INFORMATION SYSTEMS MANAGEMENT AT KOSOVO ENERGY CORPORATION (KEK)

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ABSTRACT

Purpose- With the continuous growth of global environment, the pressure in organizations has also increased in order to make their operational and strategic processes as effective as it can be. Information System (IS) is a set of components that can enhance this effectiveness and help in gathering information that can affect in decision-making. Therefore, lots of companies have decided to implement Information Systems in order to increase the performance of their company.

Methodology- However, one must keep in mind that neglecting while implementing can bring problems with it. One of the biggest companies in Kosovo that have implemented Information Systems is Kosovo Energy Corporation (KEK).

The purpose of this thesis is to show some basic concepts about Management Information Systems (MIS) and information technologies, especially about hardware, software, data processing, telecommunication and networks.

Findings- Moreover, this thesis will include how Information Systems have been implemented in KEK, an introduction about history of KEK, and what kind of information technologies are used there, particularly about hardware and software that are used in KEK for data storage and maintenance as well describing software applications like computerized accounting system. We'll talk about how are communication achieved and what kind of network's infrastructure is used by the company in question.

Conclusion- Furthermore, the last chapters will discuss database systems, with main focus on explanation of what is SQL SERVER of Microsoft and how can it help us - a software that is used in most of KEK's databases. Some databases of this corporation will also be described, including their design, database diagram, data types, indexes, as well as how we can make reports of particular databases by reporting services like SSRS, thus helping in data analysis.

Keywords: Management, information systems, software, database, data analysis.
JEL Codes: L63, L86, C88

1. INTRODUCTION

In order to understand what information systems are, primarily one should understand what a system is. In its simplest form, a system is a group of interconnected components, with clearly defined borders that work together in order to achieve common objectives. For said definition, it is easy to understand that everything that we think is a system, and a system can be formed by other systems or can be a part of a greater system. Information Technology (IT) includes the entire hardware and software that a firm needs to achieve its business objectives. This includes not only computer machines, but also software such as Windows or Linux operating systems, Microsoft Office package and hundreds of computer programs that can be found in a typical large firm.

The term "information system" is more complex and can easily be understood if we look at it not only from the technological perspective, but also from a business standpoint.

2. HISTORY OF KOSOVO ENERGY CORPORATION (KEK)

Kosovo has a considerable energetic potential in coal (lignite). Coal reserves are located in two coal basins in Kosovo, but currently only the Prishtina coal Basin is exploited, on surface mines in Southwest Sibovc and Mirash (Sitnica). Mines lie in an open area and the rate of coal extraction efficiency is very high. Reserves of coal (lignite) in Kosovo are mainly used for electricity production in two plants (about 85%). Extraction of coal from underground basins in Hade village began in 1922. With the onset of change and commissioning of the first power plant Kosovo A, coal extraction started through unveiling coal by remove dirt (wasteland), thus being a surface mine. KEK mines lie near the city of Kastriot - former Obilic.Today KEK has two power plants: "Kosova A" with 5 blocks from which the A3, A4 and A5 are available for production and "Kosova B" with two blocks sustaining production. Power plants are put into operation between 1960 and 1984, initially the A1 block (the first in 1960s) up until 1984 when power plant "Kosova B" was put into operation. Power plants are located near the coal mines, about 10 to 15 kilometers away from Pristina. Kosovo Energy Corporation is a public company owned by the state, which deals mainly with coal production for the needs of generating electricity, but also in small quantities for open market needs. Currently the annual output of coal is 8.2 tons, while the capacity for generating electricity are approximately 900 to 950 MWh or roughly 6 million MWh per year (TCA 3x150 MWhwhereas TCB 2x250 MWh). KEK currently has about 4,800 workers. The electricity distribution division was separated from KEK in 2006, for which a Kostt was established as a state enterprise (System, Distribution and Market Operator, JSC).KEDS has the exclusivity for distribution services of electricity in Kosovo. KEDS was established in 2009, and started its operation on May 8, 2013, when it is eventually split from KEK JSC. It is a privately owned consortium of Turkish companies Çalik Holding and Limak.

