
Implementation of fully automated electronic processes within the accounting system

Ene (Mucuță) Marilena, PhD Student
Valahia University of Târgoviște, Romania
E-mail: marilena.enne@gmail.com

Ponea Maria Georgiana, PhD Student
Valahia University of Târgoviște, Romania
E-mail: georgia_ponea@yahoo.com

NAJM ALFRED, PhD Student
University of Medicine and Pharmacy “Carol Davila”, Romania
E-mail: alfred.najm@yahoo.com

Abstract: The technological evolution is strongly visible in all aspects of social and economic life, in the business environment, as well as in the management of patrimonial assets and liabilities, as part of computerization. The operationalization of computer systems at the level of the accounting system aims to create tools for quantifying the evaluation and control processes in order to increase the efficiency of a company, as a result of the decision process.

Applying integrated systems at finance& accounting management level has the role of rationalizing the consumption of limited economic resources with the aim of reducing long-term accounting costs, increasing operational efficiency, rapid recovery of investments in the production process, including technological investments, with the intention of CAPEX generated in order to restore the technological infrastructure affected by obsolete equipment and impacted by technical development, adapting the production methods used at the company level to e-business models.

Keywords: computer system, accounting system, computerization, development, evaluation and control process;

JEL codes: D21, C61

Introduction

The implementation of fully automated electronic processes within the accounting system, make a deep analysis of the role and importance of companies in the Romanian economy, highlighting the need for the development of companies by attracting investments.

The socio-economic development in this period of modern society brought new phenomena to the fore, imposed the need to use appropriate ways of approaching them, brought back to the actuality the idea, according to which the evolution, the progress of the society is closely linked to the promote specific relations to the free-market economy and some tools of quantifying economic performance. The new realities and the new socio-economic conditions impose new features on the financial-accounting management aimed to identify the factors

that define, implement and make more efficient the economic variables factors at the decision-making unit level (Radu & Tabirca, 2019).

The research-development system from an economic point of view highlights the causal relationship between the ability of the human factor to develop decision support systems at the economic entity level and technology, in direct relation with the principles of financial-accounting management (Tanase & Petre, 2019). Achieving this goal requires solving the following activities:

- ✓ identification and research of the main paradigms of financial-accounting management at global and regional level;
- ✓ establish the objectives of the research;
- ✓ the analysis of the financial-accounting management directions in the context of improving the financial accounting system, in complementary with internal and international financial reporting standards;
- ✓ establishing ways to improve managerial activity within companies by evaluating the accounting information system, as well as its contribution to ensure economic performance.

With regards to the issues adressed into the work, the research methodology involves several stages, as following:

- a) Research – build-up new information by studying specialized literature and structuring current knowledge in the researched field ; data colection related to the specific accounting information system ;
- b) Data consolidation and data grouping;
- c) Processing and analysis of the data obtained in the documentation stage;
- d) Analysis of the economic performance level generated by the implementation of an efficient accounting information system;
- e) “*The Comparison*” with the help of which the specificity of the different forms of manifestation of the accounting information system is identified;
- f) “*The Observation*” method scope is to gather more information specific to the accounting information system at the economic level and to choose those methods and courses of action that lead to its improvement.

