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The concept of local governance in BiH information system development

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ABSTRACT

This paper deals with the implementation of information systems for public administration in BiH. IS implementation is a complex process that involves solving problems such as: a review of IS theoretical aspects, analysis of the current state, selection of the most appropriate methods for IS development, implementation of the IS, post implementation support and measuring the practical benefits of IS implementation.

Keywords: information systems, development, methodology.

Introduction

Several methodologies for the software systems development and design are known in theory and practice. In present conditions, the development and design are realized by forming mixed teams that include: users (analysts of the real system), information system analysts and software system designers. Using modern tools for software systems development and design (CASE - Computer Aided Software Engineering), the project team develops a software system in phases, depending on the chosen methodology.

Today, when asked, the question of how to actually develop and design a software system in the context of information systems related to automating certain functions across all the levels of municipal structures and services presents a highly topical response. However, due to the high complexity of the functions and processes in the system, which needs to develop a software, it is necessary to invest a lot in finding methodologies that will best suit the software systems development needs.

The failure to develop and design complex information-software systems, as well as low productivity of the project teams encourage research dealing with finding new methods.

LIS development concept proposal

Using past experience in working on IS development, and some of the existing methodologies and lessons learned in the application of the methodology, MIRIS is given a concept for OCT development of. The development of IS for the local government in BiH can only be done by a combination of several available methodologies. If we decide to develop the IS from the top down, it is necessary:

- To establish a Government Information Centre for Information Technology (ICVI), at least at the level of entities;
- To define the role of government in development

The main ICVI task is to make a satisfactory computerization of the public administration. Among other things, ICVI would be responsible for:

- the development of application software,
- advising government bodies on planning and implementation of information technology,
- supervising the application software development and implementation,
- guaranteeing adequate quality services and products of information technology,
- methodological and technological coordination in project development.

Enumerated tasks correlate closely with the chosen methodology of information system development. Besides the above listed, the ICVI task is to take care of developing a methodology that would deal with the development of information systems for public administration. Computerisation of public administration will make the state authorities, service users and, in some segments, the purchasers themselves involved in the process. The Government Information Centre for Information Technology would assume the function of the professional coordinator and contractor, who would carry out most of the Performer Affairs. Such a situation leads to the fact that different approaches are used for individual developments, which in turn leads to the emergence of various products (mainly in the analysis and planning phases). Such diversity makes it difficult, if not impossible, to conduct effective supervision and quality assurance, which the Government Information Centre for Information Technology would be in charge of. This further aggravates re-usability of the product development and comparison between various development projects. To make high quality IS, it is necessary to involve the government at the entity level for several reasons:

- the software would be cheaper for municipalities,
- software quality would certainly be much higher because several municipalities would make suggestions in the process of application development,
- a universal system applicable to the whole territory of Bosnia and Herzegovina would be created,
- people would have some standard procedures for dealing with their problems no matter where they are,
- the government would have better control of individual municipalities,
- the Election Commission would receive unique data,
- Departments of Statistics and various departments in charge of municipality development would also provide the necessary data,
- simply stated, all the participants would benefit - the state, municipalities and the end service users as well.

An overview of the methodology for LIS development

The main purpose of the proposed concept for information systems development, the Government Information Centre for Information Technology and, of course, other state authorities can offer:

- assistance in preparing, setting up, coordinating, managing and supervising the projects development, carried out for the needs of the Government Information Centre for Information Technology (joint ventures) and the needs of other state bodies,
- a gradual approach to the development and implementation of information systems for state bodies,
- methodological support in monitoring the projects execution quality involving/regarding the contractor and
- creating positions for the contractors involved in the process.

Table 1: The content of information system development methodologies

Information system development methodology								
Information system structural development methodology			Information system object oriented development methodology			The methodology for the development of "workflow" applications		
Rules and the use of diagramming techniques	Development process	CASE tools	Rules and the use of diagramming techniques	Development process	CASE Tools	WfMC model	Development process	Review BPR and WF tools

Structural Methodology

In structural methodology, where diagrammatic techniques for data and functional modelling are presented and without which it is not possible to imagine a good approach in information system development, the development procedures used for information systems and diagram examples are formed by using the CASE tool, which offers very good support for the teams developing the IS, as well as those who maintain them. Information system structural development methodology arises on the basis of information engineering methodologies Oracle CDM and SSADM.

Rules and diagramming technique usage

Easy-to-understand and in detail defined structural diagrammatic techniques are crucial in the development of information systems. In the development of the information system, close preparation of the people developing the IS (developers, analysts) and IS users is necessary. All of them have a role in the process, from the start of IS development to its implementation and even later maintenance. Diagrammatic techniques are invaluable for the exchange of ideas, and in the final stage, unambiguously guarantee that developers correctly, and in detail, understand the effect and importance of the organization itself.

