Management of information systems, implementation and their importance in Albanian enterprises

V Prifti\textsuperscript{1,}\textsuperscript{*}, I Markja\textsuperscript{2}, K Dhoska\textsuperscript{3} and A Pramono\textsuperscript{4}

\textsuperscript{1,2,3} Production and Management Department, Faculty of Mechanical Engineering, Polytechnic University of Tirana, Mother Teresa No.3, 1001 Tirana, Albania.
\textsuperscript{4} University of Sultan Ageng Tirtayasa, Department of Metallurgy Engineering, Cilegon Banten 42435, Indonesia.

\textsuperscript{*}E-mail: vprifti@fim.edu.al

Abstract. Management information system collects and processes data (information) and provides it to managers at all levels who use it for decision making, planning, program implementation, and control. In addition to the global studies of management information system, this paper will analyze similar cases in Albanian enterprises. Albanian enterprises strongly need management information systems and the facilities that they bring to their management ensuring a better functioning and higher performance of different enterprise processes. In this paper was taken the case study of the Microsoft Dynamics NAV system, the implementation in “Infosoft Systems” enterprise in Albania and the impact of NAV system in some of the enterprise departments. Implementation phase of management information system is one of the most important stages which starts with the organization of the information systems management department and ends with the procurement of the relevant software. To get more information we used a questionnaire which was designed and sent to some enterprises in Albania. The purpose of this questionnaire was to learn how many of them use management information systems, what type of information system they use and the advantages or benefits that the implementation of information systems brings to enterprises in Albania. As a conclusion, management information systems have contributed to enterprises to put in place better functionality, which leads to increased enterprise performance, increased profits, simplified work processes in different departments.

1. Introduction

A management information system (MIS) is a computerized database organized and programmed in such a way that it produces regular reports on operations for each level of management in an enterprise.\cite{1}. Also it can generate easily special reports from the system.

The main objective of MIS is to provide managers feedback on their performance so that managers can monitor the enterprise. The information displayed by MIS usually shows the “real” data versus the “expected” results and the results from previous year, it measures progress against goals. MIS receives data from enterprise units and functions. Some of the data are automatically collected from computer-related check-out counters and other data are collected at periodic intervals. Daily reports are pre-programmed and run at intervals or as per request, while others are executed using query language construction. Many advanced systems also monitor and display enterprise stock performance. The information system is an agreement between human, data, processes, and interfaces, interacting to support day-to-day operations in an enterprise, as well as support to solve problems and decision-making needs of managers and users. Also the information system can be described as a group of tools and methods that provide managers information for making decisions and for supporting different
operations in an enterprise. Referred to literatures we have defined information systems as a set of different components that store, collect, disseminate and process information to support in an enterprise managers for decisions, job coordination, and also process control. Within the enterprise or in the environment in which it operates, information systems contain important information about things, people and locations. Information means data that is shaped in order to make sense and to be usable by humans.

In the enterprise, one of the key roles, from enterprise information systems is to provide applications for effective support to enterprise strategy. In the global market, this is done by developing services, capabilities or products that give the enterprise great importance over the competitors. In the enterprise, different information systems that are developed for supporting strategy decisions, can shape their position regarding the competitors and strategies. Any type of information system that help the enterprise with different decisions for the strategy, such as how to deal with competitive advantage or disadvantage and many other objectives from a strategic point of view, can be a strategic information system (example DSS, MIS, etc.).

2. Literature review
2.1 Classification of Information Systems (IS) and their fields
Karim (2011) stated that Management Information Systems (MIS) is the key factor to facilitate and to have in an organization an efficient decision making. His research explores the extent to which management information systems implemented to make successful decisions at two selected financial organizations.

Knight Moore (2005) and Fabunmi (2003) have shown that the limitations and deficiencies in the process of management information system performance are the main reason for diminishing the efficiency of decision-making process in the organization.

Whitten et al. (2004, p.12.), stated that “information is an arrangement of people, data, process, and information technology that interact to collect, process, store and provide as output the information needed to support an organization”. The research indicates that information system is an arrangement of data, processes, groups and technology that act together to accumulate, process, store and provide information output needed to enhance and speed up the process of decision making. The case was in a Bank’s information system.

Laudon and Laudon (2003) have defined MIS as “the study of information systems focusing on their use in business and management”.

