universities to their local, regional and metropolitan service systems.

An alternative organization of the Center could be as a single governing location that serves as the point of contact, and submits potential projects to the affiliated sites, who serve as “outsourcing partners”. We feel the collaboration and incentives provided by the hub-and-spoke model make it the superior structure for the Center.

**Expected Impact**

- Enable NYS services industry to “move up the food chain” by help design Service systems via co-creation. These new services will create economic value in New York State, while building our national reputation as a leader in this important area.

- Develop new competency to produce professionals in service sciences ready to design, execute, lead and manage services innovation in every sector of the private and public economy.

- Proactively help meet the fast growing public and private sector future talent needs while participating in the national “call to action”—the America COMPETES Act.

- Enable STEM graduates to stay in the State of New York helping local economy.

**Potential Funding Model:**

To achieve the proposed broad collaboration across Government, Academia and Industry, the key needs are faculty and other researchers, private sector research and development talent, staff, facilities and additional coordination and marketing resources. Universities like RIT have established records creating and managing these Centers. RIT alone hosts over 50 labs and centers across 30 disciplines. The financial resources to fund these groups are highly variable; however based on recent examples, an initial estimate of founding grants would be around $10 million for the center. These monies might be acquired through a variety of sources, including State, Federal and Private sector. The example value map below demonstrates some of the value exchange possible with the proposed Center.
Source of this proposal:

- Build on the on-going dialogue with IBM, Xerox, Oracle,--------.
- Learning from NCSU, Berkley, ASU, UM, -------.
- Recent Royal Society of UK report and Jim Spohrer Blogs
- “Experts Point to 5 Emerging Majors”: Service Science, Health Informatics, Computational Science, Sustainability, and Public Health

Higher Education Partners

- Potentially: RIT, Cornell, Clarkson, NYU, CUNY, UOR, and RPI. We continue our dialogue to invite additional academic and industrial partners

Metrics used to measure impact:

- Will work on it later

Champions: Interest and Support

- Jim Spohrer and Linda Sanford (IBM) and Santokh Badesha and Steve Hoover (Xerox)
- President Bill Destler and Dean Ashok Rao (RIT)
- Paul Horn (NYU)
- Gillian Small and Sanjay Banerjee (CUNY)
- President Anthony Collins (Clarkson U) and STEM Deans
- Rohit Verma (Cornell U) and Joe Thomas (Cornell) and STEM Deans.
- Mar Zupan and Edi Pinker (UOR)

**Best Practices /Examples:**

- North Carolina State University, Arizona State U, U Maryland, UC Berkeley.
- A significant number of international universities (Jim Spohrer has the details)

**Relevant Data:**

- Wendy Murphy and Jim Spohrer of IBM have extensive data and are the champions of service science education.
- UK Royal Society on Hidden Wealth: Science in Service Sector Innovations
- Service Science coalition
- Services Research Innovation Initiative (SRII)

**Supporting Documents:**

Can provide later if needed.
December 2, 2009

Dr. Sananick Barbash
Xerox Fellow and Manager, Open Innovation
Xerox Corporation,
800 Phillips Road, Mail Stop W147-59C
Webster, New York 14580

Dear Sananick,

Thank you for sharing with us your ideas and draft proposal for a STEM center (Center for Excellence for Services Innovation) to be established in New York State. The service sector is clearly a large and growing entity with potential for great expansion and job creation in the 21st century.

The City University of New York (CUNY) recognizes the importance of services such as those provided by Xerox, IBM, Kodak, etc., and we understand the role of research relative to this sector. At CUNY, we have many entities that could interact well with such a center. There is clear potential for collaboration with the Lawrence N. Field Center for Entrepreneurship at Baruch College, for example, as well as with our nursing programs and STEM research centers to name a few.

We would be happy to work closely with you and colleagues at other institutions in the state to advance education and research in the dynamic discipline of service science and to pursue applications to industry. CUNY supports your proposal and looks forward to playing a seminal role in the development of the Center for Excellence for Services Innovation.

Please feel free to contact me should you require additional input into this exciting project at this time.

Sincerely,

[Signature]

Gillian M. Small
Vice Chancellor for Research

cc: Interim President Stan Altman, Baruch College
To: The Members of Governor’s NYS Economic Task Force

From: William W. Destler, Ph.D.