Due to automation and CASE tools usage, clearly defined diagrammatic techniques become even more important because automation allows translations of syntax, automatic switching between different diagrammatic techniques and automatic translation of diagrams at the logical and physical levels. There are a lot of reasons why the development and maintenance of information systems is not possible to imagine without the use of structured diagramming technique.

Below are a number of diagramming techniques that recommend a structural part of the Methodology for developing information systems and its different stages. Diagrammatic techniques, used in the analysis phase, are used to represent actions and the need an organisational information system (state body) has, or an action area pertaining to an organisation system in a logical level. This does not later serve a physical embodiment of the information system. Diagrammatic techniques, which are used in the planning stage, have already built an application systems reflection plan - developed in the construction phase.

A review of diagramming techniques, which are used in various stages of information system development, can be seen in the table below. The leftmost column lists diagrammatic and other formal techniques, whose use is recommended in the Methodology of information systems development, primarily the listed stages of information systems development. The diagrammatic technique suitable for each phase is placed at the intersection between each phase and diagrammatic technique. The diagrammatic technique is not used at the stage where the cross section is empty.

Table 2: A review of diagramming techniques by stages in the information system development

Development stages of diagrammatic techniques	**Strategic planning**	**Analysis of work areas**	**Planning application systems**
Decomposition diagrams	The organizational chart,	Detailed functional decomposition	Plan of the application system structure
Diagrams data flows	Functional	Detailed functional model	
Diagram entities	Decomposition,	Detailed data model	
Matrix connection	Strategic elements	Matrix connection	
Diagram action		Processes - entities	Process plan
Structure charts			Structural plan of the application system
Structured language			Process plan
Decision making tables and tree			Process plan
Diagram of the transition state			Process plan
Relational scheme			Data structure plan

Development Tools

Modern CASE tools are essential in the development of information systems. In the structural part of the methodology and in the information systems development, the tools used to create diagrams are Oracle Designer / 2000, PowerDesigner, etc. Diagrammatic techniques supported by tools and the type of graphical notation that needs to be described, should be visible from the development of diagrams.

The methodology of developing applications to support the work process

Basic concepts

Tools used to support work processes can roughly be divided into:

- Tools for the analysis and planning of work processes (Business Process Reengineering Tools - Tools BPR) and
- Tools for managing work processes (Workflow Management Systems - WFMS).

Tools for analysing and planning workflows are meant for making shots of existing processes, their future modelling and detailed analysis. With such a tool, the created models of the processes are used for their evaluation, which takes into account cost,

- time (performing, waiting for the whole time) and
- quantity (the number of embodiments in a time interval).

In the results of the evaluation process, models of the reconstructed process are made with the same tool. It is possible (if the tool allows) to check the feasibility and consistency of the models.

Tools that manage workflow allow you to perform work processes before it is possible to perform those required by the model, in the way that they recognise each tool. To avoid repetition, the different tools are necessary to develop guidelines that allow data transfers to a model made for tools used in the analysis and planning processes, as well as tools for managing work processes. Tools for workflow management enable IT supervision and direction through the work process, from one activity to another. In guiding the process, it is necessary to inform users that they must perform a task that guarantees the user appropriate software tool, which will be able to perform the required task, and appropriate information. A tool should also allow the user to see where its requirements are in the context of the entire process, which can contribute to the gradual improvement of the process itself.

Development process

The process of building applications for the support workflows (Workflow Application) is different from the classic approach. Since the work area of such an application can represent all the activities of the organizational system, it is very important to have a developed access to the description of the organizational system. Key elements of such descriptions are organizational chart and description of the work processes. The main reason for the differences between the classic and an approach in developing applications for workflow management is the emphasis on content and not on performance.

Connecting with other methodologies and projects

One of the guidelines given when creating a methodology for information systems development should be that it must be compatible with the existing methodologies, which have already been used, that ICVI benefits from it, and that it could be used for the informatisation of state authorities. Introducing a new methodology incompatible with the existing ones would actually open a lot of questions and dilemmas, and in turn be the opposite of that which we want to achieve.

Thus, for example, the strategic planning methodology can be created on the basis of information engineering methodologies, within which the first phase is not strategic planning. In the strategic planning methodology, the procedures, development and final products of strategic planning should be described. This would serve as the fundamental methodological basis for the execution of projects regarding strategic plans for developing information systems. It will prove to be both the strategic plans for developing a unique public administration information system and the strategic plans for developing an information system pertaining to individual state bodies that are listed in the “products” created by specific projects regarding information systems development and with it, represent one of the foundations for the projects’ products.

