

Analysis of Questionnaire Results in the Use of BP and ND in Public Administration

Larisa Survilo¹, Ilze Buksa², Andrejs Gaidukovs³, Vira Shendryk⁴,
¹⁻³*Riga Technical University, Latvia*, ⁴*Sumy State University, Ukraine*

Abstract – The goal of effective public administration is to provide qualitative services to citizens. Due to the increasing use of information and communication technologies (ICT), e-government is one of the possible solutions in achieving this goal. This solution includes a good understanding and management of the existing business processes, the use of normative documents and the effective use of information systems in public administration. To get the current view of all mentioned necessary components, the questionnaire was made. This paper is devoted to the analysis of questionnaire results. As a result of the analysis, hypotheses for further study are set.

Keywords – Business process (BP), compliance, document management system (DMS), information system (IS), modeling, normative document (ND), quality management system (QMS).

I. INTRODUCTION

The main task of public administration is to provide qualitative services to its citizens. Information and communication technology (ICT) plays an important role in the implementation of these tasks. Denmark can be mentioned as a good example, where all processes and documents in public administration are made electronically; namely, there is implemented an e-administration 100% [1]. The meaning of ICT and the growing demand for more efficient business process (BP) management and analysis is also emphasized in the planning documents related to the sustainable development strategy of our country [2]. Execution of public services is closely related to the regulatory documentation of a certain process. The processes supporting them must be compliant with laws, rules, guidelines or other legislative procedures of our country. This is a specific character of public services. The specific character, the growing number of available services and the opportunities offered by ICT drive the development of research on compliance and linkage of business processes (BP) and normative documents (ND) [3]. Management of documents and processes ensuring BP and ND compliance and linkage highlights other issues related to e-administration, such as electronic signature, availability of the online databases (DB), IS used in organizations etc. [4].

One of the most important issues is the identification of the current state in the use of BP modeling techniques and tools, implemented IS and existing cycle of regulatory documentation in public institutions. Survey is one of the best known research methods to detect and to clarify the viewpoint of the current situation [5]. Within the project “Research of Automated Analysis of Regulatory Documents and Business

Process Compliance Management”, this method is implemented (see Acknowledgements).

The aim of this paper is to propose a detailed analysis of results of the survey, to make conclusions and to set up hypotheses about the use of BP modeling techniques and tools and the cycle of ND in public authorities. It is also important to clarify the opinion of employees in the need of BP and ND joint management.

The rest of this paper is organized as follows. In Section II, a research methodology is described. Section III provides the essential conclusions of survey results. Section IV includes a detailed analysis of results, and in Section V hypotheses are set.

II. RESEARCH METHODOLOGY

During the development of questionnaire, the following general scientific research methods were used [6]:

- *Descriptive or monographic method*, including a review of literature on BP modeling methods and tools [7], BP and ND compliance management [8], and BP and ND joint management capabilities [9];
- *Comparative document analysis method*, including the analysis of documents related to the sustainable development strategy of our country [10], [11] and the experience of other countries in surveying the public sector [1], [12];
- *Systemic analysis method* for composing the structure of questionnaire [11], [12];
- *Method of synthesis* for including questions in the questionnaire form [11], [12].

The subject of research is the use of BP modeling methods and tools and the cycle of ND in public institutions.

Participants of research are representatives of public institutions, who answer on behalf of institutions.

The form of questionnaire is based on the previously developed form and structure of questions. It has been established on the basis of existing case studies, which comprise the review of the literature on a given topic, including the experience of other countries and analyzing nationally important studies made in this problem domain [1], [10], [11], [12]. The opinion and experience of employees working at public institutions were also taken into account. The overall depiction of research methodology is given in Fig. 1.

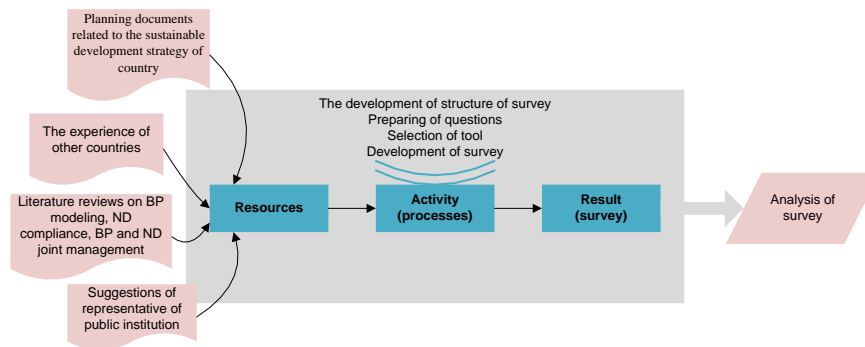


Fig. 1. Research steps to the knowledge acquisition about the current state on BP and ND in public administration.