Baskerville and Myers (2002) have examined the MIS field and found a constant shift of MIS research from a technical focus to a technology-organizational and management-social focus.

Skyrius (2001) underlines the decision maker's attitudes towards different factors influencing the quality of business decisions; these factors include information sources, analytical tools, and the role of information technologies.

Liu and Young (2007) have defined key information models and the relationships in business decision support in three different scenarios. The authors proved that global businesses are in advance due to the Enterprise Applications System provided by modern IT tools such as Enterprise Resource Planning (ERP), Knowledge Management Systems (KMS) and Customer Relations Management (CRM) to enhance the efficiency and effectiveness of the process for decision making.

Becta (2005) describes an information system as “a system consisting of the network of all communication channels used within an organization”.

Adebayo (2007) explained that the existence of MIS is needed to improve and enhance decision making on the issues affecting human and material resources.

Handzic (2001) has examined the impact of information availability on people's ability to process and use information for short/long term planning and in decision making. He stated that the better the availability of information, the better the impact on efficiency and accuracy of business decisions. [10]

The literatures also explore the importance of MIS in providing decision makers with facts, which consequently support and enhance the entire decision-making process. Furthermore, at the most senior level, MIS and DSS supply the data and required information to assist the board of directors and management levels to make an accurate and on time strategic decisions.
From the literatures presented, we can easily perceive that the importance of the role of both middle and top management to maintain a consistent approach to develop, use, and evaluate MIS systems within the institution. To financial institutions, MIS is used at various levels by top-management, middle and even by the operational staff as a support for decision making that aims to meet strategic goals and strategic objectives. [1]

2.2 Classification of IS based on Characteristics
In decision making in enterprises information used is categorized into three types:
• Strategic Information
Strategic information deals with the objectives of an enterprise with long-term policy decisions and controls whether these objectives are met to their level or not. Such as, buying a new plant or product, business diversification, etc.
• Tactical information
Tactical information deals with the information needed to control enterprise resources, such as budgeting, inventory level, productivity level, service level, quality control, etc.
• Operational information
Operational information can handle the proper performance of different operational tasks in the way it was planned or assigned to the various specific operators, special machines and specific job relocations for quality control operations.

2.3 Classification by Application
In terms of applications, the information can be categorized as:
• Planning information
This is the information used in enterprises for maintaining standard norms and specifications. Everything is planned here. This information is used in the strategic, tactical planning, and operation of any activity. Examples of such information are time standards, design standards.
• Control information
This information is needed for specific activities carried out by the system in order for enterprises to achieve their objectives. This information can be formal or informal and is used to control the achievement of objectives, the nature and use of important processes in a system. When this information has received any deviation from the established standards, the system must develop a decision that leads to checking the data regarding their objectives.
• Knowledge Information
Knowledge information is gained through experience and lessons learned from archival data and research studies. Knowledge is defined as "information about information".
• Organizational Information
Organizational information deals with the environment of an enterprise, where organizational objectives are met. An enterprise reduces its uncertainty by carefully collecting, managing and using this information. Everyone in the organization can use the information.
• Operational Information
This is specific information where the enterprise helps to perform its transaction functions. Mostly there are technical jobs for example, daily schedules at a manufacturing enterprise that refer to the detailed assignment of jobs to machines. This information is internal enterprise information mostly.
• Database of Information
The database of information is a collection of related data that is stored and managed to form databases. It stores large amounts of information that has multiple uses and applications. For example, for multiple users can be stored supplier information or the material specification.

3. Implementation and selection of Information Systems IS in an enterprise
The implementation plan is needed to help the user community understand the timeframe for installing the new system. Communicating the implementation plan to the user community helps users to prepare for change and makes them mentally prepared for it. The communication process can be complex in several stages. The senior can communicate the overall purpose of the new system and
then detailed information on staff can be left to the head of division. The communication process indicates the role that each employee must play in the implementation process. It includes the following steps:
1. Create a plan for different activities and their implementation
2. Setting deadlines for different activities with can be critical or not
3. Identification of major obstacles and their solutions
4. Communication of plan

3.1 Hardware Selection and Procurement
This is a very important step of the implementation process because it has to do with a lot of investments. The process of selecting and procuring equipment varies a lot from enterprise to enterprise depending on the size and the sector in which it operates.