The products, which are formed by the strategic planning methodology, as well as one that accepts such results in the information systems methodological development, should be accepted as input data. The project management methodology

in public administration can be prepared on a different basis. It should be described in the project organization and operations management. This methodology can be used for management in all the projects pertaining to the field of information technology and guarantee project quality. By connecting to the target module, it is evident that the following methodologies can be used in projects for information system development:

- An information system methodology, in accordance with which to perform technical activities and preparation of technical products and
- A project management methodology, in accordance with which the course of project management procedures and a guarantee of project quality would be conducted

This means that MVPJU / IT determines that the project should be divided into phases and the new methodology will be used to determine the stage. Further on, the methodology will determine the content of technical activities and the schedule, while MVPJU/IT will determine that activities of preserving quality will be conducted in line with the content of technical activities. This methodology is used for mutual overlapping, so it is sometimes very difficult to determine the area pertaining to one method.

Utilisation of the methodology

Given the purpose of the information systems development methodology, which represents the basis of proposals for creating municipal information systems development methodology, one can predict its usage. If you take into account that one of the project users is actually a leader in charge of developing an information system, which will be used by MIRIS so as to help define an appropriate project design and activities, select a control point as determined by one tool, which will result in process development. The project leader will choose an appropriate approach (structural, object based ...), after which he/she will run its development.

In the part of the methodology, responsible for IS development process, it will result in an output that will be used later on to determine the course of the next stage, which is a part of the project. Of course, the project leader will be able to keep the real situation in mind and on the basis of his experience maintain the recommended phase or even divide it in several phases. The presented division of stages in the methodology should not be taken as absolute, but as an ordinary example, corresponding with the contemporary development projects. The proposed division into phases is not absolute, it was already present in the structural part of the methodology proposal, and it was based on an integrated approach that was presented first and introduced more and reduced access. Apart from the activities being reduced in these phases, in the concise approach, some stages must be combined. Furthermore, the leader of the project in the area where he/she described the steps in the development, has to propose the activities and their sequence within the stage. The activities and their sequence are determined on the basis of experience in working on multiple projects, so it is recommended that the project leader proposes as many benefits as possible, but they could, of course, be individual activities according to his/her judgment for combining or modifying them.

The second part of this chapter presents the way this methodology benefits leaders and team members responsible for establishing the IS. The team leader in charge of achieving satisfactory quality has a really interesting task because the development process is presented here. Among other things, the proposal has, according to the best development project, created each phase, used as input in any part of the phase. Product analysis and planning are crucial in developing the IS. There are hidden traps, VCE and common defects, that can appear in the IS development phase.

Conclusion

In addition to the conclusion one might add that this is a Bosnian E-administrative model, which is based on building the traditions and expert systems, which have influenced the administration in the last decades. The term transformation is also to be understood as ejection, rotation and introduction of new methods used in administration, and in relation to the citizens, and not to throw too much of the old ones. The road is marked by the development of BiH municipalities. It cannot be an extreme development even in relation to the economic efficiency and launching bureaucratic ideals. It is in a grey area between black and white, where all justifications meet, but there is no collective ideal model for when, what and how to achieve it. The pressure the environment plays in the municipality and the rate of ICT development can take part in improving the tendency, seen in comparison with the competition, orientation towards the citizens, responsibility, orientation toward the goal and offer,

as well as participate in the process of moving away from politics as a profit and project based result orientation. The information system development methodology and other methodological materials designed for the needs state administration has and not for a written document (Document: UNDP BH ICT4D - ICTs for Development) will not remain unchanged. It needs to be an orderly way to renew and update. That is why, in the coming years, and based upon practical experience, new needs in the field of information systems related to public administration and new trends in technology will arise and make it necessary to update the materials. The information system development methodology adds another piece to the mosaic that is methodological order in computerisation of public authorities.

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Koncept razvoja informacionih sistema za lokalnu upravu u BiH

SAŽETAK

U ovom radu je obrađena problematika implementacije informacionog sistema u javnoj upravi BiH. Implementacija IS-a je kompleksan process koji podrazumjeva rješavanje problema kao što su: razmatranje teorijskih aspekata izgradnje IS-a, analizu postojećeg stanja, izbor najpogodnije metode izgradnje IS-a, implementaciju IS-a, post implementacijsku podršku, kao i mjerenje praktičnih koristi implementacije IS-a.

Ključne riječi: informacioni sistemi, razvoj, metodologija.