There are 39 questions in the survey. Each question belongs to the appropriate subgroup according to the subject:

- Group 1: Questions about the ND management.
- Group 2: Questions about the process management.
- Group 3: Questions about process modeling methods and tools.
- Group 4: Questions about the services provided by the institution.
- Group 5: Questions about the institution.
- Group 6: Questions about the respondents.

There are two types of answers to the questions in the questionnaire:

- *Quantitative answers* – a choice from a number of alternatives; rating scale from 1 (lowest) to 5 (best);
- *Qualitative responses*, where respondents have the opportunity to give their views on a particular issue.

The survey was conducted electronically in a certain period of time using the opportunities offered by Google Docs. All submissions were received, stored and processed electronically.

III. GENERAL CONCLUSIONS ABOUT THE RESULTS OF SURVEY

Process and ND management in public administration depends as on the number of services per day, complexity of processes, number of employees involved and their qualifications, as well as on the resources available for the implementation of processes.

The key findings of the analysis of survey results are as follows:

- Taking into account variety of development, use and storage of ND and processes; BP and ND joint management is an important issue in public institutions;
- Process documentation is already based on textual descriptions and diagrams (the leader is still the standard MS Office software); descriptions and diagrams are on the base of BP modeling tools, too. This allows making a conclusion that the implementation of BP modeling tools, including training in using them, would not cause much resistance between employees. Actually institutions are already working in this direction. There is a lack of standardized, uniform approach.

The rational use of BP modeling methods and tools can help overlap this gap;

- Regardless of the software used, employees of institutions point to necessary improvements both in the specific document management systems and in implemented IS at all. Therefore, it would be very useful to make a research on the functionality of the implemented IS in organizations. Such a study would focus on advantages and disadvantages of IS, their relevance and potential opportunities to collaborate with BP modeling methods and tools;

- There are institutions that have already invested resources in the process automation, in the selection of appropriate tools and techniques. They have accumulated experience and knowledge. It would be worthwhile to acquire this knowledge and opinion of possible ND and BP joint management in public institutions (the survey data showed that there were only about 4 institutions);

- In a number of institutions, the management of ND and processes is left under the responsibility of the employee. It is not safe from the institution's point of view. However, it has encouraged employees to organize processes they are responsible for themselves;

- Hard copies of documents are still a quite popular way of storage in public institutions. Answers of respondents confirm that despite the fact that there are implemented DMS, documents are still kept in a paper form. It means that the purchase of IS does not guarantee an efficient and modern way of document production, use and storage;

- It is worth admitting that smaller institutions from regions have at least some knowledge about BP modeling. Some of them even have implemented ISO 9001 quality management system. At the same time, large institutions with a number of clients to be served per day over 500 do not have any experience and knowledge in this field;

- Survey results also showed that there was a variety of views not only between subordinate institutions of one ministry but also among workers within one institution. Content of answers depends also on the position of an employee. This could be due to the specific daily tasks and responsibility of each employee, namely, providing that some processes are more related to ND development, usage and storage;

- Working in the BP and ND joint management direction, leaders (directors, chairmen etc.) are interested in optimization

of processes to deliver qualitative services to citizens, and it play a very important role. Questionnaire results showed that at some institutions employees were much more better informed about the processes of the institution than their leaders.

Analysis of quantitative responses of respondents correlates with reflections and recommendations given in qualitative responses. There are mentioned the most necessary needs:

- Search capabilities using different criteria (including void ND);
- Timely receiving of information about changes in ND, change management;
- Strong interconnectedness of all regulatory documentation;
- Centralized storage of all necessary information (documents, processes) electronically;
- Linking of ND with the services and related processes of the institution;
- Representation of mutual ties and dependencies of processes;
- Representation of process relationship with an appropriate ND;
- A common approach to the preparation of process documentation;
- Improving the functionality of the specific document management systems, IS;
- Integration of several IS;
- Coordination of processes using e-administration only;
- Complete transition to e-government;
- etc.

