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On the Prospective Value of ICTs to New Service Conception

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ABSTRACT

To stay competitive over time, many service providers develop new services continuously through a process comprised of three primary stages: strategic planning, in which a new service objective is articulated; new service conception (i.e., new service development's 'front end'); and service system design, development and testing (i.e., its 'back end'). Of these stages, new service conception has received the least attention from new service development (NSD) and information systems (IS) researchers, particularly with respect to the computer-mediated tools that are used to support it. After reviewing the NSD literature, this paper draws from two reference domains (new product development (NPD) and computerized creativity support (CCS) studies) to demonstrate the prospective value of information and communication technologies (ICTs) to the new service conception process. The paper concludes by introducing a sensitizing model that can be used in an exploratory, foundational study of ICT use in the new service conception process.

Keywords

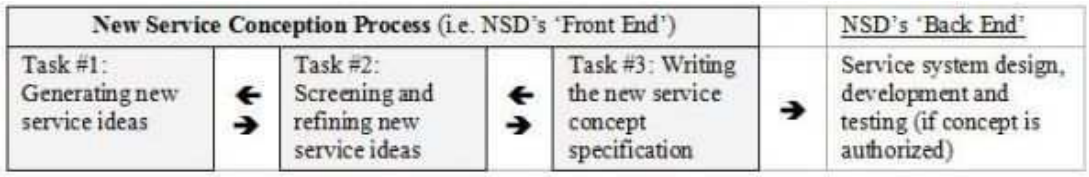
New service development, new service conception, information and communication technologies

INTRODUCTION

Regardless of the unique features of its market – whether it be investment services, hospitality, importing and exporting, health care, management consulting, package delivery, etc. – a service provider's competitive position depends on the value of its service offerings as determined by its customers [1]. A service that is valued highly today may not be valued highly tomorrow, though, so service providers must continuously develop new services even when their existing service offerings are proving successful [2, 3, 4].

The conception and development of a new service can take a considerable amount of time and effort, though. In a larger service organization, for example, a senior manager might formulate a rough idea for a new service only after a careful and integrative review of sources ranging from customer comments and market analyses to best-practice articles, reports from customer-facing staff members, white papers on cutting-edge technologies, working studies on internal capabilities and finances, and so on. Next, she might present the idea to a handful of others who will evaluate it and offer feedback on it. In preparation for the decision on whether the idea merits the commitment of resources needed to commercialize it, she would then specify how the proposed service will benefit the organization and its customers (i.e., its value proposition) and demonstrate that it is financially and operationally feasible. The resulting *service concept specification* should also guide (at a high level) the design of the service system that will support service exchanges [5, 6, 7].

This imprecise process through which a rough idea for a new service is shaped into a new service concept is known as the 'front end' of the new service development (NSD) process, or what I call the *new service conception* process. As illustrated in Figure 1, this process consists of three sequential and partly iterating tasks: generating new service ideas; screening and refining new service ideas; and writing the new service concept specification. In the 'back end' of the NSD process, the new service system is designed, developed and tested [5, 7, 8]. While this back end is not as 'fuzzy' as the front end [9, 10] – meaning that it does not involve as many "ad hoc decisions and ill-defined processes" [11, p. 143] – it, too, can consume a considerable amount of time and effort.



Sources: [8, 9, 13, 32, 33, 37]

Figure 1. The New Service Conception Process

In sum, the work needed to develop a germ of an idea into a ready-to-launch service can be substantial. But while efforts to design, develop and test new service systems can draw from an abundance of instructional research [e.g., 12, 13, 14, 15, 16], efforts to generate new ideas and develop new service concepts have much less to draw from. Indeed, regarding the new service conception process, the NSD literature only instructs us in two regards: by identifying the three major tasks that comprise it; and by demonstrating the importance of involving customers in idea generation [9, 17]. Given the importance of new service conception, this dearth of knowledge begs for conceptual and practical contributions, particularly with regard to the tools that can improve the process. More specifically, it is well worth asking whether certain information and communication technologies (ICTs) can improve new service conception efforts, especially given that ICTs have been shown to benefit new *product* conception efforts [11, 18, 19].