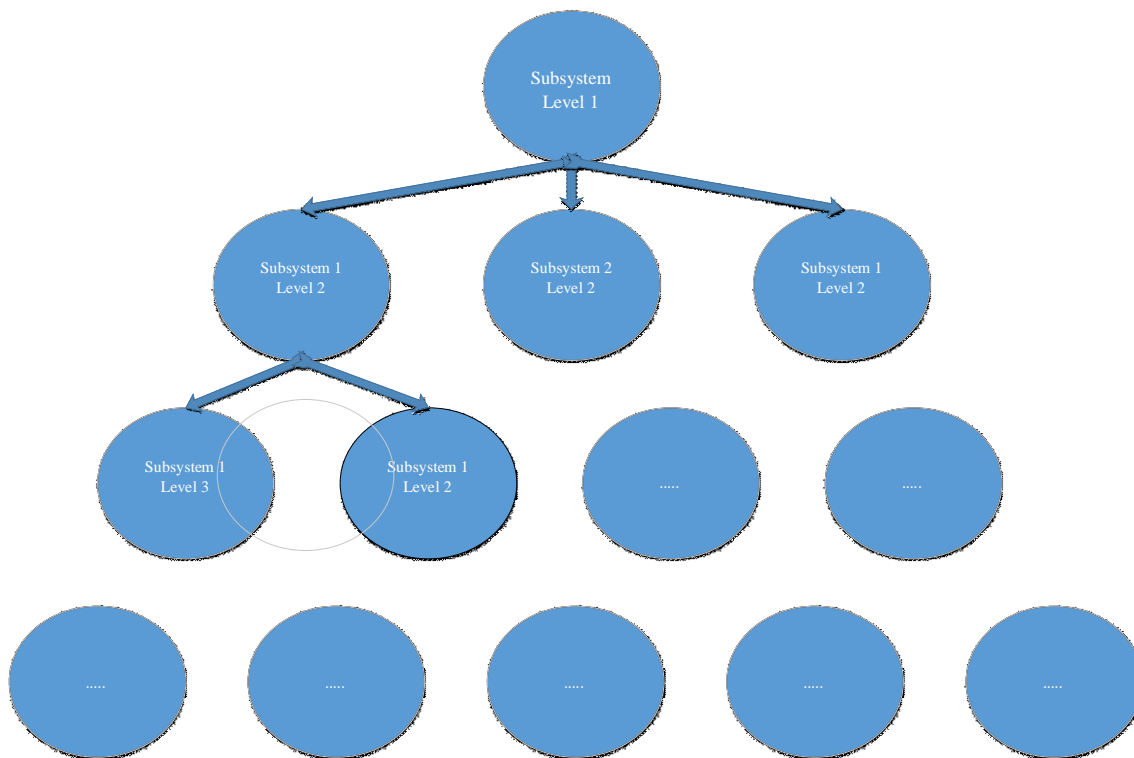
The methodology of creating an IT system

To concretely describe and understand an information system, it is necessary to understand what a system means, starting from the empiricism of a system, so that there is a sensory experience regarding the system concept. Starting from the theory of the formation of the universe and the distribution of information in space and time, an aspect closely researched by V.M. Gluscov (1964) and continuing with the theories of other authors (L. Nicolov in 1973, or W.R. Ashby since 1947), we can conclude that a system is represented by a multitude of elements governed by a governing process/ governing law (Radu, 2016).

A revolutionary theory on systems was also introduced by R.W. Gerard in 1940 when, to define the system, he used the term ORG, defining the system as an organizational unit made up of smaller units, any system being made up of several sub-systems of lower rank. The principle of integration derives from the principle of order and hierarchical organization, a principle adopted including in the field of informatics but also of organizational organization (Tabirca et al., 2020).

A simple scheme, generally accepted in all systems theories, computer or not, represented graphically in various ways, but in principle, having the same meaning, we will represent it in the following figure:

Figure no. 1. System diagram



Sursa: Own projection

Continuing this approach, M.I. Setrov (1975), shows that not every relationship is also a form of organization, or as we defined in the previous paragraph, a management process/governing law, expressing mathematically the possibilities of relationships between the elements of a system as combinations of m taken with n .

$$C_n^m = \frac{m!}{n!(n-m)!}$$

The application of logical thinking of mathematics on the theory of the systems lead to the approach of the system automatization (Gaftea, 2019).

The automation of some processes, including accounting entries (eg: the accounting entries related to the goods purchase, including also document "Receipt Note", following by consumption process documented by Consumption Receipt and generating automatically related accounting entries, implies the operation of the system as a machine, automating the sequence of operations according to the management process set up (Radu, 2009).