IV. DETAILED ANALYSIS OF SURVEY RESULTS

A. Selection and Number of Answered Questionnaires

Notice of participation in the survey was sent to 49 government institutions. 249 questionnaires were received from subordinate public authorities of 13 ministries. 70% of respondents represented public authorities, 28% were from municipality, one response was received from the public corporation, and 4% indicated other answers.

Providing services to individuals (citizens) is the main task for 37% of respondents, then services for legal entities follow – 30%, and 25% of respondents indicated services to other government organizations.

B. The Use of BP Modeling Methods and Tools

In general, knowledge and use of BP modeling methods and tools can be assessed as weak. This was confirmed by 92% of respondents who said that they had no experience of well-known BP modeling tools (*such as Aris, Adonis, Cameo etc.*). Only 4 (1.6%) respondents had experience in the use of these tools. While 16 (6%) respondents reported that they had experience in the use of other tools (*such as Visio GRADE, iGrafX, Promod, etc.*) (See Fig. 2).

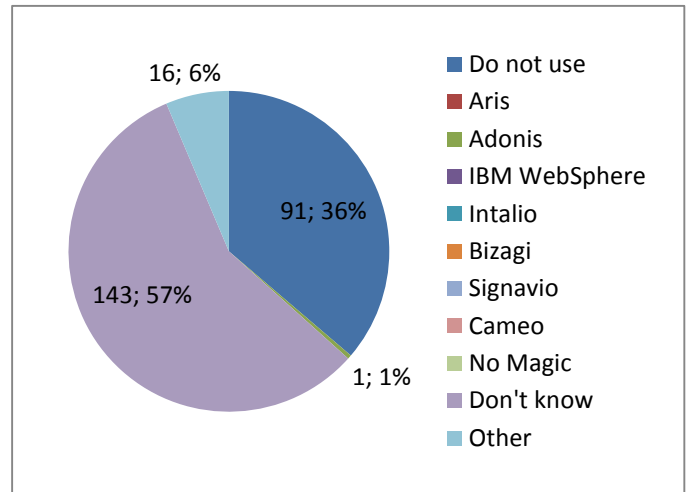


Fig. 2. The experience in the use of BP modeling tools.

Almost half of the respondents (43%) do not know what method the organization uses for process modeling, 28% of respondents have said that they have not used any method, 12% of responses are evenly spread between the EPC (Event-driven Process Chain), BPMN (Business Process Modeling Notation) and UML (Unified Modeling Language) method, and the leading position in the choice of methods is taken by the Flowchart method (15%). Five (2%) respondents have noted other methods (*such as Promod, SIPOC, Deskttime etc.*) (See Fig. 3).

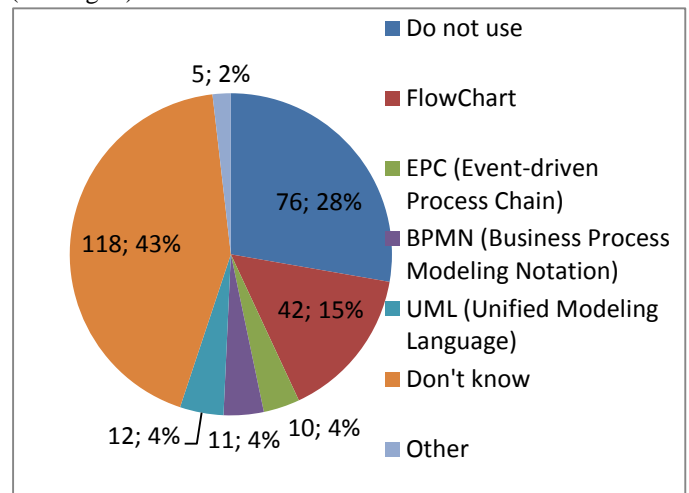


Fig. 3. BP modeling method used by institutions.

Three respondents have the experience and the methods, but there is no tool where they can apply their skills. Interesting to note that all of the 80 (32%) respondents whose institutions use some methods, nearly half (39) have marked a method, but there is no experience and also no tool implemented by this institution. It is possible that the method they use is supported by the implemented IS (DMS, record-keeping system, etc.), or the employees themselves have worked out a way how they implement a method in a standard software like MS Word, MS Visio etc.