3. INFORMATION TECHNOLOGY AT KEK

Large rooms filled with files, papers and mailing documents are disappearing rather quickly. Now, a large number of companies store digital versions of documents on servers and storage devices. In this way, these documents can at any time and by any employee be accessed safely and immediately within the company provided they have the appropriate authorizations, regardless of its geographical location. Companies are able to preserve and maintain large amounts of historical data with an acceptable economic cost, thus benefiting from the time saved by the quick access from the workers to the documents they need. Virtualized server or storage environments allow more efficient use of computer resources by sharing hardware resources. The new 'farm' IT infrastructure implemented at KEK server in the datacenter is done through the virtualization server using Microsoft Hyper-V platform 2012 R2 and IBM Storage Storwize V7000. The old infrastructure contained some older HP servers (SAN and NAS Storage), where the main IT services were installed (Active Directory, MS Exchange, MS SQL, File Server and KEK's special purpose applications). All these services are moved to the new infrastructure and are virtualized. Data Storage is only one of the benefits if these data are used effectively. Modern companies use these data as part of the strategic planning process and tactical execution of this strategy. Information management system allows companies to review the records of sales, costs and productivity levels. This information can be used to track profitability, increase return on investment and identify the areas where improvements can be made. Business managers can monitor and react immediately, overnight, to increase productivity or to reduce the price of goods. Networking and VoIP Cisco call manager are implemented in the virtualization infrastructure based on VMware ESXi hosts.

3.1. Hardware Installation

Hardware is installed in KEK's existing cabinets and shelves. Find below pictures regarding how this hardware looks like, and also how they are linked through SAN Switches.

Figure 1: Front and Back View of Hardware
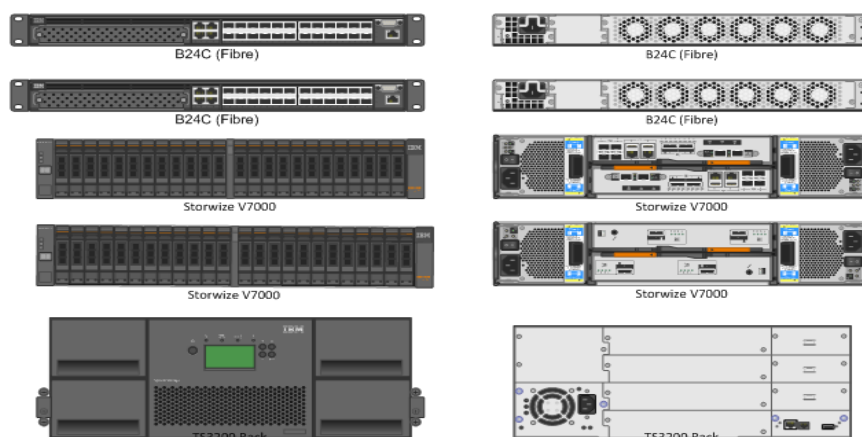
Figure 2: Physical Link of Servers and Storage in SAN Switches

IBM Storwize Controllers   10 X IBM x3690 Servers
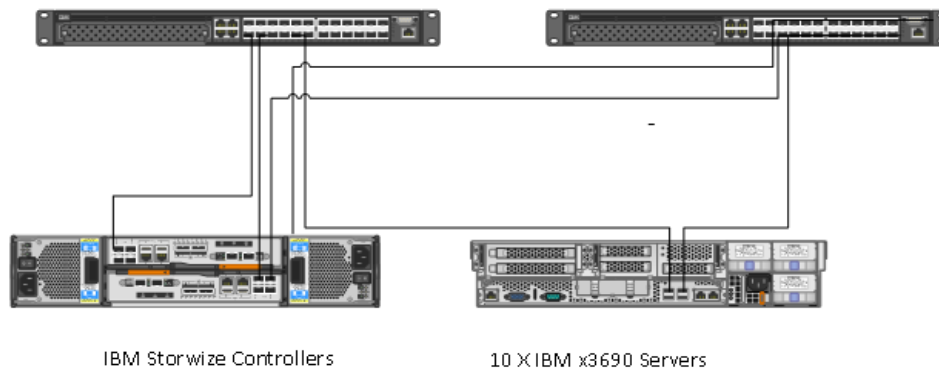
3.2. Server installation, Virtualization and Backup

For 10 x IBM X3690 servers, during this project 6 are installed, 4 for virtual infrastructure HYPER-V, one for Cisco Call Manager (VMWare ESX) and another one for backup (Tivoli). By using HYPER-V Cluster, IT services will attain high availability and can be moved from one server to the other without downtime. The figure below explains how this is possible.

Figure 3: HYPER-V Cluster
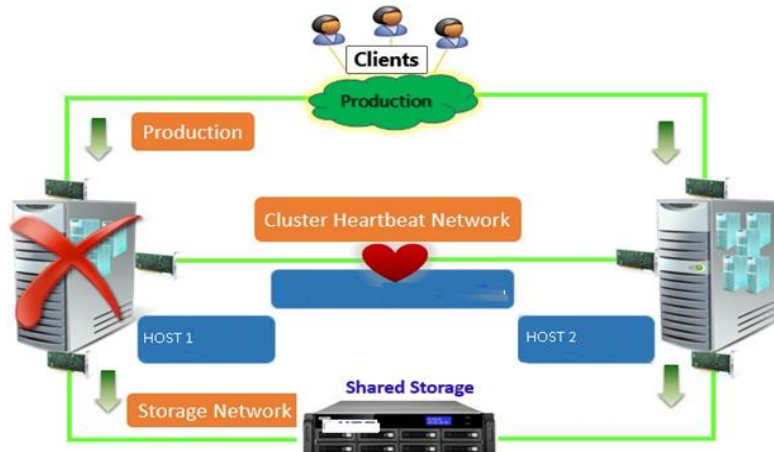
In order to protect this datacenter, KEK has implemented the IBM software Tivoli Storage Manager. This software is a platform for data protection allowing the enterprise (KEK) a unified control and administration for backup and recovery.