In the economic field, an integrated IT system presents the following advantages that can give more competitiveness to the company that owns such a system:

- Long term cost reduction;
- Increase operational efficiency;
- Quick recovery of IT investments;
- Quick migration models to e-business.

The evolution of computer systems

The 1970s: Systems were linked to several business functions: payroll, inventory, invoicing.

The 1980s: PCs and LANs are installed, departments of organizations establish their own computer systems with word processors and spreadsheets.

The 1990s: Wide Area Networks (WANs) become a corporate standard, management teams of the organization search to implement integrated data systems.

The 2000s: Wide Area Networks expands through the Internet, including businesses and partnerships at the global level, and the team management of organizations implements the exchange of data between integrated systems.

Present: Integrated IT systems move to the "cloud" through applications available on all mobile devices, facilitating data access and information exchange between systems.

Today's numerous computer systems are the legacy of the first computer systems continuously updated to ensure data integrity and improve the efficiency of the entire process, being generally focused on processing the information of organizations and sharing the benefits with the entire modern society (Kelly et al, 1999).

Thus, commencing with the first computer systems, until now, starting from simple operational systems and reaching today's strategic computer systems, the evolution of computer systems has been and is on a continuous upward trend, we can even say it is exponential.

Today's strategic information systems (SIS) support and add value to creation of a competitive strategy; an SIS is characterized by the ability to significantly change the way an organization's activity is carried out,

giving it a competitive advantage, an example of this being the SAP Romania ERP, an IT system that Ioana Pană, SMB & Partner Manager at SAP Romania, defines it as "*an enterprise resource management solution that includes business management functionalities and modules and that provides the IT basis for recording and managing financial-accounting processes, sales and distribution, purchasing, operations, production management, human resources management and services within the organization.*"

Types and models of computer systems

Systems, regardless of the degree of complexity, are and will remain something that cannot be fully formalized, thereby generating the individuality of each system itself. The possibility of describing a system becomes more and more difficult, along with its degree of complexity.

To plan a complex IT system, whether it is in the accounting field of activity or not, the need for such a system must first be identified.

After identifying the need, the current situation of the organizational environment must be analyzed and the transition strategy from the current situation to the implementation of the plans established.

Following the analysis of the current situation and the establishment of the transition strategy, it is impetuous to carry out a feasibility study, in order to determine the costs and benefits (Radu et al., 2016).

If the results of the feasibility study indicate a sub-unit cost-benefit ratio ($\text{benefit} > \text{cost}$), proceed to the next step, respectively, the determination of system requirements, which is carried out through interviews, questionnaires, analysis of work procedures.

The information resulting from the analysis of system requirements will be used to create and logic model the data flows and their processing. Logical modeling is carried out with the help of logical schemes in order to prepare the "system" for conceptual modeling. The immediate next step after the conceptual modeling, modeling that creates in detail the informational flow of the system, is the selection of the programming environment (software) and the necessary hardware related to the physical implementation of the system.

Planning and design of computer systems

Form and report design, dialog interfaces and database design are the immediate steps before physical design.

Once the IT system has been created, there are only three steps left to do, as important as the others, respectively:

- System implementation
- Users training
- System maintenance

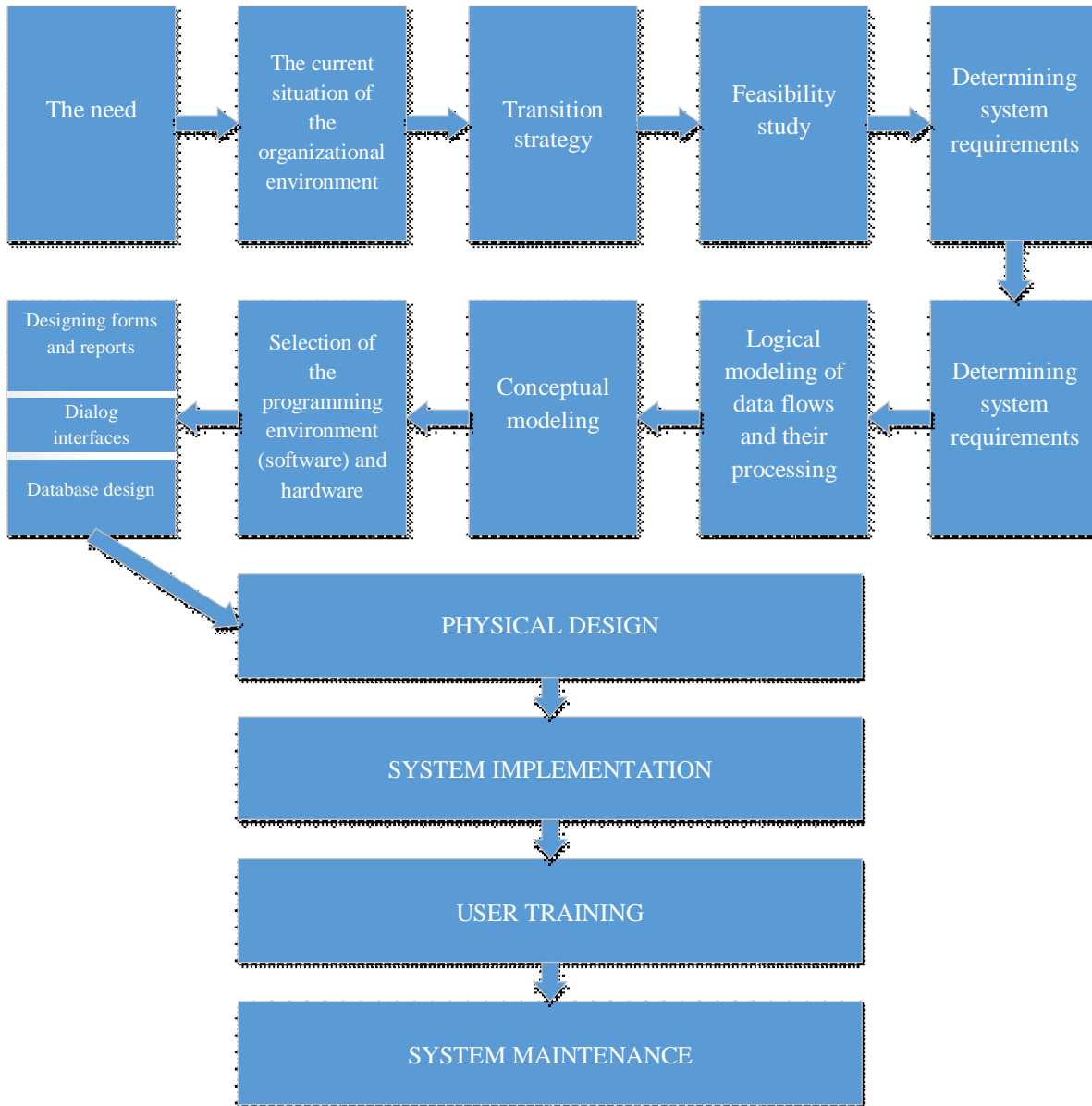
The economic IT systems used by the companies are different types:

Simple systems: used in various departments of the unit, for example Ciel, Saga for accounting, SmartBill for invoicing, Persal for payroll and HR, Freya for Horeca activities, Apollo for property management, Hydra for project management, so forth.

Complex systems: Enterprise Resource Planning (ERP) systems such as Oracle, SeniorERP, so forth.