36% of respondents believe that there are no tools used in their institutions, while 57% have said that they have no information on the use of tools in their organizations and 6% have said they use other BP modeling tool (such as *iGrafx*, *Visio*, *CAF*, *Promod*, *Aloha*, *Deskttime* etc.) (See Fig. 4).

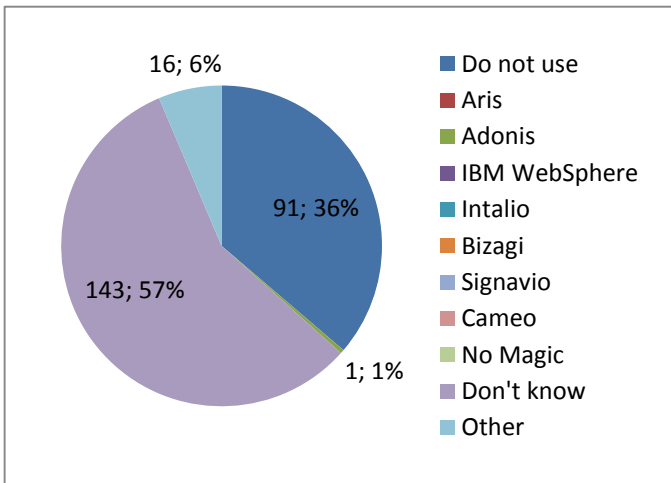


Fig.4. BP modeling tool used in institutions.

All three components – experience, method and tools – are only in 9 (3.6%) answers of respondents, 2 of which represent the same institution. Only the method and tool are used in 3 institutions.

Various responses lead to a conclusion that, on the one hand, the authorities inefficiently use the potential of their employees, on the other hand, employees are given an opportunity to realize the initiative in order to organize processes they are responsible for. For example, the institution in general does not use tools or methods, but the employee himself has found a way to effectively organize his work. However, many activities (in document storage, change management etc.) are left as “employees’ own business”.

C. Development and Use of ND in Public Institutions

The results show that there is a reason to distinguish between internal documents and external documents. Public authorities mostly take part in the development of internal regulations (37%). Development of external documents was selected in 29% of answers of respondents, and development of administrative acts – in 27% of answers of respondents.

From the usage point of view, the most used ones are laws (21%) and regulations of the Cabinet of Ministers (21%). These are external documents and mostly retrieved from online databases. The most used database of ND is *www.likumi.lv* (33%) and *www.mk.gov.lv* (23%).

From the quality point of view, internally developed documents seem to be little better in comparison with the external documents. 54% of respondents are almost satisfied (rating 4) with the quality of internal documents, while 49% of respondents assess the quality of external documents as satisfactory (rating 3). This could be due to the transparency and clarity of internal document production cycle. Usually the development of internal documents is carried out within the institution and is guided by the responsible employee.

Therefore, this process is easier traceable and the possible ambiguities, uncertainties can be resolved more effectively.

It is worth noting that the use of IS (including BP modeling methods and tools) plays a significant role in the development of documents. Document quality is rated higher where the IS is used. In all institutions, where BP modeling method and tool are implemented, document quality ratings are not lower than 4.

In general, management of ND is good – 37% of respondents have given evaluation 4, 14% of respondents consider it to be excellent (evaluation 5) and 36% think that it is satisfactory (evaluation 3), 11% of respondents have given 2, and in answers of 5 respondents (2%) there is the lowest assessment – 1.

Regulatory environment is considered to be highly variable [13]. However, the respondents do not confirm this – 35% of respondents answered that the changes in ND were every six months. It seems to be related to processes an individual employee is responsible for. For each individual, ND does not change often, but for the whole organization the regulatory environment, however, is quite variable. Despite the fact that changes do not happen often, the answers of respondents show that the need to receive timely information on changes is very essential, while 41% of employees follow the changes themselves, 39% receive an e-mail from the person responsible for the process and only 16% receive a notice from the implemented IS (See Fig. 5).

