

A critical analysis of innovation management in service sectors

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Abstract: The number of innovation management literature grew considerably over the last four decades. This led to an increasing amount of different models of innovation processes. Actually, in this paper we tried to define management innovation as the invention and implementation of a management practice, process, structure, or technique. The most utterable words in management sector are 'innovation' and 'organizational change'. By becoming more innovative is the top most priority of the business leaders or CEO's of big industries. Here, we gave a critical overview of this new technology which is being implemented in the service sector as a need for today's business world.

Keywords: Innovation management, service science, organization, change, service sector.

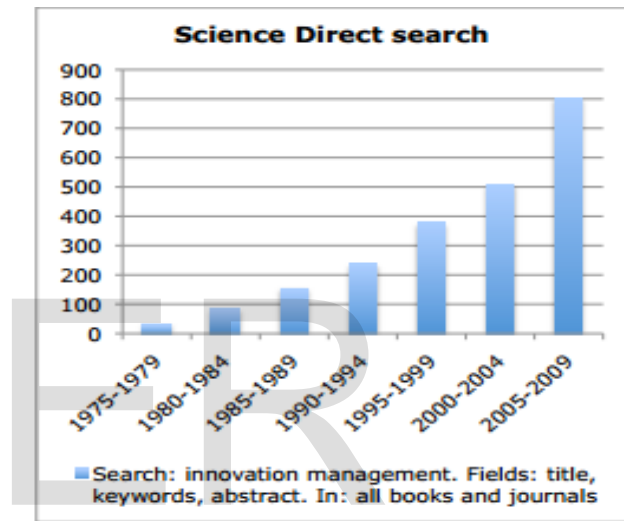
Introduction:

Actually the service sector is huge. It could make or break a nation's economic competitiveness easily. The knowledge services of innovation breed new economic activities and enterprises, and spawn further innovation. So normally a question rises here, what is new here—that we do not already know. The field of service studies is indeed very old. However, the newness may be the

realization that what we already know is just the beginning of an emerging story. Such an example if computing is being made a service then should manufacturing, energy, and agriculture also incorporate the service paradigm as a means to improve and even reinvent themselves? The story should progress to new genres of manufacturing, agriculture, energy, healthcare, and all other sectors of the economy, as well as the traditional service sector. The transformation should

have the promises to make the economy more sustainable and equitable as well as efficient and advancing so a new service led revolution will result reminiscent of the industrial revolution. A new science will consolidate results in the field and support the change. Service is a well-defined concept, but service science is not. In fact, the notion that the world needs a new service science could be perplexing. (Hsu,C.2009).Whether service holds the key to global competition and the future progress of humankind; or it just follows the lead of break-throughs elsewhere, such as technology and industrialization? Is service the locomotive of the economy, or the load on the locomotive? Then, why are many serious people on the industry and academia alike, urgently calling for a new service science, as evidenced in the Cambridge Paper by a service coalition(Cambridge 2008)? Why has there been a never ending parade of many other compelling calls under various popular banners in recent years, that consistently suggest the need for new basic scientific knowledge similar to the call of new service science ?They are unequivocal evidence affirming the existence of major basic gaps in the accumulated body of knowledge. One could recall the popular outcries of the challenges of the productivity paradoxes (e.g., the investment on information technology versus the lack of gains on productivity in the service sector),of the information revolution, and of the digital economy. To many, the science of service already exists, in the form of knowledge accumulated over thousands of years from the continuing practices of service activities .The knowledge, in the eyes of the beholder, could refer to the scientific studies of service operations ,systems technologies, enterprises and industries, in the literature of management, engineering, and science as the substance of the service science. In this view, service science is an umbrella name for all these results. As such the service science has a natural-born research paradigm to accompany it—the application-dominated

theory building and proof to meet the requirements of a philosophy of science. This view renders any call for new service science, based on the sheer size of service alone to be scientifically ambivalent or even outright frivolous.(Cheng Hsu,2009) The learned people in this field say that the field's practices and precepts have been around for 20 years. However, work on formalizing it into a focused discipline didn't begin until 2004, when IBM hosted meetings on the subject for a number of universities and corporations.(Linda,P.)



Innovation:

“Basic research is what I am doing when I do not know what I am doing.”

-----Dr.wehrner von Braun.

Before a definition of innovation can be discussed, the related term ‘invention’ must understood. Florida considers invention as a breakthrough and innovation as an actualization (Florida,1990).”Innovation generally lowers the cost of responding to a change in the commercial environment”(Wallace,1995).Thus, innovation has the connotation of market influence. Services have become more innovative in both technological and non-technological ways. Services industries are strongly associated with technological innovation via the uptake of new technology

incorporated in new equipment and capital goods.(OECD,2001).

