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# Innovating with enterprise systems and digital platforms: A contingent resource-based theory view

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ABSTRACT

In an era of new technological advances and hyper-competition, it is no surprise that organizational innovation enabled through information systems in order to achieve competitive parity will remain a core topic of interest for both scholars and practitioners. Understanding the process of innovation through enterprise systems (ES) is especially critical, given the contradictory beliefs surrounding the role of ES in organizational innovation. Conversely, recent anecdotal commentary suggests a substantial growth in digital platforms, purportedly energizing innovation. This study seeks to address our limited understanding of how digital and ES platforms attain innovation, through a study involving 189 organizations.



## 1. Introduction

The relationship between information technology (IT) and innovation has been a much discussed topic in academia [116,29] and practice [48,111], with many studies resorting to a highly positive view of technology's role in assisting innovation [112]. In the current competitive and aggressive corporate environments, organizations are increasingly under pressure to maximize their resources [123], especially to maximize the values and benefits embedded in their existing technology infrastructure such as enterprise systems (ES) [123]. Despite their continuing dominance as the most salient corporate information systems (IS) since the mid-1990s [47], the role of ES in innovation is yet to be comprehensively understood [165,166]. The advent of ES provided the much-needed IT functional capabilities for organizations to innovate through process orientation, integration, and standardization [154,13].

The majority of past studies discussed the influence and importance of the features and functions of an ES that bring forth operational flexibility [85], business process improvements [73], productivity [140], transparency [5], innovation [145], and profitability [134,146]. However, there is a growing recognition that ES is now evolving to play a more salient role as a *technology platform*. The literature provides the characteristics of a technology platform such as providing the basis for further actions, changes, and evolves but in a stable manner, not providing value itself, and the actions conducted on the platform are restricted by its nature [64,150]. Gawer [64] recognized that ES acts as a building block, providing an essential function to a technological system that acts as a foundation upon which other complementary products, technologies, or services can be developed (for further details, refer Appendix A). The widespread adoption of ES across industry sectors and geographical locations and the emergence of unrestricted platform architectures (e.g., the NetWeaver platform interface by SAP) further recognize ES as a dominant corporate technology platform [66]. Moreover, adhering to the fundamentals of a "platform" [64,150], the "ES technology platform" (henceforth referred to as an ES-platform) facilitates an ecosystem of third-party software products, services, and suppliers [28]. Gawer and Cusumano [66] observed that reducing the restrictions in an ES platform assists organizations in innovation. Other studies have observed that an ES platform may hinder innovation [91]. Practitioners have also likened installing an ES to "pouring cement" [91,45], and an ES is not, in general, designed with flexibility in mind. Gable and Sedera [60] and Sedera and Gable [139] suggested that the lack of flexibility in an ES platform hinders growth opportunities. However, with contrary views of Swanson and Dans [147] on systems being upgraded or replaced periodically to minimize deterioration, Eden et al. [52] noted that ES is rarely replaced or retired.

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Moreover, since the mid-2000s, corporate IT has been presented with a plethora of technology options. The advent and massive proliferation of mobile computing, cloud computing, in-memory technologies, and social media, collectively referred to as digital platforms [120,161], fueled by the consumerization of IT [75] have presented organizations with other opportunities to innovate, signifying an era of technology that epitomizes flexible, easy-to-deploy, and cost-effective IT solutions [152]. Here, the study makes a distinction between "functional" capabilities and the capabilities of a digital platform. Although it is acknowledged that the functionality of such technologies may have differences, as digital platforms they possess very similar characteristics. A digital platform in this research is defined as a technology architecture that allows development of its own computing functionalities and allows the integration of information, computing, and connectivity technology platforms available to an organization. The common characteristics of digital platforms represent newer technology ecosystems that can be interconnected to provide creative solutions to organizational problems. Therefore, the use of the umbrella term "digital platform" is appropriate. While we acknowledge the functional differences in digital platforms, this compromise was made to focus on the ability of these technologies to foster innovation.

For organizations, the growth of digital platforms has provided an ecosystem of providers and suppliers of tools, techniques, and practices, beyond the conventional boundaries of traditional corporate IT [161,75,3]. As Yoo and Boland Jr [161] identified, digital platforms denote broad and evolving models of highly distributed computing and related solutions that rely on heterogeneous, ubiquitous network services, and associated protocols [32,113]. Researchers also indicated that digital platforms have the potential to trigger innovation in organizations [120], facilitated by their trialability, cost-effectiveness, and ease of use [26,108].

