

---

# *Mapping, optimizing, and adjusting for the introduction of e- construction of the procedures of the Register of Buildings*

## Final report

Ministry of  
Economic Affairs  
and  
Communications

11 March 2019





**Taavi Jakobson**

Ministry of Economic Affairs and Communications  
Suur-Ameerika 1  
10122 Tallinn

11.03.2019

Mr. Taavi Jakobson,

We carried out the works on the project “Mapping, optimizing, and adjusting for the introduction of e-construction of the procedures of the Register of Buildings”. In the execution of the work, we proceeded from the bilateral agreement No. 1.9-8/18-387-1 from 19 October 2018.

This document is the final report. If the conclusions in the final version differ from those outlined in our previous discussions or described in the interim report, the conclusions presented in the final report should be preferred.

Our analysis is based on the information and publicly available data (including research, statistics) received from the Customer and collected from the interviews by various agencies. Our tasks did not include verifying the accuracy of the source data, so AS PricewaterhouseCoopers Advisors (PwC) is not responsible for the accuracy of the source data or for the results if they are based on inaccurate or incorrect source data. Our work was limited to the activities set out in the contract.

In addition, we would like to draw your attention to the fact that AS PricewaterhouseCoopers Advisors does not accept any liability to the third parties to whom this document has been disclosed or otherwise made available.

Kind regards,

*/digitally signed/*

Teet Tender

AS PricewaterhouseCoopers Advisors

# Contents

<b>Contents</b> .....	<b>3</b>
<b>Authors</b> .....	<b>5</b>
<b>Brief summary</b> .....	<b>6</b>
<b>Terminology</b> .....	<b>7</b>
<b>1 Description of the existing situation</b> .....	<b>8</b>
1.1 Methodology .....	8
1.2 Process mapping .....	8
1.2.1 The proceedings of alterations related to construction works .....	9
1.3 Data flow mapping .....	27
1.3.1 Preparation for applying for a service.....	29
1.3.2 Preparation and submission of the application/notice .....	30
1.3.3 Reviewing application/notice.....	31
1.3.4 Application/notice proceedings .....	32
1.3.5 Executing register amendment entry.....	34
1.4 Conceptual data view .....	35
1.5 Problems, unwanted manifestations.....	36
1.5.1 Preparation and supplementing the application.....	36
1.5.2 Carrying out proceedings.....	38
1.5.3 Approval and providing an opinion .....	40
1.5.4 Inter-proceedings navigation .....	42
1.5.5 General problems.....	43
1.5.6 Legislative issues .....	44
1.6 Best practices.....	46
1.7 Suggestions for amending the situation .....	48
1.7.1 Suggestions for simplification of proceedings and processes outside of the scope.....	48
1.7.2 Proposals for standardization of proceedings, automation, and simplification of movement of information/formats.....	51
1.7.3 Proposals to increase procedural transparency .....	52
<b>2 Future vision</b> .....	<b>54</b>
2.1 Vision about digitalized steps .....	54
2.1.1 Submission and proceeding of applications/notices .....	54
2.1.2 Executing register amendment entries.....	57
2.1.3 An alternative scenario: Application based on BIM .....	57
2.2 TO BE process cards .....	58

2.2.1	Applicant’s view .....	58
2.2.2	Case handler’s view .....	64
2.2.3	Performance of the procedural act.....	74
<hr/>		
2.3	TO BE data flows .....	77
2.4	TO BE conceptual data view .....	78
2.5	Additional requirements .....	80
2.6	Checklists of the proceedings .....	83
2.7	Recommended practices and instructional materials for the case handler for introducing a new proceeding environment .....	84
2.7.1	Methodology.....	84
2.7.2	Recommended practices.....	84
2.7.3	Recommended measures.....	91
<hr/>		
<b>3</b>	<b>Impact analysis.....</b>	<b>93</b>
<hr/>		
3.1	Analysis methodology .....	93
3.2	Quantitative impact .....	95
3.3	Qualitative impact .....	97
<hr/>		
<b>4</b>	<b>Annexes.....</b>	<b>99</b>
<hr/>		
Annex 1.	List of interviewed institutions .....	99
Annex 2.	Checklist .....	101
Annex 3.	Table of source data .....	108
Annex 4.	GAP matrix .....	110
	Explanation of the impact of the measure.....	114
<hr/>		
Annex 5:	Cross-tabulation of measures and proceedings .....	122
<hr/>		

# Authors

## *Steering group of the project*

<b>Name</b>	<b>Institution</b>
Taavi Jakobson	MEAC
Jüri Rass	MEAC
Lillian Välison	MEAC
Valentina Konks	MEAC
Jaan Saar	MEAC

## *Project operators*

<b>Name</b>	<b>Institution</b>	<b>Role in the project</b>
Janar Linros	PwC	Project leader / analyst
Kaarel Koosapoeg	PwC	Analyst
Sander Lootus	PwC	Analyst
Sirly Märdla	PwC	Project assistant
Konstantin Raimla	PwC	Project assistant
Andres Uueni	Heritage OÜ	BiM specialist
Mihkel Uukkivi	ITEA OÜ	User interface and user experience expert

The project team would like to thank all the parties involved in the project, including the local authorities, public institutions, network operators and companies involved in design and construction, which provided input and feedback.

---

# Brief summary

The final report is one of the results of the public procurement “Mapping, optimizing, and adjusting for the introduction of e-construction of the procedures of the Register of Buildings” (reference no. 200098) organized by the Ministry of Economic Affairs and Communications. The purpose of the public procurement was to make the Register of Buildings’ procedures more efficient, easier and transparent.

The first chapter of the report provides an overview of the current situation in the use of the Register of Buildings from the perspective of the local governments, approving government agencies, network operators and construction-related companies. The review outlines a description of the situation in the form of descriptions of process mapping and process completion practices, as well as data flow mapping and conceptual data view. The existing problems, good practices, and suggestions by users are described to improve the procedures of the Register of Buildings as a tool or the services of procedures supported by it, which is advisable to take into account by the register’s owner in the organization of further developments.

The second chapter of the report describes the vision of what kind of tool could be the procedural system of the Register of Buildings be in the future. The vision for the future describes the steps to be digitalized, including an alternative process flow as an innovation for applying for notifications and permits using an information model that would allow faster course of the process. In addition, future vision processes, data flows, and conceptual data views are described. As an addition, complementing requirements for the product development have been described which further convey the requirements that have become apparent during the work, the conveying of which was not practical with the final prototype or the aforementioned descriptions.

In order to simplify future procedures, checklists were prepared for the case handlers in cooperation with the competent authorities, which is an internal tool for the Register of Buildings in carrying out future procedures. The suggested practices and measures that the case handlers could apply to carry out procedures to ensure a more efficient procedure were also described.

The third chapter of the report carries out an impact analysis as a qualitative and quantitative analysis to assess the impact of the implementation of the future vision (including the new EHR user interface, new processes, and compliance with best practices described) on the case handlers and other competent authorities.

---

*The analysis found that, if the procedural volumes of the year 2018 are taken as the basis, the implementation of the future vision saves working time for the competent authorities in the amount of at least 45 FTEs per calendar year.*

---

Saving in the amount of 45 FTEs would mean an increase in efficiency of about 8-10% compared to the current situation in the workload of the competent authorities. The assessment is rather conservative and proceeds from the measurements of the procedural activities for which the measurements existed or could be gathered from the users as an expert opinion. It can be concluded from the analysis that in addition to the saving of working time, the user-friendliness and transparency of the Register of Buildings is also increasing, which has a positive effect on all users of the Register of Buildings, which may indirectly increase the actual time-saving even more.

# Terminology

The abbreviations and acronyms used in the document are explained below.

Abbreviation/acronym	Explanation
<b>m</b>	
ADS	Address data system
DSN	Data submission notice
DEC	Document exchange center (xTee service)
OCWA	Organization of construction work's address
CCN	Construction commencement notice
EHR	Register of Buildings
BP	Building permit
BN	Building notice
ETDB	Estonian topography database
APA	Administrative Procedure Act
IFC	<i>Industry Foundation Classes</i> , construction work's description standard
EB	Environmental Board
UAOP	Use and occupancy permit
EPIS	Environmental permit information system
CASED	Comprehensive autonomous system of environmental decisions
LG	Local government
LR	Land Register
UAON	Use and occupancy notice
RA	Road Administration
NHB	National Heritage Board
MEAC	Ministry of Economic Affairs and Communications
REA	Register of Economic Activities
DS	Design specifications
RB	Rescue Board
RAE	Register amendment entry
PR	Population Register
HB	Health Board
TRA	Technical Regulatory Authority
CDN	Complete demolition notice
WURIS	Water utilization reporting information system
BR	Business Register
xGis	Geoportal of Estonian Land Board
XML	<i>Extensible Markup Language</i> , machine and human readable data exchange format

# *1 Description of the existing situation*

## *1.1 Methodology*

An overview of the existing situation was based on the materials provided by the contracting authority, publicly available information (e.g. legislation, EHR user manual, etc.) and interviews conducted with EHR users.

Interview planning was based on the points outlined in the procurement document, where 24 interviews with the competent authorities, 12 interviews with the construction companies compiling the applications (the so-called professional applicants) and 10 interviews with the procedural approvers and authors of opinion were needed to get an overview of the current situation.

The list of interviewees was compiled on the basis of a list from the contracting authority with the contacts of competent authorities, the approving authorities and the construction companies that should be included in the interviews and the parties missing from the sample were proposed by the contractor. The selection of the sample of competent authorities was based on the involvement of large, medium and small local governments. The approvers' sample was drawn up on the basis of the involvement of all the approving bodies involved in the procedural processes and the major network operators. The sample of the companies was based on the idea that there would be both larger and smaller construction and design companies among the interviewees.

In the sample proposed by the contractor, the primary address was made to the central contact of the institution involved (e.g. the secretary of the local government) to whom the content of the project was presented, the consent to participate in the project was requested and information was asked to be provided to all persons involved in the construction procedures. When the participants gave consent to be interviewed, it was agreed that the contractor would contact the interviewees in order to agree on the time and place of the interviews. The venue and time of the interviews were agreed by e-mail or telephone, and the interviewees were also provided with a draft interview to better prepare them for the meeting. Different interview plans were prepared for the competent authorities, approvers/authors of opinion, companies, and Technical Regulatory Authorities.

The interviews were conducted either at the location of the interviewee, at the PwC office or via digital data transmission using the telephone, Skype or Google Meet service. Each interview lasted for 2-4 hours. It took more time with the first interviewed institutions, as more new information was available. There started to be repetitions in each subsequent interview, which made it possible to conduct an interview in a shorter time. One interview was conducted with each institution, except Tallinn Urban Planning Department and Land Board, where separate interviews were conducted with different units within the institution.

In total, 42 interviews were conducted with 21 competent authorities (LG, TRA), 12 construction and design companies and 9 approving or opinion providing institutions. The list of the interviewed institutions can be found in Annex 1: List of interviewed institutions.

## *1.2 Process mapping*

The Register of Buildings (EHR) is used as a tool to support 10 public service processes. These services include:

1. Providing design specifications (DS);
2. Providing building permit (BP);
3. Receiving building notice (BN);
4. Receiving construction commencement notice (CCN);
5. Providing authorization for use (UAOP);
6. Receiving use and occupancy notice (UAON);

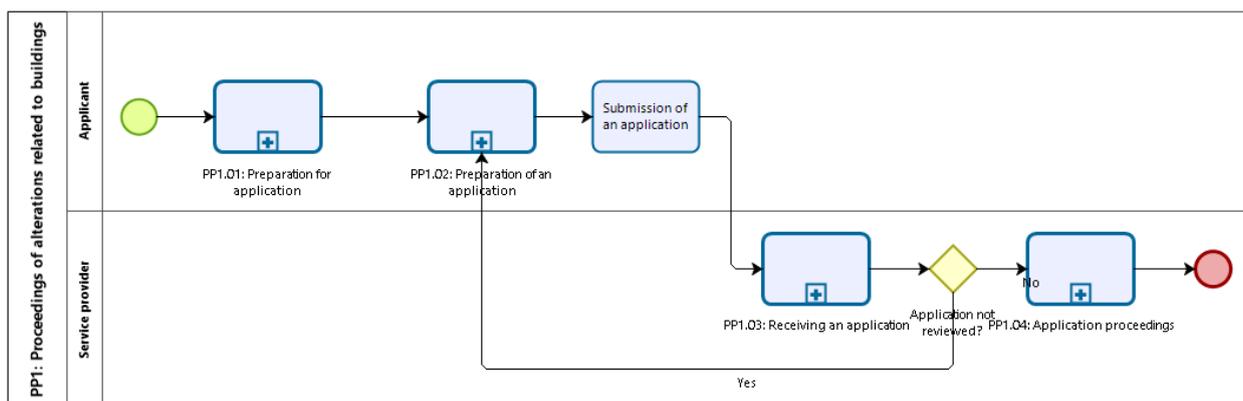
7. Receiving notice of complete demolition (CDN);
8. Executing register amendment entries (RAE);
9. Receiving data submission notice (DSN);
10. Organization of building's address (OBA).

These services relate, in particular, to ensuring the legitimacy of the design and construction of buildings and facilities, including their occupation. At the same time, it also relates to the recording and management of the construction works' data. Services are divided into two main categories by the content activities:

1. The proceedings of alterations to buildings (DS, BP, BN, CCN, UAOP, UAON, CDN), whereby the planning and/or execution of alterations of buildings (including new buildings) and their occupation is started. The purpose of these services is to ensure that buildings and construction activities comply with legislation and regulations. As a result of the procedural processes carried out in the services, the building data is stored in the Register of Buildings, which allows understanding before the construction activity what construction activity is planned to be carried out and to inspect and ensure after the construction activity that the completed building responded to the requested. As a result, the register contains data on both planned and occupied construction works.
2. Improving the quality of register data (RAE, DSN, OBA). These service processes make it possible to correct the data in the register of the buildings without planning or conducting an alteration of the construction work. (For example, the entry into the register of an existing construction work that is not in the register or the specification of data of an existing construction work). These documents do not allow the construction of buildings or construction works without legal basis.

### 1.2.1 The proceedings of alterations related to construction works

The general process of proceedings of alterations related to construction works is directly based on the Administrative Procedure Act<sup>1</sup>, and for each individual process, more precise business rules are laid down in the Building Code<sup>2</sup> and the related implementing legislation. Figure 1 describes the service process and the related activities in a high-level of generalization to illustrate the sequence of activities in services. This generalization was an effective tool for mapping the different practices of the existing process across institutions, within which all parties were able to place themselves and share their experience with the services they manage.



Powered by bizaai

Figure 1: The general process of proceedings of alterations related to construction works

In general terms, the proceeding process related to alterations to construction works can be divided into three broad stages:

<sup>1</sup> <https://www.riigiteataja.ee/akt/128122017021?leiaKehtiv>

<sup>2</sup> <https://www.riigiteataja.ee/akt/129062018010?leiaKehtiv>

1. Preparation, during which the applicant identifies more specific needs for the implementation of his/her proposed activities and produces and aggregates the necessary materials for this purpose;
2. Submission of an application, during which the applicant compiles and submits an application to the competent authority (LG, TRA);
3. The application proceedings, in which the competent authority receives the applications, processes their content and communicates the procedural decision. During the proceedings, the case handler shall, in accordance with the procedure prescribed by law, involve persons/institutions or the necessary third parties to approve the content of the application or to express its opinion or position.

As a functional tool, the EHR supports, to a greater or lesser extent, all three stages and the related activities as follows:

- At the preparatory stage of proceedings, the EHR provides the **applicant** with information in the form of the existing and planned building data. It also provides support for services that the applicant can apply for and is a tool for interactive preparation and submission of applications at the application submission stage. It is also the main source from which the applicant receives feedback on the progress of the proceedings and with the functionality provided by it the applicant can submit additional information during the proceedings if necessary.
- For **service providers**, this is the main tool for conducting proceedings related to applications being submitted at the stage of the proceedings, providing functionality for reviewing applications and planning and managing procedural actions.
- For the **approving parties to the proceedings**, the tool offers functionality to perform the approved procedural actions.
- The tool provides functional support to voice relevant opinions to the **parties to the proceedings expressing the opinion**.
- **To the parties to the proceedings as third parties (Clause 11 (1) 3) of the APA**, the tool does not provide functional support to participate in the proceedings. However, it is possible to send notices of involvement to a person being involved from the competent authority view.

The activities of the services' each stage and the practices to cover them are described in more detail by the various parties.

### 1.2.1.1 Preparation for application

In preparation for application, the interested party tries to find out what he/she has to do to fulfill the statutory obligations related to the planning of the construction, the construction or the occupation of the building in case of the particular object and aggregates the material required for the application. The future EHR service applicant (landowner, potential buyer) or its representative (broker, real estate developer, construction company, designer, another third party) may be an interested party.

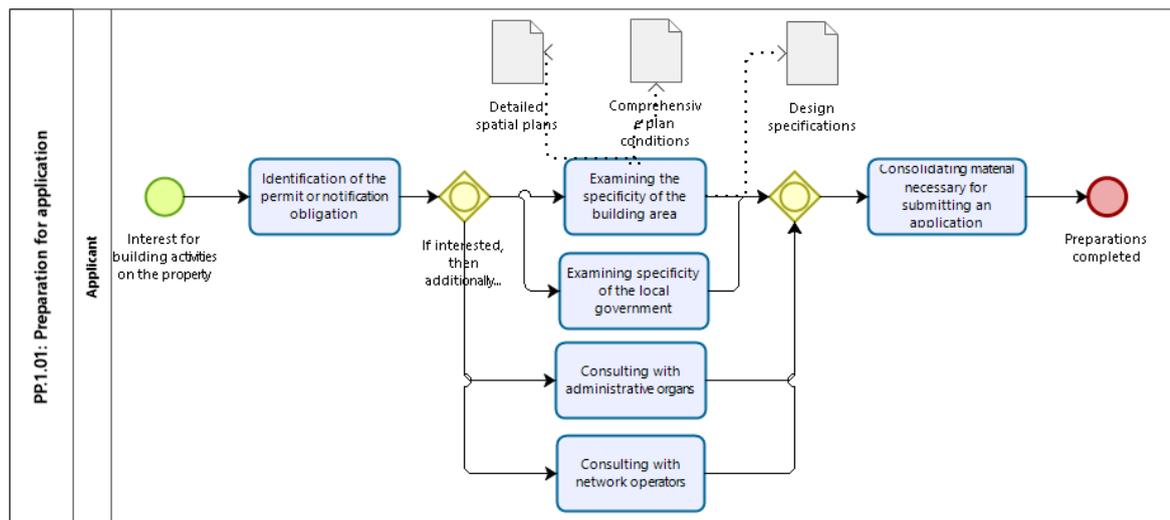


Figure 2: The process of preparing for an application

Planning a building often starts with questions from the interested party: "Can I build here?" and "What do I need to do for that end?" The easiest solution is usually to contact the competent authority (LG, TRA), which is consulted and clarification obtained on the conditions to be taken into account in the design of the building and what to apply for. Occasionally, these conditions already exist as a valid detail plan or issued design provisions, but sometimes require to apply separately.

From a local government point of view, finding and giving answers to such questions can be considered as a stand-alone service, which may be called a "pre-counseling service" or "pre-consultation service". However, in order to provide such a service, the amount of working time for construction officials can be very high, consisting of the weekly regular consultation periods arranged to provide immediate counsel as a so-called over-the-counter service and outside the time to answer similar questions in other channels (telephone, e-mail). During the interviews, it was asked to estimate the amount of working time of pre-counseling, and as a result, it turned out that in larger local governments it stays between 15 and 30% of the officials' working time, but for smaller local governments with less workforce and a smaller number of officials dealing with the questions, it can reach up to 50% of the officials' working time.

However, not all interested parties turn to a local government for answers to these questions. Often attempts are first made to find answers from the public information space, starting with familiarizing themselves with legislation and identifying the necessary conditions up to the constraints and restrictions of the construction site. Keeping up to date on the topic is certainly a welcome phenomenon, but for the most part it may involve the risk of misinterpretation of something, and, therefore, the quality of the application being prepared suffers and thus the length of the application procedure may be delayed as it needs to be supplemented during the procedure and sent to recurring administrative procedures.

Independent identification and interpretation of constraints or restrictions may lead to a situation where interested parties, before submitting their applications, turn to the administrative bodies approving possible future proceedings in order to obtain their pre-submission position. Provision of positions is processed and issued by the administrative body upon the request of the interested party. The positions are communicated to the relevant local authority by the issuing official, but not always - some officials do it, but some not. Alternatively, the pre-application position reaches the local government as an appendix to the application by the applicant itself but also not always. While obtaining a position provides the interested party with the assurance that if the conditions set out in the position are met in designing, the proposed construction activity is allowed, but in obtaining the position they still have no assurance that the project submitted later to apply for BP complies with this position. Thus, in the proceedings, the same administrative body is also sent a approving procedural act, the necessity of which arises from the law. Depending on the awareness and attentiveness of the parties, it may happen that the existence of an earlier position may be neglected so that the conditions already agreed in the previous position are re-established in the approval process. The time spent on the activity is mainly related to the provision of a position.

It became apparent from the interviews with the designers and other construction-related companies that, as the provisions of services today leave some power of assessment to local authorities, which is one of the foundations of the APA, it may happen that different local governments submit different conditions to applications. It has happened that differences can also occur internally within a local government by different officials. As the submission of applications is part of the business activities of those interested parties, they are interested in the smooth submission and processing of their applications without any costly additional burden. In order to minimize risks, some interested parties – but not all – make efforts in the form of pre-counseling to familiarize themselves with the particular wishes or specificities of local authorities or officials.

In case any network operator can be identified in the framework of pre-counseling or some independent request for information, where the planned construction activity may remain in the network protection zone, the aware interested party shall contact the relevant network operator during the pre-counseling and apply for the technical conditions for the design of the building. These conditions are followed in the design and are usually submitted together with the application to the local authority. In the case of most network operators, this is a free of charge service. In the case of two known network operators, the issuance of technical conditions is also provided as a paid service. Potential parties must always be involved in the proceedings, otherwise, the interested party may have the opportunity, for example, to challenge a building permit in court and to cancel the building permit due to failure to comply with this formality.

By receiving information on the fulfillment of the necessary conditions, the future applicant collects and, if necessary, produces information required for the application in a pre-defined format, after which they are ready to prepare and submit the application.

Supporting these activities by the EHR is limited to the provision of existing design provisions, building permits, authorization for use and data on the building.

### 1.2.1.2 Preparation and submission of the application/notice

The purpose of preparing and submitting an application/notice is to publish a formal request for the competent authority to receive the service. Nowadays, applications for services or notices can be submitted to the local governments through different channels. Application forms are available in the public information space in the digital document format on the MEAC website<sup>3</sup>, sometimes also as a duplicate on the website of some competent authority. In addition, according to common practice, application forms on paper are available in over-the-counter service of every competent authority. According to the law, the EHR offers as a self-serving e-service the ability to create and submit applications/notices.

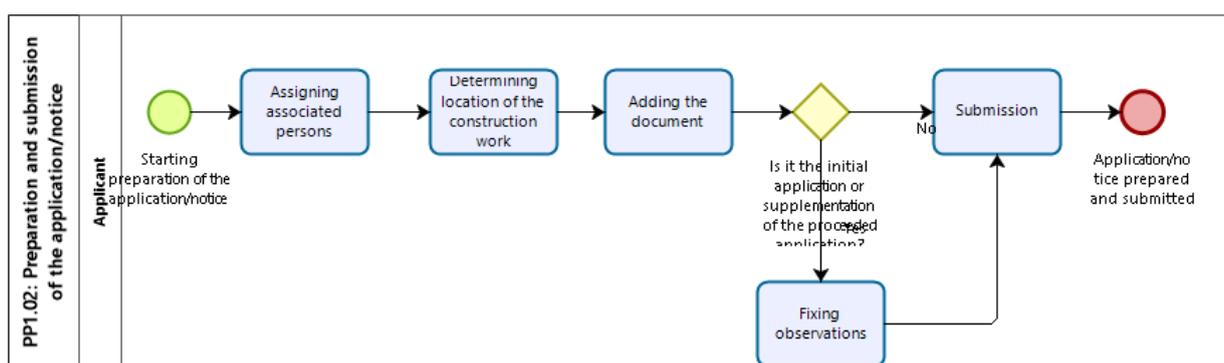


Figure 3: Process of preparation and submission of the application/notice

<sup>3</sup> <https://www.mkm.ee/et/ehitisregister>

Applications are prepared and submitted by the interested party interested in receiving the service. According to common practice, applications for design provisions, building permits, and building notices are prepared and submitted by design companies for which this is a part of the service provided to the contracting authority or the owners of the property, in rare cases third interested parties. Construction commencement notices, use and occupancy notice, applications for authorization for use and complete demolition notices are submitted in practice by the construction-related companies, which also do so as part of their services or by the contracting authorities or owners themselves.

Those interested parties to which submitting applications/notices is part of their service are generally better informed about service-related regulations and tools (including the EHR) and relying on their experience are able to minimize certain risks in the preparation and compilation of the application that would otherwise hinder the efficiency of the process. According to the assessment of the competent authorities, the applications made by such interested parties are generally of better quality and thus – but not always – the timely process of the proceedings could be positively affected.

In contrast, there are submitters of applications/notices who are mostly owners of immovables who may want to erect or rebuild a building and who do not have any previous experience of applying for services and are expected to never repeat this process in their lives. Such interested parties can often make more effort in preparing and submitting applications and certainly consume more of the services related to pre-counseling. If such an interested party decides independently to submit an application in the self-service of the EHR, then it is likely that he/she is eventually not able to do so, because of lack of knowledge on the topic, starting with knowing the terminology to understanding the regulations or the computer skills are inadequate.

According to the competent authorities, the EHR is too complex for such interested parties to use intuitively and does not provide sufficient support for self-management. Some of these interested parties turn to the competent authority to deal with the EHR, some try, via telephone and e-mail, to understand and advise to the best of their ability in order to understand the problem of using the EHR. However, since there is no way to assist interactively, the problem may be incomprehensible also to the local authority. In practice, the recommendation for the occasion is often either:

- to submit a form-based application (in digital or paper form);
- to come to the local authority for help, where the problem is tackled together with an official;
- to call the EHR product support line (to the MEAC) for assistance.

Interviews with the competent authorities (LG, TRA) revealed that the proportions of professional applicants and inexperienced applicants may vary by the competent authorities. As a pattern, it could be established that in urban environments and in larger local governments, the proportion of professional applicants, as a rule, is 80-90% of the annual volume of applications submitted. However, when moving to smaller local governments between big cities, this proportion can only be 50%. At the same time, however, the annual volumes in local governments are so different that, in terms of pieces, 10% of the volume of a larger local government may be the same, which is 50% of a smaller local government.

The preparation of applications/notices in the EHR is divided into three more general data sections:

1. data of associated persons, to which the persons related to the application can be added;
2. buildings and the related data, including the related documentation (e.g. energy labels);
3. documents to be submitted, where you can upload the required project or implementation documentation.

In order to facilitate the submission of data in the EHR, the display forms are provided with the helping information from the business rules and additional explanations are provided for each data field in the data fields. In addition, the EHR user guide is available, including a separate user guide for using the map application when determining data related to the location of the building.

When entering data, the required fields must be filled in with the appropriate data and upload the project documentation in a predefined format. The uploaded documentation is prepared and signed outside the EHR, following the rules provided by the EHR for naming, structuring and signing documents. Entering approves as well as drawing on the map can be used to determine the location of the buildings. If all the necessary information has been entered in the given composition and format, the applicant can submit the application to the competent authority.

If the application has been submitted and returned from the proceedings to the applicant to be supplemented by the competent authority, the applicant must also fix the submitted observations, supplement the application accordingly and resubmit the updated application.

As a result of the process, the application or notice prepared by the applicant is delivered to the competent authority for service reception.

### 1.2.1.3 Receiving application/notice

The purpose of receiving an application/notice is to ensure that all the received applications for relevant services reach the procedure, ensuring a complete view of the same type of service cases by the competent authorities. The generalized process scheme for the reception is given below (Figure 4):

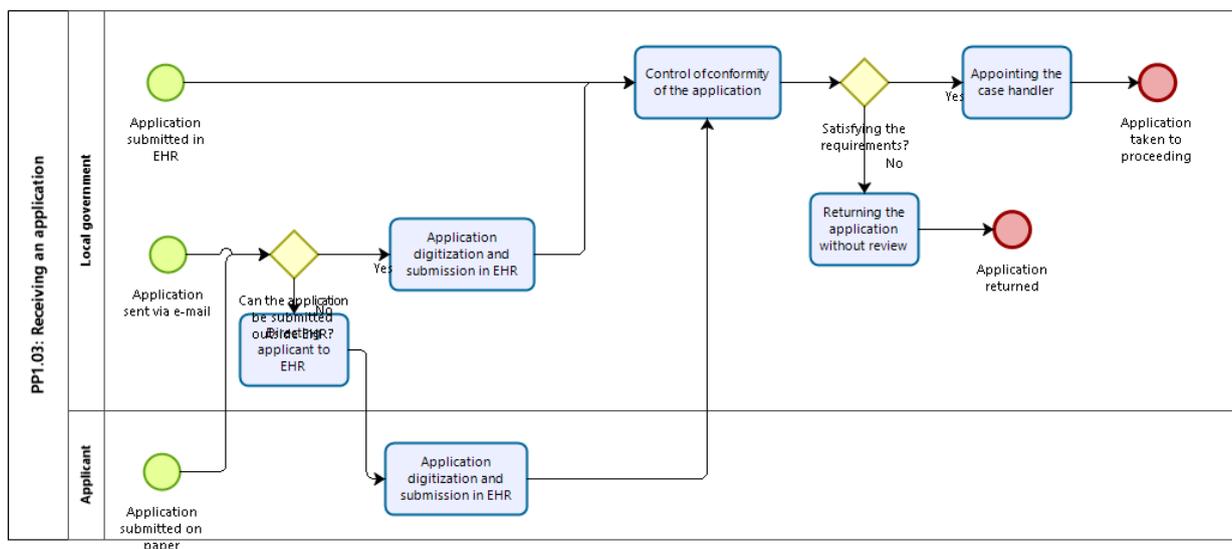


Figure 4: The process of receiving an application

The reception of application by the competent authorities has been organized differently by the channels. Some competent authorities accept applications/notices on paper or sent in digital form to e-mail, while others generally refuse to accept on paper or as a digital document and direct the applicant to the EHR to prepare and submit the application. If necessary, assistance is offered to prepare the application by submitting the application with the applicant. Some of the interviewed local governments are happy to accept applications on the form and enter them themselves without the applicant's presence for the applicant (remaining in the role of the applicant in the EHR). In this case, communication with the applicant within the procedure takes place in a way chosen by the applicant, which is further specified with the applicant.

Regardless of through which channels the application reaches the competent authority, the application for each service is entered in the Register of Buildings as a result of one or the other actor, which ensures a complete view of the applications received and the proceedings to be initiated for them.

For each application received by the EHR, the system automatically issues a notice to the general e-mail address of the relevant competent authority. Many of the interviewed local governments refer to this message as an incoming document, which they also additionally register in their document management.

Upon acceptance of the application, the competent authority carries out a conformity clearance of the application in order to determine whether the application is of sufficient composition and format in order to initiate the procedure. The controls most mentioned in the interviews in this stage are:

- Whether in this part what is applied for, the right application for the service is submitted?
- Whether in this part what is applied for, the right type of construction activity is chosen?
- Has the application been received by the right competent authority (the procedure for dealing with the

differences takes place in the TRA)?

- Are the necessary prerequisites for applying for the service fulfilled (e.g. are there design specifications or a detailed spatial planning, or a previous authorization or notification)?
- Is the project documentation attached to the application?
- Has the state fee been paid to provide the service?

The scope of claims may vary between competent authorities, so there are, for example, practices where proceedings are initiated in some local governments also for an unpaid state fee and its payment is guaranteed at a later stage of the proceedings. However, if the application does not pass the conformity clearance, the EHR's function "Returning the application without reviewing" is used, which sends the applicant a notice of the return of the application and erases the application from the list of documents entered by the relevant competent authority without initiating the proceedings.

Pursuant to Section 41 of the Building Code, an application may be returned together with explanations without reviewing if the provision of the authorization is manifestly impossible. In accordance with Section 15 of the APA, a deficient application must be accepted by the administrative authority and a deadline for rectifying the deficiencies shall be given. Here, however, it remains for the administrative authority to interpret, in which case the provision of authorization is manifestly impossible and in which case it is only inadequate. In practice, for example, the absence of a construction project or the absence of a document certifying the payment of a state fee is often interpreted by the application as something without which it is not possible to initiate proceedings or issue a permit. In addition, the initiation of proceedings would result in additional activities in the EHR and would leave a potential "dead procedure" in the list of EHR's proceedings that clutters the desktop.

Returning the application without its review deprives the competent authority of the opportunity to posteriorly identify the reason why did it reject the application. At least three rudimentary procedural behaviors have been identified that are generated to preserve this information:

- an official keeps a system-external database for personal use (e.g. entering data in one of the MS Excel spreadsheets or printing them out, by systematizing and storing data);
- all incoming applications/notices are additionally registered in an internal document management system of the agency, which also records the grounds for rejection, which ensures the retention and reuse of data there;
- no application is rejected, but all are brought to proceedings, regardless of inappropriateness and the observations are returned as a procedural act.

In the latter case, it often occurs that the applicant submits a new application and the old one remains in the EHR list of proceedings of the competent authority for the time being as an ongoing but overdue procedure.

If the application complies with the conformity clearances, a case handler is assigned to the application and the application is processed. In the EHR, these two activities are functionally combined into one activity: at that moment, when the application/notice is assigned a case handler, the time calculation of the procedure starts automatically and the system sends out the corresponding messages.

### 1.2.1.4 Application proceedings

The purpose of application proceedings (DS, BP, UAOP) is the provision of the public service applied for by the applicant (Figure 5).

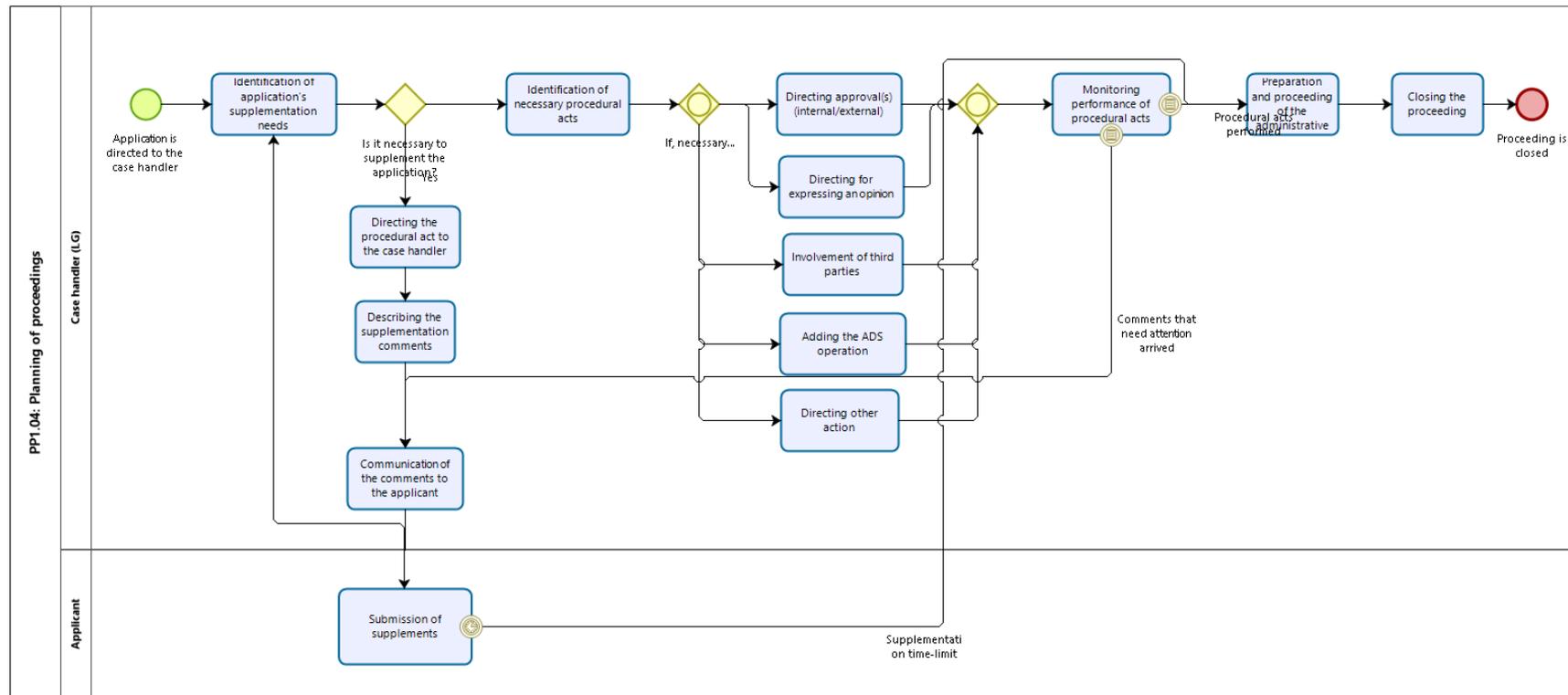


Figure 5: Process of application proceedings

The EHR is used primarily by the competent authorities as a tool for processing applications, but in special cases or when performing specific operations, the proceedings are also carried out outside the EHR system. For example, a large number prefers:

- to plan and conduct open proceedings from the competent authorities outside the EHR;
- to conduct procedural acts outside the EHR from the case handlers (including approvers and authors of opinion).

At the same time, the interviews revealed also the competent authorities, which carry out all procedural acts through the functionality of the EHR and outside the system no procedural acts are not performed.

#### 1.2.1.4.1 Initiation of proceedings

In the common practice, the proceedings start from the moment of appointment of the case handler. The case handler is usually an official of the competent authority responsible for receiving and/or processing applications. In larger local governments, there are practices where applications are processed, i.e. procedures are managed by one set of officials, but are reviewed in essence and commented by others. In medium-sized local governments, this responsibility is concentrated on a single official, but in terms of workload sharing, responsibility is divided among the officials by services. In smaller local governments, all responsibility for all services is often concentrated on one official and sometimes without a possibility for delegation.

#### 1.2.1.4.2 Initial application control

First, the application is examined and the need for supplementation is identified without which further proceedings may be impeded. In larger local governments, the application is first sent to internal approval round, which includes several officials (e.g. there are 6 approvers in the Tallinn Urban Planning Department alone, but ca 60 approvers involved with the relevant services in all Tallinn offices). Each official, within the limits of their competences and responsibilities, reviews the application documents and returns them with their observations to the case handler. The case handler aggregates all the observations from all the internal approvers, if necessary, edits the wording and form of the observations and submits the observations to the applicant for fixing.