Date: September 2, 2009

Sub: Services Innovation Research Center/Institute (SIRC) proposal support

The service industries have been growing significantly over the past several decades. And, innovation in these service industries is critical for the US to maintain a competitive edge over global competitors. I firmly believe NY State can seize a leadership position by encouraging academic institutions in the state to educate professionals and conduct research in the service sciences.

In Western New York, Xerox, IBM, Kodak, and others are committed to growing their service operations. They recognize the need for technical graduates familiar with the STEM (science, technology, engineering and mathematics) disciplines and conversant with multidisciplinary skills including management and the arts. IBM has been promoting this as the “T-shaped” individual – deep knowledge in technical areas with a broad understanding of implications for people and the environment.

My business management and engineering teams are excited about the proposal which has been put forward by the Industrial Advisory Council, led by Xerox. This proposal has my full support for a jointly funded center for services innovation in NY State. In addition, we are willing to establish such an entity at the RIT campus due our strength in STEM, Information Sciences and Technology, the arts and business management.
NEW YORK UNIVERSITY

Office of the Provost

J. HUNT HONAN
Distinguished Scientist in Residence &
Edward W. Clark Professor of Research
Department of Economics
New York, NY 10021-6390
Telephone: (212) 998-5328
E-mail: honan@nyu.edu

3/7/19

To: Members of the Governor's NYS Economic Task Force

Re: Services Innovation Research Center Institute (SIRC) Proposal

Today, various service industries dominate the New York State economy, and growth in these industries represents the single most important opportunity for the future of the state. It is sometimes believed that service businesses are low-wage, labor-based enterprises that generate only low-wage jobs. Nothing could be further from the truth. A services economy fueled by innovation can be vibrant and exciting, generating challenging new jobs. One need only look at companies like Google, Amazon, and IBM. While quite different, all are growing based on a services paradigm.

To be a leader in this growing economy, we need a workforce skilled at the interface between the business and technical disciplines, and we need support for innovative research in this multidisciplinary space. It is for this reason that we at NYU support the proposal which has been put forward by the Industrial Advisory Council, led by Xerox. Our strength in business and the Stern Business School, and technology (with the addition of the NYU-Polytechnic Institute) makes NYU a natural participant. We would be excited to contribute these strengths to this initiative.

Sincerely,

J. HUNT HONAN
Distinguished Scientist in Residence and
Assistant Vice President for Research.
September 14, 2009

To: The Members of Governor’s NYS Economic Task Force

Re: Services Innovation Research Center/Institute (SIRC) proposal support

Today, innovation is the key to economic success. As this has become a fundamental economic reality, the service industry has seen exponential growth. For the US to maintain a competitive edge in the global marketplace it is critical that these two phenomena be brought together. NY State can seize a leadership position by encouraging academic institutions in the state to educate professionals and conduct research in the service sciences.

In Western New York an effort led by Xerox, IBM, Kodak and others has developed growing their service operations. They recognize the need for technical graduates familiar with the STEM (science, technology, engineering and mathematics) disciplines and conversant with multidisciplinary skills including management and the arts. IBM has been promoting this as the “I-shaped” individual – deep knowledge in technical areas with a broad understanding of implications for people and the environment.

At Clarkson, we are encouraged by the proposal which has been put forward by the Industrial Advisory Council, lead by Xerox. This proposal has my full support for a jointly funded center for services innovation in NY State.

Sincerely,

[Signature]

Anthony G. Collins
President
To: Members of Governor’s NYS Task Force on Economic Development

From: Rahit Verma, Ph.D.  
Professor and Executive Director, Cornell Center for Hospitality Research  
School of Hotel Administration, Cornell University  
Phone: 607-255-2688  
Email: rahit.verma@cornell.edu

Date: November 19, 2009

Subject: Multi-University Services Innovation Research Center/Institute (SIRC) proposal support

There is ample evidence that a well-designed and developed service system is a representation of “quality of life” in societies. Furthermore, in most of the modern economies, the service sector now not only accounts for close to three-fourths of total employment and value-added, but also accounts for the largest employment growth. Some scholars even argue that several nations have become so service-oriented that they can be described as “experience economies.” Recognizing the importance of services, many traditional manufacturing firms (e.g., IBM, Xerox, Kodak) are also turning to services for growth. Therefore, my colleagues and I firmly believe that to take a leadership role in the fast-growing service-based economy, we must make research related to the service sector a priority.