Defining services science:

Service Science is all about using the principles and tools of science (theory, experiment, observation, repeatability) in order to improve the delivery of effective, agile services in the public and private sectors. The complicating factor in such an application of science and technology lies in the human dimension inherent in the problem domain; services heavily involve, and are measured by their perceived impact on, people. Services science is a multidisciplinary field that seeks to bring together knowledge from diverse areas to improve the service industry's operations, performance, and innovation. In essence, it represents a melding of technology with an understanding of business processes and organization. "It's a shift from a technology-centric view to a holistic view that encompasses both technology and business," said University of Manchester lecturer Liping Zhao. Professionals need new skills and education in a variety of fields to yield the best results in service industries, according to EDS Fellow Mary Ann Wangemann. (Linda,P.).To sum up, Service science an integrative science is short for service science Management Engineering Design(SSMED).From a business perspective, service science should explain how to invest (internal, external and interface) in exploration and exploitation.(Grasso,D,et al 2010).

A new innovation:

In the design of service systems, service innovation is represented to implement a new value of propositions. A new science is a distinct new discipline that requires a new fundamental scientific field characterized by new research paradigms and education programs to advance its knowledge. A new vision, which avoids an outright judgment of the dichotomy, is provided in Hsu and Spohrer(2008) as follows: The time when professionals

are calling for a new science to guide their efforts to systematically innovate and improve service quality and productivity, they see existing academic disciplines as knowledge silos, each with something important to contribute, but nonetheless with only a piece of the puzzle. The most successful sciences (physics, chemistry, and biology) all provide models at the appropriate level of abstraction to deal with the phenomena relevant to their emergent layer of the complex systems that exist in the world. However, judgement of value from a customer-perspective involves psychology and marketing. Measurement of value from a provide perspective involves computer science, management of information systems, industrial and system engineering, operations disciplines, etc. The new service science is conceptualized to integrate these knowledge silos and fill in gaps with new basic results (Hsu, C.2009).The theoretical foundations of service science are based on ten concepts(Spohrer and Kwan,2009):

1. Resources.
2. Access rights.
3. Service system entities.
4. Value-propositions-based interactions.
- 5.Stakeholders perspectives.
6. Service system network:.
7. Governace mechanism.
8. Measures.
9. Outcomes.
10. Service system ecology.(Grasso,D,et al 2010).

The innovation management process:

- Searching – scanning the environment (internal and external) for, and processing relevant signals about, threats and opportunities for change.
- Selecting – deciding (on the basis of a strategic view of how the enterprise can best develop) which of these signals to respond to.

- Implementing – translating the potential in the trigger idea into something new and launching it in an internal or external market.
- Learning – enterprises have (but may not always take) the opportunity to learn from progressing through this cycle so that they can build their knowledge base and can improve the ways in which the process is managed.

Process model:

Models can represent the structure in reality. It dignifies the road map or back bone of the assumption. In other word it tells us how it would look like or in which way it has been developed. From the table below we can see that how innovation management models have become more complex, more interdisciplinary, more integrated and more connected with their surroundings, more links between organizations.

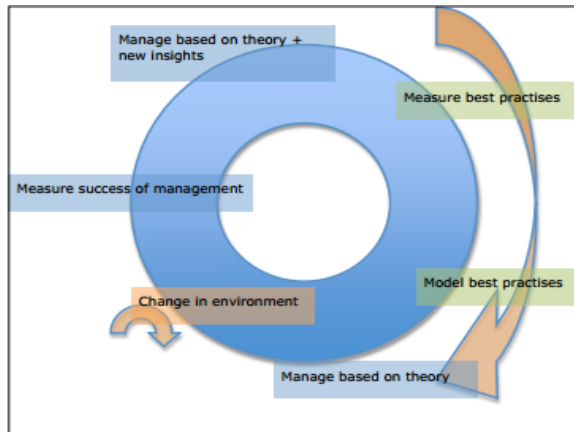
Verloop (2004)	Rothwell (1994)	Jacobs and Snijders (2008)	illustrations
Trial-and-error approach (pre-historic)			Discovery of fire or discovery of America
Scientific curiosity driven model (industrial)		Entrepreneurial laboratories (about 1865)	BASF, GE, Bell Labs
	Technology Push (50s -Mid 60s)	Focus on result; introduction of project planning, coupled to business targets (about WWII)	Science discovers, technology provides, man conforms (logo of the 1932 Chicago World's Fair)
Opportunity-driven bridge-building model (post industrial)	Market Pull (Mid 60s - Early 70s)		Fordism, Mass production
	The "Coupling" Model (Early 70s - Mid 80s)	Technology management in context of financial risks, strategical planning and technological roadmaps (late 80s)	Propelled by scarcity; oil crises, financial crises
	Integrated innovation process model (early 80s - early 90s)		Japanese reverse engineering and manufacturing
	Integrated, parallel, flexible and connected model (90s - now)	Emphasis on learning and interaction with the market to satisfy existing and latent market demands (mid 90s)	Huge global networking firms