Tallinn should be considered here as the statistical exception of the competent authority, as Tallinn is the only one with the majority of the competence holders in its organization and the whole process is mostly conducted through internal approval (except for the RB). In other local governments, the case handler has to review the documents themselves and identify possible shortcomings from different aspects, using both in-house colleagues and state agencies providing approval services (e.g. RB, EB NHB, HB, RA, Land Board etc.). Similarly to Tallinn, the case handler also collects and delivers observations received from external approvers to the applicant.

The pervasive practice in local governments is that when accepting an application, the case handler first checks whether the application has deficiencies and, if so, allows the applicant to remedy the deficiencies. Only then the application is sent to the approval round. This saves time for both applicants and competent authorities. During the interviews, no situation was identified where applications unchecked for deficiencies were sent to the approval round. However, an example was given by one approving authority where the application was sent for approval without the project documentation being attached to the application. Such an example can be considered an exception, as it remained isolated. The reasons given for this individual case were not identified.

In agencies performing external approval, there is a trend to subject the application to the primary independent check to see whether the necessary material for external approval is attached. If it is not present, the application is not sent to the external approval at all, but the application with the observations is returned to the applicant immediately for supplementing.

In case the case handler wishes to submit the initial observations to the applicant independently and leave out the additional approval round, he/she must currently complete the following chain of activities in the EHR:

1. Open proceedings;
2. Add an internal approval action for yourself;
3. Navigate to the approval actions view;
4. Search and open from a list an action directed to the agency;

5. Describe the notes and mark the action as performed;
6. Navigate to the view of the list of proceedings;
7. Search and open proceedings;
8. Send your own comments from the approval round to the applicant to resolve.

When sending observations, the system automatically issues a relevant notice to the applicant.

#### 1.2.1.4.3 Planning of proceedings

During the examination of the application, the case handler identifies the supplementing need of the application but also plans the procedural acts that need to be carried out during the proceedings. When planning, the case handler tries to identify the answers to the questions:

- **To whom the application must be sent for the internal approval?** Internal organizational structures vary across institutions, so the choice must be based on the internal division of responsibilities within a particular institution.
- **To whom the application must be sent for the external approval?** The choice of external approvers is based on the requirement of the law (e.g. construction activity or the registered immovable property is in the area of heritage conservation restrictions, environmental protection area or bore wells protection zone, in the state road protection zone, in the area of high-risk enterprises, or the construction work is subject to fire safety requirements, or heritage conservation object, etc.).
- **To whom it should be sent to obtain an opinion?** In the cases provided for by law, network operators, Technical Regulatory Authority, some state agencies, or third parties not yet mentioned must be consulted during the proceedings. To this end, the case handler identifies the potentially interested party in the area and sends them an act to express their opinion.
- **Who should be involved in the proceedings?** Owners of immovables and often owners of neighboring immovables, whose opinion is taken into account in the procedural decision making, are always involved in the proceedings.

Whereas for the first three procedural acts, the case handler in the EHR is able to give it to a particular agency and that agency can come to the system to deal with this act, then the act of involvement does not allow it. The message of involvement can be sent to a specific e-mail address, but the recipient of the message cannot leave his/her feedback in the system, but can only be forwarded via e-mail, regular mail, or over-the-counter service.

Subsequently, an example of involvement is the chain of involvement activities of adjacent neighbors. Involvement of adjacent neighbors is a common practice in open proceedings which, using the EHR, usually looks like the following:

1. Open XGis application of the Land Board;
2. Find the cadastral unit you are looking for;
3. Find the numbers of the adjacent cadastral units from the applications and compile a list of cadastral units of the adjacent neighbors;
4. Open Land Register;
5. Make an inquiry for each individual cadastral unit in the list;
6. On the basis of the results of the inquiries, compile a list of the owners of the immovables of adjacent neighbors;
7. Open Population Register (not all officials have access to RR inquiries);
8. Make an inquiry for each natural person owner in the list;
9. On the basis of the results of the inquiries, compile a list of contacts of the owners of immovables of adjacent neighbors;
10. If the person's email address information is not available in RR, use the address form <personal code>@eesti.ee
11. If there are legal entities among the involved, open the Business Register;
12. Make an inquiry for each legal entity owner in the list;
13. Update the list of contact details of owners of immovables of adjacent neighbors with inquiry results;
14. Open EHR;
15. Navigate to the right proceedings;
16. Add a separate involvement procedural act for each participant using the contact list;
17. In order to make sure that the letter reached the persons of being involved, open your email inbox;
18. Send an additional letter to each person involved.
19. If you receive a message about an unsuccessful sending to one of the recipients, then search from RR

the postal address of the addressee's place of residence.

20. Prepare and send the letter on paper by regular mail.

In addition, the EHR, as a procedural act, enables the verification of address data and spatial representation data using the Land Board database interface and the ADS procedural act. The ADS action is necessary to ensure the quality of the data entered in the registers. The system is configured so that data that has not passed the control cannot be entered in the register as a result of the proceedings. Some competent authorities carry out the ADS controls at the beginning of the proceedings to avoid the control failure at the end of the proceedings and, consequently, the return of the application to the applicant to be supplemented by the latter.

In addition, there is a possibility to perform one act in the EHR called "Other act". Among the 22 competent authorities interviewed during the interviews, there were no case handlers who would ever have used that procedural act or knew for which it could be used.

#### 1.2.1.4.4 Monitoring performance of procedural acts

If the procedural acts are planned and distributed to the parties, the case handler has to wait until all the procedural acts have been completed so that any observations received may be forwarded to the applicant. For each performed procedural act, the case handler can receive a notification to the email address. In order to see if all the planned procedural acts are performed, the case handler must monitor it in the system by the relevant proceedings.

The applicant does not see the planned procedural acts by the case handler or their progress. Nor does the applicant see any procedural acts in the proceedings for which the approval has been granted. However, it is possible for the applicant to see the performance of the procedural acts for which the applicant has received observations. The applicant has the opportunity to familiarize themselves with the observations and prepare for their fixing, but they can only be fixed and answered once all the procedural steps have been taken and the case handler has submitted the observations to the applicant for fixing. In order to obtain more detailed information on the progress of the proceedings, the applicant must contact the case handler and request clarification.

#### 1.2.1.4.5 Supplementing applications

As part of the application supplementation process, the applicant is able to respond to observations received during the review process by correcting the data in the application, supplementing the attached documentation, and responding to observations that need to be answered.

According to local authorities, the number of such applications, which allow the service to be provided in such a way that all the necessary approval is given during the first time and it is not necessary to return the application to the applicant, almost non-existent. Most interviewed case handlers have no such example in their practice. The average number of applications is estimated by the competent authorities to be around 3 submissions of supplements and recurring approval rounds. Considering that the length of the proceedings for each round is about 30 days longer, it means that the average proceedings take about 3–4 months.

According to the interviewed professional applicants (design companies, construction companies, real estate developers), the average proceedings also need at least 3 additional rounds and the average proceedings take 3–7 months. This is the time that various companies take into account when planning to submit applications. One of the interviewed construction companies producing standard factory houses had once managed to submit an application without additional approval rounds. This was supported by the previous experience of proceedings of the same house's building permit.

When supplementing the application, the applicant must independently update the part of the building design documentation to be upgraded or replaced and put it back in one digital container together with the rest of the documentation of the construction project, sign the container and upload it.

If the applicant resubmits the application after the observations have been fixed, the application will undergo the same proceedings and the approvers who have made the observations receive automatically recurring approval tasks.

#### 1.2.1.4.6 Termination of proceedings

With the EHR tool, it is possible to carry out proceedings from start to finish without using the external systems, but only a few competent authorities use this option. In practice, for example, in the case of permits, the proceedings are mostly carried out in the form of a draft proceedings, which some process within the EHR and others outside the EHR in their document management system.

The purpose of the draft order is that, since the official conducting proceedings is not authorized to sign the permit as an administrative act, the authorization is decided by the order of the administrative authority carrying out the proceedings, on the basis of which the processed permit and construction work data are entered in the register. Such orders are prepared by officials for municipal sessions where they are signed. Such sessions take place periodically, for example once a week or once every two weeks. Often, giving of a permit must wait until the next session.

However, some competent authorities have resolved it differently and have delegated the power to sign the administrative acts to the case handlers. These competent authorities do not draw up draft orders or wait for the municipal authorities to grant a permit. The procedural management in this behavioral pattern is significantly greater than the alternative, as such behavior involves time-saving in the proceedings. Such local governments include, for example, Türi parish, Saare parish, and Tallinn.

Considering that the draft order is prepared by the case handlers who bring it to be signed at a session where no substantive review takes place and the signature is given as a matter of trust of the employee who prepared the order (unless the draft has previously passed the internal approval). As for the above, there were no substantive reasons during the interviews why not to trust the employee with the right to sign the order. Nor did any of the interviewed case handlers remember a precedent where the draft order would not have been signed at the session.

Once the procedural act have been completed and the grounds for terminating the proceedings are available, the case handler can enter the data in the EHR – at the same time also by issuing an administrative act – and consider the proceedings to be terminated.

## 1.2.1.5 Notice proceedings

### 1.2.1.5.1 Proceedings of building notice and use and occupancy notice

The purpose of proceedings of the notice (BN, KT) is to ensure the public service of the notice submitted by the applicant.

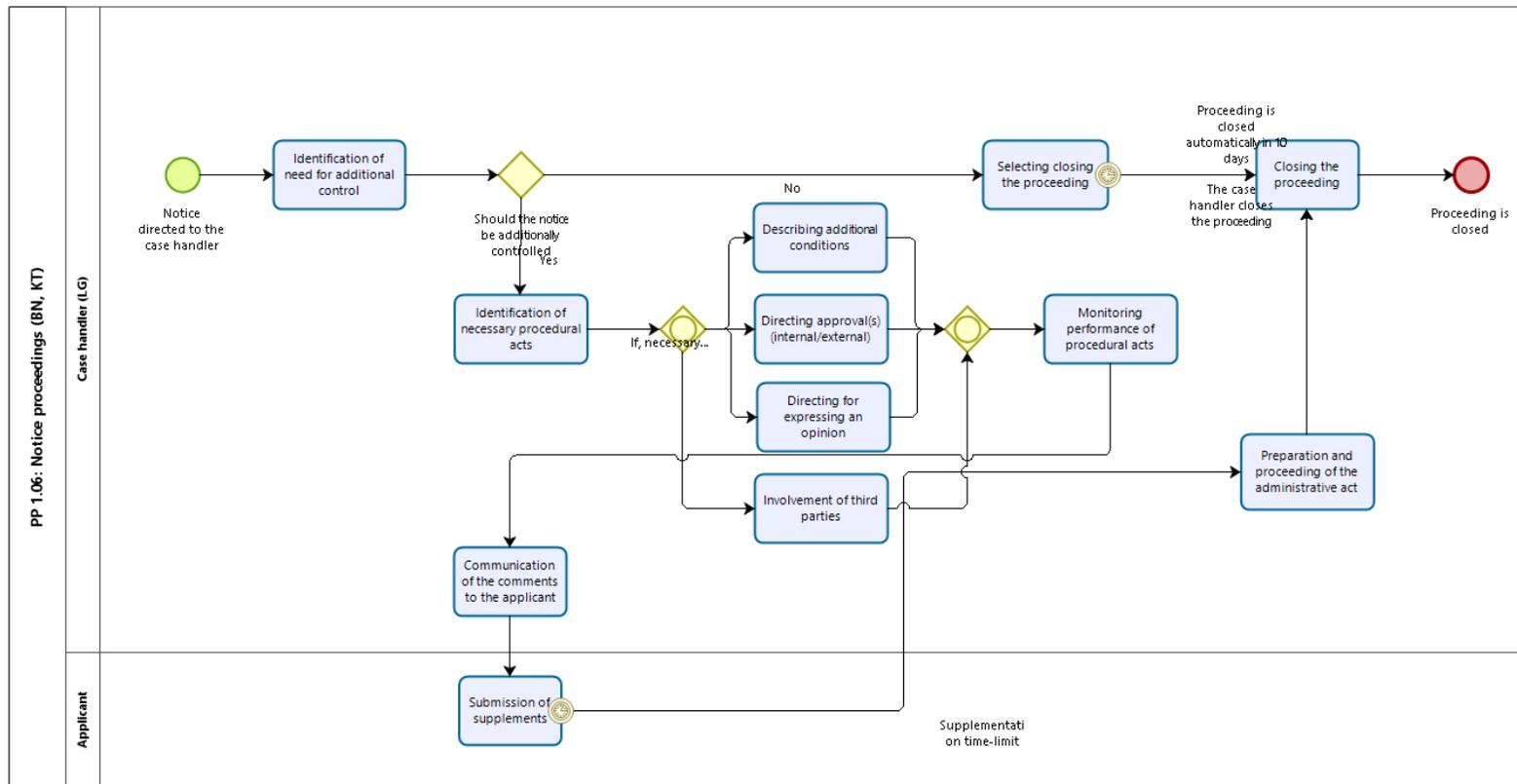


Figure 6. Process of notice proceedings (BN, KT)

The applicant must submit the building notice at least ten days before the construction of the construction work begins. The process of notice proceedings begins with the appointment of the case handler. If a building notice or use and occupancy notice is addressed to the case handler, she/he must first ascertain whether the notice needs further verification. If not, the case handler shall choose whether to regard the notice as being notified “by hand” and to immediately enter the notice in the register or the case handler shall not perform any act and the notice shall be deemed as being notified automatically within 10 days. In both cases, the proceedings are terminated and the notifier can start the construction.

If the case handler is persuaded that the notice needs further verification, the notice processing is extended by 30 days and the notice is processed on the same basis as for the building permit or authorization for use application. The case handler can submit to the notifier additional conditions (e.g. to submit additional architectural, constructional and design requirements or demand the building/construction to be in compliance with requirements), as well as to send the building/construction to the approval of some relevant authority or to involve the owner of the immovable and the adjacent neighbors. The requirements as a result of additional verification of the notice are issued by the competent authority as an administrative act, after which the proceedings are terminated and the notifier may start construction in accordance with the conditions set out in the administrative act.

#### 1.2.1.5.2 Proceedings of construction commencement notice and a total demolition notice

The purpose of proceedings of the notice (EAT, TLT) is to ensure the public service of the notice submitted by the applicant.

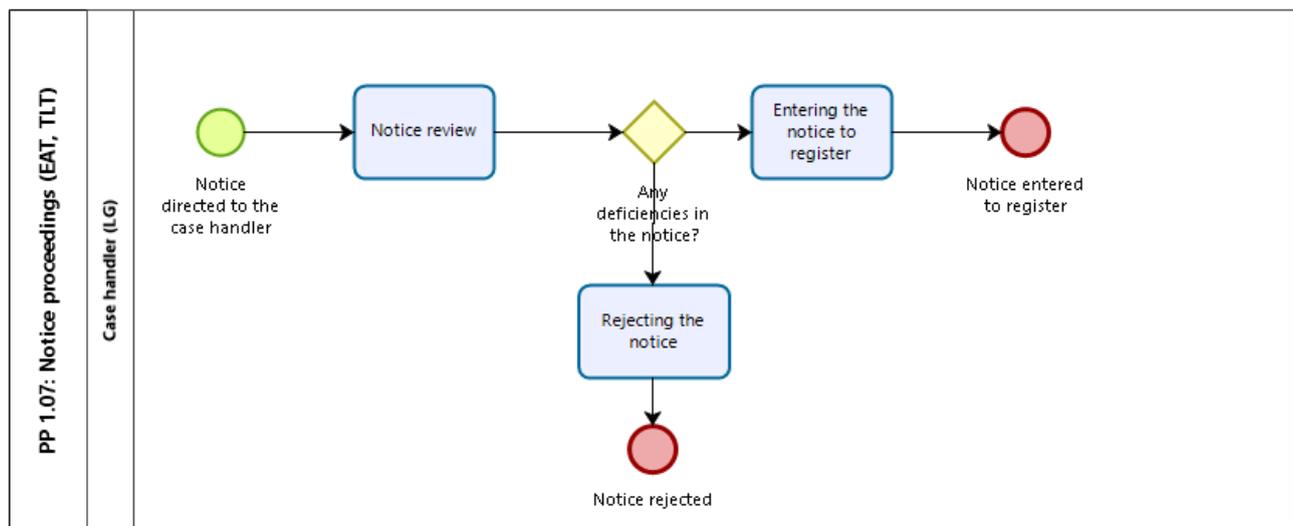
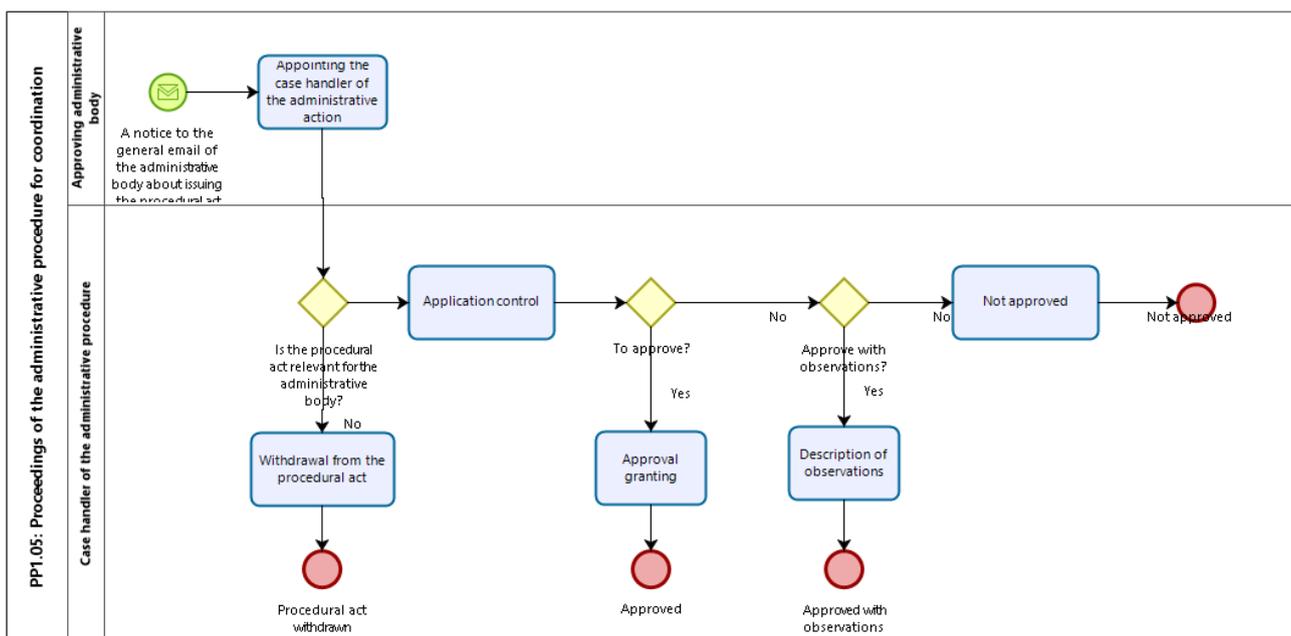


Figure 7. Process of notice proceedings (EAT, TLT)

When a construction commencement notice or total demolition notice is received by the case handler, the notice is directed to the case handler for review (Figure 7). Following the review, the case handler has the opportunity to either enter the notice into the register or reject it. Compared to the process of proceedings of an application, the difference lies in the fact that in the case of these documents, the case handler does not have the possibility to accept them for proceedings or to send them to the approval round. If there are no deficiencies in the notice submitted, the case handler may enter the data in the EHR and consider the proceedings to be terminated.

### 1.2.1.6 Proceedings of the administrative procedure for approval

The purpose of the proceedings of the administrative procedure for approval is to support the competent authority with the sectoral expert knowledge in the conduct of the administrative procedure related to the construction.



Powered by

Figure 8: Procedural process of the administrative procedure for approval

approvers can be either internal parties of the competent authority (LG, TRA ) or other public authorities (RB, EB, RA, HB, NHB, Land Board, etc.) and their authorized officials.

The proceedings of the administrative procedure for approval begins when the case handler assigns an administrative procedure being approved in the proceedings to some administrative authority. The internal and external processes of the proceedings of the administrative procedure for approval take place in the same way (generalizing), so we can talk about the practices of both types of approval at the same time.

The process begins when the approving administrative body receives notice of the need for the administrative procedure's proceedings. Depending on the approver, the reception and further handling of notices are different. Some administrative bodies register a notice as a referral in their document management, some not. In some administrative bodies, a process has been agreed where notices reaching the general e-mail are received by the rapporteur and the rapporteur directs the procedural action in the EHR to the right case handler. However, in some administrative bodies, the adoption and proceedings of administrative procedures are assigned to several officials who monitor the incoming operations and start proceedings in the order in which they arrive.

Frequently it is first checked whether the approval has been forwarded to the right external approver. To this end, the justification retained by the competent authority shall be examined, where the authority shall explain why it has decided to send the approving administrative procedure to that party. Often, however, this justification is missing or incomplete and the approver has to start by examining the application to see if the approval was relevant or not.

In the event that it is not possible to identify the reason why the approval was sent or if it is found that approval is not really necessary, the approval is waived.

In the examination of the application, sectoral controls are carried out to verify that the application meets the conditions of the specific sector. If necessary, the observations are provided to supplement the application and, as a result of the approval, the application is either:

1. approved;
2. approved with conditions;
3. not provided with approval;

The EHR allows approvers to see the administrative procedure for the received approvals, view the application and related documentation, describe the observations to the case handler, the applicant, and the administrative act, and allows to perform the administrative procedures.

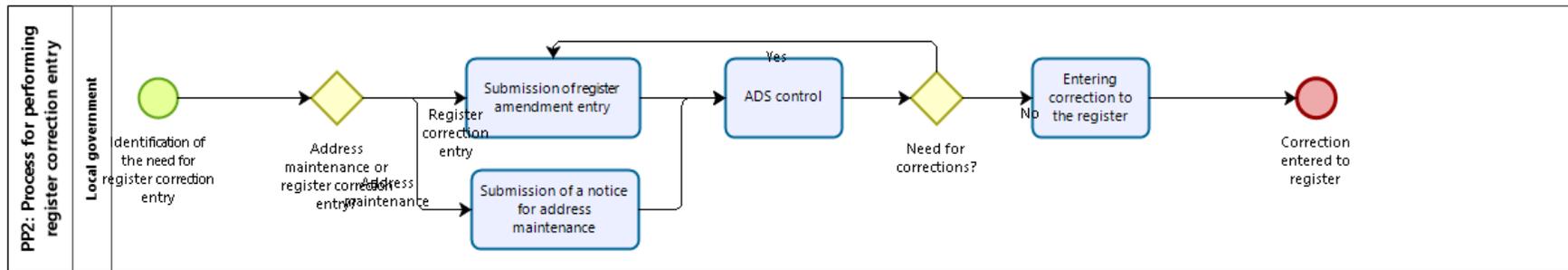
In most bodies providing external approval - the same behavioral model applies also for the opinion-giving bodies - the proceedings of the administrative procedure is not carried out in the EHR but the incoming notice of the administrative procedure is registered in the internal document management and the approval is processed there. This behavioral pattern has mostly 3 main reasons:

1. Management of data integrity issues. Based on document management data (or an alternative analog system), the agency produces management reports on tasks and this makes the compilation of management reports more complex if data is distributed in across systems (e.g. half of the tasks are solved in one system and a half in the other).
2. Operating data integrity issues. It is more difficult to support work processes of an agency with content data if data is fragmented across multiple systems and different tools need to be used to find data. Especially if the tools offered do not offer sufficient flexibility or user comfort.
3. Sometimes in order to provide a consent, it is necessary to send it (or to express an opinion) to broader in-house approval round, but this functionality is not provided by the EHR.

Therefore, the predominant behavioral pattern is that the proceedings of the approving administrative procedure is carried out in a familiar and secure system without fragmentation of data. The outcome of the procedure is formalized as a document containing the necessary observations and is loaded into the EHR administrative procedure after being processed in the internal systems and the administrative procedure is completed in the EHR.

### 1.2.1.7 Executing register amendment entries

The purpose of register amendment entries (RPK, EAK) is to ensure the quality of registry data (in particular, correctness, timeliness, accuracy, and integrity).



Powered by  
bizaai

Figure 9. Process of executing register amendment entries (RPK, EAK).

The register amendment entry activities are performed by the local government, which ensures that the data related to the buildings within its area of government are of high quality in the register.

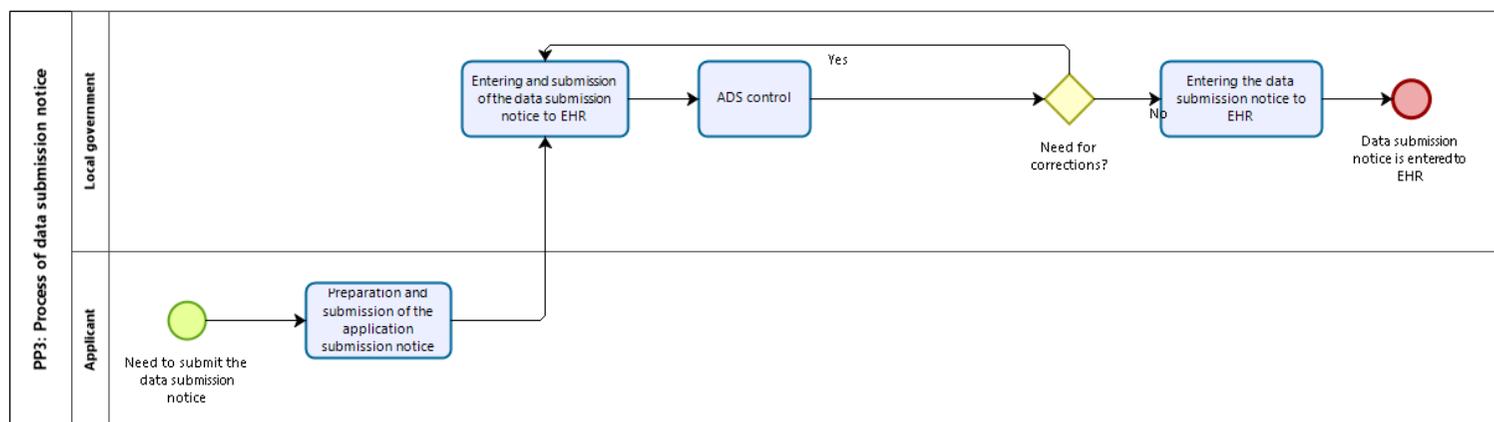
The register amendment entry process is initiated by the local government. The local government can independently change the data related to the building in the Register of Buildings, including performing the organization of address (EAK). For this, they have been ensured rights and the necessary functionality.

The case handler enters the register amendment entry into the EHR and conducts a brief proceedings for entering the amendments in the register. The case handler must justify making amendments. As a rule, third parties (approvers, authors of opinion, or other interested parties) are not involved in the proceedings, except for the ADS action that controls the need to organize address or spatial representation.

As a result of the process, register amendment entries have been performed and the quality of the data in the EHR has improved.

### 1.2.1.8 Receiving data submission notice

The purpose of the data submission notice is to ensure the quality of the register data (especially accuracy, timeliness, correctness, and integrity) (Figure 10).



Powered by  
bizaqi

Figure 10. Process of data submission notice

The process of data submission notice is initiated by the applicant who wishes to prepare and submit the data submission. Data submission notices are received from the applicants on a completed and signed form on a paper or by e-mail. Previously, there has been a self-service option for data submission notice in the EHR but is currently closed for technical reasons. During the interviews, it turned out that if the technical problems were to be solved, it would certainly be very welcome by both the local governments and the applicants.

The case handler enters the applications to the EHR and carries out a brief procedure to enter the amendments into the register. The case handler must justify making amendments. As a rule, third parties (approvers, authors of opinion, or other interested parties) are not involved in the proceedings, except for the ADS action that controls the need to organize address or spatial representation.

As a result of the data submission notice proceedings, data is submitted on the buildings that were not previously registered (including buildings constructed without the legal basis) or data that have changed over time will be corrected. For example, the principles for measuring or calculating the parameters of a building have changed over time, so the data entered under the old regulations should be adjusted to the current regulations to ensure their quality in substance. As a result of the process, the quality of the corrections is ensured and corrections of the data entered into the register.

## 1.3 Data flow mapping

The following table (Table 1) lists the data collections or data sources identified in the interviews, the data from which is involved in the processes of applying and proceedings of the EHR-supported services.

Table 1. Databases used in services

Acronym	Explanation
X-GIS	The Land Board map application and its different layers (e.g. a map of restrictions, detailed plans, etc.)
ADS	Address data system (address data)
RPIS	Spatial planning procedures information system (detailed plans)
EVALD	Mapping data service (local government mapping data)
PR	Population Register (data on persons and places of residence)
LR	Land Register (database of immovables and their owners)
REA	Register of Economic Activities (business areas, competencies)
Professional chamber	Certificates of competence of a natural person
LG's mapping data systems	ArcGIS (Harku), tailoring solutions (Rae, Tallinn), etc.
Business Register	Institutions, board members, representation rights
Document management systems	Amphora, Delta, Postipoiss, GoPro, Webdesktop (documents, proceedings data)
State Gazette	Legislation and regulations
LG's information portals	Local government websites (contact information, service instructions, local regulations, master plan data, detailed spatial plans, design specifications)
Information portals of administrative bodies	Agencies' websites (contact information, service standards, instructions)
Administrative bodies' procedural systems	For example, the National Heritage Board's system for processing a permit for the commencement of works, the Environmental Board's permits information system (UAOPIS, KOTKAS), etc.
Information portals of network operators	Network operators' websites (service descriptions, instructions)
Network operators' mapping data systems	For example, Telia or Tallinna Vesi mapping data application
Network operators' e-services data systems	For example, systems for applying for technical conditions (Telia, Elektrilevi)
WURIS	Environmental Board's water utilization reports information system (includes data on bore wells)
Google streetview	Free e-service to view street photos
Street-U	Paid e-service (Regio) to view street photos
Photo-bank of the Land Board	A repository of photos taken during periodic fly-overs
Paper archives	Non-digitized information (detailed spatial plans, design specifications, permits, proceedings data)
Repositories of procedural information	Storing of proceedings information (the reason for rejection, etc.) during the EHR proceedings. Officials use digital formats (Excel spreadsheets, other files) or paper media.
Other databases	Storing of proceedings information on paper, detailed plans in the archive
Bauhub	Paid service for project documentation storage and management (project documentation, implementation documentation)
File-sharing cloud services	Dropbox\Google Drive\OneDrive etc. (project documentation, implementation documentation)
Applicants' file servers	Internal file-sharing services (project documentation, implementation documentation)

Subsequently, a description is provided on the course of data flows in the process of the EHR-supported service proceedings at a generalized level (the so-called 0-level) as a data flow chart (in Gane and Sarson notation) (Figure 11).

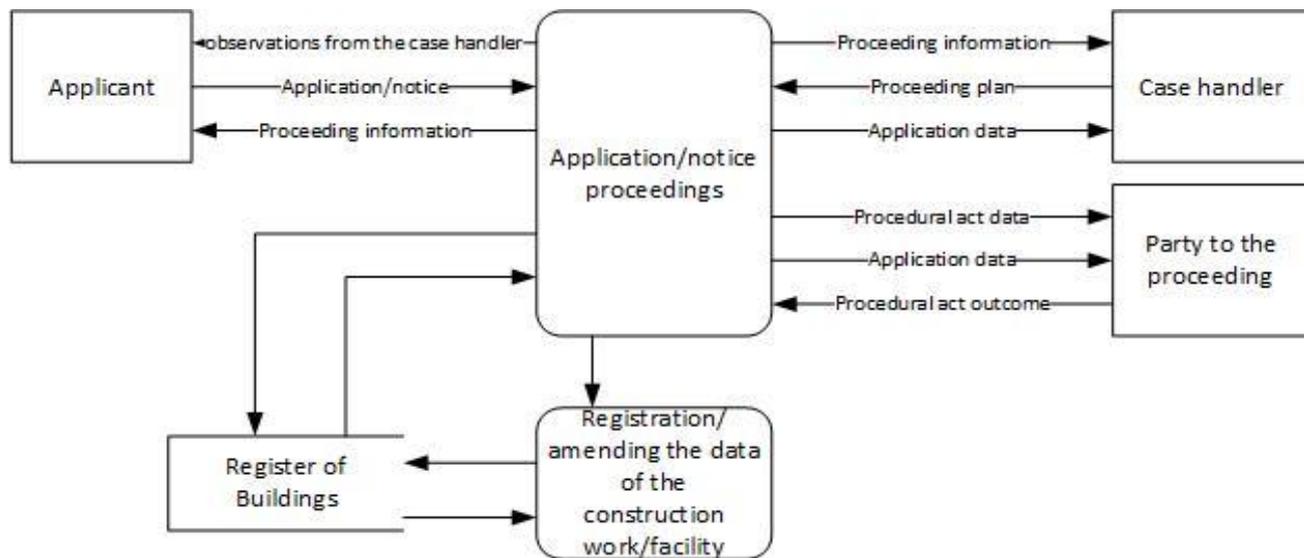


Figure 11: Generalized data flow of service proceedings.

The applicant submits a completed application/notice duly filled in with data to obtain the service, which is received and processed by the authority providing the service. During the process, the applicant receives information on the progress of the proceedings and the observations sent for fixing, which supplements they re-submit as input to the proceedings process.

In the course of the service process, the case handler receives the application data, on the basis of which he establishes a plan of proceedings that includes details of the procedural acts. In the course of the proceedings, he/she receives information on the proceedings on the basis of which it is necessary to adjust the plans of the proceedings.

The party to the proceedings receives procedural acts and related data from the process for execution. In the course of a procedural act, they can review the application data and perform the procedural act by returning the result of the procedural act's process (approval, refusal of approval, observations, etc.).

Process data produced during the process is stored in the Register of Buildings, where they are reused in during the process. As a result of the process, the building-related data is also recorded in the Register of Buildings.

The data flows of the various stages of the application and proceedings of services are described below in a more detailed view by the activities as a level 1 chart.

### 1.3.1 Preparation for applying for a service

The data flows of the preparatory process for applying for a service (in Gane and Sarson notation) are described below.

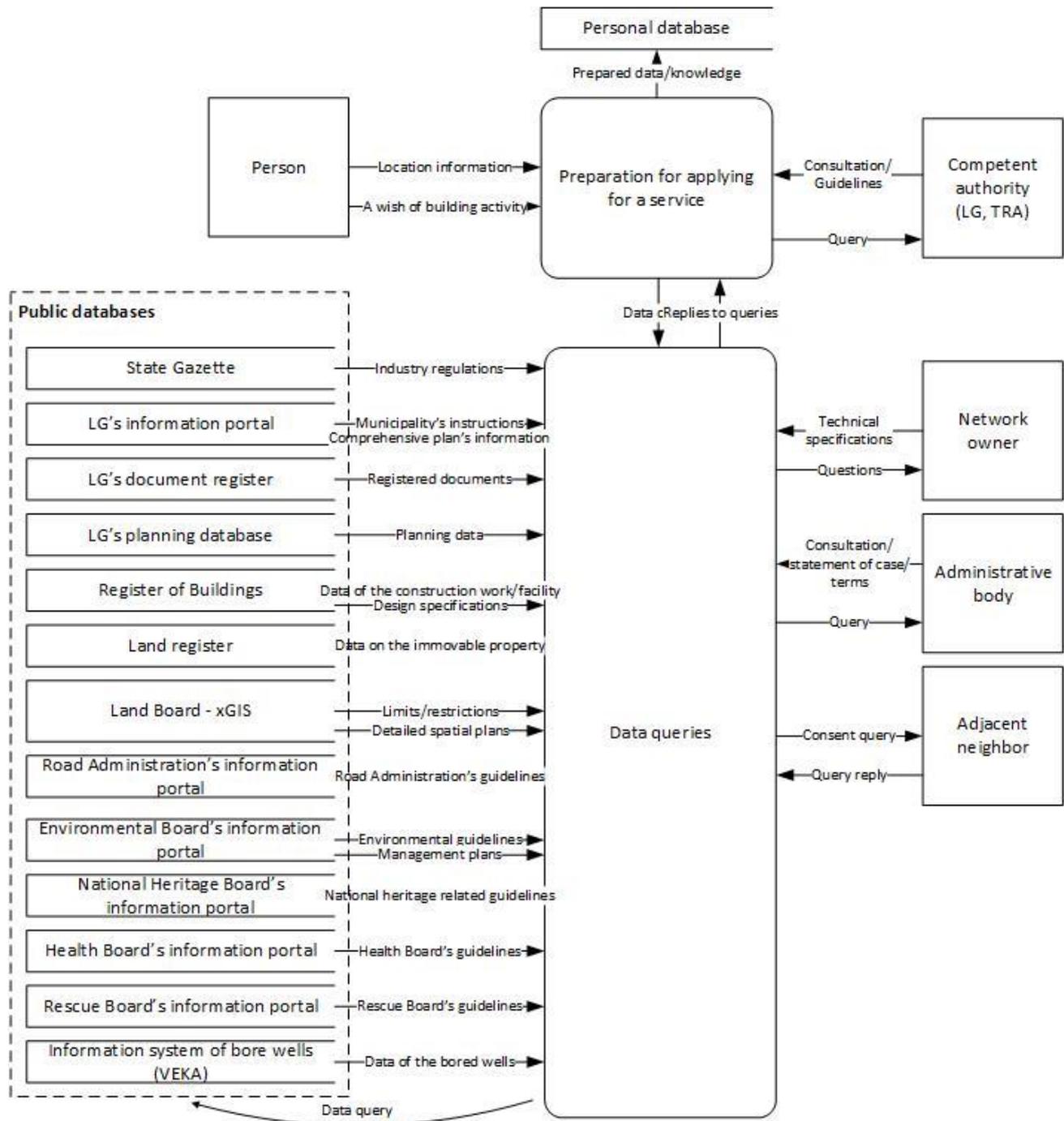


Figure 12: Preparatory data flow for applying for a service.

Preparatory activities are carried out by an individual: a legal or natural person interested in applying, who wants to find out more or less in detail what services are needed to fulfill his/her wishes and what are the conditions for his/her plans. In the course of preparation, individuals collect the necessary knowledge from inquiries from different public databases and collect and perform preparatory activities to be ready to submit the application's data composition to the required extent. The chart depicts a selected set of databases from which information is searched as examples of what information is collected from different databases.

In addition to public databases, consultative inquiries are also addressed to the competent authorities and administrative bodies. Often, a direct consultation provides quicker answers than searching from the public channels. In case the planned building or construction activity is located in the protection zone of some network, the respective network operators will also be contacted to obtain technical conditions.

If in the case of the planned building or construction activity the need for the opinions or approval of the adjacent neighbors is identified, the owners of adjacent immovables are also consulted.

### 1.3.2 Preparation and submission of the application/notice

The following are the data flows associated with the process of preparing and submitting the application (in Yourdon and Coad notation) (Figure 13).