After analyzing the experience of the enterprise sales managers with different vendors can be prepared the list of vendors or it may have been prepared on the basis of some vendor-accepted lists prepared by an organization or a regulatory body. Then is prepared the RFP by the implementation team based on the hardware of the new system. RFP must have complete technical details and information of hardware systems that are required, including here the format, specifications, performance expectations, also requirements for the warranty and service quality.

Once the RFP is prepared, it is sent through various communication modes to the simple vendor selection. The means of communication may be through an open advertisement in the electronic media, or it may be in the form of a letter to the vendors with a deadline for submission of the proposal.

Evaluation of the RFP is a very difficult process. Before the deadline, once the bids have been received, is done the preliminary check for fundamental errors. There are several evaluation methods. Evaluation can be cost-based or quality-only, or it can be a mixture of both cost and quality. Typically, a rating system which is results-based is used to rank vendor proposals. Then, based in this rating, a single vendor or a group of vendors are selected for shipping the hardware. With the selected group of vendors are held price and contract negotiations and then is signed the final contract after successful completion of negotiations. [5]

3.2 Software Procurement
The procurement of the system software is done in similar ways as procurement of hardware equipment. The only difference in the case of software procurement is that the choice of what software to support is already made in the design phase of system development and thus, the process of preparing the RFP is straightforward.

3.3 Database Creation
The new system to be implemented will have data records. Data storage is done with the database. These databases are relational database management systems which is a separate package of software applications.

3.4 User Training
The new system may not have a good use after is being installed, without proper user training. A bigger concept is implementation which is focused on installing and maintaining the transition process. A user training program is planned.

3.5 Creating physical infrastructure
Implementation of the new system may require physical infrastructure. The implementation team should ensure that system performance is not affected due to infrastructural difficulties.

Normally, since the new system is installed, the new system and the old system are both usable for a period to ensure that the company's performance will not have problems due to the transition. Later, when users have acquired more capabilities to handle the new system then the old system is discarded.
4. Case study-IS as strategic tool and implementation in an Albanian enterprise

NAV (Microsoft Dynamics) is an ERP (enterprise resource planning) application from Microsoft. The product is part of the Microsoft Dynamics family. The product aims to help finance, manufacture, manage customer relationships, supply chains, analyze and e-commerce for different size of enterprises and local affiliates from the large international groups. Microsoft announced in 2003 plans to develop Project Green which was a completely new ERP system. Later Microsoft decided to continue developing many ERP systems (Dynamics NAV, GP, SL AX). The four ERP systems that were launched were with the same new role-based interface, SQL-based reporting and analysis, portals Sharepoint-based, mobile clients Pocket PC-based, and with the integration with Microsoft Office.

The product has changed name some times. "Navigator" was used originally in Denmark. Internationally it had the name "Navision". The name "Avista" was used in US. As of 2014 its name was "Microsoft Dynamics NAV". Prior to NAV 2013, Microsoft Dynamics NAV gave administrators the ability to use a database or Microsoft SQL server, such as DBMS. Now the exclusive database option for NAV is the SQL Server. Reporting of documents is based on the RDLC 2008 format. The reports are partially edited in the NAV Development Environment and in Visual Studio. NAV 2013 R2 includes a free report editor. Each report will be presented in preview screen formats, PDF, Word or Excel, depending on users' needs.

Microsoft, with NAV 2009 introduced a whole new client interface which was called the Role Tailored Client. The RTC allows the customization of the NAV experience, based on the individuals job responsibilities and uses tool pages/menus (Profiles) and homepages (Roles). In a person's offices this can be a disadvantage for users have to re-login, change their role, or configure a different username to access the different RTCs will use. In multi-person offices when trying to help individuals who may have different screen layouts and also settings, lacking either of these options can lead to confusion. For users or groups are assigned roles. Individual users can customize their toolbar and navigation panel, or administrators can customize layouts for all users on a specific Profile; then they can disable individual customization for users in that profile. Some levels of customization are only available through the NAV Development Environment. The NAV client interface previously available in versions 5 and older was retained at NAV 2009, but renamed to Classic Client, making NAV 2009 the only "hybrid" version, offering both the Classic Interface and the RTC. Both Native and SQL databases are supported from the Classic Client. A SQL database is required form The RoleTailored Client. Additionally, SQL database identifications are not supported with the RoleTailored Client. In October 2012, was released NAV 2013, and was terminated support for Classic Client. Has been renamed RoleTailored Client with the name Windows Client. A built-in Web Client and SharePoint Client were added also. They are not required any special add-ons from the Web Client and it works on computers and mobile devices. And There are still available Repository building and database access that were previously available with Classic Client.