This research is driven by the following research question: "Does the ES-platform moderate the impact of digital platforms in attaining innovation?" It allows both researchers and practitioners to observe the changing role of ES as a platform as well as the impact it has on novel technologies cloud, mobile, in-memory, and social media platforms. Here, although the digital platforms are associated with innovation, the role of ES as a platform, particularly when embedded in the IT portfolio, is yet to be determined.

The surging changes to the corporate IT landscape [137] of cloud, mobile, in-memory, and social media platforms were evident in the sample of this study. Fig. 1 summarizes the platform composition of our study sample of 189 large organizations. The study inquired the organizations to denote the percentages of spending in relation to the complete IT portfolio 3 years ago and now (in 2014). Overall, Fig. 1 highlights the dramatic changes in the corporate technology landscape from 2011 to 2014. For example, in 2014, the emphasis on ES dramatically reduced (with a drop of 36%) and the footprint of all digital platforms increased.

Fig. 1 reflects how the modern organization is transforming from a single, monolithic ES-centric technology landscape into a portfolio of IT with an eclectic collection of platforms. The observation drawn from Fig. 1 concurs with the predictions by practitioner outlets (e.g., [22]), where they argue that contemporary organizations are much eager to integrate digital platforms with traditional ES technology platforms to *innovate* and augment the functions of the existing business processes, thereby suggesting an interacting role of ES and digital platforms in fostering innovation.

The conceptual view of the interaction of digital platforms with ES platforms for innovation is illustrated in Fig. 2. Fig. 2 alludes to two possible scenarios of the business processes involving both internal and external parties (i.e., customers and/or suppliers) posed by the advent of digital platforms: (i) the coexistence of an ES platform and digital platforms in a single business process or (ii) the replacement or substitution of platforms. In both scenarios, the digital platforms have the potential to provide an augmented, value-adding, and innovative option for completing a business process (the dotted line in Fig. 2), compared to the default ES process (the straight line in Fig. 2). The focus here shifts to functional orientation, as opposed to process orientation. The engagement focus of digital platforms is not on providing a platform to automate the entire business process, but rather on innovating through exposing a selected platform component/s to build function/s that would provide maximum innovation capacity to the organization.

Nambisan ([120], p.216) highlighted that the inclusion of digital platforms plays an imperative role in modern innovation, whereby digital platforms "are being embedded to an ever increasing range of products and services. . .thereby expanding the role and relevance of IT in any innovation." Such technologies epitomize the role of IT "as an operant resource [that] underscores how digitalization can unleash generativity and create novel opportunities for resource integration" ([105], p.28). Digital platforms purport to provide organizations with an unprecedented potential for innovation through their affordability, ease of adoption, and ease of connection with customers and suppliers [161,160]. Such platforms have disrupted the traditional linear equation, so that IT

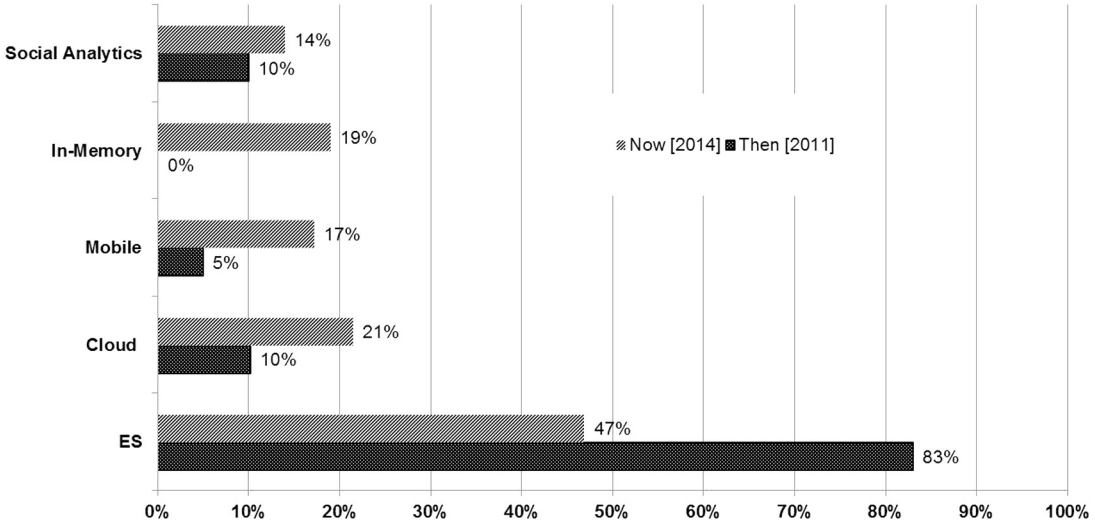


**Fig. 1.** Proliferation of technology platforms in the corporate IT landscape (expenditure in IT portfolio on digital platforms vs. ES).