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Mathematical Model for Information Technology Infusion for Healthcare Sector in Nigeria

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ABSTRACT

In this article, an IT infusion model was developed for the Nigerian health sector using teaching hospitals in Nigeria. The different IT technologies used by medical practitioners were identified. Structured questionnaires were used to elicit knowledge from respondents selected from teaching hospitals located in Nigeria. The results showed that the nurses and doctors with less than 5 years working experience were common users of IT. The results for the IT infusion showed that the earliest IT component in the health sector was the personal computer since the year 1994 followed by mobile phone and search engines by the year 1996 with the projector infused by the year 2001. The infusion model for the total number of users for each IT component was formulated using polynomial functions of degree, n with respect to t – the number of years after the base year of infusion of IT device. The IT infusion model developed in this paper can be used to forecast the future growth of IT within the healthcare sectors.

KEYWORDS

Descriptive Statistics, Information Technology, Infusion Model, Teaching Hospitals

INTRODUCTION

According to Idowu et al. (2006), the last 20 years has witnessed incredible swift and dynamic execution of information technology (IT) which has turned the world into a global village. Nations have also enjoyed an unparalleled increase in productivity as well as sustainable economic growth and development due to this evolving trend. However, this laudable development has not been evenly spread. It has only been

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concentrated around the technologically advanced nations of the world and this has been adduced to a slow rate of IT infusion in developing nations like Nigeria.

Information Technology (IT) has been integrated into business operation and management for decades. Investments in IT have become crucial organizational strategies for survival and competitive advantage (Melville et al., 2004). One of the most common questions when utilizing IT in business operation is when the business is considered to be successful at using IT or what determines the stage of success. Technology infusion has been studied by many scholars, primarily in two contexts (Kishore & McLean, 1998). In the first context, IT infusion is studied in terms of the application of IT to its fullest potential: in other words, depth of use. In the second context, it is studied in terms of an adoption or introduction of technology into a particular area; for example, an adoption of technology in teaching and educational studies (Collier et al., 2004; Rowley et al., 2005) and engineering studies (Cornford & Hicks, 2000).

IT infusion is a part of information systems planning strategies in organizations. The goal is to integrate information systems to create strategic advantages for business. IT infusion is defined as the degree to which Information Technology (IT) has penetrated a company in terms of importance, impact, or significance (Dichapong, 2010). At a low degree of infusion, IT is used for day-to-day operations such as payroll and accounting functions. The degree of infusion increases when business finds IT becoming more crucial to its operation. The infusion reaches the highest level when IT becomes a major driver (backbone) of the business. IT is used strategically in order to rival competitors.

In particular, the health sector was relatively slower than other industries in the adoption and use of information technology based solutions for its services where the use of computers, mobile phones, multimedia projectors, video conferencing, audio conferencing and internet for the improvement of individual and collective effort on the job productivity of workers in the health care system is not commonly recognized (Idowu et al., 2003). Innovation in healthcare is crucial for improving patient outcomes. However, this potential can only be fully realized when innovation is effectively spread, adopted and used.

Health workers in teaching hospital need timely information to discharge their duties effectively, to collaborate with colleagues and apply ICTs on their job. However, they are also constrained by the same factors that limit the general body of health workers from exploiting ICTs. Of major concern is the fact that many health workers who do not have access to ICT equipment, particularly in developing countries or emerging economies, do not have information on current developments in medicine because of their inadequate access to ICTs, nor are they able to collaborate with geographically distant colleagues, as their counterparts in other parts of the world can. For instance, in developed countries, health workers conduct on-line consultation with colleagues that is only possible through the use of ICTs. Thus, health workers with inadequate access to ICTs are less likely to be able to collaborate with peers, to gather current or timely information, or to be skilled in the use of various ICTs.

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