In Microsoft Dynamics NAV 2013 Web Client in relation to other Microsoft 3 ERP products, the Dynamics NAV sector is for small distribution and manufacturing companies. All product sales are via resellers approved from Microsoft who base their entire business on how many consulting hours can they do for any given installation, so only some installations have been "out of the box". The solution has a standard set of features. It can also be thought of as an "ERP System build set" if, at the end of the installation, you want to end up with any builder patch that was in the box attached to your system box. Development language like Pascal is easily accessible to the right developers and is designed for fast software customization.

In 2019, NAV reached 2.7 million users and 3500 certified partners worldwide. Dynamics 365 Business Central, which currently is a pure cloud application, will when it is combined with Dynamics NAV also be able to run on it's own server. With NAV 2018, we have probably seen the last version of Dynamics NAV and Dynamics NAV 2019 will instead go under the name Dynamics 365 Business Central on-premise.

Microsoft Dynamics NAV provides integrated functionality to provide support for: management of supply chain, manufacturing, distribution, managing customer relationships, sales and marketing,
service management, management of human resources, project management, resource management, warehouse management, financial Management

4.1 Architecture of the software
NAV software consists of three main components. First a database server, a database that stores Microsoft Dynamics NAV data. Then the application server, a service that controls all aspects of the workflow of NAV. Also the client, user interface in Microsoft Dynamics NAV. NAV 2015 introduced a Client Chart and NAV 2016 introduced a Phone Client, Tablet Client.

Microsoft Dynamics NAV uses only one concurrent user licensing model. With NAV 2013, Microsoft introduced a new licensing model called "Permanent Licensing", which significantly simplifies the pricing structure. With Permanent Licensing, clients license the solution functionality and is provided access to that functionality by user licensing. User licenses are of two types: Full user or a heavily discounted limited user. The full user has access to the entire system, where as the restricted user only has read access to the system, in addition to the main writing tables, such as time sheets, storage and commentary, plus any three additional tables selected.

During a 3 month period we studied the Infosoft Systems enterprise. Infosoft Systems works with an ERP and specifically with Microsoft Dynamic NAV. Each department has access to the relevant NAV session, which contains updated daily data on the basis of work activity. This data needs to be converted to pdf in order for the application to accept the upload of the prepared files. After preparing the technical-economic offer, the document was converted to pdf. Having access to NAV to the Sales-Marketing & Sales session. We put in the Sales Manager's previously-designated identification code, code named ASL, and uploaded the bid to the NAV system. The document is left unapproved because the approval is given by the company manager or administrator. The technical-economic bid for a specific tender was easily identified in the NAV through the ASL code, without the need for additional additional data.

Through Microsoft Dynamics Certified Partners is available Microsoft Dynamics NAV. These value added resellers offer planning, implementation, customization and support services aimed at optimizing the solution to the specific needs of each customer. customers are entitled to purchase Microsoft Dynamics NAV licenses in advance regardless of how and where the software is located, by paying a monthly fee to the service provider. Since Infosoft Systems is a Microsoft Gold Partner, it has gained access to Microsoft Dynamic NAV.

There are two models of licensing:
1-Continuous licensing
2-Service Provider Subscription Licensing

Both models are designed to simplify the process of acquisition. Customers have the right to choose from two types of concurrent users, restricted and full users, and the option to give these users access to advanced functionality through the Extended Pack.

![Figure 1. Continuous licensing, customization](Source: Microsoft Dynamics NAV 2017 Licensing Guide | October 2016)
4.2 Initial and advanced NAV packages:

4.2.1 Initial Package.
Small and medium enterprises can quickly and cheaply use Microsoft Dynamics NAV. The basic startup package offers basic financial, distribution and professional services, plus three Full User licenses for a price. In the startup package, the functionality included is designed to help clients to gain control and insight into their finances and buy and sell items and materials. It also help them to pay and manage employees and also managing invoices generated by consultants. CRM deliver the highest quality of service and support and manage customer and supplier relationships.

