

THE ANALYSIS OF INFORMATION SYSTEM IN LOCAL GOVERNMENT UNIT – THE PROPOSAL OF RESEARCH METHODOLOGY

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The information system in a local government unit should ensure an adequate flow of information to ensure the efficient and effective management of the unit. All organisations should take care of the quality and quantity of available information. This objective can be achieved by the continuous diagnosis and assessment of the functioning information system to draw meaningful conclusions, to identify actions for its improvement in order to make the system an effective support for managerial processes and adequate tool to the needs of the activity of a local government unit.

In the article the authors proposed the research methodology of the analysis of the information system in a local government unit. The proposed research methodology is based on questionnaire surveys, which allows a thorough diagnosis of the information system in local government units to identify the deficit in the tools applied in these units and to identify actions to improve the system.

Keywords: information system , local government unit, research methodology

1. Introduction

Changing internal and external circumstances of business activity need to be adapted in company's business processes by effective management both in the short term and in the long term perspective. Effective management is determined

by the adequate and detailed information about the organisation and its environment. The commune is a special kind of a company which is influenced by the dynamic environment. The adequate flow of information in the commune is one of the key factors determining the effective and efficient management. The sustainable and effective development in the commune needs the process of creating an adequate information system, which is determined by the unique past and present business processes according to applicable laws and regulations. Thus, the important issue is the detailed analysis of an information system in the commune and its permanent evaluation in order to make it adjusted to the needs of the commune's activity. In this context, it is difficult to imagine a modern and well-functioning commune without the effective information system and the computer system properly adopted to its needs.

Modern organisations realize more and more projects that play an increasingly important business role not only in companies but also in the public sector. Projects are tools for the strategy implementation of the organization. Any organization, including the local authority, has a specific objective to be achieved. The main way to implement the strategy into operational actions is the transformation of the strategy into the appropriate set of projects and programmes. A set of projects and programmes and other activities related to the work carried out in the organization is referred to as the projects portfolio. Efficient and effective management of the projects portfolio's implementation is made possible by providing the access to information and the proper information flow at each stage of implementation. The appropriate quality and quantity of information in the process of portfolio management in a local government unit contributes to the effective implementation of its strategy.

In the article the authors proposed the research methodology in the range of the analysis of the information system in relation to the whole functioning of a local government unit and the analysis of the information system in the range of projects portfolio management. The proposed research methodology is based on the research questionnaire, which enables a detailed diagnosis of information systems of local government units and the identification of the deficit in the tools used in these units. As a result it will help to identify actions improving functioning of the information system.

2. Information system in a local government unit

2.1. The definition of an information system

The quality of the management system is determined by the quality of the information system as a key tool to realize effective decision-making processes.

One can assume that the building of the functional information system leads to the efficient management of the organization.

There are various definitions of an information system. The definition depends on the objective for which the system is needed or on the discipline concerning its user. The information system is defined as a communication system of organisation that integrates the elements of the management system [7]. The management system in an organization is a set of activities covering the entire cycle of management processes to achieve the objective efficiently and effectively. According to [6], [7], the information system can be defined as a multilevel structure allowing the user to process the input information into the output information using procedures and models. As a result of the output information, decisions are made more effectively. The information system can be defined as "a specific nervous system of the organisation that integrates the elements of the management system" [9]. This statement emphasizes the priority function of an information system i.e. the support for efficient management process in the organisation.

The role of an information system for efficient management is emphasized, inter alia, in [5], in which it is stated that "the degree of efficiency of communication among organisation's elements, between organisation's elements and the environment, and the whole organisation and its environment is a direct link with the efficiency of the entire organisation". The information system of management is "an organised set of people, procedures, processes, databases and devices used to provide information for managers and decision makers" [5]. The information system is an element of the management system which enables the implementation of management processes. The information system is connected with organisation's activity including inputs, outputs, information flow and processing. The analysis of the information system should take into consideration the following functions [15]:

- the function of downloading input information (documents, messages) and information storage in a sustainable way (files, directories or archives),
- the function of information processing, calculation of indicators characterising organisation's activity, transferring the processed information to the organisation's outputs,
- the function of supporting a decision making process by operations on indicators (reasoning on the basis of stored information).

At present, the emphasis is put on the speed of information delivery, its availability and processing ability. These requirements bring the situation that more and more elements of organisation's information system is computerized. And as [9] reported, in the future there will be no differences between the concept of "the information system" and "the computer system" concerning management

information systems, because there will be no information systems without hardware.

