Development of Information Systems for Local Government such as it is in Bosnia and Herzegovina

Muharem Kozic[1], Larisa Ramic[1]

[1]*University "Dzemal Bijedic", Mostar, Bosnia and Herzegovina*

Abstract

In this paper are treated the implementation's problems of information system(IS) in public government in BH. The IS implementation is complex process which implies the resolving of problems such as: the analysis of theoretical aspects of development of the IS, the analysis of prevalent conditions, the choice of the most suitable methods for IS development, the IS implementation, the post implementation support, as well as the measurements of practical benefits of the IS implementation.

Keywords: information system, methodology, local government.

1. Introduction

In theory and practice of the information systems of the development and planning it is known more than one methodology. In today's conditions the development and planning are being realized by forming a mixture of teams in whose composition enters: users (analysts of realistic systems), system of analysts, informaticians and planners of program systems[1].

Planning team using contemporary tools for IS development and planning (CASE-computer aided software engineering) develops an information system through phases depending on selected methodology.

In the paper it is made one suggestion on concept for development of information system for local governments in BH (in the text ISL) at the way it is arranged and conditions which rules in it today.

Today it is very common the answer to the question how should it be developed and planned information system related to automation of some functions according to the district structure's levels of according to the services. However, because of great complexity and informality of some functions and processes in systems for which is needed to develop program system, it is necessary to put a lot in order to find a methodology which will be the best suitable to needs for the development of those systems.

2. Possible concept for development of ISL

Using the past experiences in progress of the IS development, applying some already existing methodologies and accomplishments on the use of the methodology MIRIS (which was completely available), it is given one concept for the ISL development [2]. Only the combination of more available methodologies would probably in full be suitable for the development of the IS for local government, such as it is in BH today.

If we decide for development of the IS, from the top to the bottom, it is necessary to:

- Form information center of government for informatics (ICGI) on the level of the smallest entity
- Defining the role of government in the development.

The basic task of the ICCGI would be to make adequately computerization of public government. The ICGI among others would be responsible of:

- The development of applying program equipment
- The advising on planning and introducing of information techniques to the organs of government
- Professional supervision during developing and introducing of the applied program equipment
- Guarantee of adequate quality of services and products of information technologies
- Methodological and technological coordination in the development of the project.

All mentioned duties are closely related with selected methodology of information system development. Beside already mentioned duties the ICGI would have to take into account the formation of the methodology which would deal with the IS development for public government.

The organs of government as users of services as well as orderers themselves would take part in the computerization of public government. The ICGI would appear in the function of a professional coordinator, as well as performer who would perform the majority of work. In situation like that it often comes to that that in individual developments are used very different approaches from which follows diverse projects (before everything it stands for phases of analysis and planning). Such diversity makes more difficult, if it does not already make impossible, the efficacious of professional supervision and guarantee of quality for what the ICGI would be in charge [3]. In further, the renewed usability of products of development and the comparison with diverse project of development make more difficult.

In order to make prestigious information system it is necessary for several to include government on the entity level:

- The software would become more cheaper for districts
- The quality of software would probably be incomparably bigger, because of suggestion from more districts during the development of applications.
- They would get one universal system applicable on the whole territory of Bosnia and Herzegovina.
- People would have some standard procedures for resolving their problems wherever they are
- The government would have better working control of some districts.
- Electoral commission would get unique data.
- Institute for statistics and different observations for development of districts would also be able to get needed data.
- Simply said, everyone would get something (the state, districts and users of services).

The basic purpose of suggested concept of the IS development for the ICGI and also to other organs of government is to offer:

- A help during preparation, establishing, coordination, leading and supervising the projects of the IS development, which are performing for the needs of the ICGI (joint projects) and for the needs of other organs of government,
- Gradual approach in the development and implementation of the IS of the organs of government,
- Methodological support for supervising the quality of the projects, which are performed by the engaged performers,
- Adding guidelines for engaged performers.

2. Review of methodology for ISL development

In the beginning it is necessary to define: working rules, procedures of development and to choose CASE tools. When we look at this chronology, it can be seen that we are slowly taking some steps which are characteristic for structural methodologies.