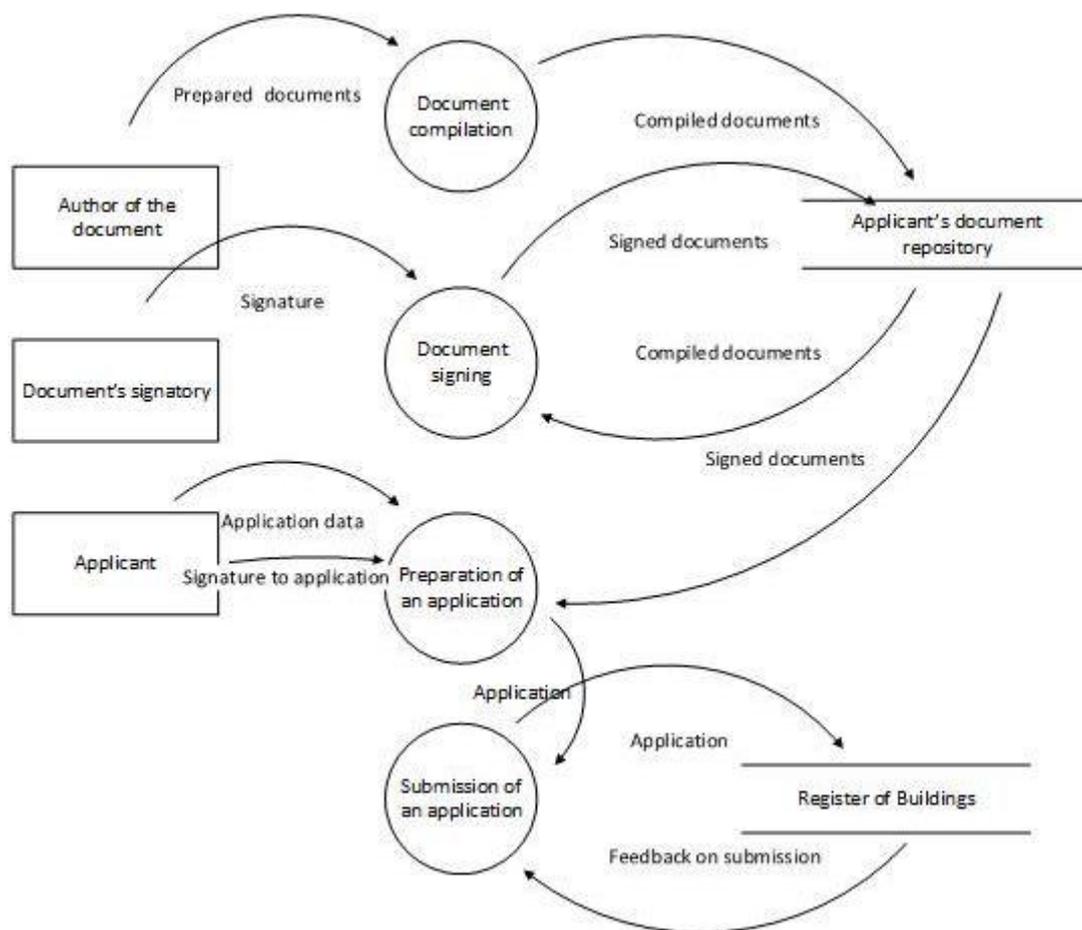


Figure 13: Data flow of preparation and submission of the application/notice

During the submission of the application, the applicant shall, in addition to the application data, also provide additional documentation on the proposed construction activity or completed building. For this, the applicant produces and aggregates the necessary materials. Often such documents are produced by a designer or a builder, to whom the application submission task is also delegated by the contracting authority. Sometimes the applicant may also be the one who prepares and submits the documents. Document compilers provide input in the form of documents to a document aggregation process that ensures that they are stored in the document repository.

The aggregated documents are signed by the required parties (including the authors of the document, the applicant, and also the owner of the immovable). The signed documents are inputs to the preparation of the application, where the documents are added. The applicant shall complete the application data. The application with the documents is submitted to the EHR.

### 1.3.3 Reviewing application/notice

Below are described the data flows of reviewing application/notice (in Yourdon and Coad notation) (Figure 14).

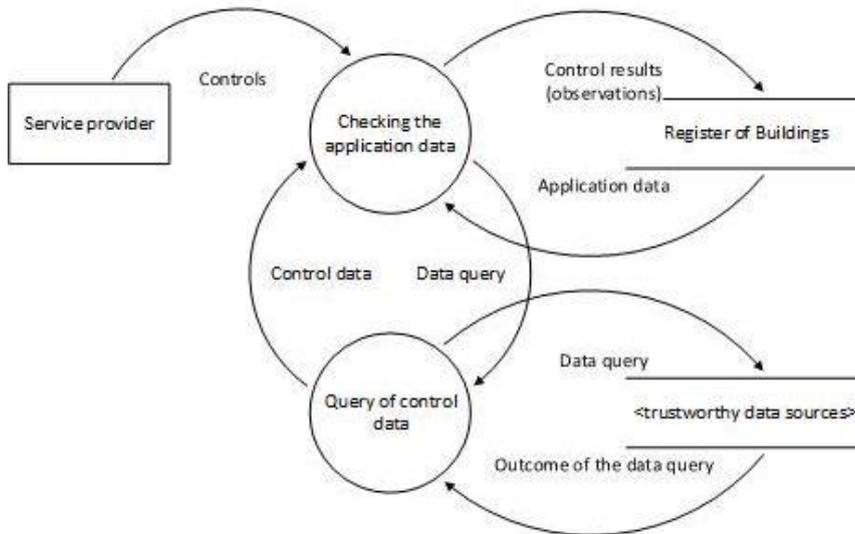


Figure 14: Data flow of reviewing application/notice.

During the review of the application, the content of the application is examined and checked by the reviewer within the limits of his/her competence. In the proceedings, there is usually more than one reviewer, and this process is repeated several times during the proceedings. Each specialist in the field reviews the application within the limits of his/her competence, and if the application needs to be supplemented, re-reviewing is required.

The reviewer brings controls into the process, and during the process, queries are made to other databases to obtain reference data or control data for performing the controls. The sources from which the data are extracted are different and there could be a different combination for each proceedings. Reliable data sources are used as source data, which are usually national databases and registers, but also often the competent authority's own databases, the quality of which it manages and can be convinced of its reliability. The list of data sources identified during the interviews is shown in Table Databases used in services.

As a result of the review, observations on the application are added to the Register of Buildings, which is further handled by the case handler of the service.

### 1.3.4 Application/notice proceedings

Subsequently, the data flows of the proceedings of the EHR's applications/notices are described (in Yourdon and Coad notation) (Figure 15).

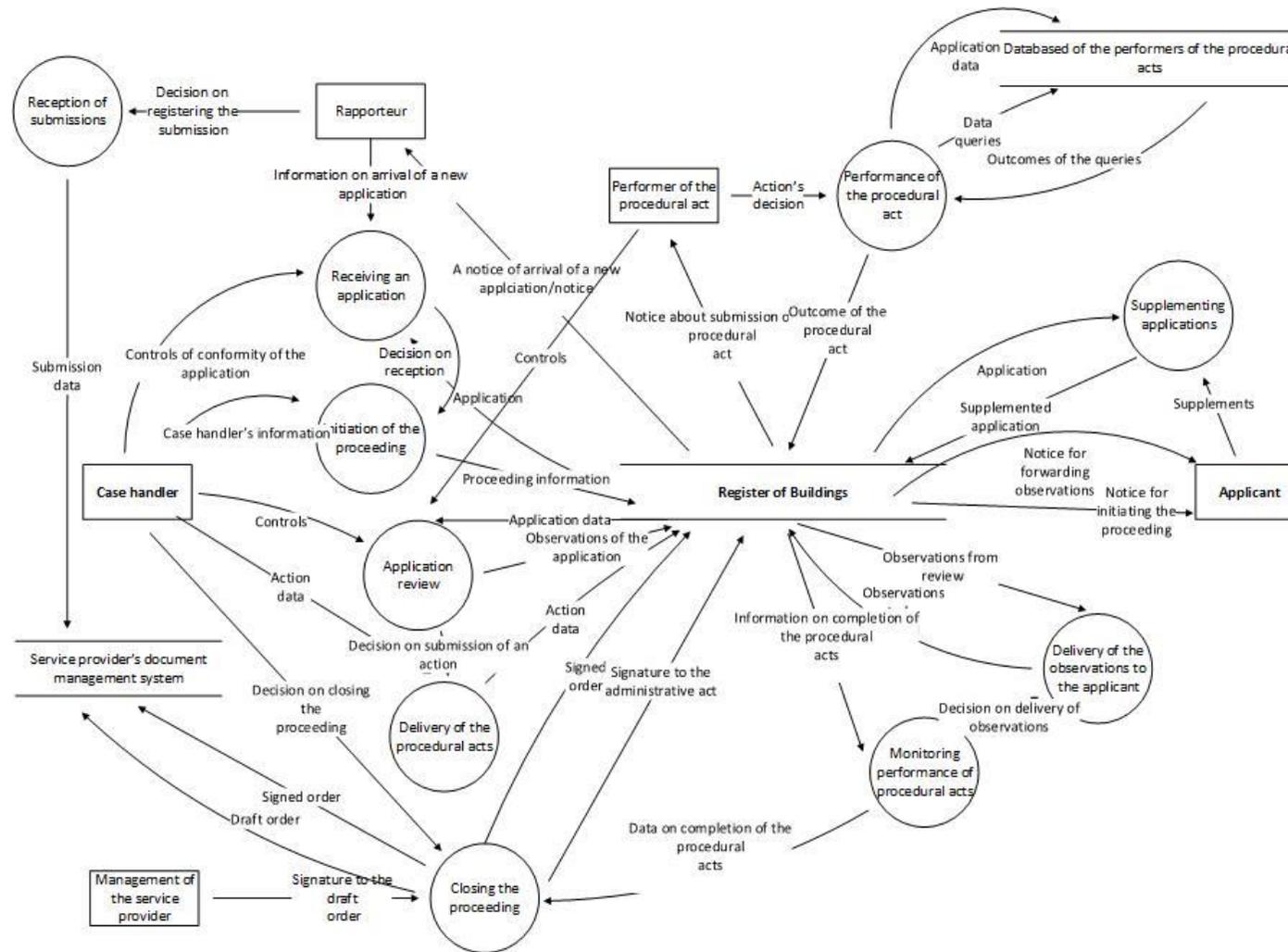


Figure 15. Data flows of the application/notice proceedings' process

The process begins at the competent authority when the EHR sends an automatic notice of the new incoming document to the authority's general e-mail address, which is often tracked in practice by the authority's rapporteur. The practice may be different in what follows, but in many interviewed institutions this notice is recorded as an incoming referral or document in the institution's document management system.

As for the internally received notice, information is forwarded according to the type of document to the responsible case handler. In some institutions, the rapporteur him/herself logs into the EHR and appoints the case handler for the document, thus also accepting the application and initiating the proceedings. However, according to the broader practice, the institutions' case handlers themselves monitor the receipt of new applications in the EHR system and process the document under their responsibility from the incoming documents. In bringing into the proceedings, the proceedings' information is stored to the initiated proceedings and stored in the EHR.

During the application review process, the EHR's observations on the application are stored, if there were any, and at the same time it is planned, what actions are to be performed during the proceedings (a procedural plan is established). Following the plan, procedural acts are set up and handed over to the parties to the proceedings to resolve. As a result, the procedural activity is recorded in the register and the EHR sends an automated notice of the new activity to the respective party to the proceedings.

The party to the proceedings carries out the review with the controls originating from the point of view of his/her specialty (if the party to the proceeding is not him/herself the case handler, who has already examined the application and set this procedural act to him/herself for sending the observations), after which he/she reaches a decision of the act. During the execution of a procedural act, the application is often downloaded and stored in its own databases, where it is more convenient to review it. In the course of a procedural act, queries may be made into their databases in order to obtain control data for the review. Often the procedural act is carried out in the internal procedural systems of the person who performs the procedural act and the outcome of the latter is returned to the EHR's procedural process.

The case handler monitors the execution of procedural acts to obtain information on when he/she can take the following procedural steps (send observations to the applicant or complete the proceedings). If the procedural acts of the parties to the proceedings have been completed and the observations made by the parties to the proceedings for further proceedings have to be fixed, the case handler shall send them to the applicant for fixing, including supplementing the application. The applicant is notified of the need to fix the observations and provides the necessary supplements with the application to the EHR.

After resubmitting the application with the fixed observations, the software automatically performs recurring approving tasks and the case handler awaits the results of the following procedural steps. If the procedural steps are successfully completed for the applicant, the case handler can complete the proceedings.

Depending on the type of document, the practice of the competent authority and its authority, the case handler must prepare a draft order for authorization, which he/she places in the internal document management system for signing during the subsequent municipal session or signs the authorization him/herself. If the case handler is authorized to sign, no separate order will be made. If the order is signed by the local government, the case handler takes it from the internal document management and loads it to the EHR. As a result of both activities, the proceedings are terminated and the records are entered in the register. At the same time, as a result of the activity, a building permit is granted.

### 1.3.5 Executing register amendment entry

Below are described the data flows related to the processes of register amendment entries (in Yourdon and Coad notation) (Figure 16).

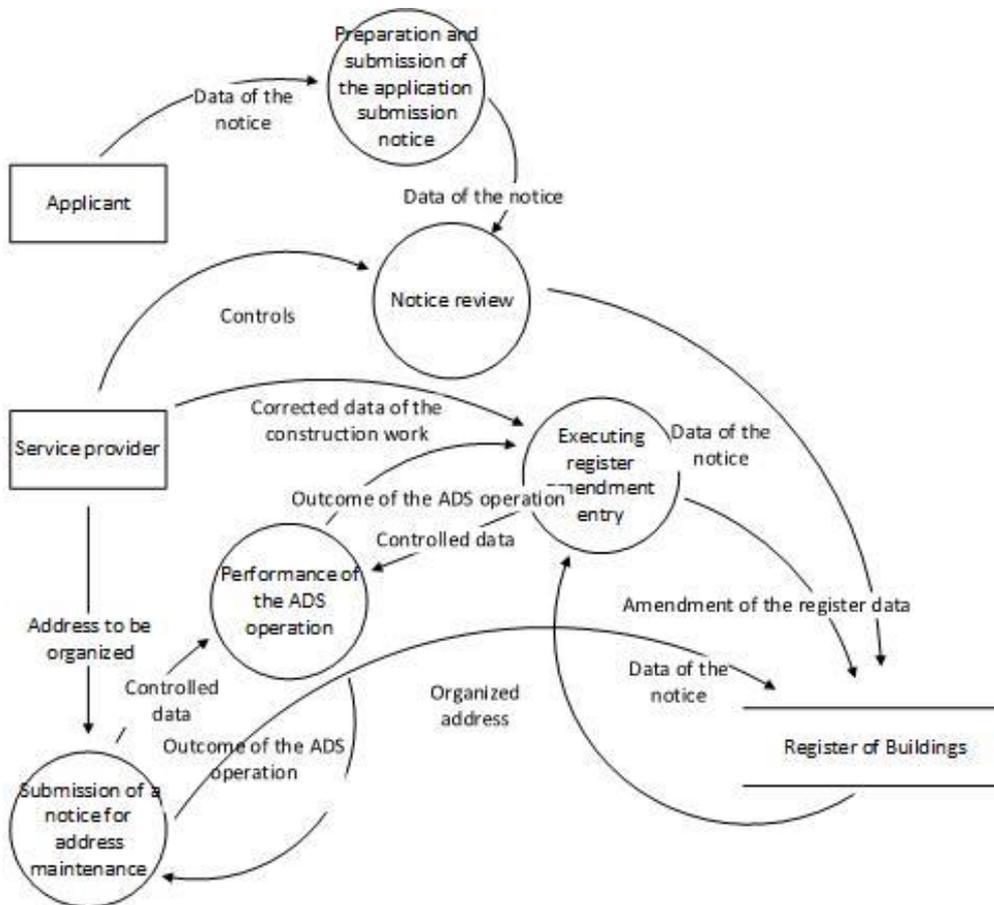


Figure 16: Data flow of executing register amendment entry

The competent authority (as a register data administrator) initiates the process independently. The applicant initiates the process with the notice of submission of the data, which is accepted, reviewed and processed by the competent authority.

The competent authority itself can perform register amendment entries by modifying data in the register and describing the reasons for the amendment. Any amendment of the register data related to the buildings is also subject to the controls of the ADS operation to verify that there is no problem with the quality of address data or spatial representations following the proposed amendment entry. In the event of the result of positive action, the desired amendments are entered into the EHR.

## 1.4 Conceptual data view

Subsequently, the current conceptual data view of the EHR core business data objects is described in a high-level generalization as a domain model (Figure 17).

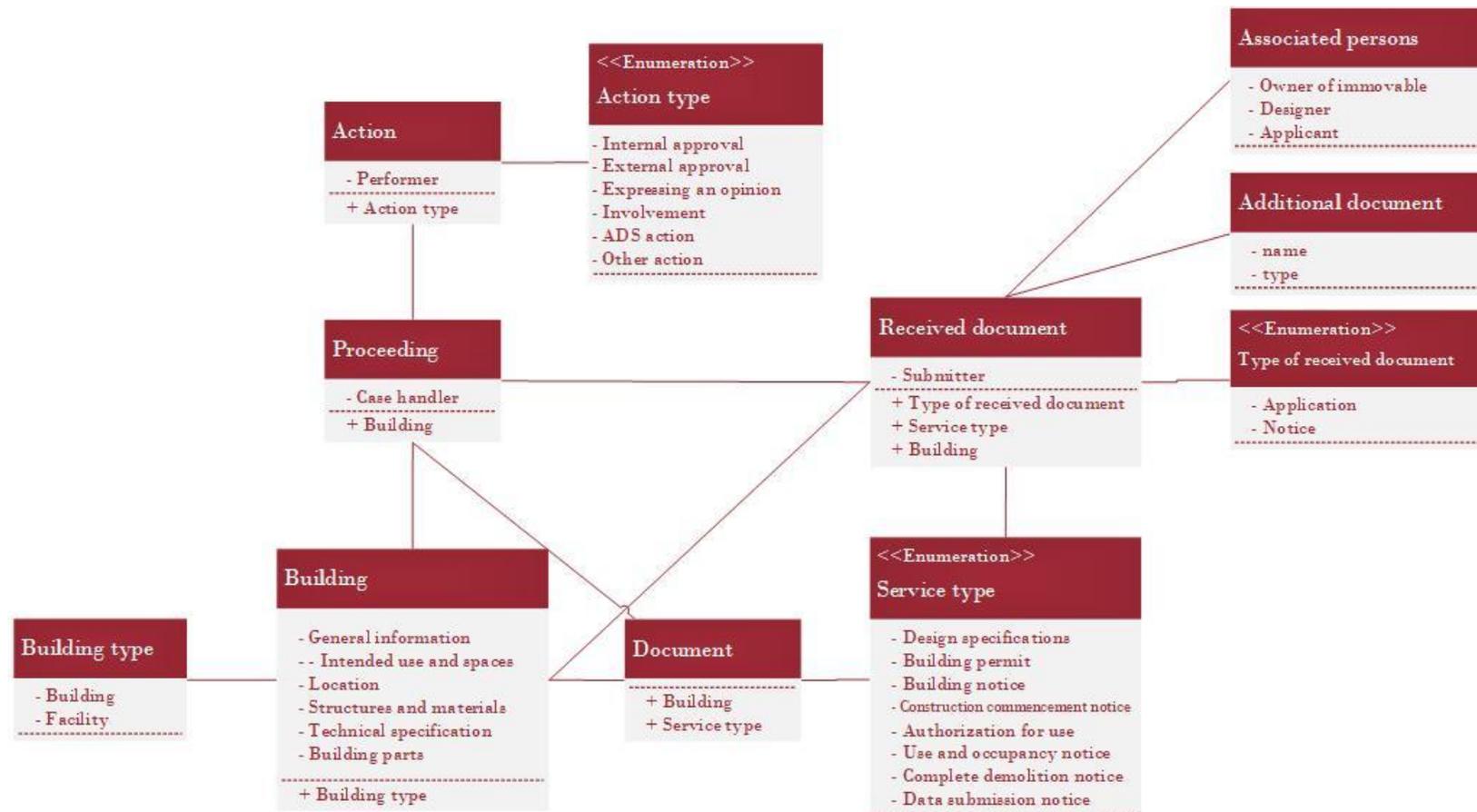


Figure 17: The generalized conceptual data view of the EHR's main objects.

With the support of the functionality of the Register of Buildings, local governments receive applications for 8 types of services, so the incoming document can be one of them. Each incoming document contains a mandatory data composition of the application or notice, which contains data on the activity applied for and the related buildings. Each incoming document may have one or more additional documents attached. Each incoming document is associated with one or more individuals who may have different roles regarding the document.

More than one building may be involved with the applications/notices (e.g. it is desired that only one application grants a permit to build both a house, bore well, fence, and an auxiliary building). Each incoming document can be related to one proceedings. Each proceedings may be related to one or more buildings and each building may be associated with 1 or more proceedings. Each proceedings may involve one or more documents of the same or different types.

There may be one or more procedural acts in each proceedings. There may also be proceedings where no procedural acts are provided separately or made automatically (e.g. data submission notice).

## ***1.5 Problems, unwanted manifestations***

The following is a description of the problems and unwanted manifestations encountered in the interviews which, according to the EHR users, inhibit their daily work in the EHR. Some problems may be related to user ignorance and the root cause of the problem has not been identified. These problem areas are distinguished by an asterisk (\*) marked after the problem. In addition, after each problem, enclosed within brackets are the parties to the interview who raised the problem (LG – local government (including TRA), AA – approving authority, APO - authority providing an opinion, C – company).

### ***1.5.1 Preparation and supplementing the application***

1. When making changes to the application, the "Send" button is not sufficiently visible to the applicant. Therefore, it has happened that the application is not sent to the LG when making changes, and, therefore, the receiving of a permit/considering notice as having being notified remains unnecessarily delayed. (LG, C)
2. The naming scheme of the documents to be uploaded by the EHR applicants is complicated and the naming scheme's error messages displayed by the EHR are incomprehensible, therefore, the documents are uploaded by the applicants to the EHR several times before obtaining the correct name form, which in turn affects the time spent on submission of the application. (LG, C)
3. The law stipulates that the builder's data is required in the application of authorization for use but the EHR does not require this and many applications are made without the builder's data, thus causing unnecessary time burden for both the applicant and the case handler to correct the observation and check the correction. (LG)
4. The error messages displayed by the EHR are not sufficiently informative for the applicant, which affects the time spent on the application. If the applicant, therefore, contacts the LGs, or the EHR helpdesk, it will also affect their workload. (LG, C)
5. The EHR does not provide feedback on the operations performed in the system (e.g. no indication is given to the applicant that the application has been submitted), which makes it unclear for the applicants whether the operation was completed in the system. (EV) Applicants occasionally submit in the EHR the documents and construction design under the documents of the Building Section 7, so the documents cannot be found by all parties. This entails additional time burden for the proceedings. (LG)
6. The types of facilities in the EHR and the table in Annex 1 of the Building Code are not compatible. For example, the EHR does not have a "Publicly accessible private road", which causes unclarity and a time burden for the applicants and additional time burden for the case handlers to consult the applicants. (LG)
7. In the EHR, the applicant has the opportunity to remove or delete parts of the building, but unfortunately, the applicants do not make a distinction between deletion and removal, which leads to an error message during the ADS procedure, which in turn generates time burden for processing the application. (LG)
8. In the case of district heating, the registration of the energy source is not justified, as in this case poor quality data may be added because the applicant does not know the energy source used by the

- district heating company. This produces poor quality data in the EHR. (LG)
9. In the case of apartment reconstruction, the indication of the height of the building upon submission of the building notice is not justified, as the applicants do not have information on the height of the building and this box is filled arbitrarily due to its mandatory nature, which is why applicants have the obligation somehow to submit poor quality data. (LG)
  10. An incorrectly attached energy label cannot be deleted or altered in the application so you must restart the application. This entails additional time burden for the applicant. (LG, C)
  11. Users of the MAC operating system cannot sometimes submit applications in the EHR. Therefore, they turn to the LG and ask that their building design documents are received on paper and hence it takes time of the applicant as well as the case handler to deal with this problem. (LG)
  12. It is not possible in the EHR to mark the separated space for the apartment. Since the banks require the given information from the applicants, the LGs mark it somehow in the EHR. If the given information is not in the EHR and there is no overlap between the Land Register and the EHR data, the banks will not issue a loan to the applicants.\* (LG)
  13. It is possible to submit an application without digital signature in the EHR (more specifically in a PDF format) because there are no automatic controls to identify it. Therefore, there may be unnecessary repetitive proceedings that affect the time spent on the proceedings. \* (LG)
  14. It is not possible to submit an application without an email address, but a person may not have email. In this case, the email address box uses the format **personal identification code@eesti.ee**. (LG)
  15. Owners of a building or immovable may not be involved in the process of design provisions or applying for permits, as the submission of the owner's data is not an obligation in the EHR. This can lead to a situation where a building-related permit or design provisions are applied for the owner's immovable without the owner's knowledge. (LG)
  16. The EHR does not allow application for a partial authorization for use of a construction work, but sometimes the bank requires authorization for use when the first floor of a two-storey building is completed.\* (LG)
  17. The applicants have uncertainties in calculating the surface of a building (net surface, the area under construction, etc.), which is why incorrect information is often presented because there is no clarity on the terms, so the time spent on the proceedings increases with the resubmission of the application. (LG)
  18. The type of application cannot be changed in the course of the proceedings, i.e. the construction notice and use and occupancy notice cannot be changed accordingly into a building permit and authorization for use, and vice versa, therefore, a new application must be submitted in case of change of the type of application, which in turn affects the time spent on application submission and receipt of the application. In addition, the old proceedings remain on the list of proceedings which makes it difficult to navigate the list of proceedings. (LG)
  19. Adding spatial representations is time-consuming for the applicants and there is no clarity as to what exactly to do, as assistive comments are incomplete or missing, and therefore affecting the time spent on the application. (LG, C)
  20. The file naming scheme to be presented upon the implementation documentation for authorizations for use is not regulated, so the case handlers cannot understand from the file names the content of each document, which in turn leads to the time burden of the application proceedings. (LG)
  21. As the file naming guide is designed to apply for a building permit, the files in the work project are more detailed for the authorization for use and do not fit the classification given by the naming scheme, so the naming scheme of the work project to be submitted for authorization of use is not harmonized and the applicants name the files at their own discretion, which in turn complicates the proceedings and causes unnecessary time burden. (LG, C)
  22. The applicant does not understand the application process in the EHR and navigation in the application submission view is unclear and the position of the buttons is not best displayed (e.g. "Save"). (EV)
  23. The applicants do not have a clear overview of whether an application for design provisions has to be submitted, which in turn creates an additional explanatory burden for the LGs. (LG)
  24. The case handlers do not receive an automated notice if the applicant has resubmitted the application, so the proceedings itself must be searched for or resubmission is found out through the applicant's telephone call. This, in turn, causes unnecessary time burden for the proceedings and the proceedings are delayed. (LG)
  25. The application for an authorization for use requires the builder's data by law, but it is not required by the EHR, therefore applications are submitted without the builder's data (for some LG, even 95% of applications of authorization for use), which in turn creates unnecessary time burden in the proceedings. (LG)
  26. The applicant has been allowed to submit an application for a building permit or authorization for use without paying the state fee, after which most of the LGs reject the application unreviewed and the time of the proceedings is unnecessarily delayed. (LG)
  27. The applicants submit documents to the register with redundancy when applying for authorization

- for use, as there is no clear overview of the documents required for submission, which in turn affects the performance of the system and the time spent on the proceedings of authorization for use. (LG)
28. The place where the building data is changed in the EHR is not well presented to the applicant, which is why the applicants run into difficulties with it, which in turn creates confusion and additional time burden. (LG)
  29. The applicants are unaware and do not have an overview of all the documents they have to submit in their applications (e.g. waste certificate), which leads to a delay in the proceedings. (LG, C)
  30. If the application is returned to the applicant with observations, the applicant has to press the button "fixed" for each observation when fixing the latter, after which, in turn, "save" has to be pressed when all the observations have been fixed. The saving button is not easy to find, and its function is incomprehensible, which is why the applicants do not submit their fixed observations to the LG, which in turn prolongs unnecessarily the length of the proceedings. (EV)
  31. Currently, the list of documents required in the proceedings is not uniform and there are differences in the LGs, which is why it is unclear to the applicants what documentation should be submitted to the LG in different proceedings. (EV)
  32. The applicants have difficulty loading large-scale document packages because it takes a long time due to the poor performance of the EHR and because of the capacity constraint of uploading, it is necessary to split the packages, which is an additional burden on the applicant. (EV)
  33. If the notice is processed by the LG, the applicant will not receive an EHR automated notice that the notification has been considered as having been notified. The applicants therefore call to the case handler to investigate the progress of the notice proceedings, which in turn causes an explanatory burden on the LG. (LG)
  34. The applicants do not have an overview of the status of the proceedings, so often the LG is approached to find out the status of the proceedings. This creates additional time burden in the proceedings both for the applicant and the LG. (LG, C)

## 1.5.2 Carrying out proceedings

### 1.5.2.1 Local governments

1. The EHR does not save old versions by adding project documents modified/supplemented by the applicant, which makes it difficult for the case handler to compare the changes made in the project documents, which in turn affects the time spent for application proceedings. (LG)
2. There is no possibility to change the type of construction activity during the proceedings, and the proceedings must, therefore, be restarted if it is necessary to change the type of construction activity. In addition, the interrupted proceedings remain on the lists of the case handlers. This affects both the time required for submitting the application and the time it takes for the application to be received and the time required to find the right proceedings. (LG)
3. When changing the procedural data and adding comments and observations, the case handler must send the changes and comments to him/herself for approval, which creates inefficiency in the procedural process and increases the time spent on processing the application. (LG)
4. The EHR does not allow observations to be made for personal use in the proceedings so that the case handlers keep the additional applications-related information on paper or in Excel, which results in the fragmented procedural data. (LG)
5. If the applicant submits a supplemented application, then in the EHR the case handler cannot see the comments given by him/herself of which were the reasons the previous application was rejected. Procedural information is therefore kept on paper or in Excel and the data relating to the proceedings are fragmented. (LG)
6. The EHR does not keep track of the deadlines for the proceedings in an accurate manner. The deadline does not stop if the application is returned to the applicant for additional comments. For this reason, the LGs have an internal database (Excel, paper medium) in order to keep track of the deadlines properly, which results in additional time burden for the proceedings. (LG)
7. In the BNAK database managed by the Land Board, aerial photographs are used to determine residential buildings, which in reality become non-residential. Data from the BNAK are transferred to the EHR, and if an application for a building permit for the construction of a residential building is submitted to the immovable, a problem of unique address arises during the ADS proceedings. Since the case handler does not have the right to independently change the unique address and spatial representation, it affects the time spent on the proceedings. (LG)
8. The applicants' competency controls cannot be performed through the EHR, therefore, the LGs check the competence of the respective persons from the MTR and the Register of Professions. This results in unreasonable time delay for receiving the application. (LG)

9. Adding a building's energy label is difficult to find and, therefore, affects the time spent for the application proceedings. (LG)
10. The EHR does not allow entry of compulsory possessions into the register, which means that it is not possible for officials to fulfill their statutory obligations, i.e. to transfer compulsory possessions into the EHR. (LG)
11. When making a register amendment entry, the case handler must complete all the fields in the parts of the building (in the appendix of the dwelling) and there is no possibility to correct only the required fields, which is why it creates additional time burden for the case handler for making the register amendment entry. (LG)
12. Submitting an ADS proceedings has become increasingly problematic. In the Land Register there are properties but in the EHR structural apartments (dwellings or non-residential premises), which do not have to be interconnected and are the same. If one part of the building is sold, 2 residential properties are created in the Land Register, but there is still one building in the EHR when applying for a building permit, and the application is not enforced in the ADS because the application deletes some connection with the Land Register. This affects the time spent on the application proceedings. (LG)
13. In the EHR, when submitting a project, a category "FOLDER" can be generated, which cannot be downloaded by the case handlers, and all the files in the folder must be downloaded one-by-one by clicking on them, which affects the time spent on the reception of the application. (LG)
14. In the case of authorizations for use, multiple building permits may not be issued at a time within one proceedings, but the buildings must be signed individually, affecting the time spent on the application proceedings. (LG)
15. When preparing a building permit, the lawful address of a building with the parallel address cannot be written in the observation box correctly (e.g. Kalda tee 41 // 43 or with spaces). An address with spaces mixes up the entire formatting and needs to be written without spaces (e.g. Kalda tee 41/ 43), which is contrary to the law. (LG)
16. According to the law, the proceedings of the building notice should take 10 days, but in most cases the proceedings takes up to 40 days, since the building notice is sent to the Rescue Board for approval by the case handlers, although it is not required by the law, after which the EHR automatically extends the deadline of the proceedings by 30 days. This results in longer proceedings for the applicant than required by the law. (LG)
17. The terminology "Returning without review" creates confusion for the applicant, as in practice the application is reviewed by the case handler before the return, which is why the case handler is asked to provide additional reasons for not reviewing the proceedings. (LG, C)
18. The process of involving adjacent neighbors is inefficient and time-consuming since both the Land Register (for identifying the property owner) and the Population Register (for obtaining contact data of the property owner) have to be consulted for inclusion, which causes unnecessary time burden for the case handlers. (LG)
19. Procedural rules have been established in many LGs that all permit proceedings have to go through the municipal council session to issue a permit, therefore, the permit proceedings may be unnecessarily prolonged (ca. 1 week) and cause additional time burden on the case handler when preparing the administrative act. (LG)
20. When making a register amendment entry, there is no automatic notice of the ADS coming into force and, therefore, the case handlers themselves have to check it from time to time, which creates additional workload for the case handlers. (LG)
21. The limited number of characters in the EHR can be added into different observation boxes, so the observations are written in a Word file and the document is then uploaded to the proceedings. This is additional work for the case handler and creates an EHR-external document. (LG)
22. The proceedings of design provisions is carried out in the LGs in internal document management systems, as the EHR does not allow open proceedings to be carried out. In terms of data integrity, this is not a good situation, because the proceedings-related process is not visible in the EHR. (LG)
23. The proceedings cannot be handed over to another case handler in the EHR, so the procedure is currently taken over in a manner that the proceedings are looked up from the list of the case handler by oneself. The wish would be for the signatory (construction consultant) to see under his/her own proceedings that there is a need to sign, after which he/she could check the application and then sign it. Therefore, the signatory does not receive a task in time to sign the application for the review, thus the end of the proceedings are unnecessarily prolonged. (LG)
24. The aggregate view of the observations is visually very confusing for the case handlers and the observations from the recurring approval rounds are not distinguishable from the other observations, which creates a complex and unnecessary time burden for the case handler for managing the approval. (LG)
25. In the case of a register amendment entry, neither the applicant nor the LG can see afterwards from the EHR side, which was changed and this causes a problem of transparency and observability of the proceedings. (LG)

26. In the case of repeated submission of a construction commencement notice, the case handler does not receive any information from the EHR that the applicant has resubmitted the notice, thus delaying unnecessarily the notice proceedings. (LG)
27. The observations made by the LG may sometimes be contradictory in the case of internal approval, which confuses the applicant and also affects the time spent on the proceedings. (LG)
28. It is not transparent for the LGs, under which legislation and for what reasons the Land Board is involved in the process of authorization or notice proceedings, which in turn creates distrust in the LGs with respect to the Land Board. (LG)
29. At the moment, repetition of the markings of building parts is not enabled, which raises the problem of drafting project amendments, as apartments were previously divided between the blocks and can no longer be distributed in the same way, even though residential properties have already been formed in this way in the Land Register, so that the markings of building parts repeat by blocks. (LG)
30. If there are multiple objects in the application (e.g. shed, house, auxiliary building), then the contents of all building notices' documents are exactly the same, and each document specifies the parameters of all three buildings, i.e. it is not possible to create a single aggregated document that would include the respective data of each building to avoid repetition of the data in the application affecting the time taken to review the proceedings. (LG)
31. Some local governments have not sent any applications to certain authorities for approval within a year, which may be due to the fact that the case handler do not have a clear overview of who they have to involve in the approval. (LG)
32. A summary sheet of observations is inadequate and misleading for the case handler because it shows the name of the LG's case handler instead of the name of the approving authority's official. This creates confusion for both the applicant and the official. (LG, C)
33. The case handlers do not have a unified overview of the procedural acts, which may lead to poor quality of the application proceedings. (LG)

### 1.5.2.2 Technical Inspectorate

1. A housing permit must be applied for from the Technical Regulatory Authority for the construction of a building in a public water body not permanently connected to the shore, after which a building permit can be applied for. The applicants are unaware of this and initially submit a building permit, which is why the building permit proceedings must be suspended until the housing permit is issued. The EHR does not allow the building permit proceedings to be suspended. To resolve this situation, the application is sent back by the TRA without initiating any proceedings, of which no mark is left in the EHR, or the proceedings are initiated, internal approval is prepared to self, in the observation box it is written that the statutory procedure is suspended until the housing permit is issued and the building permit application is requested to be submitted together with the housing permit, whereupon the application is returned to the applicant. The lack of opportunity to simply suspend the proceedings and then continue with it creates additional time burden for both the applicant and the case handler. (LG)
2. The case handler on the building permanently connected to the shore in a public water body is the LG and the TRA is obliged to collect a fee for the given building because the applicant gets hold of the state-owned property (e.g. the sea). At the same time, the Building Code does not oblige the LG to notify the Technical Regulatory Authority of such a building, which is why the Technical Regulatory Authority does not have information on which buildings they have to collect a fee for. In addition, all data necessary for requesting a fee are in the LG. This results in a greater administrative burden on the LG, as it has to provide the Technical Regulatory Authority with an overview of the project and it also creates an additional time burden for the TRA in order to collect the data needed to collect the fee. (LG)
3. The EHR does not allow to choose which procedural files are public and which are not, as all documentation is provided in a single folder so that the proceedings of the objects of national defense interest are conducted outside the EHR, which in turn leads to the fragmentation of proceedings. (LG)
4. Applications that are not within its competence to process are routinely sent to the Technical Regulatory Authority, as the applicant forgets to enter in the EHR the cadastral unit's identifier/address or some other error is made, and, therefore, no link is created between the application and the relevant LG in the EHR and all such proceedings land on the TRA's table. The reason may also be that the button for sending to the Technical Regulatory Authority is too large and too visible. Since such applications are submitted daily by 5-6 pieces, it has a strong time-related impact on the Technical Regulatory Authority's case handler. (LG)

