

Knowledge Sharing Adoption Model Based on Artificial Neural Networks

Olusegun Folorunso, University of Agriculture Abeokuta, Nigeria

Rebecca O. Vincent, University of Agriculture Abeokuta, Nigeria

Adewale Opeoluwa Ogunde, Redeemer's University (RUN), Nigeria

Benjamin Akintayo Agboola, University of Agriculture Abeokuta, Nigeria

ABSTRACT

Knowledge Sharing Adoption Model called (KSAM) was developed in this paper using Artificial Neural Networks (ANN). It investigated students' Perceived Usefulness and Benefits (PUB) of Knowledge Sharing among students of higher learning in Nigeria. The study was based on the definition as well as on the constructs related to technology acceptance model (TAM). A survey was conducted using structured questionnaire administered among students and analysed with SPSS statistical tool; the results were evaluated using ANN. The KSAM includes six constructs that include Perceived Ease Of Sharing (PEOS), Perceived Usefulness and Benefits (PUB), Perceived Barriers for Sharing (PBS), External Cues to Share (ECS), Attitude Towards Sharing (ATT), and Behavioral Intention to Share (BIS). The result showed that Students' PUB must be raised in order to effectively increase the adoption of Knowledge Sharing in this domain. The paper also identified a myriad of limitations in knowledge sharing and discovered that the utilization of KSAM using ANN is feasible. Findings from this study may form the bedrock on which further studies can be built.

Keywords: Artificial Neural Network, Knowledge, Knowledge Sharing, Knowledge Sharing Adoption Model, Technology Acceptance Model

INTRODUCTION

Knowledge is defined as human understanding of a specialized field of interest that has been acquired through study and experience (Awad & Ghaziri, 2004). Hence, sharing this knowledge cannot be over emphasized. However, Knowledge sharing can be termed as the process where

individuals mutually exchange their knowledge and jointly create new knowledge (Van den Hooff et al., 2003). It is defined as the process of exchanging knowledge (skills, experience, and understanding) among researchers, policy-makers, and service providers (Lily Tsui et al., 2006). It is expected that increase in sharing of valuable knowledge would have a positive effect on the organization's performance. Un-

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fortunately, people do not share their knowledge under all circumstances.

Knowledge sharing has been gaining attention among researchers and business managers (Kong et al., 2009; Kim & Ju, 2008; Van den Hoot & Huysman, 2009; Lu, Leung, & Koch, 2006; Han & Anantatmula, 2007). Numerous studies (Barson et al., 2000; Murray, 2003; Levina, 2001) have examined factors influencing knowledge sharing in an organizational context. However, a few studies have addressed knowledge sharing in a classroom context. Therefore, the purpose of this study is to investigate factors influencing knowledge sharing among university students in a classroom context. Few studies on knowledge sharing paid attention to the inhibiting factors that is likely to affect knowledge sharing (i.e., perceived ease, perceived usefulness and benefits and barriers affecting the behavioral intension of potential sharers). Most of the previous studies adopted simple statistic methods, or regression-based multivariate analysis, all of which are linear, only few studies used nonlinear structural models such as the nonlinear artificial neural network model. This paper utilizes ANN for generating an adoption model for knowledge sharing in a learning environment.

Neural networks, despite their empirically proven abilities, have been little used for the refinement of existing knowledge because the task requires a three step process. First, knowledge in some form must be inserted into a neural network. Second, the network must be refined. Third, knowledge must be extracted from the network. Artificial Neural Network (ANNs) has proven to be a powerful and general technique for knowledge sharing (Fisher & McKusick, 1989; Shavlik et al., 1991; Weiss & Kapouleas, 1989; Ng & Lippmann, 1990). We illuminate into the neural network black box by combining knowledge based reasoning with neural learning. Our approach is to form a three-link chain in which symbolic knowledge, in the form of propositional rules, is revised and corrected using neural networks. Thus, the

approach we present makes possible the use of neural networks as the underlying algorithm of a rule-refinement system.

LITERATURE REVIEW

Technology acceptance model (TAM) and knowledge sharing adoption model (KSAM) are two models which are in some aspects, complementary. Therefore, it would be of great significance if they are integrated to investigate the adoption of knowledge sharing. The following sections reviews these models.

Technology Acceptance Model (TAM)

In studying user acceptance and use of technology, the TAM is one of the most cited models. The Technology Acceptance Model (TAM) was developed by Davies (1989) to explain computer-usage behaviour. The theoretical basis of the model was Fishbein and Ajzen's Theory of Reasoned Action (TRA). The Technology Acceptance Model (TAM) is an information system (system consisting of the network of all communication channels used within an organization) theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new software package or technology, a number of factors influence their decision on how, when and if it is necessary to use it. TAM posits that perceived ease of use, perceived usefulness predicts attitude toward use of a technology while attitude toward use predicts the behavioural intention to utilize it. However, intention predicts the actual use of the technology (Davies, 1989). A variety of applications have been used to validate the model (Ma & Liu, 2004). For example, the model was employed to study user acceptance of microcomputers (Igbara et al., 1995), the World Wide Web (Lederer et al., 2000), software, and decision support systems (Morris & Dillon, 1997). Figure 1 describes the model.

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