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# Understanding Information Technology Performance in the Context of Knowledge Management

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# UNDERSTANDING INFORMATION TECHNOLOGY PERFORMANCE IN THE CONTEXT OF KNOWLEDGE MANAGEMENT

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*With the rapid growth of Information Technology (IT) investments, the issue of measuring the business value or impact of IT investments has received intensified attention from both academia and practitioners. However, the empirical results of the studies regarding the value of IT investments are inconclusive. Previous studies concerning the business value of IT investment have considered the investment as a monolithic entity. However, there exist various facets of IT investments including hardware, software, and internal spending that might hold their own roles in the impact of IT investment on performance. The misunderstanding of the multifaceted nature of IT investments may lead to the so-called productivity paradox. This paper argues that investigating the impacts of IT on performance from the perspective of knowledge management may clarify the business value of IT investment.*

*The current study focuses on the very point that the three areas of IT investments have a differential impact on the national performance as measured by gross domestic product (GDP). It is postulated that each type of investment holds a different levels of intellectual capital or knowledge and thus different levels of influence. This paper conceptualizes each type of IT as a knowledge medium to facilitate country performance and to influence national performance in developed and developing countries in a different way.*

*Information technology has many dimensions in the context of knowledge management. The intellectual capital embedded in IT hardware and software has differential effect on organizational and country performance. Both hardware and software are embedded with skill and knowledge even though each has different levels of knowledge persistency, update speed, and ability to influence actual work. In particular, software is the most efficient knowledge medium and it facilitates turning knowledge into action. Internal spending represents another form of knowledge medium and facilitates the codification of implicit knowledge embedded in technology and business experts. Accordingly, hardware and software, and internal spending are interrelated to affect firm performance.*

*The focus of the current paper is on examining the two major concepts regarding IT investment as well as on the separate effect of three IT investments. One is the complementarity relationship between software purchased, hardware purchased, and internal IT spending. The complementarity relationship between software purchased and hardware purchased connotes the infrastructure investments that facilitate the utilization of the IT resources and the level of standardization, while internal IT spending implies the efforts on internal development of software and customization to create competitive advantage. The other is country effect on the relationship between the three IT investment types and their interaction.*

*This paper employs GMM estimator proposed by Arellano and Bond (1991), because the GMM method provides consistent and efficient parameter estimates as well as robust estimates both to times series and cross-sectional heteroskedasticity. The results show that software investment is important to improve gross domestic products and to maximize the utilization of the hardware investment, the commensurate internal expertise should be secured. This shows technical IT skills and managerial IT skills have potential to create competitive advantages. The study also indicates that the complementarity between the three types of IT investments works differently according to country GDP level. For developed countries, there exist need to manage the equipped hardware more effectively by securing more expertise in terms of internal spending, to increase gross domestic products.*

*Developed countries are also expected to work out their own application that can allow them to acquiring competitive advantage. On the other hand, developing countries better focus on managing the balance of the investment in purchased software and hardware by which they can advance process standardization and resource utilization, rather than in-house application development. In terms of knowledge management, the results from this study can be interpreted in the way that developing countries need additional knowledge accumulation and standardization.*

*The contributions of the current study are threefold. First, this study provides an alternative view for understanding the business value of IT investment. Secondly, the study shed lights on the relationship between IT investment or the value of IT and knowledge management. Finally, the results of this provide managers with additional insight into IT investment.*

**Keywords:** IT investment, performance, knowledge medium, knowledge management, software, hardware