4.2.2 Advanced Package.
Enterprises that require more advanced features can license the optional and add-on package. The advanced package enables clients to integrate financial management and distribution with additional features such as production, to support and control the production environment. Also storage, to manage the warehouse that supports operations.

![NAV packages, starter pack, extended pack](Source: Microsoft Dynamics NAV 2017 Licensing Guide | October 2016)

Infosoft Systems enterprise in Albania, uses the Advanced Package and has chosen a subscription for a monthly fee. Implementation of the NAV took more than 6 months, while testing lasted up to one year. Once successful, the old system was put out of service. The NAV update is done every 3 months automatically. [9]

![Licenses for additional software are not included with Microsoft Dynamics NAV licenses](Source: Microsoft Dynamics NAV 2017 Licensing Guide | October 2016)
Licenses for additional software that may be required for the solution—such as Microsoft Windows Server, Microsoft SQL Server, and Microsoft SharePoint Server.

4.3 Impact of NAV in the Infosoft Systems enterprise

4.3.1 Account Planning
It is a powerful financial reporting tool that helps accountants and financial analysts extract the most essential business data from charts of accounts, budgets, cash flow accounts and cost types in financial reports, which are used to effectively monitor business situation and make a valuable contribution to business decision makers.

4.3.2 Selling & Marketing
Organize campaigns based on the contact segments the company defines. Define segments based on specific criteria, such as sales, contact profiles, and interactions and reuse existing segments or segmentation criteria. The Merge to Word function or other file formats is used to communicate with contacts in your segment.

4.3.3 Human resources. NAV efficiently manages the company's human resources
Relevant employee information is grouped and "tracked" and employee data is organized according to different types of information, such as experience, skills, education, training, etc. Personal data is stored, new job openings in the company are tracked and a list of potential candidates for these positions is drawn.

4.3.4 Workflow Continuity
In the event that a significant sale payment to be received by two people then workflow continuity focuses on Microsoft Dynamics NAV on three key built blocks and short or long workflow processes. The steps associated with these three blocks are: Approval, Notification, and Process Automation.

4.3.5 Calendar
Calendars with working days and non-working days are set. Calendar entries will be used for date calculations for sales orders, purchase orders, transfer orders, service orders.

| Benefits of NAV in the enterprise |
|----------------------------------|
| Proven success in operating the enterprise |
| Allows greater control of the enterprise |
| Helps increase margin |
| Flexible and scalable |
| Easy to use |
| Reduce data entry time |
| Speeds up processes |

**Figure 4.** Benefits of NAV in the enterprise

4.3.6 Forecasting cash flow
The cash flow forecast provides a forecast of how the company’s liquidity and other treasury positions will evolve over time. It consists of bills and cash payments, money expected to be received and money expected to be paid, plus the liquid funds available. These elements together show a straightforward cash flow forecast.

5. Survey related with the implementation of Management Information Systems in enterprises in Albania
In this paper, we studied how enterprises in Albania use Management Information Systems in their enterprise operations in order to succeed in their markets.

A survey was developed with some enterprises in Albania. The questionnaire was developed with representatives of human resources and management level of these enterprises. The purpose of this
questionnaire was to learn how many of them use information systems, what kind of information systems they use, and the advantages they bring to enterprises which they have implemented.

The answers from the survey show that:
1. In total we received responses from 22 enterprises in Tirana, Albania.
2. 27% of enterprises are small enterprises, 53% are medium-sized enterprises and 20% are large enterprises (based on the number of employees: 1-9 employees: small-enterprise, 10-80 employees: medium-sized enterprise and with more than 80 employees: large enterprise.
3. 42% of enterprises belong to the telecommunications sector, 35% to the marketing sector, 16% to the tourism sector, 7% to other sectors.
4. 98% of enterprise have at least one computer in use
5. 82% of enterprises have internet access
6. 25% of enterprises use at least one ERP / CRM
7. Those who use ERP / CRM say that there are many advantages these systems bring such as: enterprise growth, facilitating enterprise processes, flexibility in data entry, better organization of jobs within a department and fuller control over the enterprise.
8. Small enterprises do not see the implementation of ERP / CRM as necessary.
9. 25% of medium-sized enterprises have thought about implementing it but it a matter of time and finances until it is realized.