As far as the automation of a company's accounting is concerned, the systems are still at the beginning. The definition of automatic accounting systems, strictly speaking, leads to computer programs used solely by accounting departments. The automation created in fact are just the accounting formulas as these are predefined, in accordance with the legislation, and the user enters primary data, the system processes the information automatically generating the accounting notes, balance sheet, profit and loss account and any other documents requested by the internal or external company environment. However, a total automation has not yet been discussed in order the entries to be also automatically generated.

Figure no. 2. Planning and designing computer systems



Surse: Own diagram

Often, the manager's decisions are distortion by human data entry errors. Especially in companies, the manager must make decisions and forecast costs in real time and very accurately.

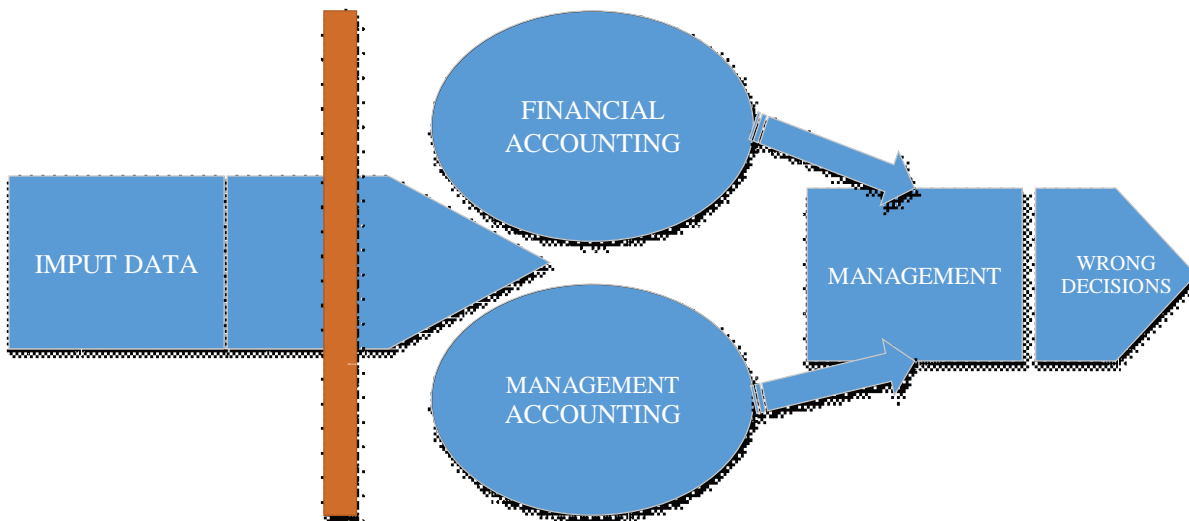
The enterprise resource planning system (ERP) is the software tool that facilitates the integration of all data of a company in a single platform (Garrison, 2008).

ERP systems appeared as solutions related to modern companies, companies that require a permanent action for adapting the volatile market, concentrating and empowering all the factors involved. The starting point of the systems development started in the 60s and having an exponential trend, in parallel with the technological developments of hardware and software.

If at the beginning, the software focused mainly on stock control (management accounting), then continuing with the automatic calculation of salaries and general accounting.

The following years, realizing the usefulness of computers and computer systems in the financial and accounting environment, the premise was created for the development of applications and in the good planning and purchasing, using stock information, slightly expanding its applicability to the financial and accounting departments, human resources, distribution, sales and including client portfolio or project management with the wider implementation of project-based management.

Figure no. 3. Accounting data



Sursa: Own projection

The 90s, however, represented the period in which ERP systems began to mature, evolving from programs used separately into integrated applications that can provide an overview to managers of modern enterprises and facilitate the reduction of human errors, as well as decreasing the work of people involved in data processing.

State-of-the-art "cloud" technology has allowed access to these resources for small and medium-sized enterprises, not only by decreasing the costs to zero from hardware equipment point of view or by reducing the

costs with software installation, but also through access to mobility, access that makes the difference between profit and loss in a fast-moving economy.