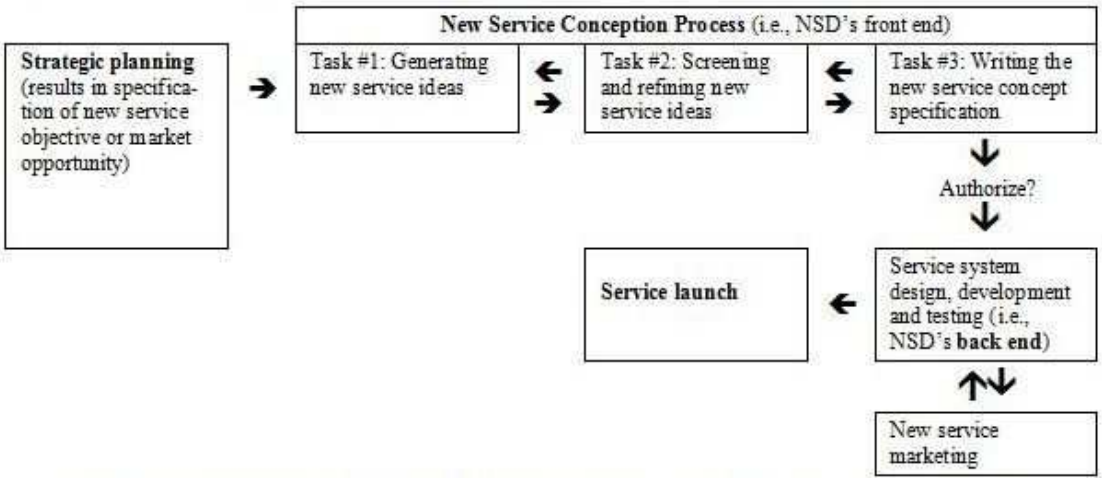
The remainder of this paper is organized as follows. After reviewing the new service development (NSD) literature and arguing that NSD's front end (i.e., the new service conception process) has received insufficient attention, we draw from two reference domains (new product development (NPD) and computerized creativity support (CCS) studies) to demonstrate the prospective value of ICTs to the new service conception process. We then conclude the paper by introducing a sensitizing model that can be used in an exploratory, foundational study of ICT use in the new service conception process.

NEW SERVICE DEVELOPMENT (NSD)

Over its roughly 25-year history [25, 26], the new service development (NSD) domain has sought primarily – through the contributions of both operations management and marketing science researchers – to determine how new service success is achieved. To this end, most NSD studies have concluded or presumed that continuing success tends to follow not from an improvised, hit-and-miss approach to NSD, but from the use of a formalized (or semi-formalized) NSD process which is tied to an organization's strategic plans [8, 27].

Accordingly, the development of a normative NSD process model was until recently the domain's most critical task. The earliest efforts in this regard were translations of the popular Booz, Allen and Hamilton [28] 'stage' model of the new *product* development (NPD) process [29, 30, 31]. As such, these first-generation models depicted a process in which service providers, acting more or less on their own, work to complete one stage (e.g., idea generation) before moving on to the next stage (e.g., idea screening), and the next one, until the new service is launched. A second generation of process models accepted that NSD should proceed through a set of stages, but proposed a cyclical, iterative process [13, 32] in which the management of concurrent stages is necessary or even desirable [33, 34]. In this way, second-generation NSD process models resemble the popular waterfall, spiral and incremental-build models of the software development life cycle [35].

Although several normative, second-generation stage models have been proposed, the differences between them – such as word/term preferences, decisions about aggregating certain activities into one stage (or disaggregating them into multiple stages), the extent to which activities are specified in detail – are generally insubstantial. Indeed, a review of these models reveals clear parallels in terms of their constituent stages. Given that none of these models predominates, we drew from several of them to produce the consensus model shown in Figure 2.



Sources: [8, 9, 13, 32, 33, 37]

Figure 2. The New Service Development (NSD) Process

Having reached a general consensus on a normative model of the NSD process, NSD researchers have in the past decade or so shifted much of their attention to four other problems:

1 Which factors most determine NSD success [e.g., 20, 36, 38, 57];

2 How strategic planning for NSD can be improved [e.g., 39, 40, 41, 42];

3 How back-end efforts (i.e., service system design, development and testing) can be improved [e.g., 5, 6, 7, 15]; and

4 How stakeholder management can improve the NSD process [e.g., 43, 44, 45].

Somewhat surprisingly, very few studies have addressed the matter of how the new service conception process can be improved, and none has examined empirically how the process' three main tasks (shown in Figures 1 and 2) are performed and completed. Matthing *et al*. [17], for example, focused only on the new service conception process' first task (idea generation) by conducting an experiment involving end users of mobile phone services and (as the control group) individuals who develop these services professionally. (They found that end users' ideas for new services were more innovative than those of the professionals.) Through interviews with representatives from 26 financial services firms, Alam [9] looked at all three tasks in the new service conception process, but his investigation did not extend beyond customers and their potential role (e.g., the importance of their input, the ways in which they can participate, encouraging their participation, etc.). And, finally, Ozer [10] developed a clustering technique that can improve idea screening efforts by predicting demand, but in doing so only considered one of the process' three main tasks.

