

# Cloud Computing Adoption and Utilization amongst Zimbabwean NGOs: A Case of Gweru NGOs

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**Abstract:** *This paper seeks to determine the cloud computing services utilized by NGOs in Gweru as well as identify reasons (which might be management related, worker related, company related or economic related) that influence the utilization or non-utilization of cloud computing services. To elicit data, the researchers used questionnaires and interviews. Results from the survey indicate that the most widely used cloud computing services are social networks (97%), Google docs (94%) and Gmail (86%). Major concerns raised by the respondents include the absence of a budget supporting ICT initiatives, indecisiveness towards adopting cloud computing due to security related concerns, to lack of technical and management oriented support, use of outdated hardware and software and lack of information on compliance requirements. The study winds off by proffering recommendations to tackle the raised concerns.*

**Keywords:** NGOs, cloud computing, ICTs, Gweru

## 1. Introduction

Cloud computing is an emerging new computing paradigm for delivering computing services that aims to provide scalable and inexpensive on-demand computing infrastructures with good quality of service levels [1]. It offers a new economic model for Information Communication Technologies (ICTs)- a model which heralds new modes of investment in and operation of Information Technology (IT) resources [2]. The new model resulting from the changes in ICTs is founded on the internet which offers significant benefits for NGOs such as improved productivity or decreased costs among other things. Built upon decades of research in virtualization, distributed computing, utility computing and more recently networking, web and software services [3], cloud computing represents a shift away from computing as a product that is purchased, to computing as a service that is delivered to consumers over the internet from large scale data centres or clouds [4].

There is no universally acceptable definition of what this phenomenon is but the definition by the National Institute of Standards and Technology (NIST) summarizes what cloud computing is all about. The term is defined as “*a model for enabling 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 cloud provider interaction*” [5].

According to [5] and [6], a cloud can be classified as private, public or hybrid. Public clouds provide access to computing resources for the general public over the Internet but the resources themselves are owned by the organization selling the cloud services. The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services. Private clouds give users immediate access to computing resources hosted within an organization's infrastructure and the resources are dedicated solely for that organization's use. The cloud

infrastructure is operated solely for an organization and it may be managed by the organization or a third party and may exist on premise or off premise. Hybrid clouds combine one or more public clouds and one or more private clouds by technology that enables data and application migration between them. Hybrid clouds typically use a shared API to enable hybrid operation.

The delivery models that exist in cloud computing include but not limited to Infrastructure as a Service (IaaS), Database as a Service (DaaS), Software as a Service (SaaS) and Platform as a service (PaaS) [1]. With Infrastructure as a service (IaaS), hardware resources and computing power are offered as services to customers. This enables businesses to rent these resources rather than spending money to buy dedicated servers and networking equipments [1]. Database as a service (DaaS) are a more specialized type of storage offering database capability as a service. Examples of service providers are Amazon Simple Database and Google. DaaS on the cloud often adopts a multi-tenant architecture, where the data of many users is kept in the same physical table. In the Software as a service (SaaS) model, software applications are offered as services on the Internet rather than as software packages to be purchased by individual customers. One of the examples of SaaS includes Google web-based office applications (word processors, spreadsheets, etc.). Platform as a service (PaaS) refers to providing facilities to support the entire application development lifecycle including design, implementation, debugging, testing, deployment, operation and support of rich Web applications and services on the Internet.

The main thrust of the research is on deducing user perspectives (in this case the perspectives of the employees in the NGOs) concerning cloud computing utilization, to determine the cloud computing services utilized by NGOs in Gweru and identify reasons (which might be management related, worker related, company related or economic related) that influence the utilization or non-utilization of cloud computing services. Findings were corroborated