In the structural methodology are presented diagram techniques for data and functional modeling (without which it is impossible to imagine a good approach during the IS development), procedures of the IS development and examples of diagrams with CASE tools which offer a very good support to the teams who develop the IS and to those who maintain them. The structural methodology of the IS development is based on the methodology of information engineering, Oracle CDM methodology, SSDM methodology.

2.1. Rules and usage of diagram techniques

Simply understandable and into detail defined structural diagram techniques are of key importance during the IS development. During the IS development it is needed a close participation of those who develop IS (teams and analysts) and the users of the IS, and both of them have its own rule from the beginning of development to the implementation of the IS. The diagram techniques are of priceless values for the exchanging of ideas, but in the final phase with its unambiguousness guarantee that the developers in the right way and to the smallest details do understand the effect and meaning of the organization of system. Because of the work automation, analysts who use CASE tools, the clearly defined diagram techniques are even more important to them, because they enable the translation of syntax, the automatically transfer between different diagram techniques and automatically translation of diagrams from logical level into physical level. There are many reasons why the IS development and maintaining is impossible to imagine without the usage of structural diagram techniques [4].

In the continuation, there are presented several diagram techniques, which are recommended by the structural part of methodology for the different phases of IS development. Diagram techniques which are used in phase of analysis, are serving for presentation of the effects and information needs for

some organizing system (the organ of government), or the effects of area inside of organizing system on logical level and they do not determine later physical performances of the IS [5]. Diagram techniques which are used in planning phases, they already reflect the structure or design of applying systems, which would be developed in the performance phase. Review of diagram techniques, which are used in different phases of the IS development can be seen in the following table. In the left column are given the diagram techniques and other formal techniques, which are recommended to be used in methodology of the IS development. In the first row are given the phases of the IS development. At the section of individual phase and diagram techniques is given products at which that diagram techniques uses at that phase. If the section is empty, that means that diagram technique is not used in that phase.

Phase of diagram techniques' development	**Strategic planning**	**Analysis of working area**	**Planning of applicative systems**
Decomposition diagrams	Organization scheme, functional decomposition, strategic elements (aims, problems, critical factors of success)	Detailed functional decomposition	Structural plan of the applicative system
Diagrams of data's flow	Analysis of data's flow	Detailed functional model	
Diagram of entity	Global entity model	Detailed model of data	
Matrix of bonds	Matrix of bonds Functions – entities	Matrix of bonds Processes – entities	
Diagram of action		Detailed functional model	Processing plan
Structural diagrams			Structural plan of the applicative system
Diagram of transition state			Processing plan
Relational scheme			Plan of structure's data

Table 1 Preview of diagrams' techniques through phases of the IS development

2.2 Procedures of development

At picture (figure 1) is shown the development of IS, that is described in the structural part of the methodology of the IS development. On the horizontal axis are given phases which follows one after another. On the vertical axis are given activities, in whose borders are necessary to do one or more activities.

An individual activity (for example defining requests) can be performed only in border of one phase, but the majority of activities are performed in more than one phase.

A product (output) has to be result of every activity, which will be based on one or more outputs, which represent an entrance to one of the activities. With regard to the dependence between activities, it is possible that some activities happen in the same time or with some degree of overlying, and some happen one by another (Figure 1).

.