In sum, what little we know about the new service conception process begs for conceptual and practical contributions. While there may be several gaps that merit filling, we argue that our lack of knowledge about how information and communication technologies (ICTs) can be used to improve the new service conception process is particularly problematic. The following section draws from two reference domains (new product development (NPD) and computerized creativity support (CCS) studies) to demonstrate the prospective value of ICTs to the NSC process.

ON THE PROSPECTIVE VALUE OF ICTs TO NEW SERVICE CONCEPTION

Given the absence of research on the use of ICTs in the new service conception process, it is worth considering the following statement: *Perhaps there are no studies on this topic for a reason*. In other words, why might one conclude that ICTs are crucial to the new service conception process?

First, at least three studies – two of them empirical – have demonstrated that ICTs can be crucial to the new *product* conception process. (Many more studies have demonstrated the importance of ICTs to other stages or aspects of the new product development process [e.g., 46, 47], it should be noted.) Nearly a decade ago, Montoya-Weiss and O'Driscoll [11] demonstrated how a desktop application they helped develop – the 'Virtual Mentor' – supported new product conception at Nortel. In sum, this desktop application consisted of 10 or so screens that took new product conception architects through a series of check lists and let them enter information that could later be retrieved. Its analytic functions were limited, though.

Two years later, Kim and Wilemon [18] argued in a rhetorical article that successful new product conception depends in part on the use of an enterprise information system that lets workers contribute to and draw from a shared knowledge repository. It is the most recent study that provides the strongest case for the importance of ICTs to product (or service) conception, though. To answer the question of how ICTs support the 'FEI', or front end of innovation, Gordon *et al*. [19] surveyed members of the Industrial Research Institute and the Babson Center for Innovation and Corporate Entrepreneurship and ran a nominal group technique exercise with 80 managers from member companies. Their analysis yielded a typology of six ICT functions in new product conception:

1 Collaboration and idea exchange;
2 Competitive intelligence gathering;
3 Information organization;
4 Data mining and analysis;
5 Data and information visualization; and
6 Brainstorming and 'ideation'.

A second source of support for the importance of ICTs in new service conception comes from a largely overlooked set of studies on 'computerized creativity support' (CCS) applications. Results from these studies were decidedly mixed, but nevertheless sufficiently promising to warrant further investigation. Barki, Pinsonneault and colleagues, for example, collaborated on a handful of studies [see, e.g., 48] that found little evidence to suggest that 'electronic brainstorming' was better – or even as good as – brainstorming in person. (Barki and Pinsonneault later conceded that electronic brainstorming is likely more useful in larger groups.) But in an experiment conducted with 44 M.B.A. students, Massetti [49, p. 83] found that responses (to problem solving questions) generated with a CCS application were "significantly more novel and valuable than responses generated by pen and paper." Massetti's findings set off a discussion, carried out in a handful of journal articles, most notably *MIS Quarterly*, about validity and reliability in such studies. (Variation across individuals in terms of their creative ability was the most frequently voiced concern.) Wierenga and van Bruggen [50] actually argued that Massetti's study *under*stated the value of computerized creativity support applications.

Around the same time, Chen [51] wrote a rhetorical article on the potential value of 'idea processors', Shneiderman [52] showed how user interfaces could be designed to better support individual creativity, and Kletke *et al*. [53] demonstrated that CCS applications can, in the right context, be essential to individual creativity, which in turn is crucial to organizational creativity. Despite these and other cautiously positive findings, interest in this topic appears to have waned, at least in information systems (IS) circles, though studies of organizational creativity persist in journals such as *Creativity Research Journal* and *Creativity and Innovation Management* [e.g., 54, 55]. Regardless, it is reasonable to conclude from this somewhat scattered body of research that ICTs may, in certain contexts, help individuals and groups exploit or leverage their creative abilities, thereby improving the new service conception process and its outcomes. Precisely how this happens – and the extent to which new service conception efforts can benefit – is not known, though (and thus constitutes another knowledge gap that merits filling). At the very least, though, these studies suggest that further research on this topic is warranted.

