

Chapter 93

ZAMREN Big Data Management (ZAMBiDM) Envisaging Efficiency and Analytically Manage IT Resources

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ABSTRACT

The ZAMREN member institutions deal with heterogeneous teaching and research materials drawn from all walks-of-life such as industry, and NRENs world over. To deal with such huge data that is in terabits for academic and economic gain becomes a mammoth task to manipulate, process, store and analyse. It is in view of that the ZAMREN Big Data and Data Management, in this work abbreviated as ZAMBiDM, is envisaged to collectively gather relevant heterogeneous large volumes of a wide variety of data from all sectors of economy. The data would be analytically managed in storage, processing and obtaining actionable insight real-time as a way to solve high-value skilled academic and industrial business problems, in order to prepare graduates for competitive future workforce. The data would be collected from all line-ministries of Zambia such as education, agriculture, health, mining, lands, communications, commerce, including industries and NRENs worldwide and be analytically analysed to exploit strategic actions that would enhance decision making in executing relevant tasks.

INTRODUCTION

The ZAMREN Big Data and Data Management, in this work abbreviated as ZAMBiDM, is envisaged with the capacity to handle the heterogeneous large volumes of data drawn from all sectors of economy, including the NRENs worldwide. The proposed ZAMBiDM is demonstrated in Figure 1 as model scale-out architecture with capacity to handle the four “V’s”, these are volume, variety, velocity, variability and complexity. The model has strategically built-in components that would accelerate processing of ZAMREN Big Data. These components include the ZAMREN Big Data and Management which would

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deal with the institutions Big Data process it to achieve business and technological goals. Surrounding it is the virtualisation which whittles down Big Data and reduces its sprawling bulk to manageable size. This is followed by a series of strategy components that are linked to the operational nodes.

Statement of the Problem

In this era, as technology evolves, the demands on the use of large volumes of data escalate. Managing such information in form of Big Data has become a challenge. In order to overcome such challenges, the industry, particularly in the developed world has engaged various technologies to manage the Big Data storage and processing. Some of these technologies and methods employed are resource virtualisation, analytic of data to predict the output, utilisation of analytic tools, Big Data management, and management of the four (4) V's. However, none or very little has been done to tackle the Big Data challenges in the developing world. It is in view of that the ZAMBiDM was envisaged to collectively bring all the resources from the ZAMREN member institutions. Using the collective resources, the ZAMREN would build the ZAMBiDM with the capacity to manage the four V's, these are volume, variety, velocity and variability of data.

Objective of the ZAMBiDM

The ZAMBiDM is developed in-line with the following objectives:

- Design and build the ZAMBiDM architecture.
- Write the ZAMBiDM road map.
- Employ highly qualified data analytics, and data-were housing personnel.
- Develop data management, analytic and quality tools.
- Acquire servers to accommodate large volumes of data.
- Collect and store large heterogeneous volume of data from academic and industry sectors including the NRENs worldwide.
- Virtualise all the data, software and hardware resources.
- Manage the four (4) “V’s” of data and these are volume, variety, velocity and variability.
- Build operational processes or nodes.
- Develop relevant strategies for the respective operation nodes.
- Elevate ZAMBiDM data to executive level.

Organisation of the Chapter

The Chapter is organised in the following parts: the first section introduces the ZAMBiDM and highlights the statement of the problem. The Literature Review section discusses various Big Data technologies employed in industries. The third section introduces the proposed ZAMBiDM model and explains the functions of the system components. The fourth section discusses the implantation of the model. The last section concludes the ZAMBiDM's operations and highlights the benefits of envisaging such a model.

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