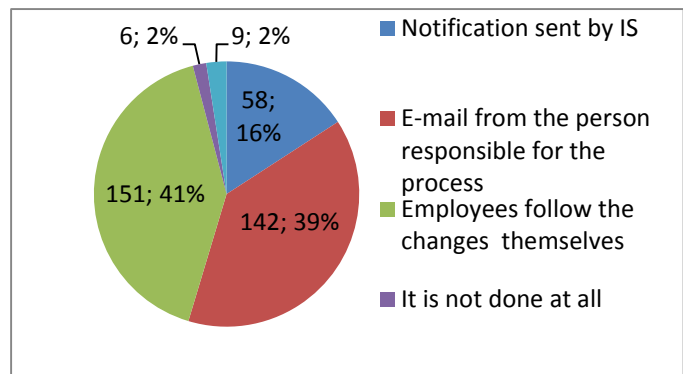


Fig. 5. Receiving information about changes in ND.

Process must be compliant with appropriate ND; therefore, implementation of changes is an important issue in the use of ND. Distribution across multiple sources of receiving of change notification can significantly lower the quality of documents and their compliancy with state laws.

D. Process Management of Public Institutions

Implementation of quality management system (QMS) usually helps to organize the process of ND management [14]. The results of survey show that a majority of processes are described in the institution’s internal documentation. This answer has been given by 99 (40%) respondents. Only 21 (8%) respondents have pointed out that there is an ISO 9001 QMS. The rest either do not know about the existence of QMS (25%) or are convinced that QMS is not implemented (24%) in their institutions. 3% of respondents have answered that

other QMS are implemented (such as *LVS EN ISO/IEC 17025:2005*, *CAF (Common Assessment Framework) model*, *LVS EN/IEC 17020 etc.*)

Almost half – 122 (49%) – of respondents have indicated that for the process documentation they use both textual descriptions and diagrams. Most often it is the MS Office software (*MS Word* – 141 (48%), *MS Visio* – 30 (10%)). 20 (7%) respondents showed that they used specialized BP modeling software for the process documentation (See Fig. 6).

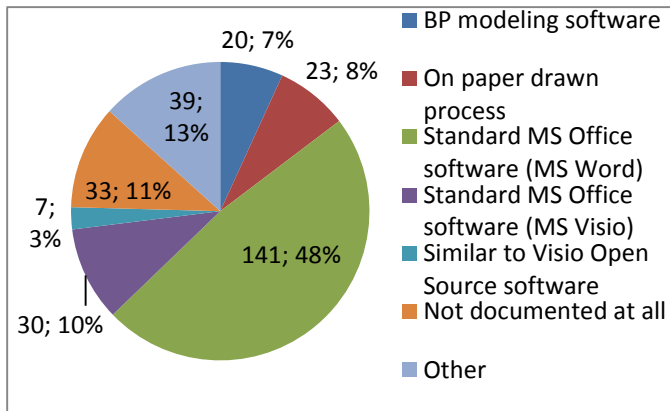


Fig. 6. The use of software for process documentation.

However, there are users (10) of specialized BP modeling software that have not indicated the experience, method and tools in questions related to BP modeling. It is possible that to some extent BP modeling activities are supported by the implemented IS. However, all respondents who use any specialized tool for joint management of ND and BP have noted desired functional improvements, where the most necessary needs are “*change management of processes according to regulatory documents*” and “*representation of interdependence of normative documents*”.

Professional BP modeling tool (*Adonis*) is used only in one institution. It should be emphasized that there are 3 institutions in public administration which have implemented ISO 9001 quality management system and specialized BP modeling software. One institution has implemented specific BP modeling software. This can be a reason why they have no need to implement QMS, and processes are well described in internal documentation. Two of these institutions serve a “*500 and more*” clients per day and the other two serve “*51–250*” and “*11–50*” clients per day.

In general, respondents are satisfied with the documentation of internal processes and services. Processes are sufficiently documented for 110 (44%) respondents. Services are fully documented for 119 (48%) respondents.

Respondents are sure that the qualitative documentation of processes ensures uniform and precise execution of processes (34%), ability to track the execution of the process (31%) and it is the basis for any legitimate performance of processes, on which 19% of respondents focus.

Although respondents are quite satisfied with documentation of processes and services, 41% of them believe that it still can be done better and necessity for “*improvements*

in management and documentation of processes” is rated with 3. Answers show that the documentation process itself is managed quite well, while for the quality of internal documentation employees (54%) have given evaluation 4. Improvements are necessary in joint management of ND and processes. Therefore, rational implementation and use of BP modeling methods and tools can help to find solutions to these issues.