Taking into account the relationships between the information system and the management system, we can say that the information system is the element of a management system. The information system makes management processes possible to be realised, because the information enable making decisions. The system as "the separate part of the information system which is computerized from the point of view of its objectives " is the most detailed term.

2.2. The structure of an information system in a local government unit

The description of an information system is the result of the analysis of business processes and information flows within the company. The analysis of the information system gives the picture of a current state, which is characterized by the following elements [15]:

- statutes, resolutions, orders, directives, decisions determining organisation's objectives and conditions for the formation of an organisational structure, competence and communication links;
- business regulations and documents necessary to perform the functions of individual organisational units;
- ways of communication between individual organisational units;
- ways of communication between the environment and organisational units in conjunction with realised tasks.

The description worked out with making use of this method contains the elements concerning the organization - the list of tasks, an organizational structure and specific elements - functions of individual units, documents. The following necessary step is to organize and systematize of the generated description. It is connected with the introduction of standardized signs and hierarchy of analysed object's elements.

The analysis presented in the article concerns the information system of local government units . However, later in the article considering the information system in local government units (communes, districts, provinces) we mean the office of these units (i.e. commune office, district office, voivodeship office). The courthouse (including the town office, the commune office), which is the organisational unit of communes, whose core activity is the support of mayor in the implementation of the commune's resolutions and commune's tasks determined by state law and teams of material and personal resources in a local government unit to ensure technical and organisational support . The commune office consists of departments, equivalent organisational units and independent organisational units. The organisational structure and functioning rules of a commune office are defined in the regulations issued as the mayor's ordinance. The office operates according to

generally applicable law, the commune statute, the city statute and other council's resolutions, ordinances and other legal acts in the area of organisation, issued by the mayor. The management system of a commune council is based on management control standards issued by the Minister of Finance. The key tool for forming management of the office are organisational ordinances. The mayor is the head of a commune council. The organisation and work orderliness at the office and related rights and obligations of an employer and employees are determined by regulations and other legal acts. Similar tasks are realised by departments in the office created by the mayor who defines the range of their tasks. Departments are managed by heads, except for the Civil Registration Office, which is managed by the manager and independent units led by supervisors. In the range of departments the mayor can create independent units and positions. Tasks realised by commune office are supervised, monitored and controlled. For this purpose, there are terms specified in the legal regulation in the area of commune's organisation, using the following tools:

- an organizational chart reflecting the division of responsibilities in the commune office,
- systems for monitoring tasks' realisation and their objectives, functioning at the operational and strategic level,
- risk management,
- financial audit carried out particularly in the form of self-control and functional and institutional control,
- management system audits conducted by the internal auditor according to the Public Finance Act,
- the review of management system, implemented in the form of annual surveys based on the current monitoring results and the target review, fixed by the mayor or a person designated by him.

Projection and development of software solutions supporting management processes require different methods of analysis and modelling of the information system [3]. In general, the concept of the information system in an organisation should be identified making using of typical elements of the system analysis. Taking into consideration such an approach the whole procedure of the model construction should begin with a thorough analysis and verification of sets of appropriate inputs and outputs of the system. The analysis should take into account the functional structure of the organisation, which includes existing information inputs and outputs of the system. As a basis for the analysis of the information system of a functioning organisation should be the research undertaken by using a formal procedure. According to the classical method of the information system analysis, the diagnosis procedure should include the following steps [13]:

1. The determination of the characteristics of the enterprise's organisational structure taking into account the division into functional units.

2. The development of the description of the organisational structure.
3. The development of the information system model of the analysed object and the further analysis and verification of information links.
4. The impact assessment of information links on decision-making processes in an enterprise and the identification of changes opportunities.

The research conducted by Grochowski and Kisielnicki in 2000 [7] was concentrated on improving the functioning of the Białystok Town Office and resulted in the proposal of the office information system (Fig. 1). The objective of the system was to ensure efficient information flow and consequently faster decision-making.