### *1.5.3 Approval and providing an opinion*

1. In the case of repetitive approval, the proceedings supplemented by the applicant is automatically directed to the approving party, which creates an additional time burden for the approver, as the changes made may not be relevant to him/her. (KK)
2. When issuing a permit, the open task remains with a specialist who has not performed his/her approval on time, which is why the list of approval includes irrelevant approval, which in turn influences the time required to find the desired approval. (KK)

3. In the EHR, the editing of observations has not been enabled before sending out the observations from the internal approvers, which is why some of the larger LGs use their own information systems for internal approval and send the observations to the EHR in one letter at once. observations are wanted to be edited for linguistic reasons. The problem creates additional moves during the proceedings, which affects the time spent on the application proceedings. (LG)
4. If the approving authority extends the review of the application, the automated notice sent to the LG does not describe how long the review was extended, so the case handler must turn to the EHR to know the length of the extension. (LG)
5. Applications are sent in the EHR to the approving authorities, which in practice do not require their approval. This is due to officials' ignorance and inadequate guidance material, which in turn creates an additional time burden for approvers in dealing with irrelevant proceedings. (KK)
6. The approvers do not have the opportunity to add supplements to the approved applications. This is necessary if the file confirming the approval is forgotten to be attached to the proceedings when providing the approval. This, in turn, affects the quality and completeness of the data. (KK)
7. There is no possibility in the EHR to approve multiple buildings under one application at a time. There is a button "approve all buildings", but it does not work and you have to choose "approve" for each building. (KK)
8. The EHR does not provide any feedback that the approval has been returned to the LG, which in turn creates confusion for the approvers in the proceedings. (KK)
9. When providing approval, the approvers do not have the complete clarity on what do the choices next to the observation box mean or how do they work: "FYI", "To the administrative act", "For resolution". This can lead to a situation where the approver's observations do not reach the desired addressee. (KK)
10. In the case of recurring approval, it is not possible to extend the deadline, although in practice it will take as much time as the prior approval process, so an extension may be necessary in this case. (KK)
11. The LG has the right to set a deadline for providing approval for the approver, but in practice, it is regulated by the law. There have been cases in which the LG has prescribed for the case handler less than a 10-day deadline for approval, which puts too much pressure on the approver. (LG, CA)
12. If the LG sends the comments from one approver to the applicant before the other approvers have given their feedback, then the approval chain is interrupted at this point and no further approval can be provided by the other authorities, which in turn results in unnecessary time burden for the approval process since the approval process stops. (LG, CA)
13. The applicants from time to time communicate directly with the approver regarding the observations so that the entire documentation should not be submitted again to the EHR. Therefore, they send the modified file/files only to e-mail of the interacting approver, which is why one approving authority appears to be somehow processing a new project, while the other ones do the old project, which in turn entails the risk that the changes in the updated project will not be processed by other relevant approvers. (KK)
14. The National Heritage Board maintains a national register of cultural monuments, which is designed to keep records of the monuments. At the time of approval, an entry is first made in the register of cultural monuments and then in the EHR, so a double entry takes place. This affects the approver's workload and the time spent on the proceedings. (KK)
15. Of approval provided without observations, no observations to the proceedings will be visible to the applicant in the EHR, so that the applicants do not have a clear overview of all the approving bodies. (EV)
16. Approval of the major network operators (e.g. Eesti Energia, Telia) takes place outside the EHR and the documentation related to the approval must be uploaded by the applicant or the LG to the information systems of the respective companies. This is not the desired situation, because the proceedings cannot, therefore, be carried out through one particular channel and the data is provided to both the EHR's and the network operator's information system, which in turn generates additional time burden for both the LG and the applicant. (AA)
17. Since the recurring approval automatically goes to the mailbox of the case handler in the EHR, then such proceedings may be delayed or automatically deemed to be approved by the LGs, as the case handler may have gone on vacation or left the work, so that the proceedings does not reach the approving authority on time. (KK)
18. The parties involved have no opportunity to participate in the EHR's proceedings and the LG currently receives an opinion on the proceedings by e-mail, which is why the data related to the proceedings are fragmented, which in turn affects the integrity of the data in the proceedings. (AA)

19. The network operators are not able to view in the EHR the feedback on the proceedings provided by themselves, which is why the internal databases (Excel) are kept, with the observations on the proceedings written down. This results in additional time burden for the approver. \* (APO)
20. In case of involvement, the case handler does not see whether the e-mail has gone to the party involved, therefore, the e-mail is sent out of the EHR and then the letter is also sent out of one's own internal work mail to make sure that the letter reaches the party involved. This causes unnecessary time burden for the official. (LG)
21. Since the proceedings are directed to the approval round by the case handler and the applicant does not see who the application has been sent for approval, there have been situations where the proceedings has not been sent to all the necessary parties for approval or provision of an opinion, which has led to an additional time burden for the applicant prior or during the construction activity. (LG, C, APO)

#### 1.5.4 Inter-proceedings navigation

1. The processors have no opportunity to search for their own proceedings by address, so other features (e.g. cadastral unit's number according to the map of the Land Board) need to be identified in order to perform searches that affect the time spent on finding the right proceedings. (LG)
2. The signed and notified procedures are displayed in the list of proceedings and it is difficult for the case handlers to navigate there, which makes it difficult for the case handlers to find the work order (the proceedings need to be processed) in the list of proceedings and requires unnecessary additional activities in the form of setting up a search filter, which in turn affects the time spent on the action. (LG)
3. The "My proceedings" list does not always contain all the ongoing proceedings (e.g. unreviewed returned proceedings), so many LGs use an internal database (Excel, paper medium) to write down the numbers of the ongoing proceedings. This, in turn, affects the time spent on finding the right proceedings, and managing and updating the database causes additional time to the case handler. (LG)
4. Applications for which there is no procedural need revealed during the proceedings remain on the EHR's list of the pending proceedings because the LG and the applicant have no possibility to terminate/delete the proceedings within the system. Therefore, the EHR's list of proceedings contains a number of irrelevant proceedings that affect the time spent navigating the list of proceedings. (LG)
5. The ADS entries (register amendments, changes to address data) being processed remain on the list of proceedings, even though the procedure is over, so the list of proceedings is irrelevant and this affects the time required to find proceedings. (LG)
6. With the merger of rural municipalities, it has not been possible to standardize the information uniformly, so that all proceedings would be visible in the EHR, therefore, the case handlers do not have an overview of all proceedings related to the LGs, and to make them visible, one has to contact the MEAC. This creates a time burden for the applicant, the LG and the EHR's helpdesk. (LG)
7. The unreviewed returned applications are not observable to the case handlers and disappear from the list of proceedings, resulting in the use of internal databases (Excel, paper medium) to retain the information required for the returned proceedings, which generates additional time burden for the procedural administration. (LG)
8. You cannot immediately move on to the permit when searching for a building permit by the permit number, because then the observations and documents related to the building permit are not visible. Therefore, you must first move to the EHR code, then find a permit from the document search, and finally, when moving on to the permit you can see all the observations and documents related to the permit. This creates an excessive amount of time spent on searching for the building permit observations. The permit number search cannot immediately open the permit and related data. (LG)
9. The order of the documents in the EHR under the building data is illogical, as the older documents are above the newer ones and their order cannot be changed, which makes it difficult to find relevant documents, which in turn creates confusion and affects the time spent on the proceedings. (LG)
10. The building's design specifications and a building permit are not related to each other in the EHR, so the documents of one building are not visible and can be found at the same time. This causes a time burden for the case handler to navigate between the building's design provision and the building permit. (LG)
11. There is no way to archive proceedings, so there are a lot of irrelevant proceedings on the lists of case handlers, so navigating the list of proceedings is time consuming. (LG)
12. The register amendment entries in which the ADS proceedings are performed remain on the list of proceedings, which affects the time spent on navigating the proceedings. (LG)

13. It is not possible to find utility networks from the EHR if the EHR code of the facility is not known and the facilities are also not indicated on the map application. This affects the time spent on finding facilities. (LG)

### 1.5.5 General problems

1. There is no possibility in the EHR for more than one person to sign the same document. In the case of applicants, it would be required for the submission of construction documentation, in the case of the LGs, for provision of an administrative act. Therefore, the signing of the construction documentation and the preparation of the administrative acts take place outside the system, which in turn affects the time spent on preparing and processing the application. (LG, C)
2. There is no user-friendly and event-based user guide for both the applicant and the case handler. The current user manual does not meet the needs of users and the information required is missing or not clearly identifiable. As a result, the applicants often turn to a LG, which creates an additional time burden for both LGs and applicants. In addition, the LG often do not find the information they need in the user manual. (LG, C, CA, APO)
3. The EHR's performance does not meet the needs of users or modern standards. Opening proceedings and conducting searches takes ca. 30 seconds at times, creating additional time burden for the applicant submitters, case handlers and approvers on a daily basis. (LG, C, CA, APO)
4. The LGs do not have a central register to carry out road-related proceedings, which is why it is common practice to carry out road-related proceedings in the EHR, where roads are classified under other facilities. At the same time, the data fields requested by facilities are building-centered, thus roads cannot be properly described in the EHR and, therefore, the quality of the data suffers. (LG, C)
5. Reports based on the EHR data are not reliable because, for example, the EHR estimates that the number of design provisions issued by one LG is 12, but in fact over 60 design provisions have been issued. Therefore, the EHR provides poor quality data that cannot be used for planning the LGs work and making management decisions. (LG)
6. The session expires too soon in the EHR, so users need to log in to the system repeatedly during the day. This generates additional time burden for the applicants, case handlers and approvers. (LG, C, CA)
7. The observation boxes in the EHR are small and do not allow you to see the entire written text. This creates a situation where the case handlers and approvers write observations as a separate document and copy the entire text from the document all at once into the observation box, which affects the time spent on the application proceedings. (LG, CA)
8. The function of the buildings to be inspected in the EHR has created additional burdens for the LGs. Previously, there was nothing to do with such buildings, which were indicated in the project plan as less than 20 m<sup>2</sup> and according to the law, they do not have to be entered in the EHR. To date, all such buildings are mapped by the Land Board as much larger and the LGs have to erase them from the EHR, which causes a time burden for the case handlers. (LG)
9. The EHR does not allow different reports to be compiled by the type of construction activity (e.g. several building permits have been issued to the new apartment buildings for erection, expansion, etc.) last year. Therefore, the LGs do not have a comprehensive overview of the issued building permits and internal databases must be compiled, which generate additional time burden. (LG)
10. The statuses of the building in the EHR are confusing since the status "under construction" is only for the buildings under construction, which have not been issued an authorization for use. At the same time, there are also extendable buildings under construction with the status "in use". The citizens, and also the Land Board, are always confused about this, and responding to such issues for the LGs means additional time burden. (LG)
11. In the EHR, the type of property "movable property" does not automatically become "immovable property" once the property is formed, which is why it needs to be changed manually, which in turn causes a time burden for the case handlers. (LG)
12. An old building notice cannot be invalidated if the LGs issue a new building notice because the construction notice is either incorrectly issued or new circumstances have emerged. As a result, there is confusion both for the case handlers and applicants with regard to the valid building notice. (LG)
13. PRIA requires a building permit for the buildings built on the basis of the grants given by them, although by law the buildings should be subject to notification obligations. Therefore, a building subject to the obligation of notification is processed with the building permit, which in turn affects the time spent on the proceedings. (LG)
14. When the precepts are uploaded to the EHR, all personal data related to the owner becomes

- publicly visible, which may not be in compliance with the new Data Protection Act (GDPR).\* (LG)
15. If the precepts are performed by the permit's owner, the case handler cannot mark the precept in the EHR as performed, which is why the quality of the EHR data suffers. (LG)
  16. The EHR does not provide automated messages on the expiring permits and notices to the applicants, so the applicants may not be sufficiently informed about the validity of their permits. (LG, C)
  17. It is difficult for the applicant to go to the LG for the reception since the LG's reception time is between 9-17 when the applicants usually have a working day and this affects the duration of the proceedings. (LG)
  18. The earlier versions of the applications are occasionally not maintained in the EHR, which makes it difficult for the case handlers and approvers to see what has been changed in the updated application, and this affects both the quality of the proceedings and the time spent. (LG, CA)
  19. The EHR has a document-based procedural system related to a spatial object (building), but no machine-processed spatial data. The EHR collects geo-source information, but it is not collected so that the Land Board can use it. It would be in the interest of the Land Board to obtain machine-processed spatial data from the EHR. (KK)
  20. The Land Board is short of the certificates of the Unreformed lands that are available to LGs to make clear whether the Land Board has a say in the proceedings. The Land Board turns to the LGs with such a request on a daily basis. This causes unnecessary time burden in the approval process. (KK)
  21. By downloading the EHR procedure documentation, all files are downloaded automatically, incl. the previous versions, so the amount of data downloaded is unnecessarily large. (KOV, KK, AA)
  22. The EHR does not allow the amendment projects to be processed and the applicants have no obligation to notify the LG and the approving authorities of any changes in the time period between the building permit and the authorization for use, and consequently there is no continuity in the procedural process, which in turn prolongs the time of processing the permit. (LG)
  23. The building notice and building permit proceedings are too similar. If the building notice is sent to the authorities for approval by the LG, the processing time for the building notice is extended by 30 days, which means that the building notice proceedings are often (ca 80% of cases) longer than for building permits. At the moment, the building notice procedure is faster because the construction notices are not processed at the sessions. (LG)
  24. The case handlers and approvers have no opportunity to provide observations across application when one application includes several buildings, so the case handlers write the same observation several times to different buildings, which in turn means that the applicants have to mark all observations separately as fixed in the EHR. This entails additional time burden for the applicant, case handler and approver to carry out the proceedings. (LG, CA)
  25. Logging in the EHR with an ID card has allowed all users to see the documentation of the issued building permits and authorizations for use, regardless of whether they are involved in the proceedings, which may not be the desired situation, as in some cases, publicly available documentation can qualify as a business secret. (LG)
  26. As the calculation of a building volume was changed in 2013, the permits issued before this date contain incorrect building volume data according to the present code, therefore, the quality of the EHR data suffers and the possibility exists that in the case of extension of the building containing the old data, instead of the mandatory activity of building notice according to the current volume rules, there is a construction activity with the mandatory permit. (LG)
  27. Since some design companies have different companies (about 15 pcs) created for the development objects, it is difficult to choose the right role in the EHR and making a separate user for each company is a time-consuming job. (EV)
  28. There is a great deal of mistrust between the LGs and approving authorities, as it has emerged that the authorities are approving procedures that do not actually meet the requirements and that the LGs, in turn, submit requests to the approvers that are not properly checked. This results in additional time spent on the proceedings, as the LGs and approvers carry out duplicate control activities to one another. (LG, CA)

### 1.5.6 Legislative issues

The following are the problematic points collected from the interviews regarding the laws and regulations pertaining to construction that need clarification or modification.

1. The applicants do not have a statutory obligation to approve with the LG on a regular basis the changes to be made during the construction work compared to the preliminary design on which the building permit was applied, therefore, the construction process cannot be monitored by the LG and the burden of the changes remains with the application process. (LG,

C)

2. Procedural deadlines are set in the legislation in weekdays, not in working days. If the applicant submits a building notice on Friday evening, the LG has time to deal with the notice only for 5 working days, which, in the opinion of LGs, is not a reasonable time for processing, as it creates unnecessary time pressure on the case handlers. (LG)
3. As the legislation leaves room for interpretation for the LGs regarding the conduct of proceedings, the applicants claim that there is too much subjectivity in the proceedings. There are differences by the case handlers of the rural municipalities and inside the rural municipalities regarding the procedural processes, and the applications are not processed on the basis of uniform requirements, which in turn creates confusion for the applicants in the preparation of the application and the ambiguity of what is required of them when submitting the application. (EV)
4. The state fee for a building permit and authorization for use is the same for all proceedings and does not depend on the volume of the object applied for, which has led to a situation where the state fee for a building permit/authorization for use of a high-rise building in the center of Tallinn and a single-family dwelling is equal, but in reality the volume of materials to be processed and time spent on the proceedings by the LGs and approvers is different. (LG, C, APO)
5. When applying for a building permit for the construction of utility networks, a preliminary design is required from the applicant, but it is not in sufficient detail to qualitatively assess the compliance of the utility networks with the issuance of a building permit. (LG)
6. There is no obligation to apply for a building permit or building notice for the construction of an underground cable line below 35 kV, which is why the LGs do not have a complete overview of the underground cable lines in the municipality. (LG)
7. The legislation does not require that the designers of communication utility lines have the competence to carry out the work in question, so people with no corresponding qualifications can also design the communication utility lines. (LG)
8. The Building Code currently states that the competent authority must issue a permit within 30 days of the submission of the application, but the duration of the proceedings does not depend solely on the party submitting the application (e.g. the application is returned to the applicant for fixing the observations which may take unknown period of time), so it is not always possible to issue a permit after 30 days from the submission of application. (LG)
9. The network operators usually require an operational project when applying for a building permit, although according to the law a preliminary design is required when processing the building permit, which is why some parts of the project (water reticulation, heating, electricity, gas) need to be done more specifically, which in turn prolongs the building permit proceedings. A uniform operating model should be provided by the legislation to provide clarity on the situation. (LG)

## 1.6 Best practices

The best practices identified during the interviews are described below, which enable to create efficiency in the present situation both for the applying applicants and the LGs and approvers in the process of conducting the proceedings.

1. Using street view software produced by Reach-U or Google allows the case handlers to better understand the environment around the procedural object and saves occasionally the case handlers and approvers from going to the on-site inspection. The practice is used in approximately 75% of the interviewed LGs.
2. Some design companies have built the automated file naming capabilities in the internal design software, making it easier to create correct file names for the EHR. The practice is used, for example, in the Novarc Group.
3. The EHR proceedings are made more efficient by the LGs through the simultaneous processing of several proceedings and the verification of professional competencies within several proceedings all at once. The practice is used, for example, in Jõelähtme rural municipality.
4. In individual LGs, the right to sign a permit is delegated to a construction specialist, which allows the permit to be issued without the intervention of the rural municipality, which in turn shortens the duration of the proceedings by about 1-2 weeks, as it does not have to wait for the municipal sessions. The practice is used for example in Türi rural municipality, Tallinn City, and Saaremaa rural municipality.
5. In order for the EHR to keep a record of all the proceedings, all applications are automatically processed, regardless of their shortcomings, and the application is then returned to the applicant for fixing the observations. Therefore, in some LGs, the practice of returning the unreviewed application is not used to prevent the proceedings from disappearing from the EHR and can be found within a system without having to look for data from the EHR-external databases. The practice is used, for example, in Kuusalu rural municipality.
6. Individual LGs carry out the ADS operations instead of the EHR in the ADS's system (ADS procedural application), which is more user-friendly and less time-consuming compared to performing an operation in the EHR. The practice is used, for example, in Põltsamaa rural municipality.
7. The approvers use the practice that if the proceedings are not within their sphere of competence, then the simplified procedure is executed, i.e. the official document is not formalized and the decision to abandon the proceedings is made directly to the EHR, which helps to save the time that would otherwise be spent in the institution's document management system to perform the procedural act. The practice is used, for example, in the Environmental Board, and in the Road Administration.
8. All orders of permits issued by the decision of the rural municipality government are labelled with the EHR's proceedings number so that in the future it would be easier to find the proceedings from the EHR when the need arises. The practice is used, for example, in Põltsamaa rural municipality.
9. Some LGs have a policy of storing data in one place, which means that if an application is registered in the EHR, it will not be duplicated in the local document management system of the LG, which will save the time of receiving the application. The practice is used, for example, in Põltsamaa rural municipality.
10. Since the EHR session expires quickly, in the meantime, users are going to the EHR where some operation is being performed to prevent the EHR from automatically logging out, which allows saving the time spent on re-logging to the EHR and navigating to the previous location. The practice is used, for example, in Rapla rural municipality.
11. As the performance of the EHR is slow in making queries, the LGs deal with the other activities related to proceedings as long as the EHR loads to allow the procedural efficiency. The practice is used in 90% of the LG.
12. In the EHR, the e-mail address of the official who is going on holiday at the approving authority is exchanged so that the information on the recurring approval reaches the authority and the approval procedures can be carried out in due time. The practice is used, for example, in the Rescue Board.
13. In some LGs, paperwork applications are not accepted and the applicant is directed to submit an application in the EHR in order to save time for the case handler, which would be otherwise spent on re-entering the proceedings in the EHR. The practice is used, for example, in Lääne-Harju municipal municipality.

14. In order to involve the landowner of the immovable being applied for, the reference data on the building is used in the EHR, which can be used to more effectively retrieve the data and the personal identification code of the owner of the immovable. The practice is used, for example, in the town of Paide.
15. To use the latest ID-card software because the older versions of Digidoc do not allow to display the full length of file names in the container, wherefore in order to understand the files' content, they certainly need to be previously unzipped, which could be avoided with the new software because the newer Digidoc software no longer has this problem. The practice was highlighted by the city of Tartu.
16. To direct the applicants by the LGs to submit applications as follow-up documents, which allows, for example, to use the building permit data in pre-filled form when preparing the application for an authorization for use, which in turn allows to shorten the time needed to prepare the application and save the applicant's mistakes in re-submission of data. The practice is used, for example, in the city of Tartu.
17. The ADS control is performed as a first operation in carrying out the proceedings (before comments are added and sent for approval) to ensure that the proceedings are handled quicker and to allow the problems related to the ADS to be dealt with on an ongoing basis during the proceedings. The practice is used in 50% of the LGs.

## 1.7 Suggestions for amending the situation

### 1.7.1 Suggestions for simplification of proceedings and processes outside of the scope

The following are the suggestions gathered during the interviews which, according to the interviewees, would make it possible to simplify the proceedings and create efficiency in the processes.

1. The data submission notice could be submitted electronically by the applicant to the EHR, which would save time for the case handler otherwise spent by the applicant manually entering the paper applications to the EHR.
2. The EHR could have the Smart-ID support for logging in to allow the on-site observations to be inserted into the EHR with a tablet to save time.
3. The applicants could have the opportunity to repeatedly submit files one at a time in the EHR when it is necessary to introduce changes to some documents in order to allow more effective submission of changes to the EHR.
4. The EHR could include the possibility of signing inside the system, which would make it possible to simplify the internal approval rounds of both applicants and approvers.
5. The search system in the EHR should be made more efficient. For example, it should be possible to search for proceedings by an address and the latest proceedings could be displayed as a shortcut on the desktop of the case handler.
6. Instead of the term of "returning without review", the term "to be returned without accepting for proceedings" could be used, which is more in line with the LG's activity and more understandable for the applicant.
7. The applicant could have the opportunity to submit his/her own observations when preparing the application, for example, to provide the LG with information on the network operators that need to be involved, which in turn would allow the proceedings to be carried out more efficiently.
8. The summary view page for observations could be more comprehensive, open in a separate window, and allow only unfixed observations to be highlighted, which would allow the case handler and the applicant to deal with the observations more effectively.
9. There could be fewer types of documents in the EHR and they could be more user-friendly. There are currently 190 types of documents, whereby the distinction is made for the same type of documents being produced at different times. Temporal differentiation can, if necessary, usually be done with the date range in the search, so there is no need to provide the additional document types based on temporal differentiation. More user-friendly selection could be done by determining the basic type (e.g. .110, 111, 129, 900, etc.), which will be specified if necessary. Finding documents of the same type at the same time could also be easier.
10. The EHR could allow filtering the list of proceedings (e.g. displaying the proceedings in which the permits are issued, what are being processed, etc.), which in turn would allow more efficient navigation between the proceedings.
11. The EHR could allow for the possibility of storing the standard texts (e.g., a reference to challenge, content texts) to facilitate the preparation of texts in the system.
12. The apartments in the complex buildings should be able to be divided by the sections so that there is an apartment No. 1 in each section (for example, there are 5 apartments with the sign No. 1 in the entire the complex building), which means that the repeating markings of the building parts should be enabled.
13. For utility networks and other facilities, presenting the spatial representation should be mandatory (e.g. adding multiple lines, distinguishing between water, rainwater and sewerage), which would enable the LGs to get a better overview of the location of the facilities.
14. The ADS proceedings could stand separate from the building permit proceedings and should not interfere with the building permit proceedings, as the entire address organization is within the competence of the LG to ensure faster processing of the building permit.
15. For facilities, there should be an application form separate from the building, as the description fields of the facility do not coincide with the building's own (e.g. there is no need to fill in the designs and technical data).
16. In order to increase procedural efficiency, rural municipalities could delegate the system-internal right of signing for the construction specialist, for which the MEAC could organize a discussion among the

- lawyers of the municipality in order to reach a common position on whether it is reasonable to delegate the right of signing to the construction specialists.
17. The case handler could, under the simplified procedure, be able to improve the matters related to the unique address him/herself, as it is within the competence of the LG and this would help to save time in the proceedings.
  18. It should be possible to archive inactive proceedings in the EHR to ensure that the list of proceedings is up-to-date and to facilitate navigation in the list.
  19. It could be possible to delete erroneous applications in the EHR to ensure that the list of proceedings is up-to-date and to facilitate navigation in the list.
  20. The case handlers could be given better guidance on how to complete the building notice proceedings within 10 days in order to meet the statutory deadline.
  21. The EHR could have a frame of reference assisting the case handler to ensure high quality and complete execution of the proceedings.
  22. The search filters of the list of proceedings could be supplemented, which one, in turn, should be able to save to ensure more efficient navigation in the list of proceedings.
  23. Payment of the state fee could take place in the EHR via a bank link and it should not be possible to submit the application before the state fee has been paid. This would save the time of the proceedings, as the case handlers usually return the application without reviewing to the applicant if the state fee has not been paid.
  24. The EHR could make it possible to prepare for an application, which includes several buildings, a single document separately and a specific document for each building, in order to eliminate redundancies in the documents and allow the application to be reviewed more quickly.
  25. In the proceedings, it could be possible to approve all the buildings at once in order to avoid separate approval of each object in the application.
  26. The MEAC could organize periodic EHR-related training courses, as there is a flow of staff among both the LGs and design companies and approving authorities, so new people today do not have good support to start working with the EHR. The training would also be necessary to introduce the EHR updates to long-term users.
  27. Detailed spatial plans could relate to the proceedings to speed up the process of receiving and processing the application. This requires linking the proceedings to the cadastral unit and the Land Board's GIS-layer, and from there one should find the plans.
  28. The EHR could display descriptive boxes of hints at different fields, which would make it easier to submit an application, but would also be of help to the case handler and approver.
  29. The button for recurrent submission of an application could be better visualized and placed in the last section to make it easy and understandable for the applicants.
  30. The EHR should allow the proceedings of the amendment projects to ensure that the building under construction is in compliance with the building permit.
  31. The wording of the checkmarks upon sending the approver's comments could be made more comprehensible to all parties (e.g. "For the LG's information", "For the applicant's information", "For the applicant to resolve").
  32. From the EHR one could find all the buildings and facilities that are on the unreformed land and display them in the map view to ensure the faster processing of applications of the unreformed land.
  33. The ministries could have the option of directing proceedings to their sub-offices. There are problems, for example, with the procedures concerning deposits, which require approval by the Department of Geology of the Land Board, but since the Ministry of the Environment dealt with this approval earlier, then some of such approvals go out of the old habit to the Ministry of the Environment, not to the Land Board, and the proceedings cannot be directed to the Land Board, therefore, the case handler her/himself must send a new approval application to them.
  34. The LGs should not have the possibility to set a deadline of approval to the approvers as it is established in the legislation.
  35. The case handler could have auxiliary material in the planning of the proceedings, in which case the approver should be involved (assisting questions in a style of "whether the object is in the protection zone", "whether a turnoff is designed", etc.) to help the case handler understand to whom the proceedings should be sent for approval.
  36. In the case of recurrent approval, it should be possible to extend the deadline, as the procedure is the same as during the first time, so the approval may not be completed within 10 days.
  37. The EHR could enable carrying out the proceedings related to the roads managed by the LG in order to ensure a LG-wide unified procedural practice related to roads. Currently, the road-related proceedings are carried by the LGs in different ways (e.g. in the EHR by selecting "Other facility"), so there is no overview of the roads associated with the LGs.
  38. All versions of the project documentation submitted by the applicant should be preserved in the EHR for observability of the proceedings.
  39. The EHR could allow the protocol constitution and internal approval to enable the process

of drafting the administrative acts to be transferred from the agencies' document management systems to the EHR.

40. The applicants could have a standard list in the preparation phase of the application, which documents need to be submitted to the EHR in order to facilitate the preparation of the application and conduct the proceedings, because the material is currently being presented with redundancy, which affects the performance of the system and creates complexity for the approvers and the case handlers in orienting in documents.
41. The case handler and the approver could be allowed to refer the proceedings internally to another case handler, in the event of being overloaded by the proceedings or going on leave, to ensure that the proceedings are kept within deadlines.
42. The EHR could support the creation of reports and statistics based on the in-system data. The LGs and the approvers are interested in the number of different permits and notices within different residential types (apartment building and detached house). In addition, it would be necessary to see how many proceedings are currently underway in the institution in order to monitor the workload.
43. There should be no obligation to fill in the applicant's fields when making a register amendment entry, as the LG does it always itself, so the applicant is actually missing.
44. When issuing notices and permits, there should be 2 dates in the proceedings – the date of receipt of application/notice and considering a notice as having been notified/the date of issuance of a permit. This would help to ensure a better temporal observability of the proceedings.
45. Calculating and collecting the fee for a building permanently connected to the shore could be within the competence of the LG (currently within the competence of the Technical Regulatory Authority), since all the components needed to calculate the fee are managed by the LG.
46. The proceedings of the national defense objects could take place in a separate module in the EHR, where unauthorized persons could not access the proceedings, and it would be possible to choose which document and to whom it is sent for approval/provision of opinion.
47. If a building permit is issued for demolition, the automatic notice could be sent to both the applicant and the LG that there is an obligation to submit a notice of demolition of the building, which would give the applicant an indication that a notice is required to start demolition.
48. In the case of applying for a notice of complete demolition and authorization for use, the EHR could show the obligation to submit a approved waste certificate and, if the waste certificate is not approved, it could be possible to involve the relevant approving body in the approval round.
49. There should be no possibility for the applications related to the LG to choose the Technical Regulatory Authority proceedings in the EHR in order to reduce dealing with the applications not relevant to the TRA.
50. There could be faster navigation between the proceedings and the application, so that the proceedings can be carried out faster.
51. In the EHR, the case handler and the approver could have the possibility to make a mark/checkmark on the document that the document has been worked through because it allows officials to better keep track of their work.
52. The EHR could support the conduct of the supervision proceedings, as the entire procedure is currently carried out in the document management system within the LGs and upon completion of the proceedings the formalized document (e.g. a precept) is uploaded to the EHR.
53. The naming scheme for building projects should be as simple as possible when applying for a permit, and there should be no obstacle to naming it as it is a ready-made project. This would make it easier for the submitters to submit an application, which would lead to time-saving.
54. In the case of applying for a notice of complete demolition and authorization for use, the EHR could show the obligation to submit a approved waste certificate and, if the waste certificate is not approved, it could be possible to involve the relevant approving body in the approval round.
55. The EHR could communicate to the applicant the necessity of submitting a notice of construction commencement via the automated notices to an e-mail. This means that if the building notice process is completed, then an automated notice of the non-mandatory nature of the notice of construction commencement could be received, and the mandatory nature of the notice of construction commencement could come when the building permit process is completed.
56. In order to find the current proceedings faster, it could be possible for the case handler to request them from the map view.
57. The capacity limit for the uploaded documents could be increased to simplify the process of uploading documents for the applicants.
58. The applicant could have the opportunity to add approvals to the application at the application preparation stage because in some cases the network operators provide approval already before applying, but it must be possible to identify to which version of the project the network manager has given the approval. This would help ensure that the case handler has an overview of the approvers the applicant has contacted.

59. The "Location" page could be optimized in the EHR, as private individuals have difficulties in completing it.
60. It could be possible to submit projects to several LGs at the same time, as one utility line may cross several LGs and this would prevent a situation where within a context of a single facility 5 applications to different LGs should be submitted.
61. The EHR could allow the applicants to manage approval before applying, and to choose who and in what order the application is sent for approval, as it is unreasonable to send the approvals elsewhere before the gas company has provided its approval, as the most drastic changes can come from there.
62. The information of the network operators' facilities could be available to both the applicant and the parties to the proceedings in the EHR in order to ensure a better quality of the proceedings and the procedural management.
63. The LGs should be better communicated about whether the course of the proceedings are managed with the MTR and whether it is a reliable source that should be used in the procedural processes
64. The network operators' information should be collected and a comprehensive and up-to-date view of all networks should be created to ensure procedural efficiency.
65. Since some network operators charge for the approval process (this action is unlawful according to the Chancellor of Justice), then the network operators' fees could be harmonized and incorporated into the legislation so that there would be uniform processing across the different network operators.
66. All network and cabling work should be included under the permits to ensure the LGs' review of the facilities within the municipality.
67. If some party provides negative approval, the proceedings should not stop for other approvers in order to ensure that all approvers provide comments to the applicant.
68. The EHR could provide a search for buildings/facilities from the map view to facilitate the conduct of proceedings.
69. The EHR could send an automated notice to the case handler that all the procedural acts have been completed and the proceedings are ready for approval, which would enable a faster procedural process.
70. The EHR could allow opening a document preview within the system so that you do not have to download and open the document separately to see the contents of the document.
71. The property owners should always be involved in the procedural process as persons involved and should ensure that the owner is given at least an automated notice that his/her property has been applied for and he/she should be able to keep up with the course of the proceedings if so wished.
72. All digitized detailed plans could be assembled on the map of the Land Board in order to be able to display detailed spatial plans on the map data and make it easier to find them.
73. The unreviewed returned applications should be retained in the EHR so that all the proceedings associated with the case handler are observable and accessible for him/her.
74. It could be possible for the case handler to select the observations in the approver' observation view that go to the building permit/authorization for use. This would allow creating efficiency instead of current manual copying.
75. Once a building permit is issued, a summary table of approval could be retrievable from the EHR in a PDF form that the applicant can submit to the builder in order to save time for the applicant who would otherwise create a summary table of approval manually.

### *1.7.2 Proposals for standardization of proceedings, automation, and simplification of movement of information/formats*

The following are the suggestions made during the interviews that would allow according to the interviewees to standardize, automate the proceedings and simplify the movement of information/formats and thus create efficiency in the procedural processes.

1. The EHR could allow for automatic controls to communicate with the applicant about the errors in the application and not filling in the mandatory fields (e.g. a phone number, the builder, and the owner should be marked as the persons involved, etc.) before the application is submitted, which in turn would allow to improve the quality of the applications. For example, the EHR could automatically carry out volume controls to determine whether, in case of rebuilding, the extension of the building is above or below 33% and to communicate in case of the incorrect type of application, for example, a building permit should be presented instead of a building notice.
2. The EHR could, when submitting the application, allow the categorization of the documents to be submitted, after which it would be possible to automatically generate file names for the documents by the system. This would save time for the applicants to generate the correct file name.

3. The EHR could allow the use of a DWG/DGD/DXF file in the proceedings, for example, to automatically insert the spatial representation of an object and request constraints related to the object from the map view to automate the procedural process.
4. The EHR could allow localization of network service providers related to the object applied for, which would allow the publishing of an opinion and approval processes to be carried out more efficiently, as with little time there would be knowledge of the network operators who could be involved in the proceedings.
5. An XML format with specific data fields should be set up for the submission of a construction journal, which would allow the submission of a machine-readable construction journal to be submitted to the EHR, which would help save the applicants' time spent on uploading the construction documentation to the EHR.
6. The EHR could allow the control function to determine the correctness of file names in order to save the time it takes to generate file names when preparing the application.
7. There could be an interface between the internal information systems of the EHR, the approving network operators, and the authorities (e.g. Telia, the Register of the National Heritage Board) to allow the applicant to submit an application to the EHR, which in turn, if needing approval, would go to the internal information systems of the network operators/authorities, where they can perform the approval process, and the decision to be issued with the necessary observations from their information system would automatically reach the EHR. This would allow the entire process to be carried in the applicant view in the EHR, and it would save time, otherwise spent on the duplicate data management between the EHR and the internal information system, for the approvers.
8. The EHR could have an interface with the Technical Regulatory Authority's register of electrical installations audit so that the required document can be added from the register of electrical installations audit when attaching the application for the authorization for use.
9. The control of the completion of mandatory fields of an application submitted in the EHR could be at the end of each category (currently only at the end of the application) to ensure more efficient application preparation and to allow for more prompt correction of errors.
10. In the proceedings, the collection of documents required for the application should be standardized, i.e., it should be transnationally established which documents are to be submitted in the various proceedings to improve the quality of the applications submitted.
11. In case of the involvement, the e-mail sent to the parties to be involved could include a specific reference to the proceedings, clicking on which opens up a proceedings view on a relevant location in the EHR for the party to be involved.
12. The EHR could have an interface with the MTR and the Professional Chamber to allow for the automatic controls on the competence of the persons associated with the application, which save approximately 15 minutes of time in each proceedings.
13. The EHR could have an interface with the Land Register and the Population Register in order to enable the process of involvement of adjacent neighbors to be carried out as effectively as possible.
14. In the EHR, there could be a possibility to submit a file in an XML or CSV format that provides to the system all building/facility related data from the cadastral unit number to information on how wide is the well and how long is the utility line or how many square meters of the non-residential space there is, which would allow making the submission of the application more effective.
15. The EHR could provide an interface with the Business Register, which would make it easier to associate a private individual with a legal entity and to facilitate the creation of a company user in the EHR.
16. The Land Board's map application could be integrated into the EHR's system and this could enable to view objects in the map view, the related constraints, and the opportunity to view the design provisions and permits related to the object. This would allow finding all the information the case handler needs in a compact manner from one location.
17. In the EHR, there could be an opportunity to inquire about the constraints related to a cadastral unit in order to provide an indication during the preparation phase of an application of what can be built on a cadastral unit.

### *1.7.3 Proposals to increase procedural transparency*

The following are the suggestions gathered during the interviews that would allow according to the interviewees to increase the procedural transparency.

1. The applicant could see in the EHR all the parties involved in the proceedings, which would increase the procedural transparency and reduce the LGs' explanatory burden during the proceedings.

2. In the involvement process, an automated notice could be sent to the case handler in case the e-mail sent to the party involved does not reach the addressee to ensure that the information needed reaches the parties involved.
3. The EHR could allow users to configure which automated notices they wish to get to their e-mail in order to prevent unnecessary information reaching the users' e-mail.