Source: *Historic overview of innovation management models*

Service innovation and advancement:

The blessing of the application of science, management and engineering to the improvement of agriculture and manufacturing, remarkable products, from disease resistant crops to automobiles and personal computers, can be produced flexibly and efficiently and are widely

available. However, as product complexity and diversity increase, it can take more time and consume more resources to search for, obtain, install, maintain, upgrade and dispose of products than production itself. This leads to a big preference for service innovation – including both incremental improvements and radical changes to service systems. In modern economies, the growth of service has gradually driven scholars to service-related studies. Whilst research into service can be traced to as early as the 1940s, significant developments were not possible until the late 1970s when service research was broken free from product-centric concepts and theories. The field of service research now covers a wide range of subjects, including service economics, service marketing, service operations, service management, service engineering, service computing, service human resources management, service sourcing, service design, and many others. Despite these progresses in the service field, however, there has been a growing perception that it is time to take stock and to explore the possibility of bringing coherence into the various strands of knowledge and experience. Without a clear understanding of the domain and how it relates to existing theories, knowledge will continue to be fragmented. In response, Service Science, Management and Engineering (SSME), or in short Service Science, is emerging as a distinct field to look for a deeper level of knowledge integration. (Strauss,B.et al.2008).



Source: from website

The Argument:

The innovations in service, foremost among them internet-based enterprises, have singularly heightened the issues and constantly been pushing the envelope. It is these new economic activities that have brought to the fore virtual firms, real-time and transient regimes, and large-scale collaborative computing. On balance, they all reflect the scientific challenges of the changes in knowledge-based economies, and hence resonate on the same need for a new service science. Therefore, a reasonable argument seems to be that the “traditional service science” is not sufficient for the new knowledge-based practices of service. It follows that a new service science will address these new basic on results; and an accurate approach to developing it is to focus expressly on the common scientific characteristics of new service practices. With this the remaining question is the value of new service. The answer starts with our experience in our web-centric society. Given the support of the internet in our lives, one has to wonder, is it not true that knowledge-based economies are based on (new genres of) service and led by innovations in service? Is it not true, then, that the value of a new service science is its pivotal contributions to the understanding and promotion of service’s leading role for a knowledge-based economy? To contemplate further, it is recognized that service is not necessarily a homogeneous concept. The perplexity of service may be rooted in its double

nature. There is service and there is digitally connected service. Service may include many pre-industrial revolutionary activities, such as hair cutting, cooking and theatric performance. Digitally connected services, on the other hand, as exemplified by social networking, e-business and digitization of systems are definitely post-industrial revolutionary. If an economy is dominated by service, then the society may either be enjoying the leisure created by mature industrialization as in the First World; or, be lagging behind industrialization as in the Third World. However, if an economy is dominated by digitally connected services, then the society is unequivocally signaling its transformation of industry, agriculture, energy, health-care, education, government, defense, and all other sectors as well as service into a new knowledge-based mode of production for a better future. Digitally connected services are philosophically a class of service; but this class is new and progressive, worthy of a new science to guide its transforming power towards sustainably prosperous knowledge-based new economies. The new service science will explain the transformation and growth where the linear extrapolation of the previous knowledge for service does not. From the context of service science, people businesses, nations and other organizations, even disciplinary and professional organizations are all example of service system entities. Service science is integrative disciplines, and while professional still must be deep in some area(traditional disciplines),they must also have complex communication skills across a wide range of other disciplines. Fundamentally, this is the change in human capital that is required to make collaborative innovation truly successful.

Fortunately the progress has been made especially over the last twenty years, and recent activities around the world show signs of accelerating that progress(Tien and Berg,2006).Such as, in business schools, courses in service management, service operations, service

marketing and other aspects of services have well established textbooks, journals and conferences. In engineering schools, operations research as well as industrial and systems engineering are shifting their focus from factories to service operations and service value chains. The social science, especially economics are delving deeper into the production, provisioning and consumption of services. Even the noted economist William Baumol, who studied the unproductive nature of many services in the 1960s and 1970s, has recently begun to devise theories of research and investment in services, concluding that... "Innovation activities are fundamentally service activities". (Strauss, B. et al. 2008).

