Information Technology Impact on Productivity: A Systematic Review and Meta-Analysis of the Literature

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ABSTRACT

The notion that an increase in information technology investments will result in a positive impact on productivity has been deliberated comprehensively at various levels. Initial studies have established that, there was no link between investment in IT and productivity while others suggested otherwise. Even though there is a growing number of an academic studies on this topic, most of them has been centered on America, Asia and Europe. This current article reviews and analyzes literatures on the topic and presents a quantitative analysis of the literatures on continental bases. The study uses PRISMA Flow diagram and examined 141 studies that have been published between 1990 and 2017. The results suggested that Europe led with 36.88%, whilst Africa has not contributed much to IT and productivity literature with just 8.51%. The study therefore concluded that more studies on the topic should be done using data from Africa.

KEYWORDS
Impact, Information Systems, Information Technology, Organisation, Productivity

INTRODUCTION

A significant growth in productivity cements the basis for improvement in the standard of living (Niebel & Mannheim, 2014). Heavy investments and effective application of Information Technology (IT) have been considered as important stimuli with respect to productivity growth (Niebel & Mannheim, 2014). According to a report by the Development & Research Center in 2004, enterprises that effectively use IT in their business process and operations experience greater productivity leading to greater competitiveness that promotes sustainable economic growth. IT have considerably transformed humanity in the later part of this century by prompting unanticipated qualitative and quantitative changes (Biagi, 2013a). Abri and Mahmoudzadeh, (2014) in a study also discussed the role of IT in renaissance of productivity for economic development of several advanced economies. IT generates new E-business models, save cost of doing business, improve both qualitative and quantitative variables of production and this also leads to an increase in competition in markets (Abri & Mahmoudzadeh, 2014). The unexpected massive growth of investment in IT became the center of controversy in the impractical prospects and extreme interest that bordered the “new economy” during the late 1990s (Ark, Mcguckin, & Inklaar, 2003). A lot of research studies has established on the positive impact of

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ICT in the US development rebirth witnessed between years 1995 and 2006 (Biagi, 2013a). The notion that an increase in IT investments will result in a positive impact on productivity has been deliberated comprehensively at numerous levels of economics and statistical analysis (Dedrick et al., 2016). Initial studies established that, there was no link between investment in IT and productivity. Dedrick et al. (2013) indicated that some authors also suggested otherwise that there was solid empirical evidence that the business value of IT investment are positive and significant for organizations, and even economy like U.S. During the middle of 1980s a strong effort was made to measure the business value of IT and this debate was stirred by the eminent statement by Robert Solow in 1987: “You can see the computer age everywhere but not in the productivity statistics” (Biagi, 2013). Although academics have comprehensively examined statistical data during the 1980s, there was little evidence to back the postulate that IT significantly improved productivity (Brynjolfsson & Yang, 1996). Even though there is a growing number of an academic study reporting on the positive impact of IT on many methods of economic performance, an accord on the connection between investment in IT and its economic performance is still remains obscure as reported by Dimelis and Papaioannou, (2011). Information Technology positions a severe quandary for management today. On one instance, investment in IT can give a competitive advantage over their competitors. On other instance, budgetary allocation of IT puts increasing burden on directors to measure its returns and conclusions drawn from recent studies are at best inadequate (Mukhopadhyay, Lerch, & Mangal, 1997). Most studies of IT and productivity has also been centered on America, Asia and Europe leaving Africa behind. Looking at the ongoing discussion about whether the business value of IT investments is positive, this study censoriously surveys the large body of empirical research on the topic. The main purpose is to review and analyze critically the literatures on IT and productivity to ascertain the current trend on the significance of IT investments (Dedrick, Gurbaxani, & Kraemer, 2003a). The present study contributes to the relevant literature by extending the conceptualized framework to explore the ICT impact on productivity .The study also extends the debate by introducing a new ICT concept “gamification” (Antwi et al., 2017; Appiahene et al., 2017; Aziz et al., 2017; Deterding et al., 2011) “…the application of game features and game procedure to engross users in order to solve problems.” The goal here is also to help identify future research areas into the impact of gamification on organizational productivity.

Specifically, this article attempts to (1) provide both qualitative and quantitative information about the vast literature on IT and productivity (2) give a new research direction to the IT and productivity debate by looking at the impact of gamification on productivity, (3) provide an update information on the number of literature on IT and productivity, the study area, the methodology, the study duration and so on. (4) assess concerns in current study, and (5) identify potential areas for future study. It is envisioned that this study will aid academics to appreciate this research area, motivate specialists to tackle unanswered questions and finally assist top managers on making meaningful decisions about IT investments. This study examined 141 empirical studies that have been presented and published between 1990 and 2017. The study emphasized largely on studies whose findings and conclusions are in international peer-reviewed journals, conferences and other recognized institutions.

Background

Information Technology (IT) also called Information and communication Technology (ICT) (Appiahene et al., 2014) is the appropriate use of technology tools by which users operate and exchange information or data in its various forms such as text, graphics, sound and video (Patti, 2006). According to (Brynjolfsson & Yang, 1996) IT can be explained and categorized in different forms such as in terms of capital, including the simplest one is the BEA’s (U.S. Bureau of Economic Analysis) category “Office, Computing and Accounting Machinery” (OCAM), which involves mainly of computers.

It is imperious to suggest that productivity is not a uniform widespread concept but there exist different definitions that are appropriate under different circumstances. Productivity is generally explained as output per unit of input. It is an important indicator of the efficiency with which organizational resources been it human resources or material resource are being used, so it is important
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