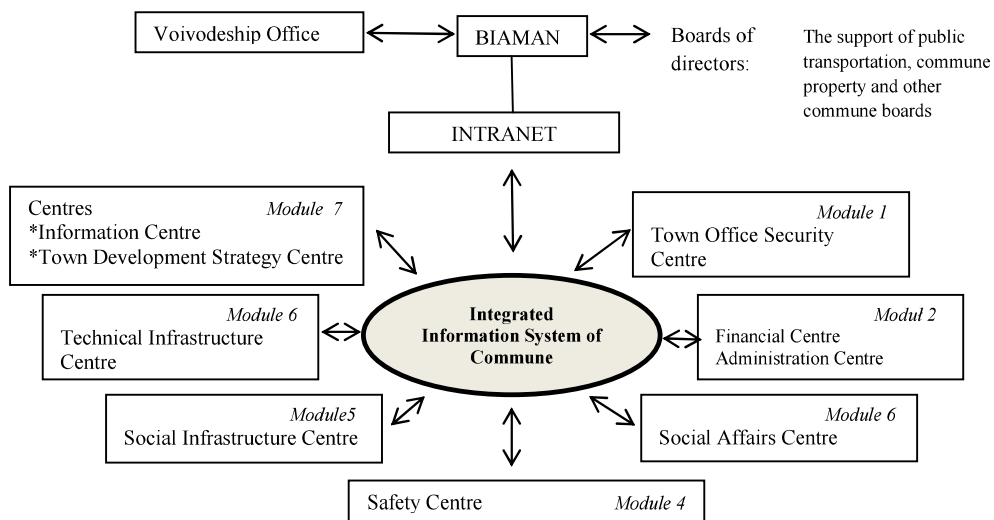


Figure 1. Information relationships in the Białystok Town Office
Source: [7]

3. Assumptions and objectives of the research

The issue of information systems is often undertaken by many researchers. Most often, however, they engaged in business information systems (A. Gumiński, W. Zoleński, J. Kisielnicki, S. Senczyna, K. Wodarski, A. Kozminski, W. Piotrkowski, G. Morgan). There are a small number of studies - particularly in Poland - concerning information systems in local government units.

Local government units are obliged under the law to realise a lot of tasks, and one of them is to work out and implement development strategies. The Act of 6th December 2006 on the principles of development policy clearly indicates the

principles of development policy and procedures for cooperation between them [the Law of 5 June 1998 on Regional Government, as amended. d. (Journal of Laws 1998, No. 91, item. 576)]. In accordance with Art. 4 of the Act, policy development should be carried out on the basis of the development strategy using programmes that lead to achieve the objectives.

Achieving the vision of the development and the implementation of strategic objectives require the preparation and realisation of projects. Working out the system for managing a projects portfolio in a local government unit can make this process effective. Such a system cannot be separated from the information system of a local government unit. It should be properly integrated with the existing information system. To make it possible it is necessary to analyse:

- channels of communication between departments,
- channels of communication between a local government unit and the environment,
- organisational regulations, statutes and other documents relating to the tasks of organisation,
- competences of individual organisational units (departments, independent units, authorities of these units).

Efficient planning and effective management of the realisation of programs and projects is essential to ensure the success in the effective implementation of strategies of local government units. To ensure the effectiveness of this process it is necessary to make the information flow efficient and as a result faster and better decisions. The literature study in this area, and preliminary case study in selected local government units show that a large part of the information is collected traditionally or in stand-alone, not in network computers. The cooperation between organisational units is weak and there is indirect realisation of individual tasks, and are long decision-making terms. Therefore, it is necessary to undertake the study in order to analyse the information system in selected local government units to work out the computer system supporting projects portfolio management.

The achievement of the main objective can be possible by realising the following steps:

- the identification of the information system elements in a local government unit,
- the diagnosis of a functional range of implemented IT solutions in selected areas of management in a local government unit,
- the definition of roles and relationships of the information flow between departments in a local government unit,
- the diagnosis and analysis of information flow in the process of project management,
- the identification of decision-making competences in the range of project and projects portfolio management,

- the determination of the deficit in the applied tools in local government units,
- the development of the model of the information system of projects portfolio management in local government units.

The research will be conducted in the area of Silesia Voivodeship in selected offices of local government units (communes and towns with county rights).

4. The research procedure

Based on the literature study and web/desk research the authors suggest that the proposed research methodologies in the range of information systems analysis in local government units do not meet the research purpose and the research object. And this is the reason why the authors propose the research procedure which is described below. The research are to be undertaken in six stages. The research procedure is shown in table 1 and includes the description of the research stages and proposals of methods and research techniques.