4. Before the proceedings' deadline has been reached, the approver, the author of an opinion and the case handler could get the automated notice from the EHR about the approaching deadline, which would help to prevent the situation where an involved person for some reason overlooks the proceedings.
5. Procedural information could be more transparent for the applicants. It should be observable at what stage is the proceeding, to where, to whom and when the applications for approval (both internal and external) and letters of involvement have been sent.
6. The date of registration of the building notice/use and occupancy notice and the name of the person making the entry should be visible in the EHR (currently only the date of application, and no other information is available) to ensure the procedural transparency.
7. The external approver could be obliged to include a relevant reason for extending the deadline to increase the transparency of the approval process for the LG.
8. Upon the entry into force of the ADS-operation, an automated notice could be sent from the EHR to the e-mail of the case handler, in order to ensure the procedural transparency and thereby also a faster procedural process.
9. The opinions expressed by the approver during the preparation phase of applying could be available to the case handlers in order to bring efficiency to the procedural reception process.
10. The approver's information could be public to the applicant to allow more effective communication between the applicant and the approver.
11. The EHR could better interact with the user, i.e. give feedback within the system, for example, that the approval provided by the approver has been communicated to the LG or the recurrent submission of the application has been made by the applicant.
12. The applicants should see the proceedings' number in the EHR so that during the counseling the official can find the object under observation from the list of proceedings with maximum efficiency.
13. The case handler could be provided with an automated notice when the notice of construction commencement has been resubmitted, which would enable the procedural process of the notice to be carried out more effectively.
14. The EHR could be allowed to send automated notices to the applicant about the outdated permits and notices to ensure the informed state of the submitters of notices/permits on the validity of notices/permits issued to them.
15. If in the EHR, an application has been attributed to the case handler, the return of the application could take place under the contact of the case handler, rather than impersonally as at present, which would make it possible to facilitate a direct contact between the applicant and the case handler.

## 2 Future vision

### 2.1 Vision about digitalized steps

The following vision describes the most important digitalized steps by generalized processes and their stages that may most probably contribute to remarkable efficiency in applying for services and procedural processes.

#### 2.1.1 Submission and proceeding of applications/notices

##### The phase of preparing for application

The preparation phase is time consuming for the applicants who try to catch up with things as well as for the case handler who advises them during that process. Hence the vision could consider the self-service services that would enable faster consolidation of information that is collected during preparation. One of the ideas could be the service where a person gives the cadastral unit ID as an input for which they will get the following information in return:

1. Valid and invalid documents that are related to the unit and the construction works (incl design specifications (DS), notices, permits and possible precepts); Possibility to start compiling the follow-up documents immediately by the documents;
2. Valid detailed spatial plans (if can be centrally requested);
3. Restrictions that are related to planning a building to that site, incl information about what is needed or reasonable to do before submitting the application for minimizing the restriction-related risks.  
For example:
4. please find the comprehensive plan valid for the registered immovable here;
5. the protection zone of the network operator's route passes the registered immovable, which may involve technical specifications upon design works (apply for these here);
6. the registered immovable is on the nature reserve and hence the planned design must comply with the conservation management plan (find it here);
7. there are objects protected under heritage conservation on this registered immovable, hence a separate permit from the National Heritage Board (MKA) may be needed for construction works (apply for it here);
8. an opportunity to open immediately the restrictions on the map (inside EHR or with a Land Board link).

This service could enable save time for data queries significantly.

Beside the above specified, to help the interested parties to understand what they exactly need to apply for for satisfying their interests (which service to use), it would be possible to create a questions-based service about the wishes the outcome of which will state the correct service to apply for (a notice or a permit or maybe nothing should be submitted). If necessary, directs the applicant directly to the application whether as a follow-up document or a new document.

##### Preparation of the application/notice

When the applicant prepares the application, a lot of time is spent for incorporating and signing the documentation submitted as annexes, i.e. correct naming and structuring and later uploading of documentation. Today, incorporating and signing, including structuring of documentation and ensuring naming schemes is performed outside the system and correctness of the prepared items can only be checked after uploading the files.

Efficiency could be increased a lot for the applicants if in addition to the existing situation, it would be possible to incorporate and sign documents also inside EHR, e.g. based on invitations. The applicant controls the whole process:

1. They start compiling the application and fill in information that is necessary for applying;

2. Different scenarios could be available for consolidating documentation and loading these to application :
3. the applicant compiles and signs documentation outside EHR system by ensuring the correct naming schemes;
4. the applicant compiles documentation outside EHR system by ensuring the correct naming schemes; but can upload the whole package without signatures and emails the signing invitations to these who have to sign via EHR. The recipient of the invitation has a link in the e-mail that immediately opens EHR for signing (similar to Digidoc.ee service).
5. The applicant compiles documentation outside EHR system without signatures and ensuring the naming scheme to the package register where it is possible to correct the names and change the document structure, if necessary. The system itself enables to check the correctness of the naming schemes and give indication about the correctness of the names. The uploaded and organized documentation package is signed via the signing invitations. If the different parts of the documentation package need signatures from different parties, it is possible to send just that part of the package to the relevant party.
6. The applicant sends invitations for documentation loading to different parties who load the documentation to the system where the applicant can reorganize these as to the structure of location (e.g. catalog), if needed and organize the documents. Then it is possible to sign by the means of invitations in the system according to the scenarios above.
7. If it is necessary to amend signed documentation, it is also possible to make amendments to a single document (load a new version of the existing one, versioning it automatically, if needed or add a new document). As the result, the system itself is able to identify the persons whose signatures should be repeated for making the amendments in the document structure and their signatures' hierarchy and send these parties the signing invitations automatically.

The support for such additional scenarios could solve majority of the problems related to incorporation and loading of additional documents that may be very time consuming.

Another added value for efficiency would be if the applicant could transfer within EHR the DWG file of the uploaded project to the Land Board's restrictions' map and view it by toggling the layers (incl also e.g. the layers of the danger zones of dangerous enterprises, layers of mapping of ETDB (grey buildings) and other beside the restrictions) that would provide maximum ease of use for the professional applicant to be sure that what is planned complies with all necessary items. An addition where the case handler or a reviewing official could have the same functionality would give remarkable added value that would guarantee that all parties have the same views within the system and that would also make feedbacking much simpler. An impact would be increased quality of applications and reduced number of rounds of repeated approvals caused by current possible ambiguity.

### **Receiving application/notice**

The main time commitment upon reception of applications is related to entering the applications on paper or as digital documents to EHR.

1. An API could be created so that the parties interested could transfer the applications to EHR via machine-machine interface. Creation of such interfaces will allow to create greater potential for submitting the data in machine-processable format (incl e.g. submission of design documentation as BIM, DWG\DGN\DFS project, as a XML format documentation, or other). It would also create an opportunity for the web service developers and SaaS service providers to develop better, more efficient and user friendlier e-services for compiling and submission of applications, including for developing the event services where some EHR service could be a component service. There is an option for opening the doors for public as well as private sector for using the API.
2. Appointing the case handler and initiation of the proceeding could be separate procedures in the system. Initiation of the proceeding could be automated since it directly follows the Administrative Procedure Act that states the proceeding starts on the day after arrival of the document.

### **Application/notice proceedings**

The repeated approval rounds are one of the main reasons for extended and lengthy proceedings. To reduce the repeated approvals, the quality of the submitted application and the review of the application should be increased and managed. Quality management of the application should start at the preparation phase where the emphasis should lie on helping the applicant at creating quality. Case handlers, parties to proceeding and also applicants who submit supplements should be helped during proceeding.

The following includes recommended digitized steps in the proceeding phase that could enable to

1. The address information part could be separated from the composition of the application in proceedings so that this part could be proceeded separately, in parallel with the rest of the application documentation and the related changes would not cause the need for supplementing the application and repeated approvals. Address maintenance is in the competence and responsibility of LG. The address submitted by the applicant should be taken as recommendation but LG need not follow it necessarily. LG itself may correct the address so that it is correct without the need for the applicant to supplement it in the application. Solution for that recommendation would eliminate plenty of repeated approvals caused by the need to change the address at the final phase of proceeding.
2. It should be possible for the case handler to give possible provided options by ticking several procedural steps. Each institutions could set up their own options. 10 day deadline could be applied automatically for coordination so that the case handler need not select it. Queries of contact information of the involved persons of the procedure of involvement of the adjacent neighbors could be performed as an automatic chain within EHR and performed on command of the case handler. Upon involvement action, it should be possible to enter the cadastral unit numbers of the adjacent neighbors to the system as comma-separated, select the list by clicking the units on the map, or request the adjacent neighbors from the Land Board by an automatic request resulting in automatic Land Register and commercial Register requests which gives the case handler the list of involved persons (that can be later updated, if needed). It is possible to enter a single standard involvement text to the whole list that is sent automatically to all contacts who are ticked in the list. Involvement is carried out as an invitation of the procedural act to the e-mail address that contains a direct link to involvement with an option to examine the application and express an opinion. If the personal identification codes are recorded as the result of the chain query to the specified procedural acts, the involved persons could see the act on their desktop by logging in to the system. When the involvement invitation is sent, it must be possible to identify whether the invitation was received and ideally, it could be automatically displayed in EHR. As an alternative, the failure notice of sending the involvement invitation could reach the e-mail of the case handler based on which they could find out the ordinary mail address that is received according to the data of residence that were saved as the result of the chain request in the system and it is possible to print the involvement invitation directly from EHR on paper (or as .pdf document) to give it to the institution's rapporteur for sending (ideally the .pdf of the generated invitation could be sent directly to the rapporteur's e-mail within the system).
3. The case handler could see the restrictions on the map that is integrated within EHR with the spatial representation submitted with the application similar to the proposals made during the application preparation phase.
4. During the coordination round, the applicant can communicate with the official who received the observation and before the end of the coordination round, the coordinator/author of the opinion can change their opinions or observations. For example, sometimes the proceeding party cannot identify a necessary document during reviewing the application although it is added there. If today, the performer of the operation leaves a observation about it and then the applicant should wait for the whole coordination round to tell the official that the document is actually there after which the new coordination round should be performed. Enabling that proposal could avoid such situations.
5. EHR could provide an automatic interface to the institutions for giving the procedural acts and receiving the outcomes of the procedural acts. Many coordinators and authors of opinion prefer their internal systems for performing procedural acts. Enabling the automatic interface could allow these parties to make their own interface to their system that would inquire the procedural acts given to the institution and the related information (incl an application, if needed) and register these in the internal systems where these are proceeded. The outcome of the proceeding would be returned to another EHR interface that receives the outcome and updates it by the relevant procedural act. MEAC could consider developing the EHR procedural act interfaces to the standard document management systems. Necessary API for creating interfaces could be provided for the institutions who use tailor-made solutions. This could be an alternative to the situation where the institutions are forced to use EHR for performing procedural acts. The interviews showed that there are institutions who are very much interested in these services (e.g. Telia). This could enable continue with a flexible situation to use own solutions for proceeding the administrative actions but without an extra burden for data transfer across systems.

### 2.1.2 Executing register amendment entries

At urgent request of LGs, the self-service of notice submission could be recovered for execution of the register amendment entries. The LGs have also asked for an option to proceed such notices and not only registering these. The LG should still have an opportunity to correct the address, if needed, or specification of the spatial representation. It must be possible to differentiate the proceeded notices according to their state from other notices and filter these, if needed.

### 2.1.3 An alternative scenario: Application based on BIM

One of an important alternatives for MEAC in the future of the EHR proceedings is submission and proceeding of the BIMs. According to the vision, the BIM could replace the current voluminous documentation package of the building design documentation which management and preparation for application is an activity with high administrative burden.

This vision is favored by the fact that by now, a considerable number of designers and companies who deal with building use the standard BIM format (*IFC - Industry Foundation Classes*, ISO 16739-1:2018<sup>4</sup>) for creating and managing the building design documentation. This was also confirmed in surveys carried out among the applicants. Since the BIM stores the data that describe the buildings in a machine readable form, this seems to have high potential for automation of application and proceeding in EHR.

But considering that not all businesses today have the BIM capability and also the private persons who build for themselves submit applications who also do not have skills or possibilities to describe BIM, the BIM-based application is seen as an alternative scenario for the current situation. This will open the door primarily to the businesses who already use modeling but are also forced to deal with management of the documentation package beside that because of a lack of good alternative.

Use of BIM presumably creates efficiency to the procedural acts since estimably it will:

- reduce the time spent for management of the design documentation;
- reduce time spent for submission of application (uploading and filling in the data);
- reduce time of proceeding (options for applying the automatic controls, faster review of the model by 3D visualization, simplified supplementation of information during proceeding).

Emergence of BIMs in EHR environment will also create additional possibilities for checking data and finding possible conflicts inside the design documentation as well as across design documents that could enable planning of construction activities with higher quality to minimize the risks occurring during construction activity. The BIMs also create a potential for the construction industry also in a longer perspective since more accurate and machine-processable about the used materials and volumes enable to perform improved demand forecasts for managing the supply chains of construction materials or treatment of construction waste.

<sup>4</sup><https://www.iso.org/standard/70303.html>

## 2.2 TO BE process cards

### 2.2.1 Applicant's view

#### 2.2.1.1 Preparation for application

During the preparation for application, the interested party requests information about the building requirements on the cadastral unit and information on buildings on it/passing it. In the future practice, such information could be obtained also from the relevant service of the Register of Buildings beside counseling with the local government.

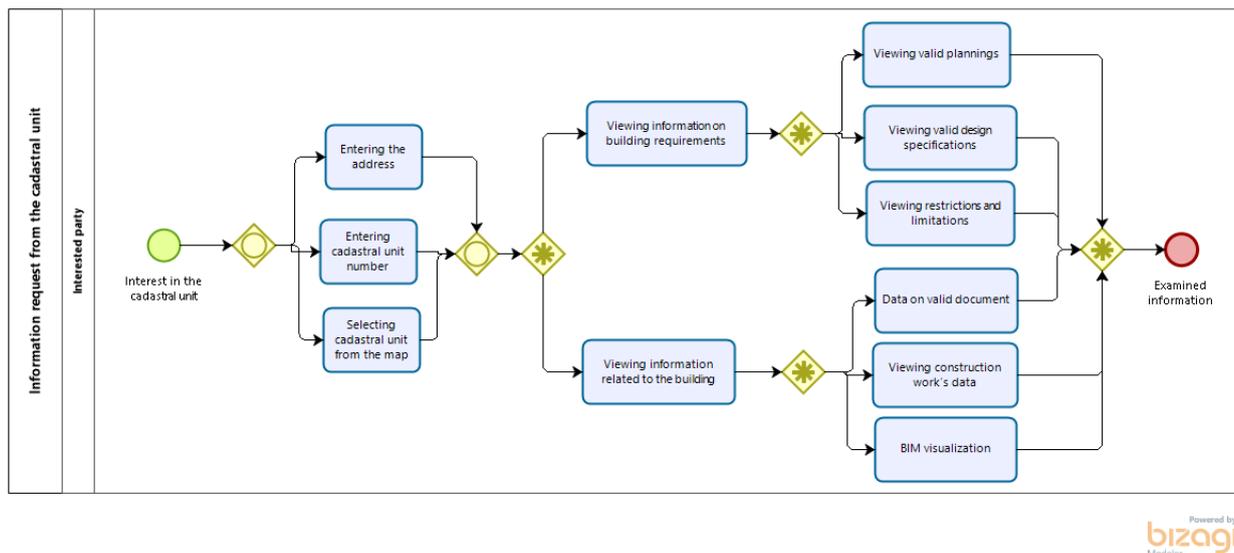


Figure 18. Information request service of the cadastral unit

This service should be easily available on the homepage of EHR. Service will start from determining the location of the interested site by initiative of the interested party. It must be possible to determine the location by the cadastral unit ID, address as well as by locating the site on the map. The system will use maximum amount of trustworthy data sources that enable to obtain information about the building requirements, limitations and restrictions and at the same time it is possible to obtain information about the buildings on the site and related data (incl valid permissions and registered notices). If the register has any BIMs of the buildings, the system should also show the building's BIM visual as a 3D model. This enables to percept fast the shape and position of the building in the space as well as obtain more detailed information about the structure, materials and technical systems of the building, if desired.

Information gained through requests should indicate the direct references to the original source of information that enables to navigate to the relevant databases for getting more information. Information from the requests should be synthesized enough to create an understanding about which kind of building activities can be carried out in the location and what can be built there, also an understanding about what should be done to do that.

#### 2.2.1.2 Preparation of the application/notice

The application/notice is prepared in three stages. In the first stage, the applicant will find out whether they could create the application/notice as a follow-up document. The information request of the cadastral unit is a good starting point. This shows the valid documents of the buildings on the site. It should be possible to create a follow-up document from the valid document.

The follow-up documents enable to reduce the inconsistencies with earlier documents when entering the building data that would otherwise show only when reaching the proceeding. If the applicant wishes to start a new document, the system should automatically check whether the buildings on that location already have some valid documents when the location is determined upon preparation of the document and offer to convert the prepared document to a follow-up document when something similar already exists at the same location with the same coordinates. The applicant should retain the right to reject this offer.

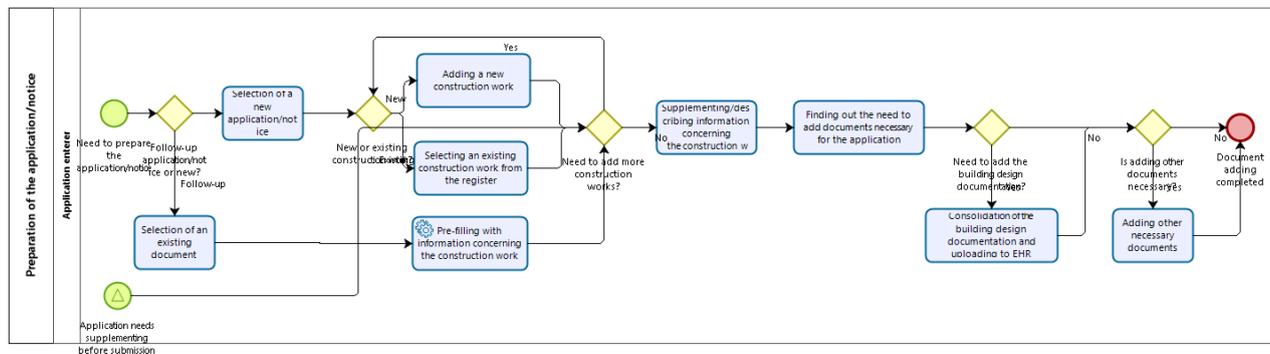


Figure 19. Preparation of the application/notice

The second stage includes adding the building's data to the notice/application. If it is a follow-up document, the system should pre-fill the application's data to the extent possible with the data of the follow-up document. The applicant must be able to add to the application the buildings that exist in the register as well as the ones that are not in the register yet. Upon selecting the building from the register, the building data are pre-filled on the application/notice to the extent possible. The applicant must be able to correct the data on the pre-filled application according to their planned building activities.

The system must enable the applicant to view the spatial form of the buildings that are added to the application on the internal system map where it is possible to view the sites with the Land Board's restriction map's layers that can be turned on and off. This way the applicant can identify possible additional restrictions or limitations to consider with the building design documentation, if needed.

Upon entering and changing data for preparation of the application, the system should interactively check whether the building activity type that forms the basis for the application/notice correlates with the planned type (primarily the volume) and provide relevant feedback to the applicant about whether the permission or notice is necessary for the described volumes and whether it is necessary to submit the building design documentation.

The third stage of preparation includes adding the necessary documentation/data to the application/notice that additionally describe the planned building or building activity. For the building design documentation, it is necessary that the system enables to upload the data of the building design documentation that have been collected and organized outside the system as well as enable to upload the data of the building design documentation and organize and sign them inside the system.

If the uploaded building design documentation has the project data in the machine-readable form (IFC models, DWG\DXF, LandXML, GML, or other), the system must be able to read the spatial forms and coordinates of the building automatically for the application and compare these with the spatial forms and coordinates that have already been entered to the application to identify possible inconsistencies.

If BIM is uploaded with the building design documentation, it must be possible to view the 3D visualization of BIM inside the system (e.g. BIM Surfer<sup>5</sup>).

<sup>5</sup><http://bimsurfer.org/>

### 2.2.1.3 Preparation of the application with BIM

As an alternative scenario, the applicant must be able to prepare the application and submit it by the means of the BIM. The figure below illustrates preparation and submission of the application by the means of the BIM.

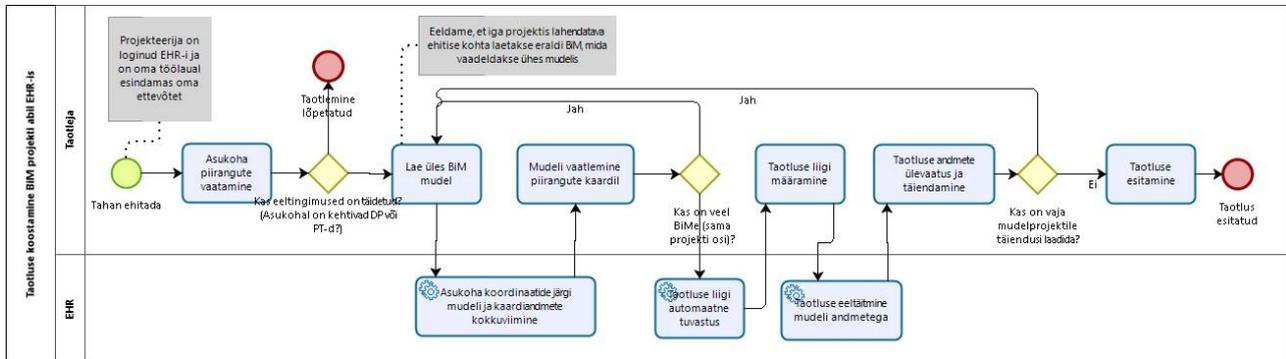


Figure 20. Application preparation by the means of BIM project in EHR

The process description presumes that the provider of the application is a designer who has the completed BIM of the building and who wishes to apply for the building permit with it. The designer has logged into the EHR environment where they have selected the represented person and are at their desktop. During designing, they have repeatedly viewed the restrictions that are related to the location of the planned building. They have earlier received information about the valid detailed spatial plan or existing design documentation terms, and if they did not have these during the design works, these were applied for separately. By now, they have prepared the BIM and they are ready to apply for the building permit (or notice) by the means of the BIM.

As the first activity, they will upload the completed BIM. After uploading the BIM, the system will automatically read the location coordinates of the building and the spatial form from the model and displays it visually on the map. The map is positioned to the location where the building is planned (to the whole extent of the building) and the applicant is able to turn on the Land Board's restriction map's layers to identify visually the possible conflicts and make sure that everything is where they should be.

Since the BIMs management logic allows to load different parts of the building (e.g. piping, foundation, roof, floors, etc) to the model design as separate BIMs, the applicant will repeat the BIM loading until all necessary parts are added. If the applicant confirms that they have finished loading the BIMs, based on the data of the loaded modelings and earlier existing building, the system tries to identify automatically the type of proceeding and building activity and offers the applicant, whether they need to complete the building notice or building permit and the type of the building activity (e.g. reconstruction, addition, demolition, or other) based on the data.

The applicant will check the accuracy of information provided by the system and corrects it, if needed. According to the selected proceeding and type of the building activity, the data necessary for the relevant application are read from the BIM and the application is pre-filled. The applicant will review the pre-filled data, and if it is necessary to correct the data, uploads the relevant modeling (or part of it) again. Modeling uploading should follow the principle that the data are changed only in the original source and hence it should not be possible for the applicant to correct the data elsewhere than in the modeling. This will prevent the situation where the application has data that do not comply with the modeling.

After loading the modeling and pre-filling the application data, the application will be submitted in the same way that the application with design documentation is submitted.

## Important observations

1. One of the main obstacles for taking the BIMs into use in the world is lack of manuals and standards. To start to use the BIMs in EHR and gain the expected benefits from it, the BIM standard should be first created and taken into use. This standard should state the type of the data that should be guaranteed in the modeling and the form of these data. In the Estonian practice, Riigi Kinnisvara AS has developed the requirements for modeling the building information<sup>6</sup>, by taking the COBIM modeling design general requirements and the related standards as the basis. To achieve the BIM-based application and proceeding in EHR, it is reasonable to implement similar requirements that the applicants could follow. It would be impractical to create different modeling requirements for different institutions since this would probably increase the management load of the modelers. It is reasonable to extend one model so that it would suit for all instances who need such information. This would allow to implement better the *once-only* principle introduced in the country by allowing to share the modeling provided for one national authority with others.
2. Selection of the BIM visualization technology in EHR should consider that different technologies display the same information differently. The following illustrates the troubleshooting views of the same modeling in different technologies:

Case	Revit Geometry	Revit Interference Check	gbXML Viewer	FZKViewer	Effect of Energy Modeling
Errorless					
Duplicated Object					Wall Area Error
Interference between Objects					Roof Area Error
Space Setting Error					Wall/Roof Area Error

Figure 21. Differences upon visualization of the BIM with different technologies

It is reasonable to perform selection of the best technology before implementation of the technology by involving the industry experts, modelers as well as case handlers. If needed, the middleware should be used by the help of which the modelings that are uploaded to the system are checked and, if needed, harmonized.

### 2.2.1.4 Compilation of the building design documentation and uploading to EHR

It should be possible to compile the building design documentation by the support of the EHR system. This will remarkably contribute to document loading problem that comes from the pre-structuring requirement of the building design documentation. Majority of the non-professional applicants are in big trouble with it and their life could get much easier if the Register of Buildings could enable to load the documents to the system without structuring. On the other hand, this situation will naturally cause problem for the case handlers who would not be able to understand the content of the building design documentation when it is not structured.

<sup>6</sup> <https://www.rkas.ee/kasulik-info/bim>

Hence it is reasonable here to use the options for a “middle ground” and enable the applicants to upload the documents without the structure but help them form a necessary structure within the system by the help of the system.

Still, for professional users, there could be an option for uploading the pre-structured documents from which the system is able to read all necessary items. The professional users need an additional tool that they can use before uploading and taking signatures to the building design documentation that would enable to understand whether the compiled documentation has correct structure and naming schemes. It is reasonable to add an additional functionality to preparation of applications in EHR that will enable to scan from the digidoc container, or the structure of the documents in the zip/rar format with naming schemes (incl metainfo of the documents) without uploading the documents and give fast and immediate feedback whether the structures is OK for uploading. This simple checking service hides a remarkable gain in time for professional users.

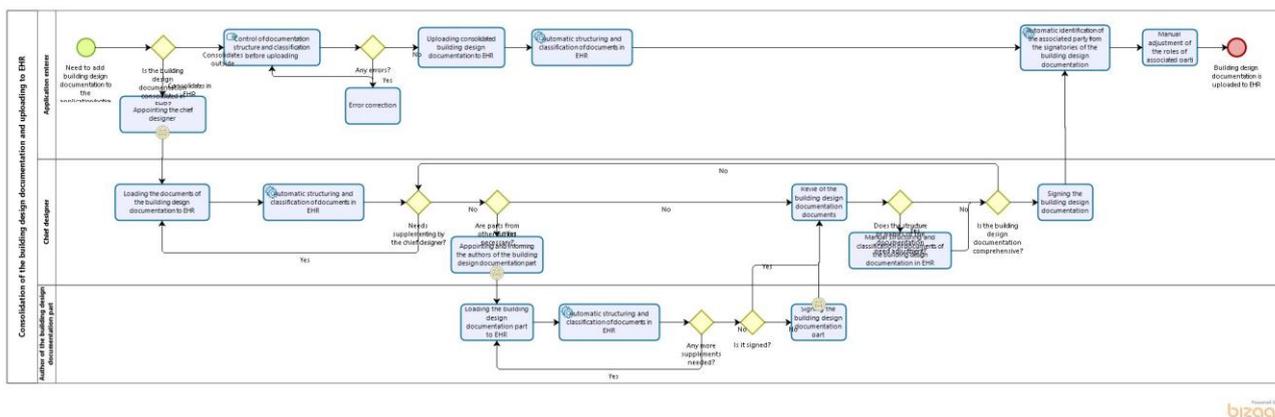


Figure 22. Compilation of the building design documentation and uploading to EHR

In addition to an option for uploading the documents in unstructured form, the system could provide support regarding consolidation of the whole documentation by being a central repository for preparing the application documentation by the head designer as well as the authors of all parts of the design documentation. It must be possible for the head designer to invite the authors of the parts of the design documentation to upload the documents by sending notifications to the authors of the parts of the design documentation as a shortcut to the relevant application in EHR. The head designer follows arrival of the documents and is responsible for the conformity and integrity of the building design documentation. The system should allow signing of the documentation or its parts. That way the authors of the parts of the design documentation can sign their part of the design documentation and the head designer can sign the whole building design documentation. Signing must also be done as an invitation with shortcuts to the signing operation for giving a necessary signature with minimum effort (good example is a digidoc.ee <sup>7</sup> service).

The system must be able to read the persons related to the application/notice from the signatures in the building design documentation automatically and this will facilitate checking of the competencies of the persons in the later phase of the proceeding. The applicant should be able to appoint the roles of the automatically identified associated persons.

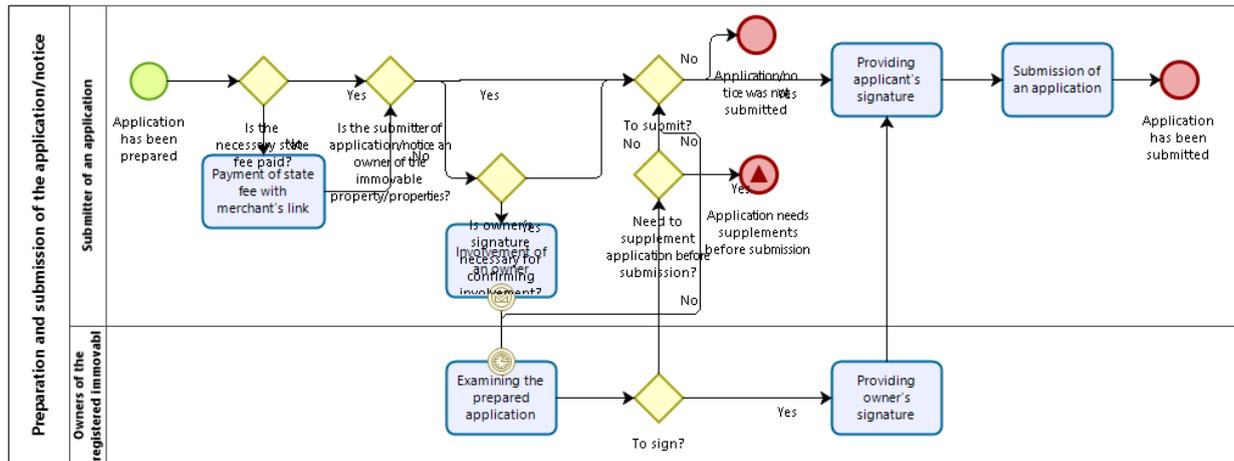
### 2.2.1.5 Preparation and submission of the application/notice

After the application has been prepared, the payment of the state fee must be confirmed for application of the permits. An applicant must be able to pay the state fee directly via the bank link before submitting the application. It must also be possible to certify payment of the state fee as the payment order.

There are often situations where the applicant is not the owner of the immovable to which they apply/submit the permit/notice. In that case it is a common practice that the actual owner of the immovable is involved in the proceeding.

<sup>7</sup> [www.digidoc.ee](http://www.digidoc.ee)

To ensure procedural economy, the applicant will visit the owner before submitting the application and takes the necessary confirmation of the owner as a separate document. EHR system could help and provide an option for receiving the immovable owner's confirmation directly before submitting the application/notice. The applicant could be able to involve the owner, if desired, and the owner can deliver their confirmation about examining the design documentation before submitting it.



Powered by  
bizagi  
Modeler

Figure 23. Preparation and submission of the application/notice

In theory, the owner of the immovable can refuse approval or ignore it, or object to this. Despite that, the applicant must have an option to submit the application, if desired. If needed, it must be possible to go and change the information on the additional documents by coordinating it with the owner. After the changes, the applicant can involve the owner again by hoping that everything is OK now. Before submission, the applicant may re-think and not submit the application if they see that the probability of achieving what is applied for is low.

### 2.2.1.6 Supplementation of the application/notice

The application/notice is supplemented when the competent authorities who have reviewed and checked the application find that there are insufficiencies/inaccuracies that should be solved for continuing with proceeding.

An important addition for saving the time would be if the applicant could start fixing the observations already when they get aware of these (before the end of the approval round). Making amendments to the building design documentation of additional documents by the documents could also save time remarkably. Signing with invitations as shortcuts within the system could greatly contribute to this solution.

These solutions help the applicant to enter supplements to the application already during the approval round. Each added/changed/amended/supplemented document versions automatically by enabling to track the documentation amendment more easily, incl it is possible to trace the document versions that the competent authorities have viewed or not viewed. When the amendments are added, it is possible to identify automatically which parties need to sign the amendments and immediately send the signing invitations to the relevant parties from the system.

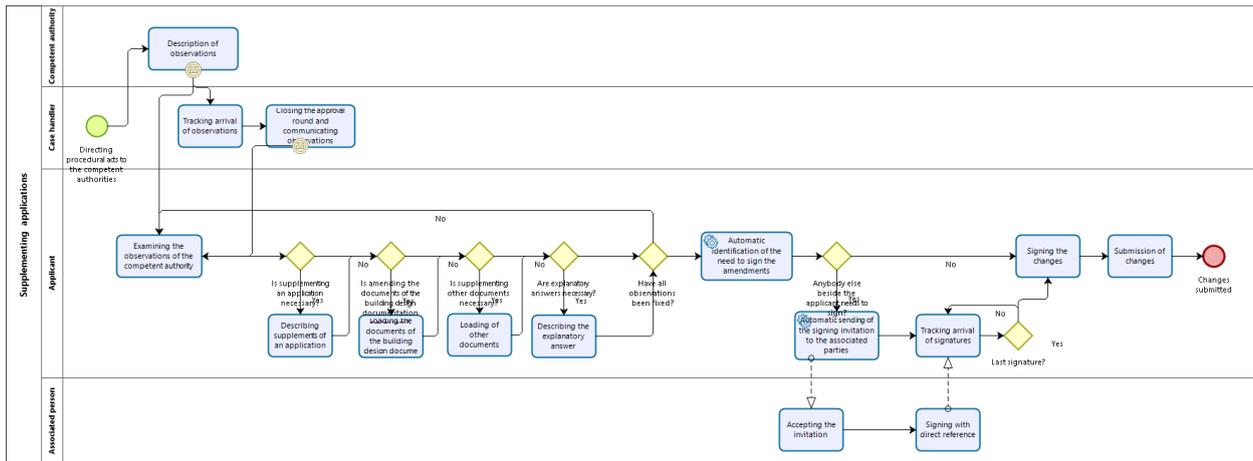


Figure 24. Supplementation of the application/notice

When the approval round has been completed, and all previous operations are performed and the case handler submits the summary of observations, the applicant can enter the last remaining supplements and submit the application/notice supplements again to proceeding without a long delay.

## 2.2.2 Case handler’s view

### 2.2.2.1 Reception of the application/notice and initiation of the proceeding

Competent authorities receive the applications via 3 main channels, as currently. A fourth channel could be added to allow reception of applications from other systems in a standard agreed form (e.g. XML). The relevant interface or API could be made public to raise healthy competition among the software service developers and providers.

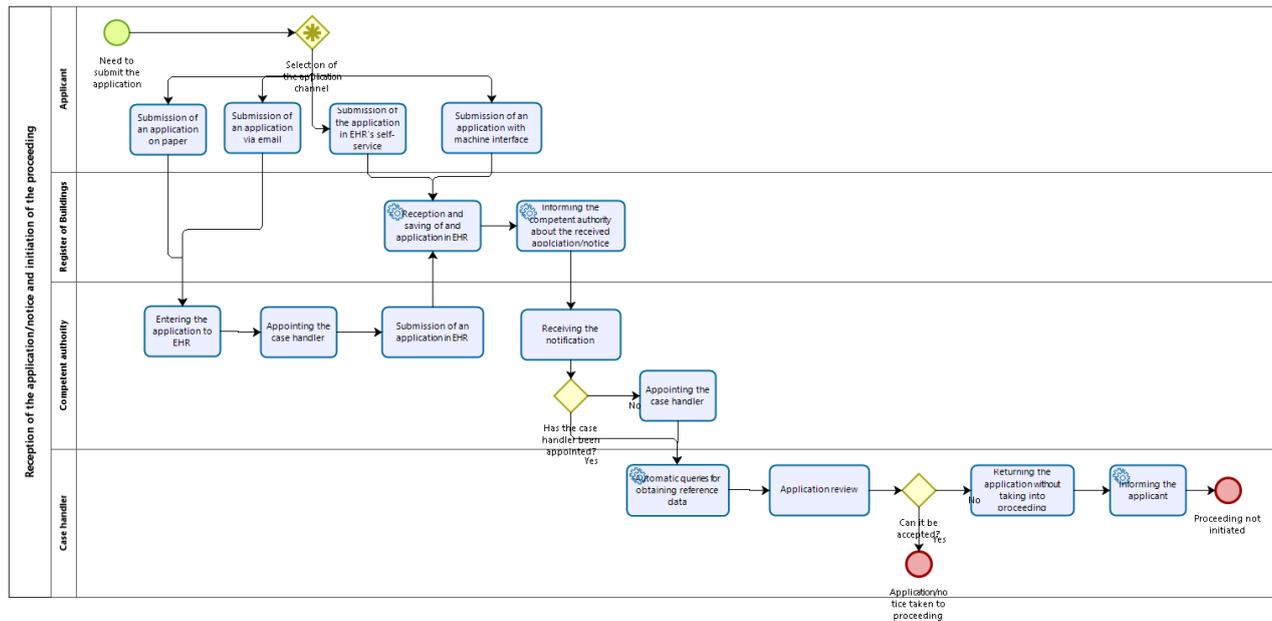


Figure 25. Reception of the application/notice and initiation of the proceeding

One of the foreseen important automated steps is that at the moment when the case handler is appointed for the application/notice, the personal identification code of the appointed case holder is used for making prenotes to the systems that use the services of X-Road to get the necessary control data immediately to the proceeding, e.g.:

- Data of the owner of the immovable if they are not among the associated persons;
- Control data of the competence of the associated persons from MTR as well as databases of the Qualifications Authority;
- Link the application/notice with existing design provisions if the applicant did not do this (direct link for opening);
- Link the shortcut of the detailed spatial plan in other IT systems to the application, if enabled.

The control data can be used at review of the application to make sure its conformance to the requirements. Compared to current situation, it would save time remarkably upon reviewing each application/notice.