E. The Use of IS in Public Institutions

IS includes any type of software used by the institution for the management of processes. There can be document management system (DMS), record-keeping system, BP modeling tool, standard MS Office software, as well as internally developed IS. It is positive that nearly half (49%) of respondents store ND in DMS, but for 22% of respondents the storage type of ND is still hard copies. Moreover, an individual approach of each employee to document storage is not safe, but this way has been noted by 11% of respondents (See Fig. 7).

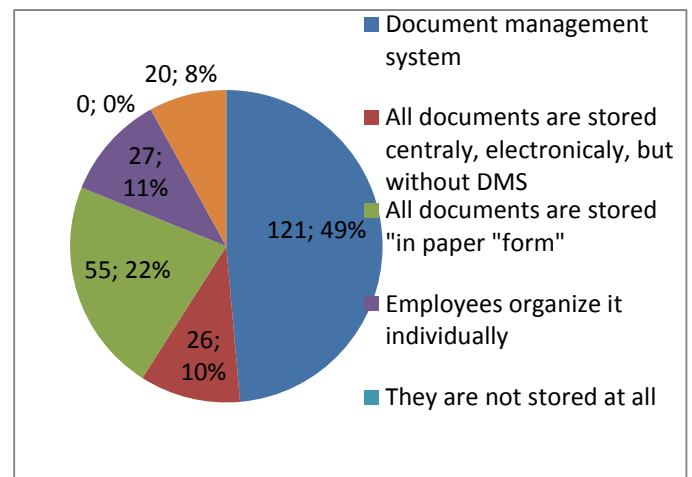


Fig. 7. The way of storage of process documents.

A leader in process documentation storage ways is “*a centralized shared network of institution*” (29%), which is followed by storage in IS (27%) and 22% of respondents still store process descriptions in paper form. 15% of respondents organize the storage of process descriptions individually. It is important to note that 37% of all documents (documents stored in a paper form + documents stored individually) are stored unsafely or ineffectively, while 2% do not store documents at all.

MS Office software (*MS Excel*, *MS Word* (21%)) is still used in most institutions. Often this software is used together with implemented IS (DMS, record-keeping system etc.). This ensures that the existing IS does not provide all the functionality required for process execution. The most commonly used DMS are *DocLogix* (13%), *LotusNotes* (12%), *DocsVision* (7%), *Namejs* (5%), etc. Other ISs constitute 10%, and they are “*ACTO*, *Optima WorkFlow*, *OneSystems*, *RDLIS*, *KAVIS*, *RDLIS*, *DMS developed by Vidzeme University*, *DMS –“intra”*, *DATORIKA*, *VUIS*, *KUVIS*, *SAIS (Social Insurance information System)*, *URIS*, *ELDIS etc.*” (See Fig. 8).

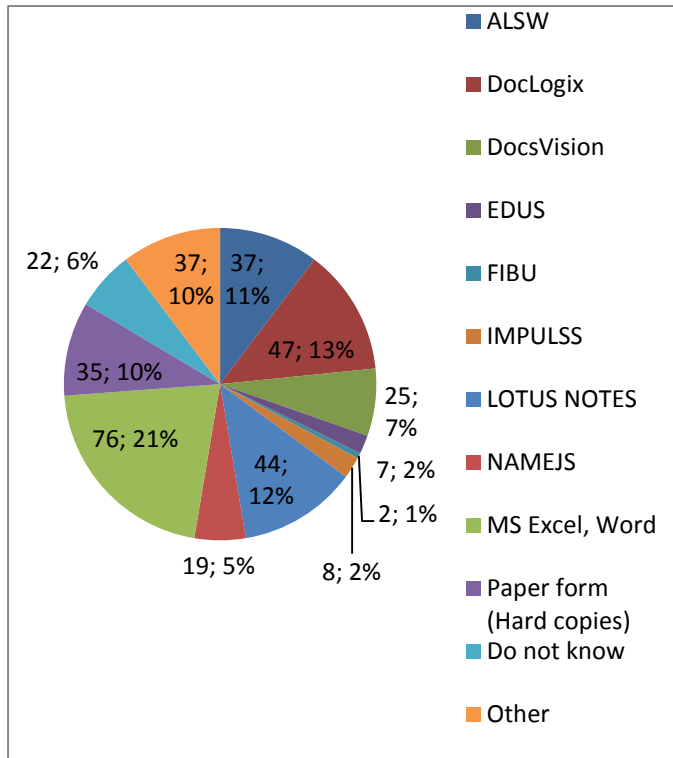


Fig. 8. The use of IS for development, use and storage of ND and processes.