5.1 Results of the Graphic Questionnaire

![Figure 5. Percentage of enterprise types](image1.png)

![Figure 6. Percentage of enterprise sectors](image2.png)

![Figure 7. Use of computers](image3.png)

![Figure 8. Internet access](image4.png)

![Figure 9. Use of ERP or CRM](image5.png)

![Figure 10. Information for ERP and CRM](image6.png)
6. Conclusions and future work

Management of information systems brings benefits associated with achieving a higher level of efficiency and is essential in improving the performance of each enterprise. Managers have the information needed to identify enterprise strengths and weaknesses. It also improves the quality of decisions. Good information availability reduces uncertainty and allows managers to make more rational decisions based on reliable data. Communication between departments in a workplace is better. When managers, department heads, and employees share the same information, there is better communication between them to identify problem areas and find acceptable solutions.

Management is able to consider different alternatives to see possible outcomes before making decisions and commitments. Employees are more productive because they do not have to spend time collecting the data that the manager wants. The enterprise is more efficiently running by reducing and eliminating weaknesses and problem areas, thereby increasing the competitive advantage of the company over its rivals, and enhancing the competitive advantage of the company. With more data on customer needs, management is better able to improve customer service, marketing effectiveness, and promotional campaigns.

The need and importance of information systems in enterprises is increasing day by day in Albania. Using information systems in different businesses is turning into a strategy that is changing the way enterprises today think and operate. There are many advantages of implementing and using management information systems. They have helped enterprises for a better functionality, which leads to increased enterprise performance, increased profits, facilitated work in different departments (for mid-size and big enterprises).

From the survey with enterprises in Albania we saw that only a small percentage of enterprises use management information systems and this is due to two main reasons:

1. The high initial cost
2. Lack of information and uncertainty in the functioning of the management information systems

However, despite these two factors, Albanian enterprises are moving towards the trend of foreign enterprises when we take into account the use of information systems. Based on the main components of management information systems, starting with the basic ones, such as the computers, its use has become a huge necessity even for small enterprises that own at least one computer to perform different operations.

As in small, medium or large businesses, the advantages that management information systems brings are numerous, helping them grow day by day, it is certainly worthwhile to recommend new entrepreneurs to learn more about management information systems, understand the importance that they carry and to implement those systems in their enterprises.

For enterprises that have already implemented and operated a specific information system it is recommended that they develop more training on the latest management information systems updates, always with the primary objective of improving the current system they use.

In the future, we can continue the research with different surveys regarding the management information systems, the different technologies that enterprises use and how they are implemented, data management, big data and their advantages and internet of things.

References

[1] Karoline B O, Julie R Olsen, Polyxeni V and Eli H 2018 ERP Systems in Multinational Enterprises: A literature Review of Post-implementation Challenges Proc. Comp. Sci. Science Direct 541 – 548

[2] Olga V V, Anna A K, Irina P F and Tatiana V B 2017 Implementation of an information management system for industrial enterprise resource planning Rev Espacios 23

[3] Fiona F N and Janet L L, 2015 Critical factors for successful implementation of enterprise systems Business Process Management J. 285

[4] Ermelinda K T IT 2011 Service Companies in Albania and Implementation of Information Technology Service Management International J. of Computer Applications 7-11
[5] Kozeta S and Ermelinda K T 2011 Information Systems and Information Technology as Strategic Tools - Their Use in Albanian Business J. of Knowledge Management, Economics and Information Technology 1-23

[6] Nebojsa D, Nebojsa Z and Boris S 2013 Management of the Information Systems Implementation Project Annals (Oradea University) 32-35

[7] Shari Ch and Tim S 2004 Managing User Resistance in Enterprise Systems Implementation Tenth Americas Conf. on Information Systems 149 – 153

[8] Katica S, Goran S, Sara H, Dunijela P and Ilija S 2017 The Role of ERP System In Business Process and Education (Tehnički vjesnik) 711-719

[9] Microsoft Corporation 2016 Microsoft Dynamics NAV 2017 Licensing Guide

[10] Akram J K 2011 The significance of management information systems for enhancing strategic and tactical planning J. of Information Systems and Technology Management 8 459-470