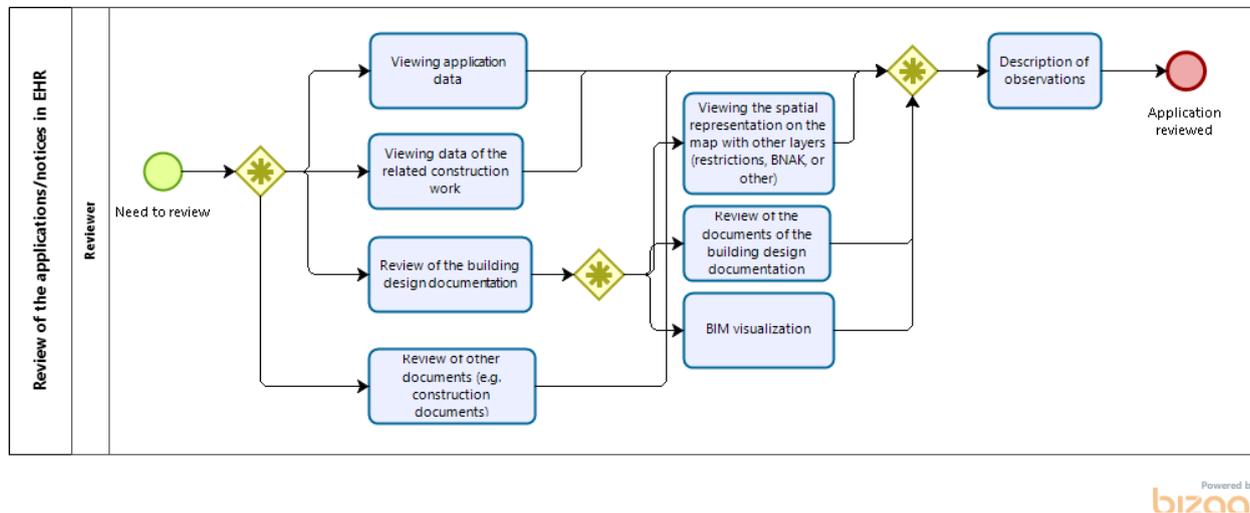
If the proceeding is not started upon receiving the application and the application is returned without taking it to proceeding, it is important that this case will be visible in the register for the case handler “as is” that could be a source for explaining the situation in case of questions.

### 2.2.2.2 Reviewing application/notice

The officials of competent institutions as well as other parties to the proceeding (network operators, authors of opinion, involved interested parties, and other) will review the application/notice. To support the application review process, emphasis should be put on functionality and ease of use of the review so that it would run as smoothly as possible and without an extra effort.

This means that on the one hand the access to the application information is simple and logical but since also some checks of conformity of the data to the requirements are performed during the review, it is of the same importance that the system would immediately bring out possible errors as the result of the automatic controls to draw the reviewers attention to these. At the same time there should be fast access to the control data comparing to which would allow validation of conformity.

To perceive the shape and spatial location of the construction work upon examining the application's data composition, it should be possible to view the spatial representation of the construction work on the map with all necessary map layers. Also 3D visualization of the BIM dataset if it is added to the application.



Powered by  
bizaai

Figure 26. Reviewing application/notice

When the case handlers review and check the applications, the system should provide them a checklist of controls that enable to remember most important things to check/view as a reminder.

The review results in description of the reviewers observations or opinions about the application that will be used in the further proceeding as the basis for the need of supplementation and which are also considered at granting the permit.

### 2.2.2.3 Organizing the rounds of procedural acts

The case handler of the institution that proceeds the application organizes the procedural act rounds and when, during review of the application, they might identify that it is necessary to coordinate it with the experts of the competent authority of the area or get their opinion. The idea of organizing the procedural act round is to receive an input from different parties within their competence regarding the application and receive relevant observations for further management of the proceeding (incl observations of the competent authority to the case handler as well as the applicant). During one round of the procedural acts, the case handler will provide the procedural acts to all necessary parties and waits for the performance of the procedural acts by everyone before continuing with other activities of the proceeding.

It is important to follow the principle that it is not possible to supplement the application unless the procedural act round is over and all specified procedural acts are performed. This will ensure a uniform basis for the composition of the application for performers of all parallel procedural acts that will allow to link the received observations with the composition of a specific application. If the application is supplemented, the repeated approval round is organized, if needed, in respect of the supplemented application composition.

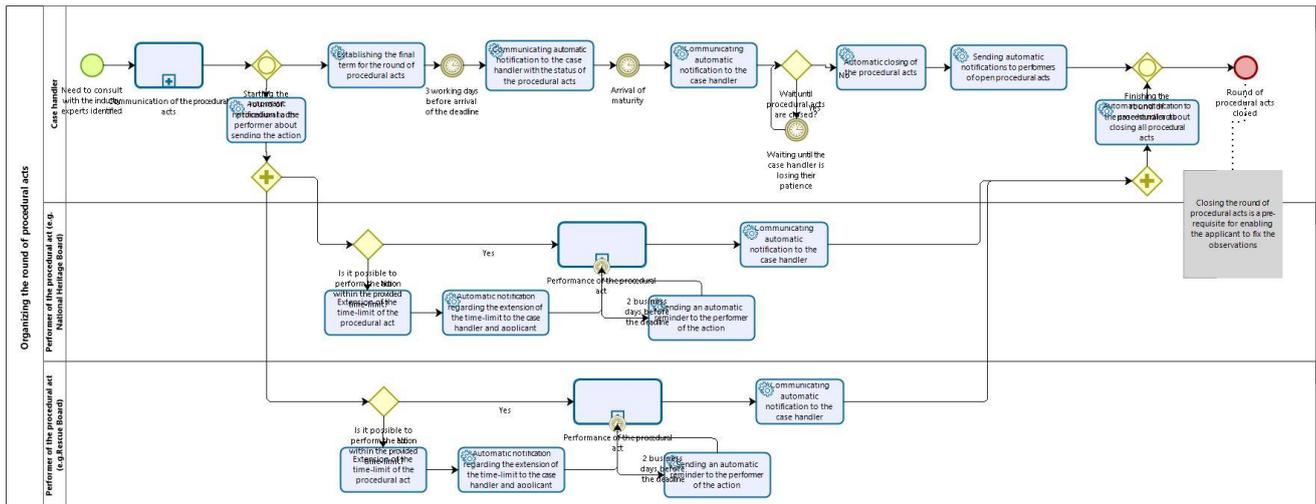


Figure 27: Organizing the round of procedural acts

For the purpose of the flow of one proceeding round, the process will be divided into two parallel flows after provision of the procedural act - in the first flow, the performers of the procedural acts perform assigned tasks and in the second flow the case handler monitors performing of operations. When the round of procedural acts is organized, it is important to follow the time-limits of the procedural acts so that they will comply with the proceeding rules established in the law. Both parties - the case handler who runs the proceeding as well as the competent authorities who perform the procedural acts are responsible for monitoring the time-limits and complying with them. Hence the round of the procedural acts can finish in two ways - when all procedural acts are completed within the timeframe, or when the competent authority has not performed the procedural acts by the deadline but the case handler decides to continue without performing it/these.

An exception for terminating the procedural act round is when the applicant decides to withdraw the application. In that case the current procedural act round is terminated immediately and performance of the procedural acts of the round is interrupted.

The monitoring flow for procedural act round starts when all operations involved in the procedural act round have been provided. First, the system will automatically set the time-limit of the procedural act with the longest deadline as the time-limit for performance of the procedural act. If the time-limit for some of the operations involved in the round is extended, the time-limit for the proceeding round is extended according to the operation with the longest time-limit. The system tracks the set time-limits and sends the case handler an automatic status report of the procedural acts 3 days before the arrival of the time-limit of the proceeding round (incl the procedural acts that have exceed their time-limit as well as the ones which time-limit has not arrived yet). So the case handler has sufficient time gap for addressing the institutions who perform the procedural acts to receive information about the current situation of the proceeding.

Procedural acts are performed in parallel and independent of each other (in process diagram Figure 27. Organizing the procedural act round illustrates performance of two parallel procedural acts during the procedural act round). Each competent authority gets to know about the new procedural act with an automatic notification from the system to the email set up by the relevant competent authority. According to the valid regulation, the performer of the procedural act has the right to extend the time-limit for performance of the operation during reception and performance of the procedural act, where appropriate. The applicant as well as the case handler will be informed about extension.

During performance of the procedural act, the system monitors the time-limit of the operation and sends a reminder to the performer of the procedural act (appointed performer or contact of the institution) about the imminent arrival of the deadline. After performance of the procedural act, the case handler (and the applicant, if needed) is informed automatically about performance of the operation. If all procedural acts on the proceeding round are completed, the system automatically informs the case handler about it. This will also close the parallel flow of tracking the time-limit of the procedural act round.

If the time-limit for the procedural act round has arrived and some procedural acts have not been completed yet, the case handler must make the decision - whether to continue with the proceeding without the input from the competent authority or not. In the common practice, the case handlers do not want to take the responsibility to continue with the proceeding unless all experts have spoken. At the same time, they still can do it after a long wait. If the case handler still decides to continue, the system must be notified about it and the system will automatically terminate the not performed procedural acts and send the performers relevant notification. In other words, the system will automatically close the parallel flow of the performance of the procedural acts after that decision and terminates the procedural act round.

After completing the procedural act round, the case handler has an option to continue with the proceeding (e.g. give the applicant a deadline for eliminating the shortcomings, draw up an administrative act, or organize a new procedural act round, if needed).

### 2.2.2.3.1 Changing the procedural act

The future vision foresees that the case handler can change the procedural act if the procedural act round has not been completed yet. The following diagram illustrates the process:

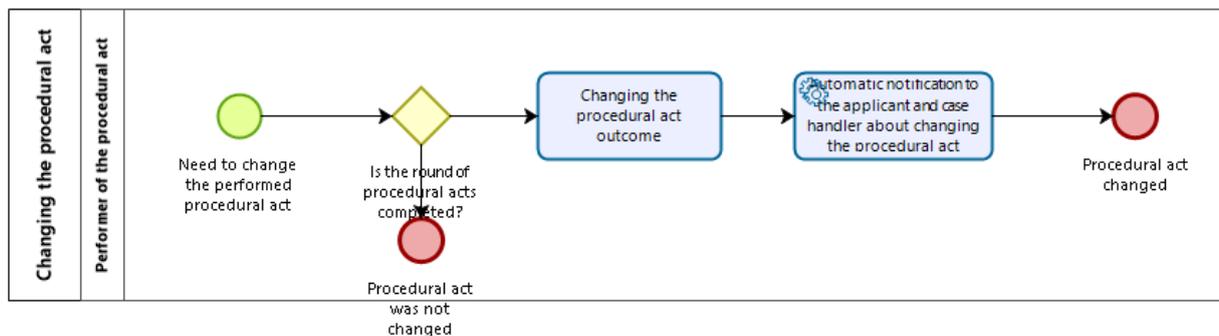


Figure 28. Changing the procedural act

The performers of the procedural act should have an opportunity to communicate with the applicant during the procedural act rounds and receive explanations to questions that arise during the review of the application. If the competent authority performs the procedural act and leaves the observations for the applicant, and the applicant can see these before the procedural act round is completed, the applicant can react to these observations already earlier and exclude possible unnecessary proceeding load.

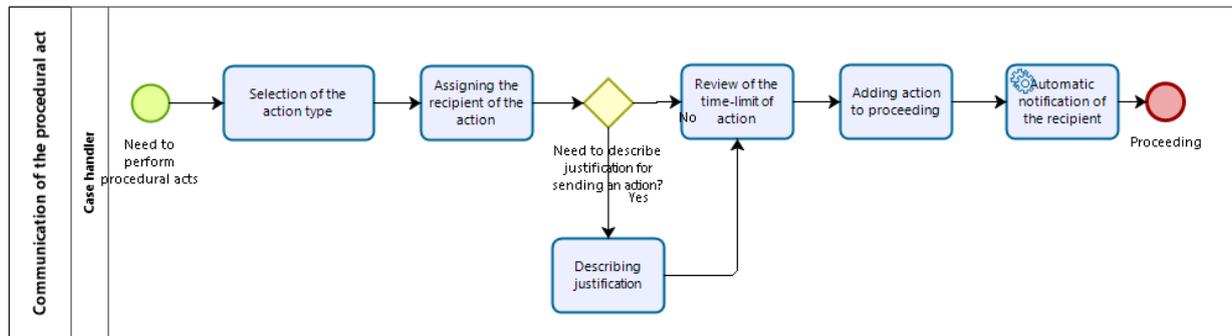
For example, if the case handler cannot find a necessary document from the design documentation and describes that this deficiency should be removed, and if the necessary information was still present in the documentation, the applicant can contact the competent authority and explain where to find this information. If needed, the performer of the procedural act can change the outcome of the procedural act (e.g. coordinate or reduce the number of observations).

It must be noted here that the competent authority must not allow to submit additional information upon external communication that it would consider at approval. Otherwise it will violate the basic principle of the procedural act round where all performers should follow the same composition of the application. Performer of the procedural act may (but not mandatory) receive documents from the applicant outside the system and review these in the context to see if these are sufficient for receiving positive decision in the repeated procedural act round. The applicant can though submit these documents as supplements only when the case handler enables it.

The procedural act can be changes only until the procedural act round is still in progress and no more supplements to the composition of the application have arrived.

### 2.2.2.4 Providing the procedural acts

Providing the procedural acts one by one is time-consuming. It is reasonable to provide the operations with the same type for performance to several institutions at the same time. There are clear standard situations where the same competent authorities or authors of the opinion perform the procedural acts and there are very few who are added as new authorities.



Powered by  
bizagi

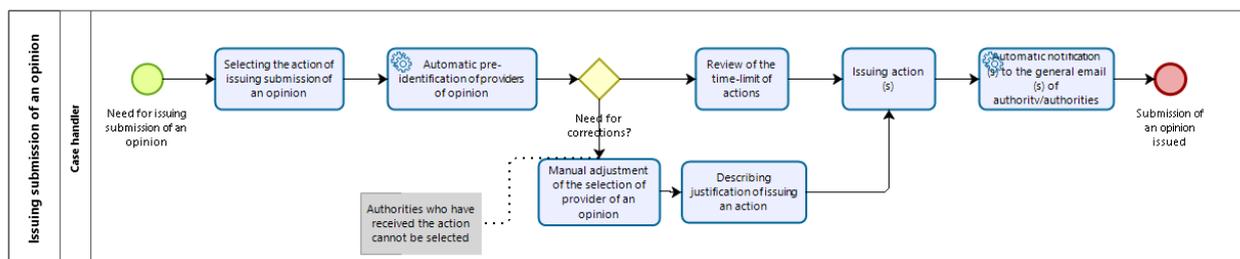
Figure 29. Providing the procedural acts

This principle is foreseen also in the future vision of providing the procedural acts and strong emphasis is put on identification and selection of recipients in providing different operation.

The following describes the process of providing different type procedural acts by highlighting more important differences compared to current situation.

#### 2.2.2.4.1 Providing the external approval

Providing external approval enables to identify the approvers partially by the means of application information and machine-processable limitations and restrictions automatically. E.g. there is a monument that belongs to protected construction work on the cadastral unit or the reconstructed building itself is a heritage conservation site. Or the building design documentation includes a drilled well to which a permit is necessary, or the intended use of the building on the use and occupancy permit is a nursery school. Or when the repeated approval is sent only to the institutions who did not give their approval, i.e. they wanted to be involved in repeated approval.



Powered by  
bizagi  
Modeler

Figure 30. Providing the external approval

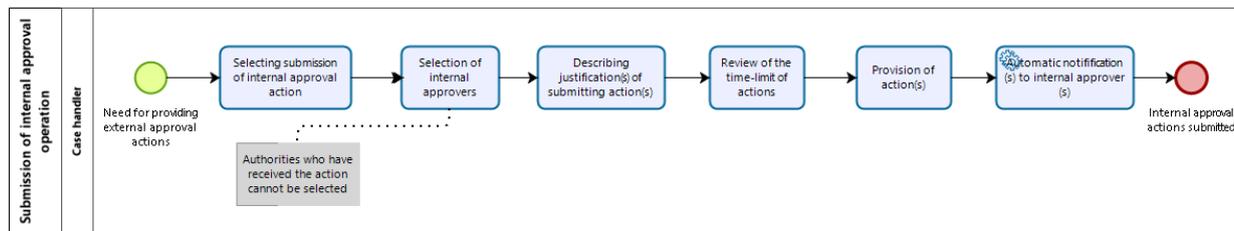
If the case handler chooses provision of the approval, the system should provide one drop-down list of all competent authorities who should grant their approval. If the system has appointed the approver automatically, the reason for making the selection must also be described automatically. The case handler must have an option not to select the approvers chosen by the system, The case handler must have an opportunity to supplement the list with approvers and describe the reason for their involvement.

The system must automatically assign the default value of 10 days upon providing the approval (i.e. the case handler need not select it). The case handler can adjust the time-limit, if needed. The case handler delivers the approval action to all approvers by one confirming push on the button.

The system adds all approvals to the list of the proceedings and sends the notifications to all competent authorities.

### 2.2.2.4.2 Providing internal approval

When the internal approval round is determined, the case handler can appoint all internal officials (from internal institutions, e.g. TUPA and Municipal Engineering Services Department) who should give their consent as one drop-down list.



Powered by bizaai

Figure 31. Providing internal approval

If needed, describes the reason for delivering that action and reviews the determined time-limit (system sets 10 days as default). When the action is provided, all selected parties get a notification of arrival of the action.

### 2.2.2.4.3 Submitting an opinion

The authors of opinion are primarily the communications companies and network operators with the network protection zones where the building activity may be performed. Similar to the approvals, it is possible to identify the networks of the network operators that are within the close area of the construction work if the restrictions map information is available, to who the procedural acts must be delivered for submitting an opinion.

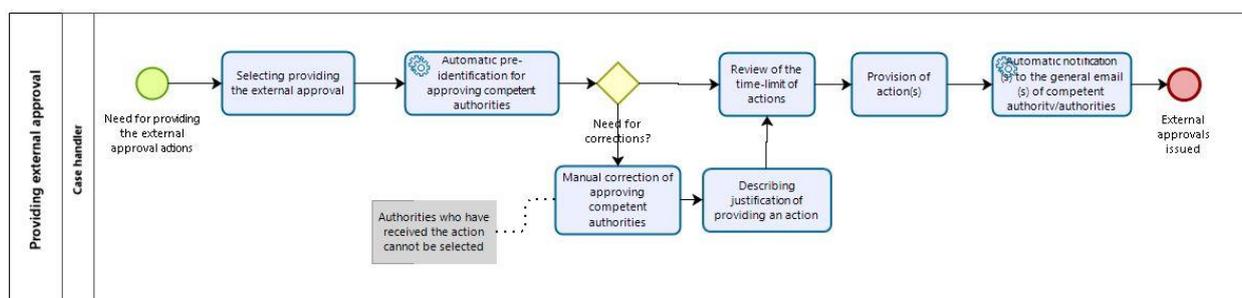
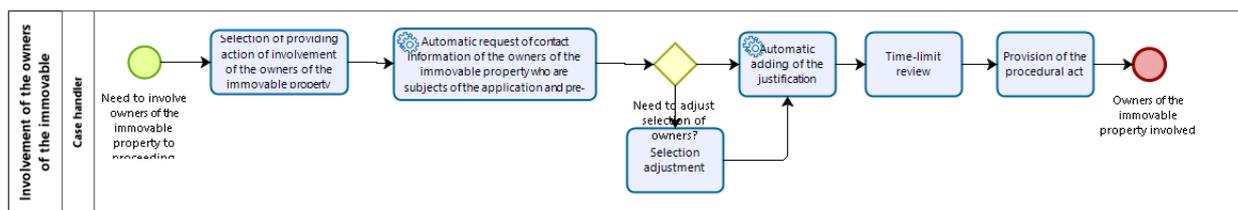


Figure 32. Submitting an opinion

The case handler can supplement the drop-down list of authors of opinion when delivering the procedural act, describe the reasons, if needed, correct the time-limits of the action (10 days by default). The system automatically delivers the notifications about issuing the action.

#### 2.2.2.4.4 Involvement of the owners of the immovable

If the applicant has not involved the owner of the immovable in their application, the case handler can do it. For the immovable with the planned building design documentation, the system identifies the owner automatically by the register inquiry. The efficiency is quite low for a single immovable, but it still exists. Benefit is greater upon proceeding the design documentation of the routes since it may pass several immovable and involve all owners. The greatest efficiency is achieved from automation for big national special planning (330 kV high voltage line via Estonia, Rail Baltica, or other). Here the case handler should be able to deliver the list of immovable that the route passes also as a comma-separated list.



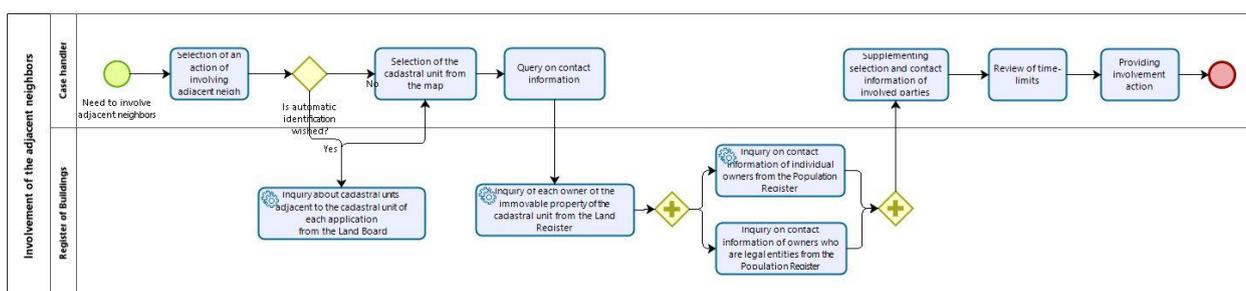
Powered by  
bizaqi

Figure 33. Involvement of the owners of the registered immovable

For involvement of owners, the reasonable justification could be the standard basis for all owners.

#### 2.2.2.4.5 Involvement of the adjacent neighbors

Form of involvement of the adjacent neighbors is often performed in proceedings, Currently it is one of the most time consuming activities in planning the procedural acts. The main problem is availability of the contact information of the involved persons and unknowing whether the involvement notice was received.



Powered by  
bizaqi

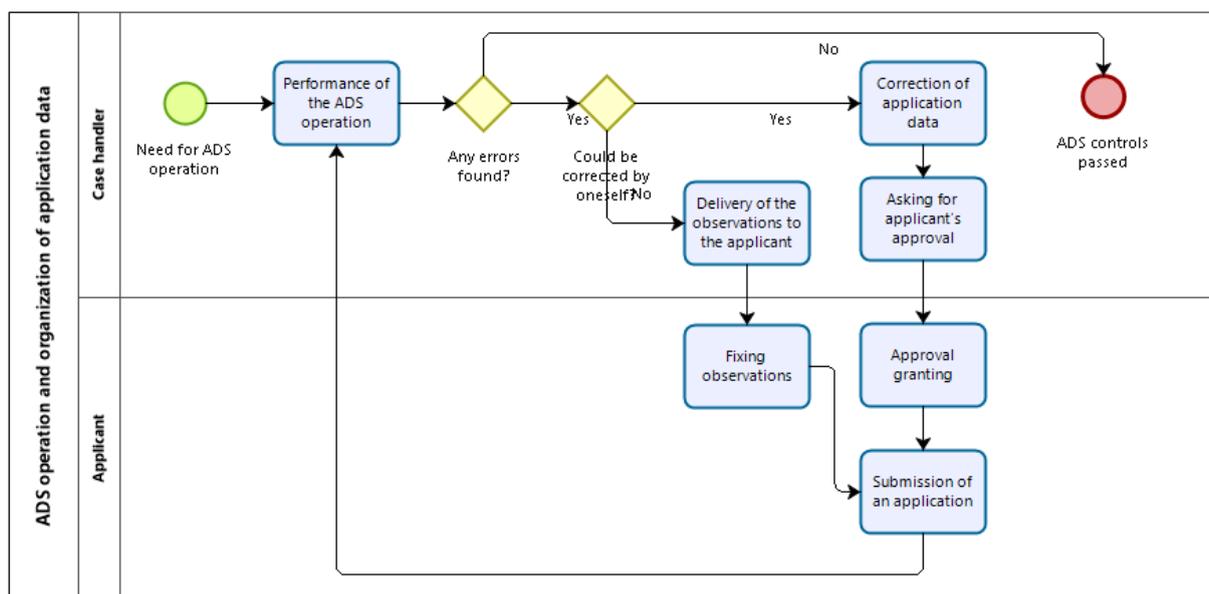
The future vision foresees that when the adjacent neighbors are involved, the involved adjacent immovables can be selected from the map and relevant owner identification and their contact information queries are made from the national registers. The outcome will be a drop-down list of owners that the case handler can supplement, if needed. Standard justification is used for everyone. All owners are involved as one operation. Already involved cannot be involved for the second time. The system sends the involvement notices to the parties automatically.

### 2.2.2.4.6 Involvement of another interested party

When the interested parties are involved, it is reasonable to follow the principle that they are involved based on the identifiable features (Commercial Register number, personal identification code). This enables to link the EHR user with the actions determined for them. If the involved party does not have the Estonian Commercial Register number or the personal identification code, it would be reasonable to enable the contact-based (email address) involvement.

### 2.2.2.4.7 Performance of ADS operations and data correction

The principle that the case handler can correct the non-compliant unique address independently in the case of ADS action but then the applicant still has to confirm it with signature (supplementing the application information). There is no remarkable increase in efficiency here.



Powered by  
bizagi  
Modeler

Figure 34. Performance of ADS operations and data correction

If the spatial presentation is not suitable and the coordinates must be changed, but this will be in conflict with the building design documentation, the coordinates must also be changed in the building design documentation. This would be easier if exchanging of single documents of the building design documentation and sending the signing invitations to relevant parties is enabled. This means that an applicant must not start to coordinate signing of amendments outside the system and upload it with the rest of the design documentation.

### 2.2.2.5 Providing the case handler's observations to the applicant

Currently, the case handler needs to address the approval to themselves to submit the observations. This means several additional clicks and navigation between views.

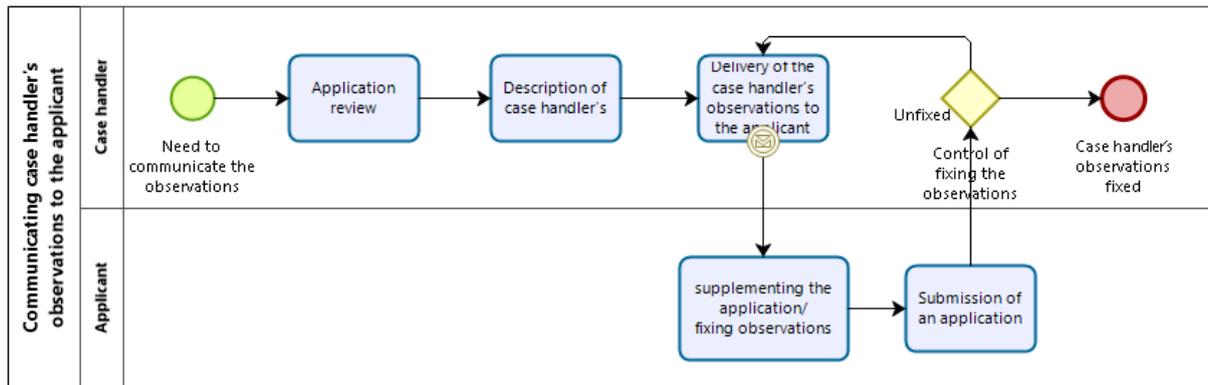


Figure 35. Providing the case handler's observations to the applicant

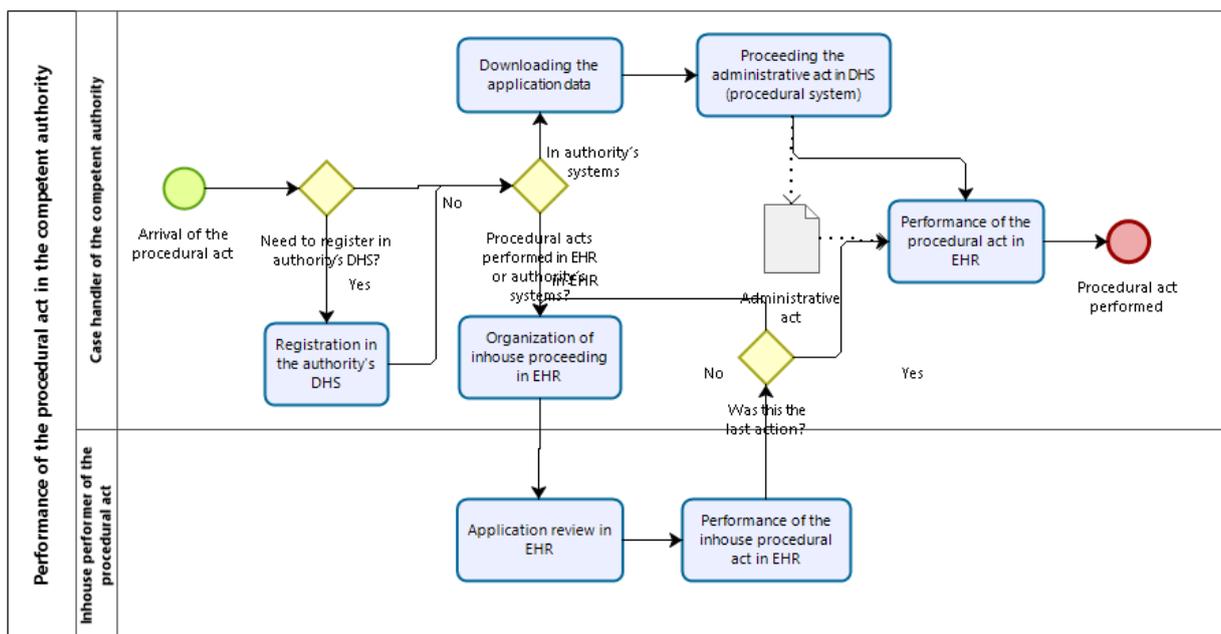
The future vision sees that the case handler does not have to make any extra moves for adding and delivering observations but it will be done immediately during review of the application. If the case handler has finished with the observations, they will notify with submitting the observations that they have finished with adding the observations and are waiting for supplements.

But the applicant can see the observations as the case handler is entering these and can start fixing them before the case handler has described all observations. After submitting the observations, the last unfixed observations can be fixed and returned to the case handler for further proceeding with minimum delay.

### 2.2.3 Performance of the procedural act

Specially the external approvers and network operators prefer to perform the activities that are needed for approval upon performing the procedural acts outside (Tallinna Vesi, Telia), or they duplicate it in several systems (National Heritage Board). One reason for such behavior is the fact that the competent authority who grants the approvals does not have the functionality for performing the round of internal approval/submitting and opinion in EHR. The user comfort of EHR was characterized as “from the last century” hence it is not recommended to use it.

Even if a proper user comfort is created to EHR and a necessary functionality is provided, there is still reservation whether it would be a motive for taking EHR into use. Rather the opportunities of automatic interfacing are expected for registering the EHR action easily in internal systems and return only the outcome of the procedural act to EHR (as the administrative act generated in internal systems).



Powered by  
bizagi  
Modeler

Figure 36. Performance of the procedural act

One option could be that EHR offers the control service for such parties that enables the external system to regularly control whether some procedural acts have been assigned to them. If yes, the application data could be transferred to the systems of the performer of the procedural act via another service. When the procedural acts are performed, the administrative act resulting from the procedural act is sent via the service of the third party (e.g. DVK or some EHR service) to the EHR procedural act and the action is deemed as completed.

This way the parties who are more capable and have the resources can create the interfaces that would reduce current manual work remarkably.

### 2.2.3.1 Performance of approval in EHR

performance of approvals will be more efficient in EHR thanks to smoother procedure of review of applications/notices. An important supplement will be that different approval forms have different meaning towards the repeated approvals. If the approval is granted on condition that the observations will be fixed, it will not go to repeated approval but the case handler can make sure that the observations are solved. When the unconditional approval is granted, it will also not go to repeated approval unless the building design documentation is change to the extent that calls for the need of repeated approval.

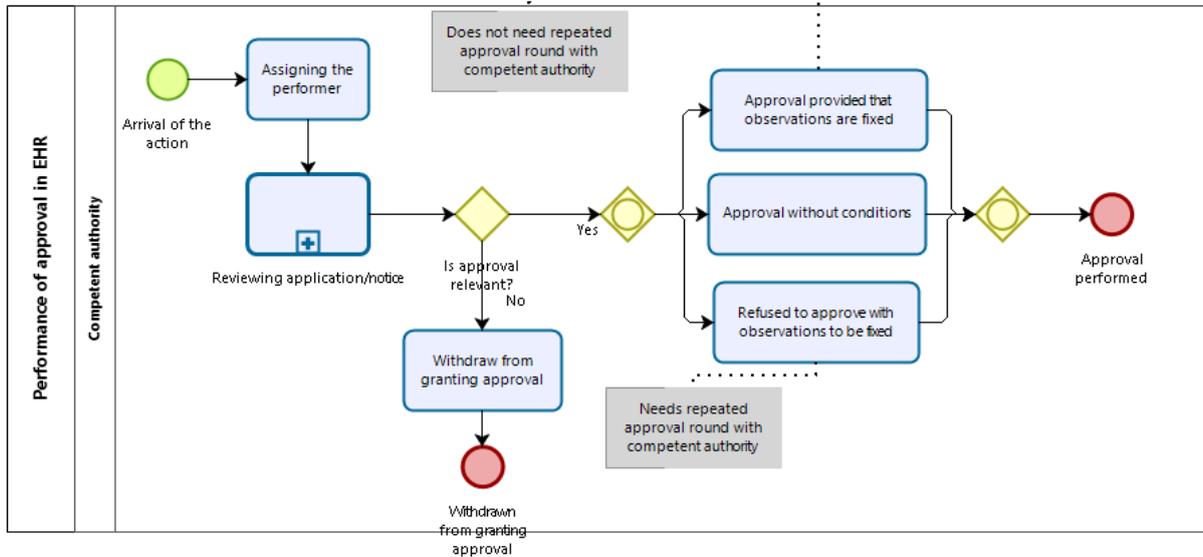


Figure 37. Performance of approval in EHR

If the approval is rejected, the repeated approval is presumed. Approval and provider of approval will be visible for the applicant by the proceeding information.

### 2.2.3.2 Performance of submitting an opinion in EHR

Similarly to approval, the main efficiency of time saving comes from making the review of applications more efficient.

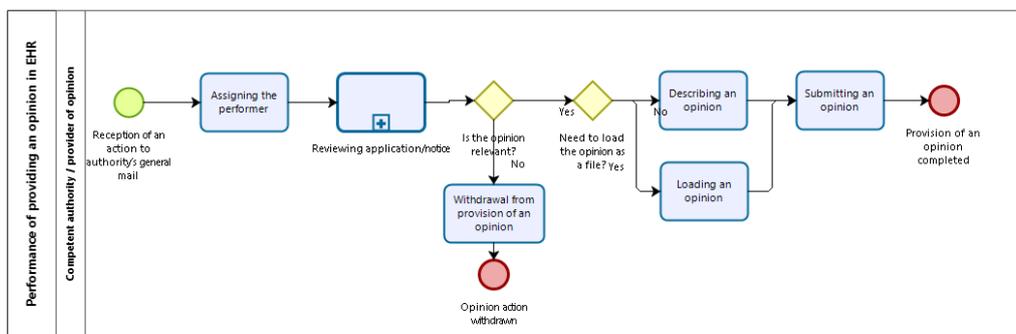
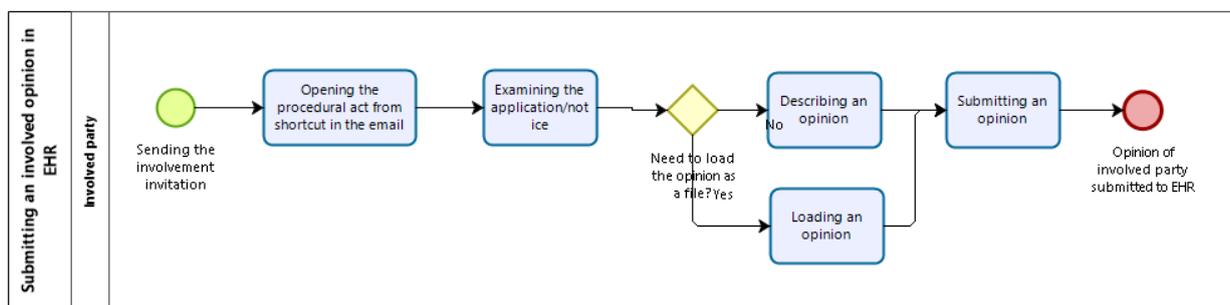


Figure 38. Performance of submitting an opinion in EHR

The procedure will remain similar to the existing procedure. For the authors of opinion, it is most likely that the automatic interfaces are made for receiving the procedural acts and returning the outcomes of the procedural acts. The reason is that the private companies have better access to IT resources since, for example, the bigger network operators employ the IT development competency. It is recommended to partner with an interested party with resources for creating and piloting the services.

### 2.2.3.3 Submitting a involved opinion in EHR

Expressing an opinion of the involved parties (e.g. involved adjacent neighbors) or submitting observations is currently done outside EHR.



Powered by  
**bizagi**

Figure 39. Submitting an involved opinion in EHR

In the future vision this should also arrive to EHR for the purpose to ensure the integrity of the proceeding data. For that, the involved person should open the EHR procedural act shortcut from the involvement invitation or log in EHR and find own action from the desktop. They should be able to examine the application and additional documents similar to the procedure of application review to understand what is planned. The involved person should be able to describe their opinion directly in EHR or upload it as a standalone document and submit it to the case handler.

---

## 2.3 TO BE data flows

The data flows mapped in the AS IS stage indicate movement of data in proceedings and refer to the used databases in the stages of different proceedings. Data and data sources that are used in proceedings will remain the same also in the future vision, i.e. there will be no new data sources by the processes and no existing ones are removed. Also the same user groups use these data in the processes.

An example could be a situation where today the case handler searches the contact information of the involved parties from the Population Register and Commercial Register, this will be the same also in the future but in the future this will be automated by the system. The queries of the case handler to the registers and the replies will remain the same.

The difference in the future vision is related to the data exchange channels and data formats of the data flows. The future vision should enable automated data exchange in the process by creating new and using existing APIs or X-Road services but the data and their flows will remain the same. Also the data formats of the processes may change. For example, the IFC format data could be taken into use since they can be viewed more easily in the applications. There will be no changes in the data composition.

For the purpose of compactness of the report, the same schemes were not repeated and they can be viewed in report's chapter 1.3 Data flow mapping.

## 2.4 TO BE conceptual data view

The following figure describes the relations between the main data objects of the Register of Buildings and their classification as entity diagrams by indicating the power of the relations between the objects.