Toward a Sensitizing Model for an Exploratory Study of ICT Use in the New Service Conception Process

While a foundational study of ICT use in the new service conception process is greatly needed, we propose that such a study need not be designed 'from scratch'. Instead, it makes more sense, given the ample evidence suggesting that there are more similarities than differences between new service development (NSD) and new product development (NPD) [see, e.g., 21, 22, 23], to use Gordon *et al*.'s [19] aforementioned typology as a sensitizing device [24]. If the similarities between NSD and NPD are more similar than different, though, one might sensibly ask why the proposed study does not simply test Gordon *et al*.'s typology using, say, large-N survey methods.

While it is generally true – or at least believed to be true – that NSD and NPD "share the same underlying dimensions" [22, p. 247], they also differ in three significant regards. First, research and development (R&D) strength relative to a firm's rivals is typically more important in NPD than it is in NSD [22]. As a result, manufacturers are more likely to have a dedicated R&D unit. Second, the purchase of services often involves provider-customer interaction to an extent (and in a way) that the purchase of material goods may not. Stauss [56] has suggested that this and other service-specific attributes may impose unique demands on new service developers. Third, "a company's willingness to cannibalize organisational routines and prior investments" is more important in NSD than in NPD [22, p. 241]. In other words, a service provider must be more willing to make potentially disruptive changes to its organizational structure and capital resources. Thus, in sum, while NSD and NPD are sufficiently similar to permit the use of a model from one as a sensitizing device for the other, they are sufficiently different to assume that the model applies as-is.

As Figure 3 illustrates, a sensitizing model has been constructed from (i) Gordon *et al.*'s [19] typology of six ICT functions and (ii) the new service conception process' three constituent tasks. While it is expected that this model could prove very useful in analyzing and interpreting results, it should be emphasized that its explanatory potential is limited in three important ways. First, the findings of Gordon *et al.*'s study are limited to the firms that are represented by the Industrial Research Institute and the Babson Center for Innovation and Corporate Entrepreneurship. While most of these firms are regarded as innovators, it still cannot be said that all the uses of ICTs in new product conception have been identified. Second, even if it is found that the model is a credible representation of a new service conception process under examination, more detail is needed with respect to how and when certain types of ICTs are used in the process. In other words, we need to move beyond simply saying, for example, that data visualization tools can support idea generation, as the value of such statements is limited. How and when (i.e., under what conditions) do they do so? Finally, we cannot presume that the sensitizing model applies to the innovation processes of every type of service provider – big and small, for-profit and non-profit, retailers and banks, consultants and restaurants, libraries and telecommunications providers. Given the extent to which service providers differ in terms of their market contexts, it would be difficult to argue the case for this assumption without supporting evidence collected from a diverse set of cases or a large-N variance study.

	Sequential and Iterating Tasks in the New Service Conception Process*				
	#1 Generating New Service Ideas (Ideation)	← →	**#2 Screening and Refining New Service Ideas**	← →	**#3 Writing the New Service Concept Specification**
Possible ICT Functions (from Gordon *et al.*'s (2008) study of new *product* conception)	• Collaboration and idea exchange • Market intelligence gathering • Information organization • Data mining and analysis • Data and information visualization • Brainstorming		• Collaboration and idea exchange • Market intelligence gathering • Information organization • Data mining and analysis • Data and information visualization • Brainstorming		• Collaboration and idea exchange • Information organization • Data and information visualization

Figure 3. A Sensitizing Model for an Exploratory Study of ICT Use in the New Service Conception Process

In closing, there is a clear and strong need for a set of empirical studies that explore how ICTs are used in the new service conception process and how they can be better exploited to improve the process and its outcomes. The sensitizing model introduced here can support such studies by instructing researchers to be mindful of the possible use of ICTs for these functions in the context of these tasks. What we envision, ultimately, is an empirically validated and more detailed model that specifies, for example, *how* and *when* (i.e., under which contextual conditions) 'information organization' ICTs help service providers screen and refine new service ideas. We see this sensitizing model as a catalyst for such a model.

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