Respondents' expectations about the improvements of IS functionality depend on the level of detail of question.

There are 2 main needs in the improvement of *ND management* using IS: 1) a variety of search options and 2) change management; both have been evaluated by 19% of respondents. The next important need is a possibility to show links and dependency in ND (17%), a common approach in storing ND electronically (16%), and 15% of respondents have indicated that the document status display facilities are also not sufficiently implemented.

In *process documentation and management*, 20% of respondents have emphasized a possibility to depict process relation with appropriate ND. For 19% of respondents the next important need is depiction of linking and dependency of processes, change management (16%) and display of qualitative and quantitative indicators of process execution (15%). Necessity to show processes both textually and graphically are equally appreciated by respondents (12%).

There are 3 main issues in *BP and ND joint management*: change management, performance monitoring and compliance management of ND. The role of change management has been evaluated by 16% of respondents, the process execution control is essential for 14% and the opportunity to examine the process and ND compliance has been appreciated by 13% of respondents. Interestingly that the need for change management of processes is greater than the need for change management of ND in case a business process is changing (14%). This could be due to the specific use of external and internal ND (See Fig. 9).

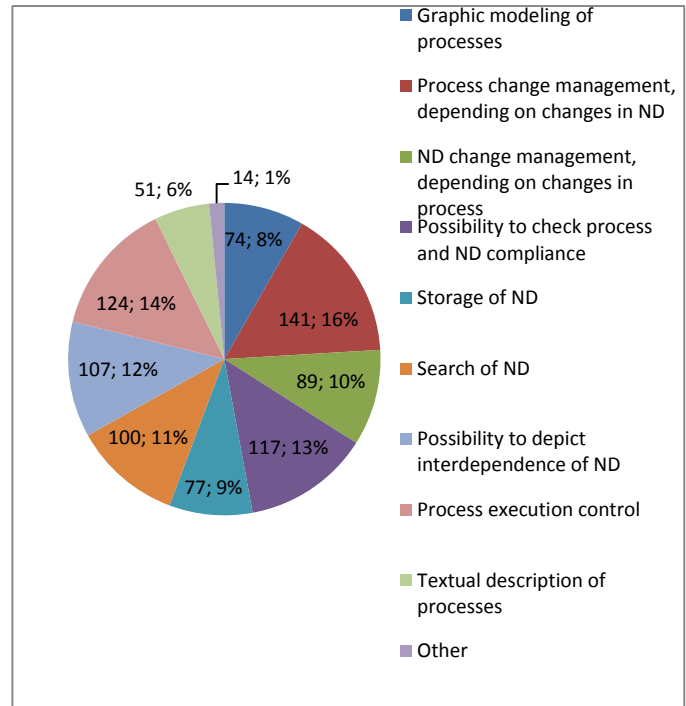


Fig. 9. The most necessary needs in improvements of IS functionality to ensure ND and BP joint management.

It is interesting to analyze the answers of respondents who have indicated that IS cannot provide any support. There are 16 (2%) of such respondents in ND management, 34% in process management and 11 (4%) in BP and ND joint management.

Ten of respondents have noted that there is no need for improvements in ND management, but at the same time they have pointed out necessary improvements in process management and BP and ND joint management. Response of one specific authority shows that the ND and process management is in order, and no improvement is needed, but in BP and ND joint management there are marked all possible suggestions for the improvement of functionality. This institution uses BP modeling method, VISIO is used as a BP modeling tool and ISO 9001 QMS is also implemented. In this case, a professional BP modeling tool can be used as a common environment for improving the whole performance of processes.

Analyzing the answers of the required functionality for BP and ND joint management, there is an answer of respondent that no improvement is necessary because all necessary functionality provides the existing DMS (from the list of professional DMS). Another reason to deny any need for improvement is internally developed DMS, which exactly performs tasks of specific institution. It should be noted that out of the 11 respondents who believe that no better functionality is required, only 2 have shown BP modeling method (Flowchart). The rest have no experience in BP modeling and also there are not any method and tool specified. This indicates that they have no idea about BP modeling at all.