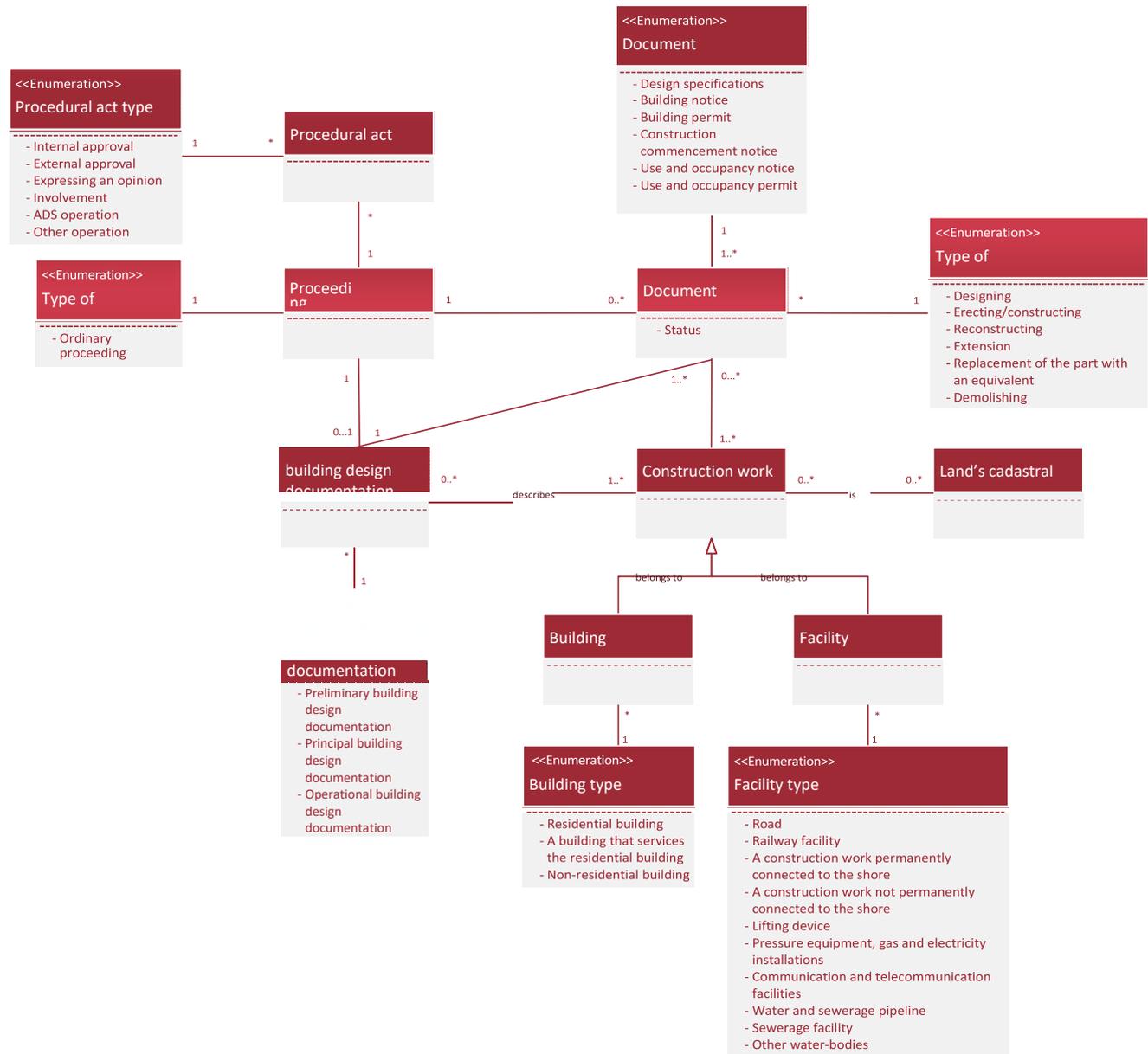


Figure 40. Conceptual data model UML as an industry model

Register of buildings contains data that are related to the buildings and facilities that in turn are classified into sub-types. Construction works are located and are related to cadastral units but not always (facility that is built into water, constructions on the unreformed land). One cadastral unit may have several buildings and one building may pass several cadastral units.

The construction work can be related to the building design documents which in turn can be related to several documents that were registered to certain construction works in the proceeding. One construction work may be related to several building design documents and one building design documentation may be related to several construction works. There may be construction works without building design documents in the register. There may also be building design documents without any construction works yet. The building design documentation may be related to design specifications and permits and notices documents

Mapping, optimizing, and adjusting for the introduction of e-construction of the procedures of the building an use. The building design documentation can be different in detail and classified into three sub-groups. Final report

The register may have documents of the construction works in the register based on which the construction work was built or taken into use, or the data related to the construction work were amended. There may also be construction works in the register that are not related to any of the documents in the register. The document connects the construction work and the related activity and the proceeding carried out for ensuring its legality. Each document is related to one certain proceeding but one proceeding may be related to several documents since one proceeding may result in issuing permits about several construction works at the same time (based on the building design documentation).

The proceedings are often related to the building design documentation since the building design documents often form a part of the documentation that is involved in the proceeding. One building design documentation is related to one proceeding. But the proceedings are not always related to the building design documentation since there are documents where the building design documentation is not necessary for the proceeding.

There are two different types of proceedings - and ordinary proceeding and open proceeding, and in the course of the proceedings, there are procedural acts that have several different sub-types. As a rule, several procedural acts are carried out during one proceeding but certain procedural acts are carried out only in the framework of one proceeding at a time.

## 2.5 Additional requirements

The following describes the requirements to supplement the vision on process cards, data flows, data views and prototypes that were envisaged in earlier chapters. These requirements mainly concern the automation-specific functional requirements and non-functional requirements of the system that are not directly reflected in the prototype. The requirements are numerated with the step of 20, meaning that each category of the requirement can have up to 20 requirements.

---

### Desktop requirements

N001	It must be possible to set up the users' desktops.
N002	The users' desktops must have role-based default templates (applicant, case handler) with pre-set content elements that are determined to each user by default by the system.
N003	The user must be acceptably able to toggle the content elements on the desktop (e.g. the map, list of proceedings, shortcuts).
N004	Upon using the desktop, the user must be able to set the filters that are applied to the content elements of the desktop. <i>E.g. when the case handler wishes to see only the certain proceedings of own local government, then by selecting a relevant filter, only these proceedings remain in the desktop view's content element of the proceedings and only these proceedings are displayed in the content element as "pins".</i>
N005	The user must be able to set at least the proceeding type, status and interval by applying the filters.
N006	If the right of signature has been determined for the user within the system, they must be able to see the assigned signing tasks on the desktop as one content element.
N007	The system must automatically save the desktop settings made by the user also for the following sessions of the user.

---

### Search requirements

N020	The system must keep internal records on the popular search terms and phrases.
N021	If the user types on the search field, the system should automatically provide up to 7 more popular search terms or phrases after the third character.

---

### Interfacing requirements

N040	The system must provide the machine-machine interface for receiving applications. <i>Performance of this requirement opens the opportunity to receive applications that are prepared outside EHR.</i>
N041	As the result of the inquiry, the system must issue the status of the proceeding to the inquiring system.

Mapping, optimizing, and adjusting for the introduction of e-construction of the procedures of Final report  
*Opens options for giving the information of the proceeding status to other systems (e.g. eesti.ee, or other).*

No42 The system must enable to deliver the arrived applications directly to the company's document management system, if the company so wishes.  
*Reduces the administrative burden of the authorities who wish to register and manage the applications or procedural acts in their document management system.*

No43 The system must enable the machine-machine interface for providing the procedural acts.  
*Enables approvals or the authorities providing the opinion to receive the procedural acts automatically and proceed these in their internal systems.*

No44 The system must enable the machine-machine interface for receiving the outcome of the procedural acts.  
*Enables the performer of the procedural acts to deliver the outcome of the procedural act automatically from the internal systems to EHR.*

### **Session expiry requirements**

No60 The system must enable the user as option to remain logged in if the inactivity time-measure of the session expires.

No61 The system must visually interact with the user's work environment to notify the user about the imminent expiry.

No62 The system must log out the user automatically if the user has not notified about the wish to continue within a reasonable time after the visual warning.

No63 When the user is logged out automatically, the system must record the data of the work in progress and remember the view where the user stayed last.

No64 If the user opens a new session, they must be able to return to the last activity they dealt with before automatic logout as a shortcut.

### **Requirements for preparation and submission of the application**

No80 The content of the data fields on the application forms must change according to the selections made.

No81 The application forms must have checks that exclude occurrence of the business logic conflict.

No82 The main user of the system must be able to set the business logic conflict checks applied automatically at preparation of the application.

No83 The data quality checks must be applied upon preparation of the application that ensure the correctness of the format of the submitted data.

No84 When applying with the BIM, the system must automatically pre-fill the application data from the loaded BIM to the maximum extent possible.

No85 Pre-filled data of the BIM can only be changed by loading a new BIM.

No86 The system must provide a solution for checking the correct classification of the file names of the building design documentation without uploading the files.

No87 When the documents are uploaded as a single digital container, the system must automatically unzip the container's content according to its structure and enable the user to navigate to the single files in their "depth". Including, the unzipping must be performed recursively in respect of the container and zipped files inside the container.

*It must be noted here that if there already is technical solution that enable visually the impression of unzipping instead of unzipping and data duplication, and enable interaction with each single file separately, such solutions should be preferred.*

No88 When the digital containers are loaded, the system must automatically read the persons who signed these. If there are digital containers inside the digital container, the signatures must be read recursively.

No89 Each file that is unzipped from the digital container must include information as metadata about who has signed that document. If the file is in the digital container which in turn is in the digital container and the unzipping of files is used, the file must have information about all signers of the digital containers where the file is located.

No90 If the applicant prepares the building design documentation in the system, they must be able to send the signing invitations to the relevant parties by indicating the documents that need signing.

No91 The applicant must be able to ask for the confirmation of the consent of the owner of the immovable before submission of the application.

N092 The owner of the immovable must be able to give the conformation of their consent to the application prepared by the third party before its submission.

### Requirements for receiving an application

N100 Upon receiving the application, the system must automatically check the conformance of the application to the requirements established for the document (if needed, presence of the design documentation, payment of the state fee, presence of the owner's confirmation, and other).

N101 The system must notify the recipient of the application about the results of the automatic checks.

N102 The official who receives the application must be able to forward the received application automatically to the internal document management system for registration.

N103 Upon reception of the document, the system must perform an automatic inquiry for checking the competence of the natural persons who are related to the application (to the register of professions) and enable the case handler to view the inquiry results.

N104 Upon reception of the document, the system must perform an automatic inquiry for checking the area of activity of the legal entities who are related to the application (to the register of economic activities) and enable the case handler to view the inquiry results.

### Application review requirements

N120 The case handler must always be able to view the last version of the document submitted by default.

N121 Upon review of the application, the case handler must be able to view visually the specifications of the different versions of submitted BIMs. (e.g. last supplement vs previous version).

N122 The case handler must be able to view the different versions of the application and its additional documents (if existing).

### Application supplementation requirements

N140 The case handler must be able to change the documents one by one when supplementing the annexes to the application.

N141 The system must automatically detect the need for signing the document exchanged by the applicant.

N142 The system must automatically version the document that is changed upon supplementation by leaving an option to compare the versions later by the case handler.

N143 The applicant must be able to send the signing invitations to application and the documentation supplements to the automatically detected parties.

N144 The applicant must be able to add new files upon supplementation.

N145 Upon supplementation, the applicant must be able to send the signing invitations to the people assigned by them regarding the application and its additional documents.

N146 Upon sending the signing invitation, the system must automatically exclude sending the applications to parties whose signatures are already present.

N147 The system must visually differentiate for the user which documents have been signed and which are not.

N148 The applicant must be able to upload a new model or part of it when loading the BIM-based applications.

N149 Upon submitting the BIM supplements, the system must automatically check whether the change impacts the selections of the proceeding and the type of the building activity and give relevant information about it to the case handler.

### Procedural act provision requirements

N160 The case handler must be able to provide the same procedural act to several parties at the same time.

N161 The case handler must be able to describe the reason of providing the procedural act specifically to that party upon providing the procedural act.

N162 The system must automatically detect the owners of the involved immovable of the neighboring registered immovable (from the national databases) and their email addresses and provide these to the case handler for use during provision of the involvement procedural act.

N163

The case handler must receive feedback if it was not possible to deliver the letter to the email address of the involved party.

*If there are solutions that would enable to consolidate that information to EHR, such solutions should be preferred. An alternative could be the use of the case handler's reply-address when sending the involvement letters that would send from the system the "undeliverable" notice to the case handler's inbox*

## 2.6 Checklists of the proceedings

The aim of the checklists of the proceedings is to give the proceeding officials an overview of the appropriate activities that they need to pass for each proceeding type they proceed in the Register of Buildings and follow that all necessary activities are passed for each course of proceeding. The prepared checklists are definitely not final or mandatory and for LGs this should rather be recommended and assisting material, not a document according to which the projects will be rejected.

During preparation of the checklists, the legal acts related to regulating the proceedings of the Register of the Buildings were detected and all the following acts and implementing acts were revised:

- Building Code;
- Administrative Procedure Act;
- Spatial Data Act;
- Law Enforcement Act;
- General Part of the Economic Activities Code Act;
- Equipment safety act.

In addition, the internal instructional materials of LGs collected from interviews were used for preparing the checklists as well as the user manuals present in EHR that are created to facilitate proper performance of the proceedings.

Total of 98 control questions were detected based on the revised materials that were divided into the following categories:

- Approvals of the construction works;
- Supplementary conditions;
- Restrictions;
- Design documentation;
- Competencies;
- Supplements;
- Validation;
- Form requirements.

The checklist was formed as a table with the control question and the related category (category is highlighted in the Excel file that is sent to the customer). The crosses ("X") after the control question indicate the types of proceeding where the control question could be relevant. A reference to the legal act of some other data source from where the control question comes is set out after the control question. Each LG can reformulate the list and add the control question, if appropriate.

The checklist was sent for validation to the MEAC and selected LGs whose feedback was the basis for the final version of the checklist. The checklist is available in Annex 2: Checklist.

## **2.7 Recommended practices and instructional materials for the case handler for introducing a new proceeding environment**

### **2.7.1 Methodology**

The aim of the recommended practices and instructional materials is to enable the local governments and approving institutions to perform the proceedings of the Register of Building more effectively than today. The instructional materials include recommended practices that the case handlers and approvers can apply when performing the proceedings of the Register of Buildings.

Preparation of recommended practices and instructional materials followed the practices creating efficiency that were collected during the interviews that according to the opinion of the contracting entity, LGs as well as approving institutions help to ensure the proceeding economy by enabling to proceed the applications with smaller working time consumption and increase the quality of proceedings. Also the tips on how to perform the optimized proceeding processes by taking the prototype that was completed during the project as the basis.

Recommended practices are divided into four bigger proceeding process steps:

- Pre-consulting;
- Receiving an application
- Management of a proceeding;
- Approval.

Feedbacking of the recommended practices and instructional materials was performed with the contracting entity in several iterations. First, the questions planned for the recommended practices were prepared that were sent for feedbacking and then the questions were supplemented with the replies to which the feedback was gathered from the contracting entity in two iterations.

### **2.7.2 Recommended practices**

#### **2.7.2.1 Pre-consulting**

1. How should the applicants submit applications?

LGs direct the applicants to submit the applications as follow-up documents in the instructional materials prepared for the applicants (if LG has created instructional materials) and during pre-consultations. The applicant is told that if they already have the building permit, they should mark the association with the building permit to the use and occupancy permit. For that, it is recommended to start the use and occupancy permit from the building permit or mark the association of the building permit to the construction work. It is also recommended to keep in mind that the energy label of the building permit is transferred to the application of the use and occupancy permit and will enter into force later when the application of the use and occupancy permit is created as a follow-up document.

Creation of the follow-up documents, for example, enable to use the data of the building permit as pre-filled upon preparation of the application of the use and occupancy permit which in turn enables to reduce the application preparation time and reduce the conflicts with earlier documents that may arise during entering the data of the construction works which would otherwise emerge only when reaching the proceeding.

2. How to reduce the time of the LG official spent for pre-consulting?

It is possible to reduce the time of the LG official spent for pre-consulting by creating the structured information and a manual for the applicant that can be displayed, e.g. on the public websites of LGs. A good example is the city of Tartu where the information needed for submitting the building-based permit or notice by the applicant is consolidated to the homepage of the city.

The general process-based manuals will be available on the homepage of the Register of Buildings. The Register of Buildings will also display the additional region-based specifications, e.g. during planning of the construction work and via the address filter. LGs can also use the EHR manuals as the basis or as a replacement of their own manuals.

3. How to increase the general knowledge about the EHR system options and proceeding performance among the LGs, designers and approvers?

The EHR users see the need for periodic EHR-related training courses by MEAC, as there is a flow of staff among both the LGs and design companies and coordinating authorities, so new people today do not have good support to start working with the EHR. The training would also be necessary to introduce the EHR updates to long-term users. It is planned to carry out 2 training tours per year (in four locations across Estonia).

Since there is staff turnover in LGs and institutions who perform the approval actions and new people are employed who are not familiar with the proceedings in EHR, it is recommended to create the tips, best practices and guidelines for individual LGs for simple and correct performance of EHR proceeding to share in-house knowledge and facilitate adjustment of new employees.

Since the LGs do not have a full overview of the cases about when and which approving institutions they should involve in proceeding, it could be useful for the case handlers of LGs as well as the approvers to draw up the list of projects that they approve. This will help to reduce the burden of the coordinating institutions who currently have to deal with irrelevant proceedings. A good example is the Health Board where this practice has been used already.

4. How to get a quick overview of the content of the design documentation?

The EHR enables to open a document preview within the system so that the officials do not have to download and open it separately to see the contents of the document. Some ongoing proceeding must be selected in EHR to see the document preview and the section Documents has the whole design documentation that is related to the proceeding. The document preview opens by clicking some file name in the design documentation.

### 2.7.2.2 Receiving an application

1. How should LGs register the received application?

Some LGs have a policy of storing data in one place, which means that if an application is registered in the EHR, it will not be duplicated in the local document management system of the LG, which will save the time of receiving the application. It is advisable to take this practice into use in all LGs to save the working time.

2. When should the application be rejected without review?

Some LGs process all applications automatically regardless of their shortcomings, and the application is then returned to the applicant for fixing the observations. Hence some LGs do not have the practice to use returning of the not reviewed applications. As this practice is partly used because this will leave a trace of the proceeding for LGs, it must be kept in mind that the new proceeding environment will also enable to track the information on the non-reviewed rejected applications.

It is recommended to reject the application only when it is obvious that it is not possible to carry out the proceeding (e.g. if it becomes evident that the application type is wrong, the construction work of the application does not need a notice/permit, or the design specifications/detailed spatial plan). In other cases it is the best practice to take the application to proceeding after which it is possible to solve the problematic issues during the proceeding (e.g. payment of the state fee, changing the design documentation).

### 3. How can the checklists facilitate and change the proceeding more transparent?

Use of the checklists enables the case handler to ensure that all necessary controls of the legislation have been performed in the proceeding. It is also a good practice to use the checklists for easily detectable references to legislation when the application/notice is returned to the applicant to justify the reasons of returning the application for fixing the observations, or returning it without review. References returned to the applicant as observations make the proceeding process more transparent for the applicant.

## 2.7.2.3 Management of a proceeding

### 1. How to perform ADS proceeding?

The ADS control is performed as a first operation in carrying out the proceedings as the best practice (before comments are added and sent for approval) to ensure that the proceedings are handled quicker and to allow the problems related to the ADS to be dealt with on an ongoing basis during the proceedings.

Land Board should be consulted as soon as possible about assigning the addresses, e.g. already when LG has information about possible application already before applying for the permit in EHR (e.g. planning or the applicant comes to pre-consultation) that there will be new buildings for the specific cadastral unit. If it is only changes in the addresses of existing buildings or the spatial representations, these could be performed in ADS (ADS proceeding application- <https://www.maaamet.ee/ADSMenetlusrakendus/> ), if it is more convenient since the data are automatically transferred from ADS to EHR.

### 2. How to perform inclusion in the proceeding?

If the applicant has not involved the owner of the immovable in their application, the case handler can do it. In order to involve the landowner of the immovable being applied for, the reference data on the building is used in the EHR, which can be used to more effectively retrieve the data and the personal identification code of the owner of the immovable.

### 3. How to close the proceeding?

In individual LGs, the right to sign a permit is delegated to a construction specialist, which allows the permit to be issued without the intervention of the rural municipality, which in turn shortens the duration of the proceedings by about 1-2 weeks, as it does not have to wait for the municipal sessions.

To raise the efficiency of the proceeding, it is recommended that the local governments consider delegation of the right of signature within the system to the construction specialist regarding the sites with lower public interest (e.g. farmhouse renovated on the forest glade) for which the lawyers of the LGs could give their assessment whether it is reasonable to delegate the right of signature for certain sites to the construction specialist.

### 4. How to find the proceeding of interest?

To find the proceeding, EHR has optimized opportunity to set the search filters to help reduce the time spent for finding the stage of work. The saving function is added to the filter to make the case handler's work more comfortable and less manual. To set the filter, select the Filter button on the Proceedings page after which the case handler can make relevant selections in the opened window.

### 5. Where is it recommended to enter the personal observations related to the proceeding?

Making comments and observations for personal use outside EHR increases time spent for the proceeding and it also favors fragmentation of the proceeding information. Hence the optimized solution enables provision of observations for personal use. To make the observations, the case handler has to select "observations and notifications" of the ongoing proceeding's general view page. The opened page enables to add observations for personal use and also see the comments from other officials (e.g. internal or external approvers) meant only for the case handler.

## 6. How to archive irrelevant proceedings?

The proceedings that are not relevant any more and are just “hanging” extend the time for navigating in the list of proceedings. To facilitate work and organize data, EHR enables to remove the irrelevant proceedings from the list by using the archiving functionality. To do that, the case handler has to go to the Proceeding list view in EHR and press the button on the far right “Archive” after which the requested proceeding is removed from the list of proceedings that are displayed for the case handler.

## 7. How should signing of documents be performed?

Signing of the construction documentation outside the system and the preparation of the administrative acts affects the time spent on preparing and processing the EHR application. The optimized EHR solution will enable signing of the same document by several people. To sign the proceeding document, navigate to the overview of ongoing proceedings in EHR page and select Documents with the button “View signatories”. Pressing this button open the information window about the signatories with an option to add signatories to the document by selecting Add a person.

Signing is based on a hierarchical model or the folder system where the whole design documentation in the sub-folders is deemed as signed when signing the main folder. Changing of one file is also enabled, i.e. when the design documentation is changed, the applicant does not necessarily need to sign the whole design documentation and upload it to EHR, but it is enough to change a single file and upload and sign just that specific file. It is also allowed to sign the folder that includes the documents.

It is also allowed to display the design documentation as wished either by the file name, group part, project part of the stage to enable finding the document that the LG’s case handler or approver are searching for with minimum effort.

## 8. How is the documentation of the proceedings downloaded?

Downloading the whole documentation could become a very long process. Downloading will be ineffective especially when an overview is necessary only about one file. In the optimized EHR solution, downloading of documentation is enabled more efficiently. It is possible to load documents one by one or only the files of interest at the same time. For that, the EHR case handler should select Documents on the general view page and select the files to be downloaded.

## 9. Which is the best practice for making observations during on-the-spot visit of inspection?

To avoid duplicated or fragmented data, the solution for making observations as well as e.g. the percepts during on-the-spot visit of inspection, is to use the portable smart devices that use Smart ID or Mobile ID solution at logging into EHR. To facilitate the use of smart devices during on-the-spot visit of inspection, the EHR environment should be optimized for different screen (tablet, mobile phone, laptop, desktop) views.

## 10. How to direct the proceeding to another case handler within the institution?

Untimely performance of proceedings affects directly the customer satisfaction as well as the compliance of the activities to legal acts. To stick to the deadlines, the new EHR solution enables the official to transfer the arrived proceeding to another competent employee on justified need (many proceedings in progress, official on vacation, or other). To forward the proceeding, select General information on the overview page of the ongoing proceeding and then the chief case handler and their substitute can be seen in section Proceeding information. It is possible to edit both by pressing relevant button.

## 11. How to get an overview of the statistics of the proceedings?

The Proceeding statistics is available in the statistics portal of the Register of Buildings (statistika.ehr.ee). To find the searched information, it is possible to select the proper subsection from the homepage and, in turn, determine the relevant parameters (e.g. local government, year of the end of the proceeding, intended use, type of the building activity). The statistics portal enables to display the data on the following indicators:

- Length of the proceeding in the local government
- Dynamics of the proceeding in the local government
- Comparison of the duration of the proceedings
- Allocation of the duration of the proceedings
- Indicators of the construction work
- REGREL information of the construction work
- Energy class information of the construction work

12. How to efficiently keep up with the works ahead?

Getting a quickly detectable overview of the works ahead helps to make work more efficient and favors meeting the deadlines. Optimized solution of EHR allows to add a observation and a tick to indicate that the document has been reviewed and this will reduce the need to peruse the content of the document that in turn helps to use the working time more effectively.

13. How to deliver the proceeding to approval effectively?

Approval of the proceeding may include the need to involve many different parties to the approval round that may change the whole process time consuming. The optimized solution of EHR enables to give the single type procedural acts to several parties for performance so that when the approval is created, it is possible to use the same deadline and observation that has been added to another approval or provision of an opinion in that proceeding. This update helps to accelerate sending to the approval round and reduces the volume of manual work of the case handler.

14. How to manage the desktop view of the case handler?

Icon Desktop shall be selected from the left menu bar to go to the case handler's desktop. Case handler's desktop is divided into two views:

1. Viewing information on the map
2. Overviews of the documents received and in proceeding

### **Viewing information on the map**

The case handler has the map and the list of applications/notices in the desktop view which can be filtered via the pre-defined selection of filter and displayed in the map view. Applications/notices can be displayed on the map by pressing the selecting the box in the left edge of the proceeding. It is also possible to select several proceedings. The last selected filter of the user is always displayed by default also after re-authentication until the user themselves changes the filter. For example, it is possible to filter as follows:

- Last arrived documents;
- Last repeatedly submitted documents;
- Applications returned to the applicant with observations;
- Applications that have exceeded the procedural time-limit;
- Applications currently pending for the longest time.

The case handler can also search the proceedings by the address, land register reference or number of the application(proceeding from the map view).

### **Overviews of the documents received and in proceeding**

This view shows the documents in top-to-bottom list that is displayed according to the pre-defined filters.

The Add overview button enables to add a new tab with the same selection of pre-defined filters as the previous tab but it is possible to display some other pre-defined filter. If desired, also the same pre-defined filter as in the first (or some other already added tab if there are more than two tabs) if there is a wish to apply additional filter that open from the table's filter icon. Each pre-defined filter selected from the added tab and filters defined from the filter icon are retained until the user changes these.

#### 15. How to manage the view of documents received by the case handler?

To go to the case handler's view of arrived documents, select the icon Arrived from the left menu bar icon.

The arrived documents show on the relevantly selected tabs whether the documents in the area of responsibility of the case handler or the documents in the whole institution are displayed. The case handler can select the administrative units (e.g. by district or cities/villages/parishes) own area of responsibility with the button Settings and the arrived documents are filtered accordingly.

It is possible to filter the documents according to the time of submission, type/number of the application, code of the Register of Buildings, name/address of the construction works. It is possible to view the document by clicking the relevant document row.

#### 16. How to manage the view My proceedings?

Icon Proceedings shall be selected from the left menu bar to go to the proceedings view. The case handler can choose the proceedings to see by pressing the following tabs:

- My proceedings - the case holder sees only the proceedings related to them and may see the proceedings of some other inhouse case handler. The case handler can filter their proceedings additionally based e.g. on the time period by pressing the filter icon.
- In the whole institution - all inhouse cases in proceeding are displayed that can be filtered, if needed, according to e.g. an interval or several case handlers. Here all the proceedings of the institution's case handlers are displayed without any exception.
- Archived - if this checkbox is active, the Case handler tab displays the not archived + archived proceedings related to that case handler. If the tab In the whole institution is active as well as this checkbox, the non-archived and archived proceedings in the whole institution are displayed.

There is a section Addressed to me for signing in the bottom part of the view from where the case handler can easily find the documents to be signed. This section also allows to filter the to be signed documents so that also the documents already signed by the case handler are displayed.

### 2.7.2.4 Approval

#### 1. Which selection to use for returning the approval and observations to the LG's-side case handler?

The following shows the approvals that the approver can select in EHR for completing approval and recommendations on the cases where the relevant approval should be used.

- Approve - this selection should be used if the construction work does not have any deficiencies and approval is granted without supplementary conditions.
- Approve with a observation - this selection should be used if the approving authority wishes to grant the approval to the construction work with conditions that the applicant is obliged to consider in the further life cycle of the construction work.
- Not approving - this selection should be used if the construction work does not meet the required conditions and based on the provisions of the legal acts, it is not possible to grant the approval.
- Cancel - this selection should be used if the approval is cancelled since the approving authority is not obliged to perform the approval based on legal acts, or for some other reason.

The following describes the selection that the approver can select upon adding the observations during approval and recommendations on when to use the selections.

- FYI - this selection should be if it is desired to make the observations made by the approver visible only to the LG's-side official and the observation does not reach the applicant.

- To the administrative act - this selection should be used if the observations and foreseen for the applicant for following and hence the observations will be automatically added to the administrative act.
- To solve - this selection should be used if the made observations are foreseen for the applicant for solving after which the application is sent to the new approval round.

The approver can also tick the selection Applicant can immediately see the comment after which the applicant can immediately see the observations of the approver and the applicant can already preventively start to prepare for solving the observations.

## 2. How to reject effectively the irrelevant approval operation?

Some authorities who grant approvals use the practice that if the proceedings are not within their sphere of competence, then the simplified procedure is executed, i.e. the official document is not formalized and the decision to abandon the proceedings is made directly to the EHR, which helps to save the time that would otherwise be spent in the institution's document management system to perform the procedural act. Hence the best practice for the approving authorities for improving efficiency is to make a decision only in EHR upon rejecting approval and not perform the duplicate procedural act in the inhouse document management system if the internal regulations of the approving authority allow this.

## 3. What to avoid during approval process?

The applicants sometimes interact directly with the approver in respect of the observations so that they need not submit the whole documentation again to EHR upon making amendments to the design documentation. Therefore, they send the modified file/files only to e-mail of the interacting approver, which is why one coordinating authority appears to be somehow processing a new project, while the other ones do the old project, which in turn entails the risk that the changes in the updated project will not be processed by other relevant approvers. Hence the applicant should not send the changes to the design documentation directly to the approving official but the applicants should be guided to submit the changes directly to EHR so that all parties to the proceeding have the same design documentation.

The approvers sometimes also check the things that belong to the LG's tasks (e.g. competencies of the applicants) which at the same time increase the general time commitment as well as workload of the approvers due to the duplicate work with LGs. But this is not favored and it is recommended that the approving authorities avoid the duplicate checks with LGs and trust the competence of LGs.

## 4. How to manage the approver's desktop view?

Icon Desktop shall be selected from the left menu bar to go to the approver's desktop. The approver's desktop has one view: viewing information on the map.

The approver's desktop view displays the map and the list of applications/notices in their approval. It is possible to filter the applications/notices via the pre-defined filter selection and display these in the map view by pressing the box in the left edge of the proceeding. It is also possible to select several proceedings. The last selected filter of the user is always displayed by default also after re-authentication until the user themselves changes the filter.

The approver can also search the proceedings by the address, land register reference or number of the application(proceeding from the map view).

## 5. How to manage the general approval view?

Icon Approvals shall be selected from the left menu bar to go to the approver's desktop. Icon Desktop shall be selected from the left menu bar to go to the approver's view. It is possible to view the internal as well as external approvals by selecting the relevant tab on the upper part of the view. Inhouse approvals are divided into three different views.

- My approvals - the case holder sees only the proceedings related to them and may see the proceedings of some other inhouse case approver. The approver can filter their proceedings additionally based e.g. on the time period, name/address of the construction work by pressing the filter icon.

- In the whole institution - all inhouse cases in approval are displayed that can be filtered, if needed, according to e.g. an interval or several approvers. Here all the proceedings of the institution's approvers are displayed without any exception.
- "Archived" - when this checkbox is active, the not archived and archived proceedings related to that Approver are displayed and if the user has an active tab and that checkbox, the not archived and archived approvals of the whole institution are showed.

It is possible to filter the approvals according to different parameters (e.g. time-limit, code of the Register of Buildings, number, status of the proceeding). Different operations can be performed with each proceeding by clicking the Actions button on the approval row.

#### 6. How to manage the application approval view?

To approve the application, click the desired approval in the approval view and then the application approval view is displayed. The upper part of the view displays the number of the approval and the arrival date and deadline of the approval.

Then the proceeding information block is displayed to the approver. The block consists of two tabs: approval and documents submitted with the application. The tab "approval" is opened by default that displays the approval-related information (e.g. LGs, name of the LG's case handler, application, associated building permit if the use and occupancy permit is applied for and time remained for approval). When the Documents submitted with the application tab is selected, it is possible to examine the proceeding-related design documentation.

Then the section for approval of the construction works is displayed where it is possible to determine the approval for all construction works that are related to the application (approve, approve with a observation, not approving, cancel).

The bottom section shows the proceeding-related observations. The approver can also add the observations with the attached file and determine the way of sending out the observation (for fixing, to the administrative act, FYI). It is also possible to determine whether the applicant can immediately see the observation by selecting the checkbox. It is also possible to submit a observation by selecting Add the observation.

Finally, it is possible to save the draft approval or submit the approval by clicking the relevant button.

### 2.7.3 Recommended measures

Recommended measures used in the impact analysis of the recommended practices are summarized in the following table (see Table 2. Recommended measures.). Beside the measures of the recommended practices, there are four measures added to the bottom of the table that according to the expert assessment should be taken into use in the impact analysis.

*Table 2. Recommended measures.*

<b>Recommended practices</b>	<b>Recommended measures</b>
How should the applicants submit applications?	Directing the applicant to submit the application as a follow-up application
How to reduce the time of the LG's official spent for pre-consulting?	Structured manual for the applicant
How to increase the general knowledge about the EHR system options and proceeding performance among the LGs, designers and approvers?	Regular EHR-related training sessions Sharing the inhouse knowledge with colleagues (e.g. tips, best practices, instructional materials) Use of the list of the design documents that the approvers coordinate

How to get a quick overview of the content of the design documentation?	Use of the document preview inside the EHR system
How should LGs register the received application?	Data storage policy in EHR
How can the checklists facilitate and change the proceeding more transparent?	Use of the checklists
How to perform inclusion in the proceeding?	Use of the reference data by the building in EHR
How to find the proceeding of interest?	Setup and recording of search filters
Where is it recommended to enter the personal observations related to the proceeding?	Entering personal observations within the system
How to archive irrelevant proceedings?	Archiving of irrelevant proceedings
How should signing of documents be performed?	Document signing within the system
How is the documentation of the proceedings downloaded?	Using an option to select the downloadable files
Which is the best practice for making observations during on-the-spot visit of inspection?	Making observations during on-the-spot visit of inspection directly to EHR system
How to efficiently keep up with the works ahead?	Marking the reviewed documents
How to deliver the proceeding to approval effectively?	Simultaneous sending of the single-type proceedings to the approval round
How to reject effectively the irrelevant approval operation?	Performance of simplified proceeding in the case of incompetence of the approver and making the final decision always in EHR
How to close the proceeding?	Delegating the right of signature to the construction specialist
How to perform ADS proceeding?	Performance of ADS control as the first action
How to direct the proceeding to another case handler within the institution?	Forwarding the proceeding to the co-worker, if needed
When should the application be rejected without review?	Returning the application only when it is obvious that it is not possible to carry out the proceeding
Which selection to use for returning the approval and observations to the LG's-side case handler?	Use of the list intended for terminating the approvals referred to in recommended practices
What to avoid during approval process?	Limiting the direct communication between the applicant and the approver
	Use of the restrictions' map
	Automatic transfer of applications in EHR to the DHSes of institutions by the means of the document exchange protocol (DHX)
	Checking the stage of the proceeding in EHR
	Performing inquiries from the Register of Professions by the means of the interface

# 3 Impact analysis

The aim of the measures indicated in chapter 2.7.3 is to improve the current situation or have positive impact on the present situation. An impact analysis was performed to identify which possible change can result from implementing the indicated measure in the procedural processes. The following sub-chapters describe the methodology that was used for the impact analysis and the analysis with the received outcomes.

## 3.1 Analysis methodology

The impact analysis was performed on three consecutive stages: creating an overview of the current situation, identification of possible potential impact by measures (GAP matrix) and finding the possible potential impact by the types of proceedings (see Figure 41. Stages of impact analysis) . During the previous stages of the project, it has become evident that present actual bottlenecks have a negative impact primarily for the time commitment of different activities and so the impact potentially involved in implementation of the measures is assessed as a time unit (in hours). The analysis used the quantitative information gathered during the interviews with different parties and delivered by the contracting entity as well as assessments of the expert.

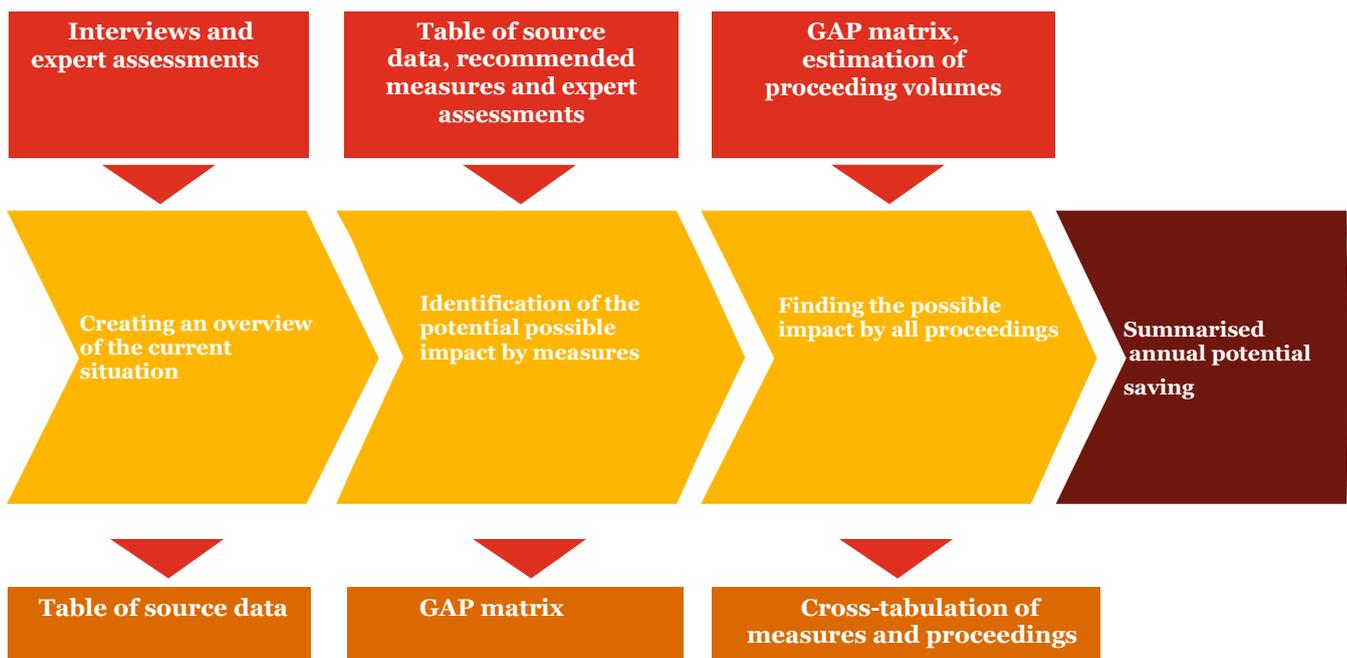


Figure 41. Stages of impact analysis

### Creating an overview of the current situation

One of the most important pre-requisites for impact assessment is to have an overview of the current situation. To achieve that, the time commitment assessments to the current situation consolidated during the interviews as well as given by the expert were compiled ( Annex 3: Table of source data). As the proceeding consists of different stages where the time commitment may be different, the procedural process was divided into logical parts to get more detailed overview: pre-consulting, preparation and submission of an application, supplementation of an application, receiving an application, managing and planning of the proceeding, application review, approval/submission of an opinion and formulation and submission or the procedural decision. The time commitment assessment reflecting the current situation received by the previously described way was highlighted about each stage. The table shows assessments on one proceeding. Information gathered during the interviews includes subjective assessments of the industry experts.