Management Innovation versus other concepts:

To signify the importance of this new operational method we need to verify the necessity of this process. For this, we proposed the three key factors that make management innovation distinctive.

Firstly, there are important differences in the nature of the outputs of management innovation and technological innovation that affect how the respective processes unfold.

Secondly, very few organizations have well-established and specialized expertise in the area of management innovation. A typical large organization might employ tens or hundreds of scientists with technological innovation skills but few with proven management innovation skills.

Thirdly, the introduction of something new to the state of the art creates ambiguity and uncertainty for the individuals in an organization. Ambiguity arises because of a lack of understanding of the intended value of the innovation, and uncertainty arises because of a fear that the innovation will have negative consequence for the organization.

By analyzing the above attributes suggest that the management innovation process can potentially require fundamental changes in the routine of the organization.

These factors highlight the need for management innovators to seek out distinctive approaches to building the legitimacy of the new practice to make it acceptable to the various constituencies in the organization. (Ashforth & Gibbs, 1990; Greenwood, Hinings, & Suddaby, 2002; Suchman, 1995).

The challenge:

In the new web-based technological world is challenging us to create new ways of doing things which demands a solid scientific foundation if we are to understand increasingly complex service systems. Service Science has the potential to be as important as the foundation provided by physics, chemistry, biology, cognitive science and computer science for agriculture and manufacturing. We must act now in order to create the next generation of innovation. Traditionally, the study of service science in business schools was anchored in human interactions, particularly the personal contact between customers and employees. Over the past 10 years however technology has dramatically changed how services are conceived, developed and delivered. Technology has not only consumed back-office processes but has become prominent within the firm-customer interface through self-service technologies (SSTS), such as online reservations, online banking and pay at the pump gasoline transactions. (Strauss, B. et al. 2008). Scholarly attention to service and technology is increasing, yet it is being outpaced by developments in business practice. Looking just at the firm-customer relationship, research is needed on how firms should plan, implement and measure the impact of technology on service encounters.

The knowledge –based service:

A service theory which originates from service research community. A Unified service theory. In Foundations and implications of a proposed Unified services theory Sampson and Froehle (2006) first introduce the need for a unifying theory of service and then outline six characteristics of a good inductive theory (Locke, 2005):

1. It is based on observation data.
2. It defines concepts in a way that differentiates them from other concepts.
3. It integrates concepts and resolves apparent contradictions.
4. It identifies causal relationships.
5. It typically takes time to develop and,
6. It is open ended allowing for extensions and re-applications.

About half of the service sector jobs are knowledge – intensive(e.g. government, healthcare, education, business, and professional) and other service jobs provide numerous entry level as well as executive-management positions(e.g. retail, hospitality, and leisure).while service jobs are often thought of in pejorative terms, well more than half the service sector is knowledge-intensive segments and those segments are growing. The knowledge –intensity of many segments is growing as the need of developing the workforce of the future, government, industry and universities have invested a lot on it. Even many sales jobs require a certain degree of technical skill in a knowledge-intensive service economy. Service science is emerging as a significant research discipline initiated by IBM and university, industry and government partners. SSME brings together ongoing work in computer science, operations research, industrial engineering, business strategy, management sciences, social and cognitive sciences and legal sciences to develop the skills required in the knowledge-intensive service economy of the 21st century. SSME students and faculty explore the current and future process of course focuses on the issues involved in aligning people and technology effectively, to generate new value for both service providers and service clients. Improving performance is therefore often conditional on issue such as stronger focus on customer service, innovation and changes in the service provided.(Strauss,B.et al.2008)

Conclusion:

Here we have argued that management innovation is an important phenomenon in the field of management and that the generative mechanisms through which it occurs (i.e., management innovation processes) are theoretically interesting in their own right, and also relatively poorly understood. We have developed a framework highlighting the important roles of internal and external change agents in the process and the ways these two sets of actors interact with one another. Our framework suggests a number of important insights, and it opens up some interesting angles for further research. Service science, Management and Engineering (SSME) has come a long way in a short time. Given the conceptual foundations of service science we can create the notion of a service system ecology micro world that is intended to be recognizable as akin to, but a greatly simplified version of the real world in which we all live. A growing number of nations have already established program to study and advance service system innovation. At the end we are all students of service system and this system is evolving rapidly driven by information technology, new business models, globalization and demographic trends (Hefley,B.2007). On any leader's agenda these days, few priorities are higher than collaborative innovation. It drives high-margin growth, strength competitiveness and creates jobs, it is no wonder that so many business and political leaders around the world have made collaborative innovation their number-one priority. So SSME has come a long way in a short time, but it's only just the beginning of a new era.

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