Present times, referring only to Romania current environment, there are many IT applications, both individual accounting, ERP and Business Intelligence

Implementation of the automated electronic process in accounting environment

The accounting information system implemented in this research is based on a logical-mathematical algorithm that facilitates the implementation of “cloud” technologies based on the complex data collection process.

For a correct data processing in the system, accounting automatic instructions must be standardized, the records predetermined in the company's accounting policy manual and the external information on paper must have a commonly accepted bar code printed on which the systems and equipment electronics to transform it from a simple scan into electronic information that will be automatically recorded in the system and transmitted to the company management and other interested parties depending on the degree of authorization regarding the information provided by the system.

Having all the information necessary to prepare the tax declarations, updated daily, the system can automatically generate and transmit the tax declarations and inform the company manager through an e-mail and/or SMS alert for the electronic signing of the state declarations and approval of their submission to the tax authorities.

To detail the accounting computer system, the accounting entries are added to the input and output data, which in fact represent the basis of the software, without which it could not function. Formulas (accounting entries) will work based on a primary key (ID).

Current and perspective social development is complementary to technological innovation, large-scale computerization in the sense of the development of programming languages and operationalized work methods that facilitate the managerial act and the decision-making process.

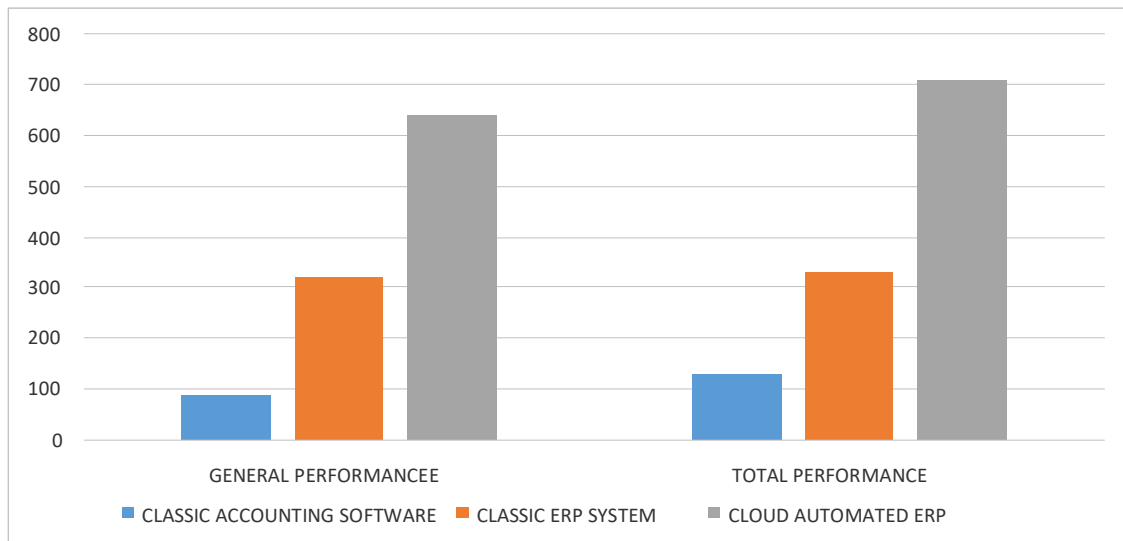
The success of a managerial act consists mainly in the operationalization of the managerial act through the IT design of all the stages that configure the input-output relationship. Thus, in order to plan a complex IT system, the logic of the market functionality must be applied, from the identification of the need for computerization/systematization, to the adoption of a strategy by which the consumption of resources is made more efficient in order to achieve expected, measurable results.

