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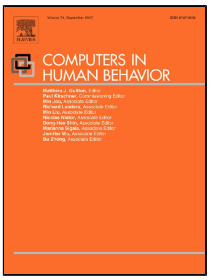

Understanding and predicting the determinants of cloud computing adoption: A two staged hybrid SEM - Neural Networks Approach

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Understanding and predicting the determinants of cloud computing adoption: A two staged hybrid SEM-Neural Networks approach

Abstract

Along with water, gas, electricity, and telephone, cloud computing has been considered as the fifth utility. Like other utility services available in today's social computing services are readily available on demand (Buyya, Yeo, Venugopal, Broberg, & Brandic, 2009). The purpose of the study is to develop a hybrid two-stage, structural equation modeling (SEM) – artificial neural network (ANN) model to predict motivators affecting cloud computing adoption services in the Indian private organizations. This research article proposes a new paradigm by extending the Technology Organization Environment Model (TOE) with external factors, namely, perceived IT security risk and risk analysis for the first time in a technology adoption study. One of the core contributions of the study is the introduction of new factors, perceived IT security risk and risk analysis. Data were collected from 660 professional experts and analyzed using structural equation modeling (SEM) and artificial neural network (ANN) modeling. The SEM results showed that perceived IT security risk (PITR), risk analysis (RA), technology innovation (TI), management style (MS) and trust (T) have a significant influence on cloud computing adoption. The only exceptions were the usage of technology (UT) and industry usage (IU) which witnessed statistically insignificant influence on cloud computing adoption. Furthermore, the results obtained from SEM were employed as input to the artificial neural network (ANN) model and results showed that 'trust,' 'perceived IT security risk,' and 'management style' as most important predictors in cloud computing adoption.

Keywords: Cloud computing adoption, Risk analysis model, SEM, ANN, Indian industries.

1. Introduction

Cloud Computing (CC) is an innovative technological paradigm that provides a stable, on-demand network access to a common pool of configurable computing resources, which can be quickly provisioned and released with negligible management effort or service provider collaboration (Michael, Fang, Annie, & J. T, 2011). Among the various definitions of CC, the one by National Institute of Standards and Technology (NIST) has gained popularity and recognition recently which states that "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services)that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell &Grance, 2011).CC