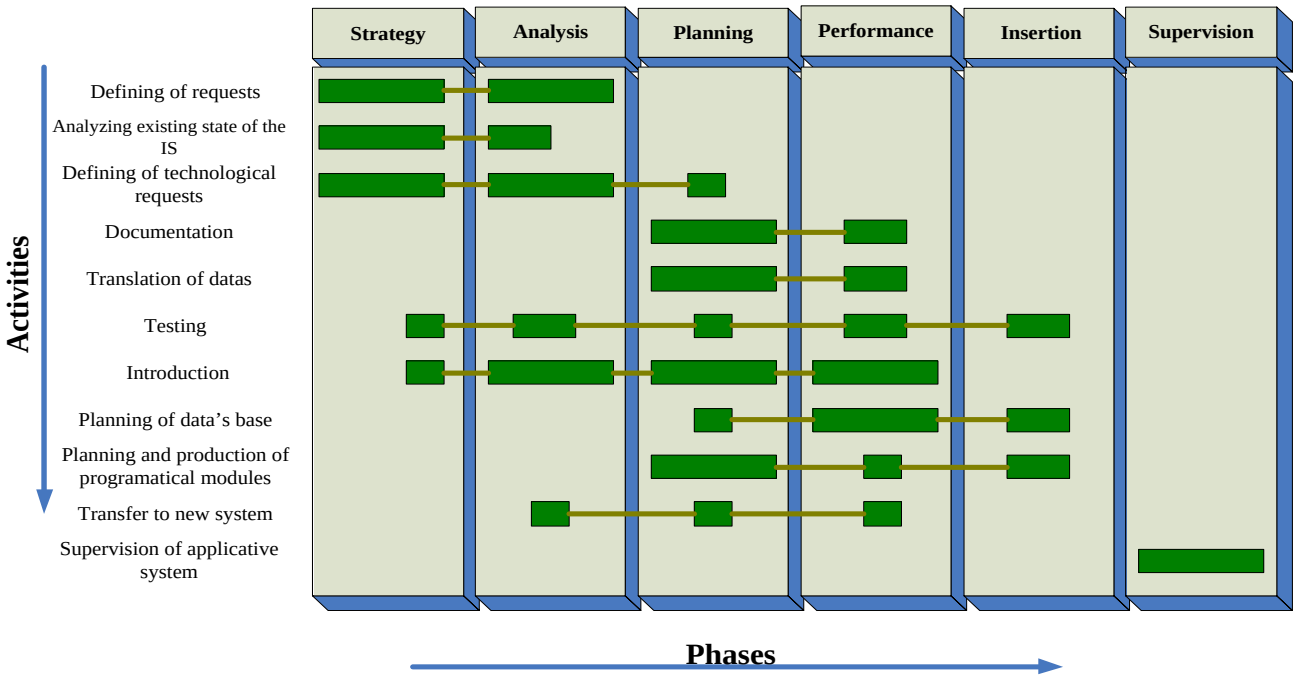

Figure 1. Phases and Activities of product output

3. The methodology of development of the applications for the business process support

Tools that would be used for the business process support can be divided into:

- Business process reengineering tools – BPR Tools
- Workflow management systems – WFMS

WFMS Tools enable the performance of the business processes. Before it is possible to perform processes it is needed to modulate them in the way on which an individual tool recognizes it. In order to avoid a repetition, for different tools is needed to produce instructions, which enable a transfer of data in the model from BPR-tools, as well as from WFMS-tool. The WFMS enable information supervision and direction of business processes from one activity to another, actually from one process performer to another. During the direction of processes it is needed to inform the users that they have to do assignment which guarantee to them suitable programmatic tool. This programmatic tool must be able to do requested assignment, to guarantee suitable data and make visible to users to see

3.1 Procedure of development

The procedure of the workflow application construction is different from the classical approach. Since working area of such application can represent a complete effect of organizing systems, it is very important to have a possible approach to description of organizing systems. Key elements of this description are: organizing scheme and description of business processes. The main reason for making difference between classical approach and approach during the development of applications for workflow management is in the content and not in the performance.

3.2 Linking with other methodologies and projects

One of the directions in the methodology of the IS development should be that methodology has to be compatible with already existing methodologies, which are already in use, which ICGI uses and which can be used for computerization of the organs of government. By introducing a new methodology which would not be compatible with already existing and used methodologies would actually open a lot of questions and dilemmas, and what would exactly be the opposite of what is wanted to be achieved by new methodology.