The advantages of implementing fully automated electronic processes within companies are:

- Integrated management of all business components, through access to a common database

- Provides an online way of working, which facilitates communication between people, departments and working point.
- Automation and standardization of operational processes, elimination of manual operations leading to increased productivity.
- Improvement of the purchasing process, through the possibility of dimensioning the purchasing according to the sales activity
- Increasing the quality of services offered to customers through the transparency of information about products, inventory, prices.
- Decreasing order delivery time, due to faster transfer of information between departments.
- Improving cash-flow through the implementation of efficient commercial policies.

Figure no. 4. Performance comparison of the proposed accounting software (automated ERP of the “cloud” type) vs. other existing types of accounting software



Surse: Own projection

The first step towards automation is the expansion of cloud technology that offers, at insignificant costs, access to mobility, and the second step, equally important, is the implementation of IT technology, facilitating the possibility of implementing the IT accounting system.

Another equally relevant aspect, which is considered to have a more than major impact on the possibility of implementing such a system, is that the technological development of hardware and software maintains the trend of automating the IT systems used in accounting.

Thus, the software market came to demand and to offer software applications available on any type of device, from phone, tablet, car computer, to laptops and PCs. Mobility and the need to access data, regardless of the connection device brought to the market, with an exponential trend, is cloud technology.

The development of technology in the field of accounting has grown enormously in recent years and has generated a great impact for accounting firms leading to a huge change in the way accounting consultants carry out their daily tasks.

The continuous development has now entered a new stage where the automation of accounting processes is perceived as the major trend and will further affect the accounting profession. "Automated accounting function can have both a positive and a negative impact on accounting firms and their consultants, but many threats can also arise about the need for accounting consultants as procedures become automated." Over the years, studies have been conducted on automation in various fields, but the impact of automated accounting on the accounting firm and their accounting consultants has been neglected in previous research. Moreover, considering that consultants are also affected, their attitude towards such changes and the corresponding impact, are of interest to understand their position towards these changes.

Cloud accounting (or online accounting) has the same functionality as classic accounting but moves the entire process to the cloud and expands it. Cloud accounting involves connecting to an always-updated online solution, with all data stored securely on a cloud server. Most cloud platforms will also have an open API, meaning that third-party software can connect to the accounting system to provide even more value to the business.

Conclusions

Current and perspective social development is complementary to technological innovation, large-scale computerization in the sense of the development of programming languages and operationalized work methods that facilitate the managerial act and the decision-making process. At each accounting sector, the complex IT system can generate solutions that lead to the efficiency of the company, that identify a system of solutions for contextual cases facing limits of economic resources (material, financial, technological).

The success consists mainly in the operationalization of the managerial act through the IT design of all the stages that configure the input-output relationship. Thus, in order to plan a complex IT system, the logic of the market functionality must be applied, from the identification of the need for computerization/systematization, to the adoption of a strategy by which the consumption of resources is made more efficient in order to achieve expected, measurable results.

The novelty of this research is the approach for the introduction of cloud computing technologies with the role of reducing costs through the use of scanning technology, which beforehand means the coding of all elements

of technical capital at an economic level, but also of the external determining factors of the supply chain: supply-distribution-sales (stakeholders) that the company has in mind when defining the profile of its economic activity in order to shape a favorable result, namely the profit and a good positioning in its market sector.

Software solutions have the role of customizing the evolution of each manufacture in relation to its own market, his profitability and a better share of its market are to be obtained by validating the best technical solutions, creating pro-active and a managerial decision support.

The role of the automated accounting system is to capture relevant data to produce representative financial reports for both management and external users in order to influence the decision-making process. The numerous advantages of using these systems have led to the conclusion that automated accounting systems in corporate reporting are the engine of growth in business organizations. Automated accounting systems allows users to input information into accounting software programs, which then, based on automated accounting instruction are processed by the system and ultimately materializes in the preparation of the financial statements from the data stored in the database. The automated accounting system allow easy supply information in real time, fast customer deliveries, accurate and reliable information provided in the decision-making process. Moving accounting to the cloud has been a significant step in financial management, by removal of many disadvantages and its related high cost of traditional accounting.

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