3.3. KEK Applications

As one of the largest corporations in Kosovo, KEK uses different applications for certain jobs. A fraction of modules are developed in Microsoft Access Applications, while the data (databases) are stored in MS SQL Server, which relate to the Corporation Accounting system with a very distributed environment. Computerized Accounting System – CAS represents a centralized and fully integrated application system, capable of managing data throughout various business areas of the corporation. The system provides:

- *Applicative software system, which allows efficiency in business*

- *Long-term and stable system with high degree of reliability and accuracy*

- *Dimensioned system with sufficient capacity and opportunities for future development*

- *A user-friendly Operating System and Software*

Computerized accounting system - CAS is an integral system of information technology management, in accordance with IAS while respecting the laws, regulations and local procedures, in the process of financial information flows, in order to create the environment for making the right decisions at the right time. Business fields supported by the CAS are:

- *Personnel records – human resources*

- *Main Accounting Book*

- *Cash register*

- *Accounts receivable– Customer Accounting*

- *Accounts payable– Suppliers' Accounting*

- *Assets*

- *Storage Management*

- *Salaries*

Main Accounting Book module is one of the modules of the system, which enables the management of financial data from the enterprises activities. This module impromptu creates all major enterprise reports: income statement, balance sheet and cash flow, the accounts' status, gross balances and a host of labor and managerial reports with a high level of accuracy, enabling financial management an updated view of firm's enterprise. The Main Accounting Book fulfills its functions through two processes. First, it allows users to edit - setting and correction of the data; and second, it allows user to approach and present at data in the form of analyses and reports.

3.4. Communication and networks at KEK

In KEK, e-mail is the principal mean of official communication between KEK workers, various economic operators and consumers. Yet over the years, there have been investments in other communication tools, enabling staff to communicate through chat systems, communicators, VOIP phones, smartphones etc. A particular challenge during this uninterrupted communication is also maintaining the system and network security in general by external and internal attacks. By enabling Internet connection only through proxy server, which has Web Gateway installed, reduction to a minimum surfing the web sites that are not related to the business of KEK was managed. This is achieved by blocking certain categories of web sites and URLs such as: making or viewing of audiovisual media (streaming media), social networks, chat, etc. thus improving the performance of business applications.

4. SQL DATABASE AT KEK

There may be many arguments regarding which platform should be used for databases. Considering the entire applications count that KEK uses, the solution was clear. Applications developed in C# as well as the widespread use of the Microsoft platform has culminated in logical use of Microsoft SQL Server as a back-end system for database management. Database for Main Accounting Book module as part of the computer system of accounting known as CAS - GL (Computerized Accounting System - General Ledger), which is perhaps the largest database, is no exception with regard to the use of Microsoft SQL Server. This is the database to be reviewed in this paper. Main tables of the Main Accounting Book module (CAS - GL) are:

- *Accounting Plan*
- *Organizational Chart*
- *Partners*
- *Personnel table*
- *Funds and donors table*
- *Projects*
- *Table of orders*
- *Transaction table or archive*

Database diagram allows for the visualization of the structure of said database for further analysis, by displaying tables (entities), columns (attributes), primary and foreign keys as well as connections between tables.

5. CONCLUSION

Describing and analyzing how information system have been managed by Kosovo Energy Corporation was the main objective of this paper. Appliance of information systems affects in improving the quality and speed of decision-making, as

well as in monitoring of financial and functional processes. These systems enable standardization of information, raise employees' responsibilities and create better work environments. Overall, appliance of these systems in KEK fulfil interaction, mobility, security and easy use challenges. To better illustrate that these challenges have been fulfilled, in this thesis is described how data are stored in KEK, beginning from use of some of the newest and best servers from IBM, server virtualization achieved from Microsoft Hyper V and disaster recovery backup from a software called Tivoli. For illustration of applications that are used, it is described the module of General Ledger, which is implemented through Microsoft Access Applications. Databases are also created through a Microsoft platform called SQL Server As a conclusion, systems used to manage information in Kosovo Energy Corporation have been applied successfully, with some of the best hardware in market, high security / easy-to-use software products and applications, and in general a great compatibility between all systems, which has been possible from almost always use of variety platforms and products provided from Microsoft Corporation.

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