The Cornell Center for Hospitality Research (CHR) was founded on the similar premise over fifteen years ago. Now CHR is the leading source for quality research on and for the hospitality and related service industry. It creates new knowledge – and shares that knowledge to power hospitality forward. At roundtables and other meetings, Cornell faculty, CHR corporate partners, and other industry leaders collaborate to frame timely issues and understand important topics. Center Research Fellows work with business leaders to develop new ideas, theories, and models that improve strategic, managerial, and operating practices. These insights are captured in research reports and industry tools that are available online at no cost thanks to the support the center’s affiliates and partners including over 75 leading hospitality and related service companies worldwide (see complete list of CHR affiliates at: http://www.hotschool.cornell.edu/research/chr/relations/affiliate/). Hundreds of thousands of academic and business leaders worldwide tap into this research stream. An active knowledge-sharing program further distributes the center’s work around the globe. The center also publishes the award-winning hospitality journal, the Cornell Hospitality Quarterly.

On behalf of Cornell faculty, the CHR would welcome the opportunity to participate in the Multi-University Services Innovation Research Center/Institute (SIRC) proposal being developed for the Governor’s NYS Task Force on Economic Development. We will be happy to collaborate with researchers at other institutions and also serve as the hub for SIRC activities within Cornell. While we can clearly lead the research efforts related to the hospitality industry, the activities at Cornell could also include research on retail and healthcare services. For example, within Cornell University the CHR already collaborates with faculty members at the School of Hotel Administration, School of Industrial and Labor Relations, The Johnason School of Management, Cornell Law School and the Sloan Healthcare Administration program and other research units (e.g. Center for Sustainable Global Enterprise; Pillsbury Institute for Hospitality Entrepreneurship; Center for Real Estate Finance).

Please feel free to contact me if you need additional information about CHR.
November 25, 2009

To: The members of Governor’s NYS Task Force on Economic Development

The service sector has become an increasingly significant part of the US economy and employer of highly educated labor. Innovation in services is critical for continued economic growth and in New York State this has become clear as leading technology firms such as IBM, Xerox, and Kodak have made major commitments to developing the services side of their businesses. Be it in information technology, healthcare or finance, a competitive service industry leads to economic growth and high wage employment. A robust and innovative service sector requires a steady stream of graduates with training not only in STEM (Science, Technology, Engineering and Mathematics) disciplines but also with the business management training to understand how to integrate technical innovation with business practice.

The Simon School of Business at the University of Rochester has recognized the importance of services science research, innovation, and training and has thus created the Center for Information Intensive Services (CIIS). CIIS seeks to foster interdisciplinary research on services, promote interaction and collaboration with the business community and to drive curriculum innovation to help produce the types of workers needed by service sector businesses. It draws upon the Simon School faculty’s long tradition of thought leadership in the area of service sciences and engineering. They are internationally recognized for their research on Business Process Outsourcing and Design, Call Center Management, Corporate Information Services, Financial Services, Medical Informatics, and Supply Chain Logistics Integration.

The Simon School, through CIIS, welcomes the opportunity to represent the University of Rochester in participating in the initiative to establish a New York State Center of Excellence for Services Innovation. In particular the Simon School can naturally fulfill the leadership role on healthcare in this effort. Many of our faculty are actively involved in healthcare research and we have also established a Center for Healthcare Management offering a Masters in Medical Management degree program and developed strong ties with the University of Rochester Medical Center the main medical research center in Western New York. In addition to healthcare the Simon School can collaborate with our colleagues in this multi-university initiative in other areas drawing upon our excellence in Finance, Entrepreneurship, and Pricing.

The proposal for establishing a New York State Center of Excellence for Services has my full support and I look forward to the Simon School playing a core role in this effort.

Sincerely,

Mark Zupan
Dean

202H Carol Simon Hall · P.O. Box 270100 · Rochester, NY 14627-0100
585.275.3316 · 585.275.0095 · fax: zupan@simon.rochester.edu
Rise of Services Economy World Wide

- Largest labor force migration in human history underway... we are becoming a world wide services economy.
- Mega Trends: Technology, Demographics, Health, Business Economics, Political Systems, Environment, Society & Culture
- Macro Trends: globalization, greening, Document communication, knowledge work, digitization etc.
- Role of services innovation is key and for that availability of critical skill sets is needed.

Source: 2006 IBM Study based on national labor data