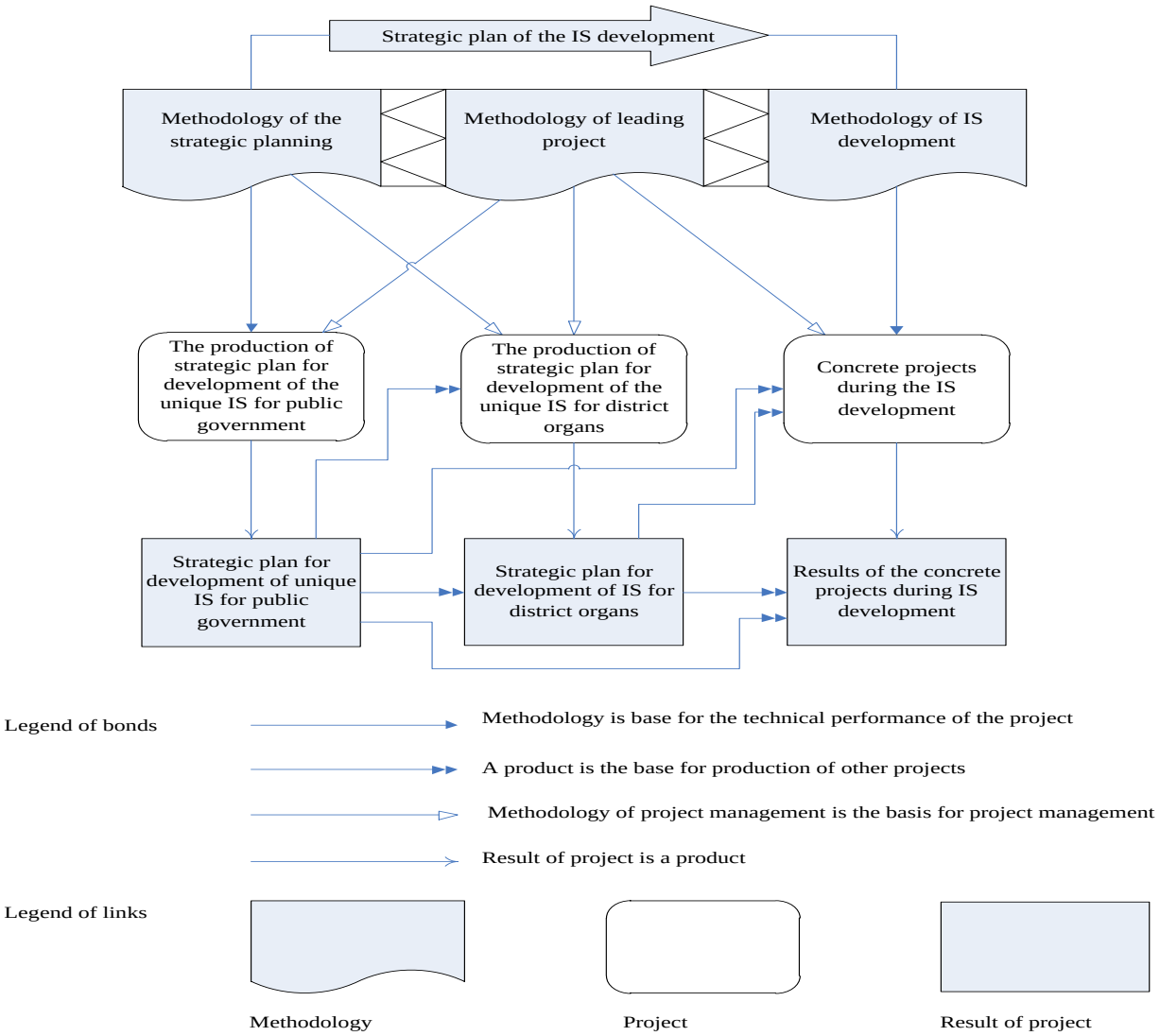

Figure 2. Metamodel bond between methodology, projects and products

The picture (Figure 2), shows that the methodology of the IS development is linked with methodology of strategic planning as well as with other methodologies who are used in the introduction of information technologies in the public government (for example methodology for the project leading).