Table 1. The research procedure

Stage	The range of the stage	Methods, research techniques	Research tools
Stage 1	Working out theoretical assumptions based on the study of literature and source documents	web/desk research research of documents, observations.	development, research reports, legal acts, websites regulations and resolutions.
Stage 2	Working out the survey questionnaire. Pilot studies.	case studies, interviews	survey questionnaire
Stage 3	Structured interviews based on survey questionnaire.	method of individual cases surveys, interviews.	survey questionnaire (interview)
Stage 4	Working out research results.	statistical methods, the method of analysis and logic construction.	spreadsheet, computer program Statistica
Stage 5	Working out the general model of information system in a local government unit.	Modelling method, mapping.	model, process map.
Stage 6	Working out the model of information system of projects portfolio management in a local government unit.	Modelling method, mapping.	model, process map.

Stage 1. Working out theoretical assumptions based on the literature study and source documents. The stage includes the analysis, using the technique desk / web research, of different types of data sources, websites, documents, ordinances, resolutions concerning the information systems, and legal acts determining functioning of local government units. From the perspective of this research a particular attention should be paid to such documents of a local government unit as:

- the statute,
- the organisational regulation,
- the book of quality management,
- the development strategy,
- the long-term investment plan,
- other documents.

The analysis of this kind is an exploration and enables to identify:

- input and output information,
- information flow path in a local government unit,
- information processing,
- problems of information systems,
- competences of departments, units, local government unit's authorities in the area of information collecting and processing.

Stage 2. Working out the survey questionnaire. Pilot studies. Based on the research problem in this stage research objectives will be determined. The survey (interview) questionnaire will be worked out to undertake the pilot structured interviews in selected local government units. The main aim of the pilot studies is to get the knowledge how the questionnaire reflects determined research problems and enables the achievement of research objectives. The result of this stage will be modified and supplemented questionnaire with missing questions.

Stage 3. Structured interviews based on survey questionnaire. The research will be conducted in the form of structured interviews using a questionnaire. For each of the questions contained in the questionnaire will be additionally asked questions that enable a broader view of the studied problem. Working out of a survey questionnaire is one of the most important steps in the proposed research procedure. In the questionnaire on one hand there should be few questions, but on the other hand, there should be enough questions to give the full knowledge of the analysed problem. Moreover, the questionnaire should include a conscious and logical layout of questions [1]. Following this principles the research questionnaire will consist of two parts. The first part of survey questionnaire includes questions about the state of management systems in a local government unit. The important item is the integrated management system. Questions concern whether there are integrated solutions or they are planned to implement, and what problems

encountered in the system implementation or the system functioning. The second part of the survey questionnaire concerns the system of projects portfolio management in a local government unit. Researchers intend to meet the general criteria which are critical in the process of construction the projects portfolio and find out if the creation of this portfolio is formalized through procedures. Problems emerging in planning and realising of projects portfolio will be analysed.

The research analyses will also concern such issues as follows:

- applied project management methodology (project management procedure in commune office),
- IT tools used in the process of project management,
- the creation of project's team,
- developing a project schedule (including the preparation of Work Breakdown Structure),
- analysis of project's budget,
- project's risk management,
- project's realisation control,
- employees competences in project management in a commune,
- knowledge transfer in project management.

Stage 4. Working out of research results. Spreadsheet and computer program Statistica will be applied to work out the research results. The analysis of survey results will enable to determine problems and deficits in the information systems in the range of used tools in selected areas of the management in local government units and in the range of projects portfolio management.

Stage 5. Working out the general model of an information system in a local government unit. The information and results derived from undertaken research in previous stages will enable to work out the general model of an information system in a local government unit in the form of process's map.

Stage 6. Working out the model of an information system of projects portfolio management in a local government unit. The analysis of results of the second part of questionnaire research will enable to work out the model of the information system of projects portfolio management in a local government unit, which will be the element of the integrated information system of a local government unit.

5. Conclusions

A properly functioning information system of a local government unit should ensure an efficient information flow within the unit to enable faster and better decisions. The cooperation between organisational units is the key factor.

The information system in a local government unit, like in enterprise's information system, must be completely subjected to the continuous analysis and evaluation of its performance. It should provide the adaptability and the ability to expand service functionalities of the system related to the needs of the system's user.

Local government units plan and realise plenty of projects which derive from the development strategy. Efficient and effective realisation of these projects require the access to suitable information to make right decisions. The information system in a commune should be adjusted to these needs.

The undertaken research will enable to diagnose the information system in the range of selected areas of management in communes and towns of Silesian Voivodeship and to work out projects portfolio management system in local government units.

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