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Determinants of Information Technology Expenditure: A Contingent Model

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Abstract

With wide proliferation of Information technology (IT) in modern business, IT expenditure has become a regular yet strategic decision for most senior management. In this short article, we propose a model to explain the determinants of IT budget. Built upon the pioneer work by Dewan et al. [4] and Kobelsky et al. [5], we attempted to extend the prior research by providing a strong theoretical underpinning for the driving forces of IT budget, incorporating both dynamic and static contingencies from internal organization as well as external environment. The proposed model is aimed to provide a reference metric for IT budget decision.

1. Introduction

With the increasing global interdependencies and the accelerating pace of change, the use of information technology (IT) has evolved from the automation of work processes to systematic transformation of the fundamental business procedures. IT is believed to enhance the competitiveness of the firm by improving its agility through the support and enablement of dynamic capabilities [1, 2]. It is not surprising that investment in IT has become a strategic decision and a significant portion of corporate budgets worldwide. According to the 2000 Gartner IT Spending and Staffing Survey¹, leading edge adopters of technology spend 11% percent of their revenue on IT. The 2003 Gartner survey predicted that most enterprises would increase their budgets by about 5% in 2004 to support new business models, e-business and the changes in the IT adoption profile within the enterprises.

Despite the substantial increase in the extent and scope of organizational use of IT, very few studies attempted to explain IT expenditure. Most previous research regarded IT investment as an antecedent of firm performance rather than the focal variable. They examined the payoffs of IT investment and reported empirical findings that are contradictory, inconclusive, and usually non-generalizable [3]. It is therefore not appropriate to assume that IT expenditure can be explained in terms of anticipated organizational performance effects that may or may not be realized.

Recently, Dewan et al. [4] made good progress towards addressing this void. They investigated the effects of a firm's scale and scope on the firm's IT capital. Using secondary data from Fortune 500 companies, they demonstrated that firms with more

related diversification, less vertical integration and more assets in place contributing to their market value tend to spend more on IT. Kobelsky et al. [5] extended Dewan et al.'s work further by accounting for both external and internal complexity and included the industry strategic IT role (i.e., the firm's membership in industries undergoing IT-driven transformation) as moderator of the complexity effects. In their model, external complexity is measured by industry concentration, while internal complexity is indicated by diversification, affordability and dynamism. Their empirical results provided support for all main effects except for that of diversification. As for the moderating effects, the data suggested that the industry strategic IT role interacted significantly with internal complexity, i.e., diversification and opportunity/affordability, but not with the external complexity i.e., industry concentration. Managers in transformative industries spent more on IT to handle internal complexity than their counterparts in non-transformative industries.

Built upon the pioneering work of Dewan et al. and Kobelsky et al., we attempt to extend our understanding of determinants for IT budget in three aspects. First, we draw upon recent theoretical developments in the information systems (IS) and strategy literature to provide a stronger theoretical underpinning to IT expenditure research. IT expenditure is considered as a strategic decision resulting from the manager's attempt to align the firm with its environment [6]. Rely on the contingency theory [7], we identify important organizational, technological and environmental contingencies driving IT spending. Second, In addition to distinguishing the internal complexity from the external complexity, we also develop another dimension, i.e., dynamic vs. static, to capture the nature of complexity and identify both the internal and external, as well as dynamic and static factors that influence on IT budget. Third, we draw upon the recent IS literature on the role of IT in developing dynamic capabilities [1] to examine the interaction between IT contingency and the other two categories of contingencies. Figure 1 shows the proposed model.

In addition to the above theoretical contributions, we also expect this research would provide valuable implications for practitioners. Managers are suggested to frame the assessment of IT strategies and subsequent IT expenditures within both business and technological contexts. We expect our model to serve as a complete metric to facilitate the budget decision and justification. Most firms' decision on IT budget is derived from the contrast with various IT budget metrics to selected benchmark firms. Our findings would suggest how to choose benchmark

¹ <http://www4.gartner.com/RecognizedUser>

firms. The empirical results of significant factors also provide a set of indicators that can be used for comparison.

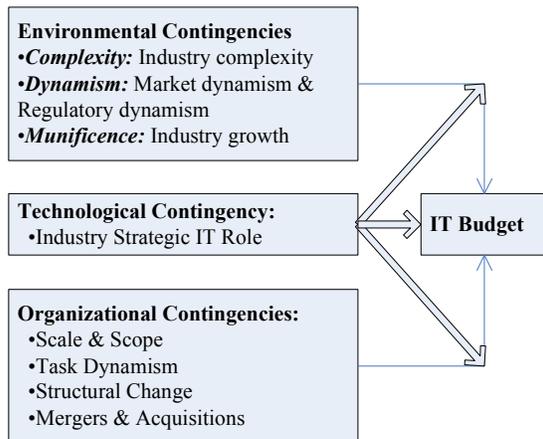


Fig 1. Proposed Research Model

Consistent with Kobelsky et al. [5], the research model will be tested with all companies listed in *InformationWeek* and *ComputerWorld Annual IT Budget* across six years. With an expectation to provide an operational evaluation metric for IT budgeting and to investigate the general pattern of IT budget determinants, we will employ objective measurement rather than perceptions of managers for operationalization. Multiple sources will be used for data collection. By the conference date, we expect to be able to report the operationalization of the constructs and preliminary results.

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