Methodology of leading project in public government can be prepared on some other base. Methodology of leading project in public government should have to describe the organization of project, and the procedures of leading. This methodology can be used for all projects in areas of information technologies for leading and guaranteed the quality of project. On meta model is obvious that during the IS development can be used more methodologies:

- Methodology of the IS development according to which are performed technical activities and preparation of technical products.
- Methodology of leading project according to which flow procedures of leading projects and guaranteeing the quality of project.

4. Projection of the usage of methodology

If we take into consideration that one of the users is a leader or the project for the IS development which MIRIS would use as a help for defining suitable projecting activities, to choose surveillance spots, as well as determining tools which would be the outcome of development process. The project leader will choose suitable approach (structural, objective…), according to which will flow the project development. In the part of methodology, where is represented the procedure of the IS development, as a result would appear an output which will be later used and which will determine the flow of the next phases from which the project is made of. Of course, the project leader would be able to retain the real condition and based on its own experience will retain recommended phases or even to break them apart into more phases. Presented classifications on phases in methodology we should not take as absolute ones, but as the most common

example which is suitable to the .most of the developing projects, but not to all. The mentioned classification of phases is not absolute, it is already said in the structural part of the methodology, where on the base of the first presented complete approach would be represented one more approach but in the shorten version. In the shortened approach some phases has to be together, with the fact that activities inside those phase are broken. Further one, the project leader in the part where is described procedure of development, will find the proposal of activity and their chronology inside the phase. Activities and their chronology is determined on the base of work experience within more projects. Therefore it is recommended to project leader to use the known model as much as possible and of course he can change or join individual activities according to its own judgment.

In the second part of this chapter is said that methodology recommended for leaders and members of teams for the establishment of the IS. Project leader is very interested in the part where the procedure of development is shown, because in spite of everything he gets the proposal what is the best way to perform some phases, which outputs would be used as entrances in some of these phases. The products of analysis and planning are of the key importance during the IS development and there are hidden the biggest traps and the most often defectwhich later on appear in phases of IS development.

5. Conclusion

As addition to conclusion it can be added that it is about Bosnian E – government module, which begins from the constructions based on traditions and professional systems which have influence on district government in the last few decades. The term transformation should understand as throwing out, rotation and introduction of new work methods in government, but in relationship with citizens, while trying not to throw too much of the old one. The path which outlines the development of districts in Bosnia and Herzegovina is not extreme either in relation to economic efficiency or in relation to the movements of bureaucratic ideals. It is found in one grey zone, between black and white, where all excuses are satisfied, but there is no collective ideal model for who, what and how can be achieved. The pressure which the environment has put on districts and the speed by which IKT develops can take part in improvement of tendencies, which can be seen in the relation with competition, orientation and auction, and in future it can take part in a politicization of terms such as profit and result orientation.

The methodology of the IS development as well as other methodological materials which are made for the necessities of government administration, not even a document (document: UNDP BH ICT 4D – ICT FOR DEVELOPMENT), which is written will not stay unchanged for the whole time. It is needed to renew and fulfill in a valid way. Therefore in the next few years needed material will be fulfilled on the basis of practical experiences, new needs on the fields of the IS development public government and technical trends. The methodology of the IS development adds one more piece to the mosaic of the methodological arranging of the computerization of the public organs

References

[1] Muharem K, *Primjena koncepta E-Uprave na lokalnu upravu – magistarski rad*, Sarajevo,Bosnia. 2005.

[2] John Mingers, Geoff Walsham, Toward ethical information systems: the contribution of discourse ethics, Journal MIS Quarterly, Volume 34 Issue 4, December 2010

[3] Alempije V., *Projektovanje informacionih sistema*, Beograd, Serbia. 2003.

[4] Rugayah Hashim, Economic Issues In Information Systems Implementation In Local Government, International Review of Business Research Papers Vol.6, No.1 February 2010, Pp. 562-573.

[5] Chad Frazier, *Deploying a Softswitch-Based Next-Generation Carrier Network: Challenges and Benefits*, IP Applications and Services 2003, IEC Publications, 2003

Corresponding author: Muharem Kozic.
Institution: University "Dzemal Bijedic", Mostar, Bosnia and Herzegovina
E-mail: muharem.kozic@unmo.ba