It means that the one who has used a method or tool can point out also improvements of existing functionality. But the one who does not use any approach or method even does not know what to point out. Therefore, during the implementation of BP modeling methods and tools it is worth taking into account the experience and knowledge of those institutions who have already made an effort in this direction. They could provide with more constructive and informed judgments on the implementation of BP modeling methods and tools in public institutions.

Despite the wide range of used IS, all the necessary functionality is not supported, especially in change management, document linking and interdependency depiction, compliance management etc.

V. SUMMARY AND FUTURE RESEARCH

The most important findings made on the basis of the detailed analysis of results allow setting a number of hypotheses about the existing processes and related ND in public administration:

1. Institutions do not use knowledge and experience of their employees 100%.
2. If employees do not have experience in the use of tools and methods, then the organization does not use specialized modeling tools and techniques.
3. Institutions with a number of clients over 250 per day have better knowledge about BP modeling, and processes; they are better managed; namely, the number of clients served per day plays a significant role in improving the whole process and ND management.
4. The need to cooperate with other state institutions positively influences the need of implementing BP modeling methods and tools.
5. The possibility to use IS has a positive impact on development of qualitative documents and processes.
6. The regulatory environment is highly variable.
7. Frequency of changes affects the necessity of using change management tools.
8. IS provides information on changes in ND.
9. Standard MS Office software still is a leader in the development of documents.
10. Processes of services are documented regardless of the quality management system is implemented or not.
11. Internal processes are documented regardless of the quality management system is implemented or not.
12. Implementation of quality management system improves the use and management of ND.
13. IS provides service execution traceability.
14. Internally developed specific IS usually satisfies the needs of users.
15. Existing IS does not link ND with the services provided.
16. ND (both internal and external) storage facilities are fragmented.
17. Search functionality in the existing IS is insufficient.
18. The existing IS for document management does not exclude the use of external IS for external ND.

19. All subordinated institutions of one organization use the same IS.

Analyses of detailed results, on the basis of which hypotheses have been set, conclusions and key findings made, clearly ensure the usefulness of implementation of BP modeling methods and tools to reach all advantages offered by BP un ND joint management. In addition, it is important to take into account the experience and knowledge of institutions, which have already done much in the field of modeling and automation of their processes.

At the end of this article, it is worth citing the recommendations of a respondent who represents an institution with more than 500 clients per day. To improve the management of processes and ND joint management there is a necessity of: *“A strong interconnectedness of regulatory documents at all levels (with links too), storage of all information in one place, the possibility to view it and to search at all necessary cuts. Links between regulatory documents, services provided and information system processes”*.

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Larisa Survilo has received her Mg. sc. ing. degree in 2000 from Riga Technical University. In 2000 she started Doctoral Studies and in 2005 she received a Certificate for completed theoretical part of Doctoral Studies from Riga Technical University.

Currently she works as a Researcher at the Institute of Applied Computer Systems and as a Systems Analyst at the Department of Systems Theory and Design. Her research interests include structure modeling within circumstances of incomplete information, complexity of systems, analysis and research of possible measures of complexity.

E-mail: larisa.survilo@rtu.lv

Ilze Buksa has received her Bc. sc. ing. degree in 2007 and her Mg. sc. ing. degree in 2009 from Riga Technical University. At the moment she is a Ph. D. Student at Riga Technical University.

She works as a Business Systems Analyst in the industry. Her research interests include requirements engineering, business process management and information systems development approaches.

E-mail: ilzebuksa@gmail.com

Andrejs Gaidukovs received Bc. sc. ing. degree in 2013. At the moment he is the Master Student at Riga Technical University.

His research interests include business process management, time dimension and information logistics.

E-mail: andrejs.gaidukovs@rtu.lv

Vira Shendryk has received her Mg. sc. ing. degree in 1998 from Sumy State University. In 2004 she has received her PhD from Sumy State University.

Currently she is working as a Associate Professor at the Department of Computer Sciences, Faculty of Electronics and Informational Technologies at Sumy State University, Sumy, Ukraine. Her research interests include information systems development approaches, modeling of information systems, structure modeling within circumstances of incomplete information, complexity of systems and decision making under uncertainty.

E-mail: vira.shendryk@gmail.com