Considering the fact that time-related costs may vary in the context of a specific case in different parts

PwC

of the procedural process, the average time commitment assessments are highlighted as source data by excluding the extremities. Additionally, some stages are repeated by the proceeding and hence also the number of repeated rounds was considered in calculating time commitment to get more integral picture for these parts. Since beside the proceeding party (incl LG's case handlers, approvers/authors of opinion), primarily the applicant has an important role in certain stages ( e.g. submission of an application), the table that reflects source data is consolidated with the time commitments of the case handlers as well as applicants. Each highlighted source of the time commitment and specifications of division between the applicant and the proceeding party are submitted in the explanation column of the table of source data.

The table of source data reflecting the current situation presents the time commitment assessments for the building permit and use and occupancy permit as these are the most voluminous proceedings with respect to the number of proceedings (based on the proceedings that were closed in 2018) as well as the duration, which is why it can be seen that implementation of recommended measures has the potentially greatest impact primarily on these types of proceedings.

### *GAP matrix*

GAP matrix was compiled for identifying the potential impact of implementing the recommended measures presented in chapter 2.7.3 (Annex 4: GAP matrix). This is the cross-tabulation with the aim to highlight which measures potentially impact which parts of the proceeding stages by one proceeding according to the expert assessment and identify the quantification of the potential impact. The selected method gives a detailed overview of the possible occurrence of impacts and the obtained results can be used for assessment of the impact actually achieved after taking the measures.

Base on the number of closed proceedings of 2018, it was found out that the volume of BP applications was a bit higher than the number of UAOP applications. During the indicated year, compare to UAOP applications, ca 40% more BP applications were closed. Since based on the description, it can be presumed that implementation of measures has potentially highest impact primarily on BP applications and according to the expert assessment, it is relevant to implement all recommended measures for BP, the BP proceeding is taken as the basis for the GAP matrix by one proceeding for identifying the impacts.

The GAP matrix considered the time commitment of a current situation as the reference point for identifying the potential impact (Annex 3: Table of source data). Based on the present situation, each measure highlighted separately the estimated impact that may potentially occur for the relevant party from application of it in a specific stage. Hereby the impact on present time commitment with the number of the repeated rounds is taken into account. Repeated rounds have been considered in the stages where it is relevant based on the table of source data. The assessments are presented by one proceeding in hours and they rely on the assessments collected during the interviews as well as given by an expert. More detailed explanations about formation of the impact assessment are provided in the sub-chapter „Explanations on the impact of measures that interprets the GAP matrix“.

According to the expert assessments, based on the differences of the types of proceedings, it is not relevant to implement all measures to all types of proceedings that are observed within this project. Assessment of potential impact by measures allows to adapt the received outcomes in the next stage of the analysis specifically for these types of proceedings where implementation of measures would be relevant (Annex 5: Cross-tabulation of measures and proceedings) Assessment by one proceeding enables to implement the received outcomes in the next stage of the impact analysis by types of proceedings in finding the annual total impacts.

Majority of the proceedings contain the applicant beside the party to the proceeding (incl the case handler, approvers/authors of opinion and so the GAP matrix also highlights the impact that may potentially occur to the present time commitment of the applicant from implementing the measures. The potential impact assessment for the party to the proceeding as well as the applicant is provided in the stages where it can be clearly recognizable that a specific party today performs the activities for which the time-saving is potentially possible when the measures of the recommended practices are implemented. Since this project primarily focuses on improvement of the activities of the case handler, the assessment of potential achieved time-saving by the applicant is rather informative and it will not be considered further in the impact analysis. According to the authors of the analysis, the applicant will gain savings in time as well as an improved service.

### *Potential savings by types of proceedings*

Preparation of the GAP matrix resulted in an overview about the potentially possible saving in time by the example of BP in one proceeding by the measure. To get an overview of potential impacts by all types of proceedings, the cross-tabulation of measures and types of proceeding was prepared (Annex 5: Cross-tabulation of measures and proceedings) This table highlights implementation of which measures in which types of proceedings is relevant according to the expert assessment and have therefore potential impact on a specific type of proceeding.

To identify the potential saving of time due to implementation of the measure by the types of proceedings, the summarized impact assessments by measures received from GAP matrix were taken as the basis by example of the BP. Identification of the recommended measures showed that for some reason, all measures do not have impact in equal volume to all executed proceedings during one year (e.g. some local governments already implement the practices of the measure, use of the measure is related to a specific part of the proceeding execution of which is not necessary in each proceeding, etc). For the created overview to reflect the potential saving in time as exactly as possible, the expert assessment formed based on information that was gathered during the interviews carried out during the project highlighted the percentage of impact of each measure to the proceedings in a calendar year. Explanation about formation of each percentage are provided in the column of explanations of the table in Annex 5: Cross-tabulation of measures and proceedings . Potentially achieved impacts by measures that were identified by the example of BP were adjusted with the percentage assessments and the obtained outcomes were used as an input to each type of proceeding in calculating the potential impact.

As the impacts by proceedings are provided by the example of proceeding the BP application and considering that the length of BP compared to other types of proceedings is different, the average duration of each type of proceeding was related to the duration of proceeding the BP application. The obtained ratio enabled to create more accurate overview of the potential impact for each type of proceeding based on the assessments provided by the example of BP. Information gathered during the interviews constitute the time assessment spent on execution of one proceeding.

To identify the potential saving in time for each type of proceeding concerning one proceeding, the potential impacts from the measures implemented to a specific type of proceeding were summarized based on the BP example and the obtained result was multiplied with the ratio described above. To find out the annual potential time saving, the result obtained for one proceeding was multiplied with the number of proceedings closed in 2018 of one specific type of proceeding. Information provided by the contracting entity was used for the number of proceedings.

By each type of proceeding, the possible potential saving in time is highlighted by one proceeding as well as one year if all relevant measures by the opinion of the expert assessment are implemented to a specific type of proceeding.

### **3.2 Quantitative impact**

By implementing the prototype created within the framework of this work, the described processes and requirements and by implementing all measures provided in chapter 2.7.3 , the estimated **91 798 case handler's working hours with the full time equivalent (FTE) is 45.38** could be possibly totally saved by the types of proceedings by the volumes of proceedings closed in 2018 (see Annex 5: Cross-tabulation of measures and proceedings)

---

*The analysis showed that implementation of recommended changes saves the working time to the extent of at least 45 FTE by the volumes of proceedings of 2018.*

---

Since these results are based on the volumes of 2018, it was not possible to transfer the result for one-to-one to this or subsequent year as the number of proceedings varies by years. Implementation of recommended measures could have the greatest impact on BP, BN, UAOP and proceedings in 2018 by one proceeding as well as by one year. According to the assessments obtained from interviews, the building notice is divided into two - BN and BN\*. The first one is simpler proceeding that takes the case handler 2–

4hrs according to the expert assessment. For BN\*, it was considered that the building notice is proceeded with the building design documentation and according to the expert assessment, 90% of BN\* proceedings become time consuming similar to BP proceedings. The interviews also referred that the use and occupancy notice is divided into two - UAON and UAON\*. The less time consuming UAON proceeding takes ca 0.5 – 2hrs for the case handler according to the expert assessment while the UAON\* with the building design documentation takes 21–45hrs for the case handler. UAON\* proceeding is similar to the UAOP procedural process and according to the expert assessment, 90% of proceedings of the notice of use become more consuming UAON\*.

The saving in time of proceeding the building permit application is estimated of ca 4,3hrs and 34,330hrs by the proceeding and per year accordingly, ca 3.6hrs and 20,967hrs for the BN\* with the building design documentation, ca 4,5hrs and 22,176hrs for the use and occupancy permit and 3.7hrs and 12,136hrs for the UAON\* with the building design documentation. With respect to the specified proceedings, these are the longest proceedings for the purpose of the average time commitment.

For other types of proceeding the impacts from implementing the measures are somewhat smaller. For the DS, the potential saving in time by the volumes of 2018 by one proceeding could be ca 0.3hrs and 1,207hrs per year, for BN, the relevant results were ca 0.33hrs and 212hrs, for CCN ca 0.04hrs and 171hrs, for KT ca 0.14hrs and 49hrs, for CDN ca 0.4hrs and 61hrs, for RPK ca 0.01hrs and 309hrs, for ABN ca 0.02hrs and 152hrs and for OCWA ca 0.01hrs and 30hrs accordingly. Differences in quantification of potential impacts mainly come from the different number of measures potentially implemented on one type of proceeding. The difference comes from the content of the measure, therefore implementation of all measures for all types of proceedings is not relevant. Specificities in possible annual saving in time come from the difference in the annual number of proceedings. The complete overview of the results of the impact analysis is available in Annex 5. Cross-tabulation of measures and proceedings. The following figure shows decrease in proceeding burden by proceedings in percentage.

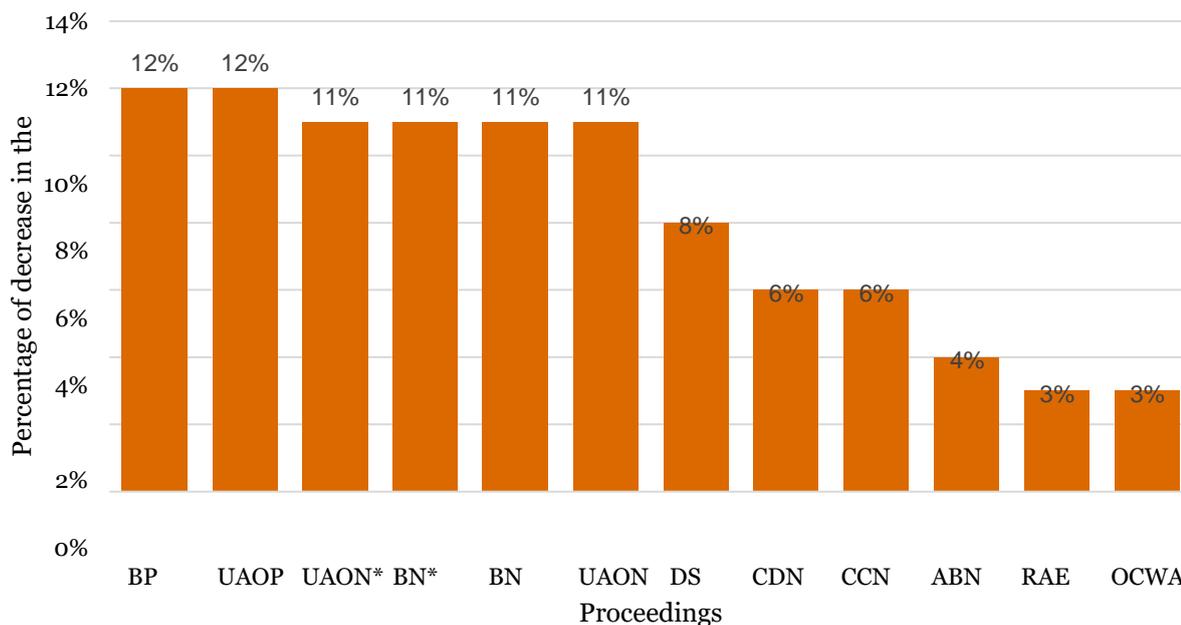


Figure 42. Percentage of proceeding burden reduction by proceedings

Conducting the periodic EHR-related training sessions have the greatest potential impact among the measures (see Table 3. Percentage of recommended measures from the overall impact) The result is supported by the information received during the interviews that in the opinion of the case handlers, there are too few training sessions and hence the knowledge base for using the tool is not so strong that it could potentially be. According to the expert assessment, the impact from attending the training sessions is that the knowledge and skills of the case handlers are improved for working in EHR system which in turn favors the efficiency gain. According to the expert assessment, the potential impact from implementing the measures can be seen in all stages of the procedural processes (except formulation and submission of the procedural decision for which the authors of the analysis have presumes that this is a inhouse regulated activity) and this for all types of proceeding. Provided that currently there are case handlers who are expert users of EHR and for who participation in EHR-related training sessions do not add values, the expert assessment shows that performance of the EHR-related training sessions impact ca 85% of the yearly proceedings of one proceeding

Mapping, optimizing, and adjusting for the introduction of e-construction of the procedures of the Register of Buildings Final report  
type. According to the impact assessment prepared based on BP, conducting the EHR-related training sessions potentially reduces the time commitment for performing one proceeding by ca 0.65 hrs.

The measure for selecting the downloaded files has less potential impact than the previously described measure but clearly more impact than other measures (see table 3. Percentage of recommended measures from the overall impact) When this measure is implemented, it is possible to select a specific required file by reducing so the time spent on downloading and unzipping. According to the expert assessment, the measure impacts potentially all proceedings for the types of proceeding where implementing the measure is relevant (BP, BN, UAOP, UAON). By the example of BP, implementing the measure potentially helps to reduce the time commitment ca by 0.45hrs in one proceeding. More detailed overview of the potential impact upon implementing the measures by the measures as well as types of proceeding is highlighted in ( Annex 5. Cross-tabulation of measures and proceedings) of this document.

The following table shows the allocation by percentage of all measures from the total impact.

*Table 3. Percentage of recommended measures from the overall impact*

<b>Recommended measure</b>	<b>Percentage from the overall impact of all measures</b>
Regular EHR-related training sessions	14.7%
Using an option to select the downloadable files	10.4%
Checking the stage of the proceeding in EHR	8.8%
Use of the restrictions' map	8.1%
Use of the reference data by the building in EHR	5.8%
Document signing within the system	5.8%
Performance of ADS control as the first action	5.8%
Delegating the right of signature to the construction specialist	5.6%
Automatic transfer of applications in EHR to the DHSes of institutions by the means of the document exchange protocol (DHX)	5.3%
Structured manual for the applicant	4.6%
Archiving of irrelevant proceedings	4.6%
Performing inquiries from the Register of Professions by the means of the interface	3.5%
Forwarding the proceeding to the co-worker, if needed	2.8%
Entering personal observations within the system	2.3%
Marking the reviewed documents	2.3%
Setup and recording of search filters	1.9%
Performance of simplified proceeding in the case of incompetence of the approver and making the final decision always in EHR	1.7%
Sharing the inhouse knowledge with colleagues (e.g. tips, best practices, instructional materials)	1.2%
Directing the applicant to submit the application as a follow-up application	1.2%
Data storage policy in EHR	1.2%
Use of the document preview inside the EHR system	1.0%
Use of the checklists	0.7%
Use of the list of the design documents that the approvers coordinate	0.6%
Making observations during on-the-spot visit of inspection directly to EHR system	0.1%

By implementing the measures in the table, it is recommended to start from the measures with the greatest impact.

### 3.3 Qualitative impact

Beside the measures which implementation has potential impact can be measured temporally based on currently available quantitative data, the impact analysis contains three measures that impact the procedural processes primarily in the qualitative way. Implementing the measure Returning the application only when it is obvious that it is not possible to carry out the proceeding potentially helps to increase the overview of the applications actually submitted in the local governments by the applicants. As today some of the local governments do not take the application to proceeding due to minor shortcomings (e.g. state fee is not paid), there is no integral overview of the applications submitted to the local governments. Implementation of the measure potentially helps to increase the integrity of the inhouse data. The impact of implementing the measure Use of the list intended for terminating the approvals referred to in recommended practices can be seen mainly due to the fact that the number of errors upon closing the approvals is reducing because it is known which selection of the approval is currently relevant. The preparer can also make the comment available for the applicant that helps to make the proceeding more transparent. As the result of implementing the measure Limiting the direct communication between the applicant and the approver, it is potentially possible to reduce the today's problem where as the result of the communication between the approver and the applicant, the changes are made to the document and these do not reach operatively all parties. This creates a situation where the approval/opinions are given to different versions of the application documents. Consolidating the communication of the proceeding to a single environment helps to ensure that all parties have the same version of the documentation of the proceeding and this will minimize the opportunity where all approvals of the decision issued to the applicant are not relevant.

According to the expert assessment, the measures provided in chapter 2.7.3 should be implemented to the maximum extent for achieving greatest possible time burden and increase in quality. Implementation of all measures potentially help to shorten the length of the proceeding that in turn reduces the time burden also for the applicant. Since the recommended measures are mainly based on recommend practices, which in turn are partially collected from the practice implemented by some parties to the proceeding, implementation of the measures might not impact all case holders the same way.

The potential saving in time achieved as the result of implementing the measure can be used, for example, for developing the area knowledge of the parties involved in the procedural process, use time for performing other tasks or introduce savings for performing larger number of proceedings (provided that the number of submissions to the municipality is increasing). The results of the impact analysis give potential saving in time that is based on the basic data described in chapter 3.1 . Since the majority of the provided recommended measures are connected with the behavioral habits of people where the person has an opportunity to continue the same way as always, realization of the potential saving in time depends on the person's behavior upon implementation of the measure. Hence it would be relevant to measure the achieved impact in each municipality after implementation of the measure.

it can be concluded from the results of the impact analysis (Annex 5. Cross-tabulation of measures and proceedings) that as the recommended measures have greatest potential impact for the BP and UAOP proceeding, it would be relevant to start implementation of measures first from the BP and UAOP proceedings.

# 4 Annexes

## Annex 1. List of interviewed institutions

The following shows the list of the interviewed authorities in the order of conducting the interview.

<b>No.</b>	<b>Interviewed authority</b>	<b>Role</b>
1	Saue Parish	LG
2	Lääne-Harju Parish	LG
3	Kiili Parish	LG
4	Novarc Group	Entrepreneur
5	Maru Ehitus	Entrepreneur
6	Harku Parish	LG
7	Environmental Board	Approver
8	National Heritage Board	Approver
9	Rae Parish	LG
10	Kuusalu Parish	LG
11	Jõelähtme Parish	LG
12	Viimsi Parish	LG
13	Rescue Board	Approver
14	Land Board	Approver
15	Technical Inspectorate	LG
16	Nordecon	Entrepreneur
17	City of Tallinn	LG
18	Rapla Parish	LG
19	Kehtna Parish	LG
20	Health Board	Approver
21	Road Administration	Approver
22	Kadrina Parish	LG
23	Haljala Parish	LG
24	City of Tartu	LG
25	Tallinna Vesi	Approver
26	Land Board - ADS	Approver
27	Kapitel	Entrepreneur
28	Põltsamaa Parish	LG
29	City of Paide	LG
30	Türi Parish	LG
31	Saaremaa Parish	LG
32	City of Narva	LG
33	City of Pärnu	LG
34	Elering	Approver
35	Kodumaja Projekteerimise OÜ	Entrepreneur
36	Kirjanurk	Entrepreneur
37	Salto Arhitektuuribüroo	Entrepreneur
38	Nord Projekt	Entrepreneur

---

..39....	Liven Kinnisvara.....	Entrepreneur..
..40....	Telia.....	Approver..
..41....	Roadplan.....	Entrepreneur..
..42....	Peeter Pere Arhitektid.....	Entrepreneur..
43	K-Projekt	Entrepreneur

## Annex 2: Checklist

Controls	DS	BP	BN	BN*	CCN	UA OP	UA ON	UA ON*	CD N	Reference
Is the application received by the proper competent authority (LG/TRA)?	X	X	X	X	X	X	X	X	X	Sections 39, 51 of the Building Code; subsection 15(4) of the Administrative Procedure Act
Whether in this part what is applied for, the right type of application is submitted?	X	X	X	X	X	X	X	X	X	Section 41 of the Building Code
Are the necessary prerequisites for applying for the service fulfilled (e.g. are there design specifications, detailed spatial plan, necessity for the building construction supervision, previous authorization or notification)?	X	X	X	X	X	X	X	X	X	Subsections 29(2); 36(3); 40(2); 48(3); 52(2) of the Building Code
Are the documents required in Annex 1 and/or 2 of the Building Code submitted?	X	X	X	X		X	X	X		Subsections 35(3), 36(4), 38(2) of the Building Code 47(4); 48(4) of the Building Code
Has the necessary information been properly delivered?					X				X	Section 43 of the Building Code
Is the owner of the immovable involved in the proceeding?	X	X	X	X		X	X	X		Subsections 31(3), 36(5), 42(6); 48(5), 54(5) of the Building Code
Is/are the owner(s) of the adjacent immovable involved?	X	X	X	X		X	X	X		Subsections 31(3), 36(5), 42(6); 48(5), 54(5) of the Building Code
Do the required competent parties have relevant qualification? (designer, granter of the energy label, builder)?		X			X					Subsections 24(2) of the Building Code
Has the necessary contact information been submitted properly?	X	X	X	X	X	X	X	X	X	Subsection 43(2) of the Building Code
Are the data submitted at application correct?	X	X				X				Section 28 of the Law Enforcement Act, Subsection 75(1) of the General Part of the Economic Activities Code Act
Have the restrictions to the building been identified and taken into account?	X	X	X	X	X	X	X	X		Sections 70, 120 of the Building Code
Have the restrictions to the location been identified and taken into account?	X	X	X	X	X	X	X	X		Sections 70, 120 of the Building Code
Have the restrictions to the building activity been identified and taken into account?	X	X	X	X		X	X	X	X	Sections 70, 120, 121 of the Building Code
Has the state fee been paid to provide the service?	X	X				X				Subsection 29(2) of the Building Code; section 15 of the State Fees Act
Does the submitted approval comply with the formal	X	X	X	X	X	X	X	X	X	Subsection 29(3); 35(6); 40(4)

requirements?										43(5); 47(7); 52(4); 60(5) of the Building Code
Do the submitted documents comply with the formal requirements?	X	X	X	X	X	X	X	X	X	Subsection 15(2) of the Administrative Procedure Act, subsection 54(3) of the Building Code
Is it necessary to submit additional information?		X	X	X	X	X	X	X	X	Subsection 36(5) of the Building Code
Is there a building permit for demolition before the complete demolition notice?									X	Section 43(3) of the Building Code
Has the qualification of the operator carrying out the construction works been certified?					X					Subsection 22(4); section 130 of the Building Code, section 68, 43 of the General Part of the Economic Activities Code Act

Controls	DS	BP	BN	BN*	CCN	UA OP	UA ON	UA ON*	CDN	Reference
Is the building permit valid?					X	X				Section 28 of the Law Enforcement Act, section 138 of the Building Code
Does the building comply with the design provisions?		X				X				Subsection 12(2) of the Building Code
Have the design provisions determined relevant terms and conditions?	X									Subsection 26(4) of the Building Code
Is the construction work in conformance with the detailed spatial plan?		X				X				Subsection 12(2) of the Building Code
Is the construction work in conformance with the special planning of the local government?		X				X				Subsection 12(2) of the Building Code
Is the construction work in conformance with the detailed spatial plan?		X				X				Subsections 12(2); 44(1); clause 55 3) of the Building Code;
Is it necessary to specify the items covered in the detailed spatial plan with the design specifications?	X									Section 27 of the Building Code
Is it necessary to initiate the proceeding of open design specifications?	X									Section 27 of the Building Code
Has five years passed from establishing the detailed spatial plan?	X									Section 27 of the Building Code
Have there been any significant changes after establishment of the detailed spatial plan?	X									Section 27 of the Building Code
Has the application for the use and occupancy permit been started as the follow-up document from the building permit?						X				EHR training 19.10.2016 (Datel)
Is the energy label registered in the Register of Buildings?		X	X	X		X	X	X		Section 66 of the Building Code
Is the energy label granted by a competent party?		X	X	X		X	X	X		Subsections 24(2); 130(3); section 66 of the Building Code
Have the construction journals been submitted? Do they meet the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 7

<b>Controls</b>	<b>DS</b>	<b>BP</b>	<b>BN</b>	<b>BN*</b>	<b>CCN</b>	<b>UA OP</b>	<b>UA ON</b>	<b>UA ON*</b>	<b>CDN</b>	<b>Reference</b>
Have the reports of covered works been submitted? Do they meet the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 8
Have the minutes of the construction meetings been submitted? Do they meet the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 9
Has the report of the technical inspection of the electrical installations been submitted or is it unnecessary for this construction work? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Has the report of the technical inspection of the gas installations been submitted or is it unnecessary for this construction work? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Has the measuring protocol of the ventilation been submitted or is it not necessary for this building? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Has the measuring protocol of the noise level been submitted or is it not necessary for this building? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Has the measuring protocol of the lighting been submitted or is it not necessary for this building? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Has the test protocol of the heating system been submitted or is it not necessary for this building? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department
Have the protocols for water and sewerage test measuring been submitted or is it not necessary for this building? Does it satisfy the requirements?						X		X		Tallinn Urban Planning Department

<p>Have the as-built drawings of the utility systems been submitted or is it not necessary for this building? Do they meet the requirements? Signed by associated parties?</p>						X		X		<p>Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 6</p>
--	--	--	--	--	--	---	--	---	--	--

Controls	DS	BP	BN	BN*	CCN	UA OP	UA ON	UA ON*	CDN	Reference
Has the demarcation report of the construction work been submitted? Does it satisfy the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 11
Has the as-built survey after construction been submitted? Does it satisfy the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department
Have the declarations of performance of the load bearing structures been submitted or is it unnecessary for this construction work? Do they meet the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department
Have the necessary maintenance manuals been submitted? Do they satisfy the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department; requirements to the construction documenting, retention and the delivery of construction documents and requirements for the maintenance manual, its storing and submission § 14
Have the documents certifying the fire safety been submitted or is it unnecessary for this construction work? Do they satisfy the requirements? Signed by associated parties?						X		X		Tallinn Urban Planning Department
Is it necessary to perform the construction survey for the construction work?	X	X								Subsections 14(2); 42(4); of the Building Code
Is it necessary to specify the existing surveys?		X								Clause 14 (4) 2) of the Building Code
Is owner supervision carried out by the person who complies with the qualification requirements?					X					Section 130 of the Building Code; section 68, 43 of the General Part of the Economic Activities Code Act
Has the temporary prohibition on construction been established for the construction work (planning)?	X	X	X	X						Sections 32, 44 of the Building Code
Does the application of the design specifications comply with the comprehensive plan?	X									Clause 32 2) of the Building Code

Does the planned construction work unduly infringe the rights of a third party?	X								Clause 32 5) of the Building Code
Is the construction work dangerous due to the changes in the intended purpose?						X	X	X	Clause 55 2) of the Building Code
Can the energy efficiency requirements of the building adapted?		X	X	X		X	X	X	Section 62 of the Building Code
Does the building's energy efficiency comply with the requirements?		X	X	X		X	X	X	Subsection 65(3) of the Building Code; Minimum requirements for energy performance

<b>Controls</b>	<b>DS</b>	<b>BP</b>	<b>BN</b>	<b>BN*</b>	<b>CCN</b>	<b>UA OP</b>	<b>UA ON</b>	<b>UA ON*</b>	<b>CD N</b>	<b>Reference</b>
Have the title blocks and explanatory notes filled with necessary data?		X		X		X		X		Requirements for the building design documentation subsection 7 (2)
Has the Health Board approved or is it unnecessary for that construction work?		X	X	X		X				Subsection 127(2) of the Building Code
Has the Veterinary and Food Board approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the National Heritage Board approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Technical Regulatory Authority approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Environmental Board approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Civil Aviation Authority approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Rescue Board approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Maritime Administration approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Has the Road Administration approved or is it unnecessary for that construction work?		X	X	X		X				Section 130 of the Building Code
Have the requirements for people with special needs performed?		X				X				Clause 11 (2) 8) of the Building Code
Has the building design documentation been submitted? Does it satisfy the requirements?		X		X		X		X	X	Subsection 15 (2) of the Administrative Procedure Act; clause 44 5) of the Building Code; Requirements for the building design documentation, chapters 3 and 4.
Has the independent competent party checked the conformance of the building design documentation to the requirements?		X				X				Subsections 14(3); 44(2); 22(4) of the Building Code
Does the building design documentation submitted upon application for the occupancy permit match the building design documentation submitted upon application for the building permit?						X				Section 55 of the Building Code

Is it necessary to establish conduct of the expert assessment of the building design documentation as a supplementary condition?		X				X				Subsection 42(3) of the Building Code
Was the expert assessment of the building design documentation performed by the competent party?		X								Subsection 24(2); 44(2) of the Building Code
Has the expert assessment of the building design documentation been submitted? Does it satisfy the requirements?		X		X		X		X		Subsection 44(2) of the Building Code, Requirements for the expert assessment of the building design documentation (Sections 3)
Does the built construction work comply with the building permit?						X				Subsection 50(1) of the Building Code

<b>Controls</b>	<b>DS</b>	<b>BP</b>	<b>BN</b>	<b>BN*</b>	<b>CCN</b>	<b>UA OP</b>	<b>UA ON</b>	<b>UA ON*</b>	<b>CDN</b>	<b>Reference</b>
Can the built construction work be used according to the requirements and intended use?						X				Subsection 50(1) of the Building Code
Does the construction work comply with the requirements established in legal acts?						X				Section 46 of the Building Code; Section 28 of the Law Enforcement Act
Has the required audit been submitted?						X				Section 18 of the Building Code
Has the competent and independent party performed the audit?						X				Section 18 of the Building Code
Has the audit of the electrical installations been submitted or is it unnecessary for this construction work? Is the company who performed audit registered in EAK?						X				Section 2 of the Equipment Safety Act; Technical Regulatory Authority Guidance material of electrical installations
Has the audit of the lift been submitted or is it unnecessary for this construction work? Does it satisfy the requirements?						X		X		Equipment with audit obligation and requirements for the audit and submission of audit results Section 6
Is it necessary to establish the audit performance requirement as the supplementary condition?						X				Subsection 54(3) of the Building Code
Does the construction work or building involve a significant environmental impact?	X	X	X	X		X				Clause 44 10) of the Building Code; subsection 54 (2) of the Building Code
Is it necessary to initiate the assessment of environmental impact?	X	X	X	X		X				Clause 44 10) of the Building Code; subsection 54 (2) of the Building Code
Have the restrictions in public law established for the construction work?	X	X	X	X						Subsection 14 (1); clause 32 4), clause 44 1) of the Building Act
Does demolition meet the public interests?		X	X	X						Clause 44 11) of the Building Code
Is it necessary to provide the restriction of the validity period of the building permit to the time-limit for the demolition of the temporary construction work as a supplementary condition?		X				X				Subsection 42(3) of the Building Code
Is it necessary to establish the possibility of altering the building permit in relation to the validity of several building permits issued in respect of the same registered immovable as a supplementary condition?		X								Subsection 42(3) of the Building Code
Is it necessary to establish the possibility of amending the term of the building permit as a supplementary condition?		X								Subsection 42(3) of the Building Code

Is it necessary to establish possibility of repeated installation of the same construction work in the same location or within the territory defined in the building permit without submitting a building notice or building permit as a supplementary condition?		X									Subsection 42(3) of the Building Code
Is it necessary to establish conditions for building work arising from the complexity of the construction work or building work as a supplementary condition?		X									Subsection 42(3) of the Building Code
Is it necessary to establish the term of validity of the use and occupancy permit as a supplementary condition?						X					Subsection 54(3) of the Building Code

<b>Controls</b>	<b>DS</b>	<b>BP</b>	<b>BN</b>	<b>BN*</b>	<b>CCN</b>	<b>UA OP</b>	<b>UA ON</b>	<b>UA ON*</b>	<b>CDN</b>	<b>Reference</b>
Is it necessary to establish additional requirement to apply, within a specified time-limit, for use and occupancy permit for the entire construction work as a supplementary condition?						X				Subsection 54(3) of the Building Code
Is it necessary to establish commissioning an opinion from a competent person to verify the compliance of the construction work with the requirements as a supplementary condition?						X				Subsection 54(3) of the Building Code
Is it necessary to start an additional proceeding?			X	X			X	X		Subsection 48(5); 36(5) of the Building Code
Is it necessary to submit the draft to some authority for approval?	X	X	X	X		X				Subsections 31(4); 42(7); 54 (6) of the Building Code
Is it necessary to submit the draft to some authority for submitting an opinion?	X	X	X	X		X				Subsections 31(4); 42(7); 54 (6) of the Building Code
Have observations made during approval and submission of an opinion reviewed?	X	X	X	X		X				Subsections 31(5); 42(8); 54(7) of the Building Code

## Explanation of the abbreviations:

DS - design specifications; BP - building permit; BN - building notice; BN\* - building notice (with the building design documentation); CCN - Construction commencement notice;

UAOP - use and occupancy permit; UAON - use and occupancy notice; UAON\* - use and occupancy notice (with the building design documentation); CDN - Complete demolition notice; RAE - Register amendment entry; DSN - Data submission notice; OCWA - Organization of construction work's address.

Used acts and codes - Building Code, Administrative Procedure Act; Spatial Data Act; Law Enforcement Act; General Part of the Economic Activities Code Act; Equipment safety act.

### Annex 3. Table of source data

Proceeding stage	Time burden		Number of repeated rounds	Total time burden		Explanation
	BP	UAOP		BP	UAOP	
<b>Pre-consulting</b>	1h		N/A	1h		This an assessment given by the local governments according to which ca 10-15% of their working time is spent on daily pre-consultations. The pre-consultation stage includes counseling of persons by the case handler of the LG.
<b>Preparation and submission of the application</b>	5hrs		N/A	5hrs		This is an assessment given by the professional applicants during the interviews according to which ca 1-2hrs is spent on filling the data on application and ca 3-4hrs for uploading and signing the documentation.. The actual time commitment for preparing the application greatly depends on the volume of the documentation. The stage of preparation and submission of an application includes activities made in EHR (entering information, uploading, signing and submission of the application). The time commitment concerning consolidation of data is excluded here as this may vary a lot and depends on the work organization of the professional applicants and personal behavior of the private persons (how fast the documents are consolidated) in addition to the volume of documents
<b>Supplementing applications</b>	1h		2-3	2 -3 hrs		Time burden for supplementing the application is provided as an expert assessment. Supplementing the application means revising and supplementing the application according to the observations of the case handler and re-submission. An average of 1h is spent on single supplementation of the application. Determination of the time burden is based on an estimated average considering that depending on the number of observations, the time burden may be longer or shorter for some cases. Determination of repeated rounds is based on the assessment of the customer to the average length of the proceeding and the legal obligation for the LG to issue the decision for the proceeding within 30 days.
<b>Receiving an application</b>	0,5h		N/A	0,5h		This is an assessment provided by the LGs during the interviews according to which reception of application takes an average of 30 minutes. The application reception stage covers the primary activities with the aim to identify whether the pre-requisites for taking the application to proceeding are performed (all necessary documents are submitted, incl the correct application form is used, the application is submitted to the correct instance); register the application and, if needed, direct it to the relevant case handler (if the recipient of the application does not carry out the proceeding). There is no substantive check of the documents upon receiving the application.

Proceeding stage	Time burden		Number of repeated rounds	Time burden total		Explanation
	BP	UAOP		BP	UAOP	
<b>Management and planning of the proceeding</b>	2-4hrs	2hrs	N/A	2-4hrs	2hrs	This is an expert assessment where the expert has relied on the information that was gathered during the interviews when providing the assessment. The stage of management and planning of the proceeding considers the activities of the person managing the proceeding, among others, identification of involved persons and organization of the approval round. For the building permit, the time burden is assessed as higher as planning and approving the procedural activities may take longer. The reason is that in the case of the building permit, it is the first examination of the site's documentation.
<b>Application review</b>	1h	2hrs	2-3	2-3 h	4-6 h	This an assessment provided by LGs during the interviews. Time difference of the specified proceeding types comes from the documents to be reviewed which number is bigger for the use and occupancy permit. The application review contains substantive assessment of the documentation. This considers the time commitment of one case handler which total amount by one proceeding depends on the number of approval rounds.
<b>Provision of an approval / opinion</b>	4-16hrs	4-16hrs	1-2	8 -32 hrs		Depending on the site, the number of the involved approvers/authors of the opinion may vary depending on the site. This is an expert assessment on time that is relying on the information received from the approving parties during the interviews according to which provision of an approval/opinion may take an average of 1-4hrs (depending on the site) provided that at least four institutions in average (Rescue Board, Environmental Board, other approving institution, institution providing public services, or other) are involved in one proceeding and have provided their approvals/opinions. This table shows the total time assessment provided by all instances who submit approval/an opinion by one proceeding.
<b>Formulation and submission of the procedural decision</b>	0.8hrs	0.8hrs	N/A	0.8hrs		This is an assessment provided by the LGs during the interviews according to which formulation of a decision takes an average of 30 minutes. The time assessment within the framework of the session of the rural municipality received during interviews is added which is ca 15 minutes (adding the proceeding to the session and participation in the session) and signing which time burden according to the expert is ca 5 minutes. The procedural decision formulation stage includes drawing up a document, its confirmation on the session of the rural municipality and signing. It does not consider the waiting time that remains between formulation of the decision and the session of the rural municipality confirming it since there is no time burden for the case handler during that time. But the waiting time is considered at calculating the total length of the proceeding as this is the indicator that impacts the total length of the proceeding.

Explanation of the abbreviations: BP - building permit; UAOP - use and occupancy permit.

## Annex 4: GAP matrix

Measure	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A
	PRE-CONSULTING		PREPARATION AND SUBMISSION OF THE APPLICATION		SUPPLEMENTING APPLICATIONS		RECEIVING AN APPLICATION		MANAGEMENT AND PLANNING OF THE PROCEEDING		REVIEW OF THE APPLICATION		PROVISION OF AN APPROVAL / OPINION		FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION		Total impact by measures, (h)	
Directing the applicant to submit the application as a follow-up application				0.25	0.1	0.3											0.1	0.55
Structured manual for the applicant	0.2	0.1	0.1	0.25	0.1	0.3											0.4	0.65
Use of the restrictions' map	0.1	0.1	0.1	0.3							0.15						0.35	0.4
Regular EHR-related training sessions	0.1	0.1	0.2	0.3	0.1	0.2	0.015		0.08		0.1		0.15				0.745	0.6
Sharing the inhouse knowledge with colleagues (e.g. tips, best practices, instructional materials)	0.1	0.1					0.015		0.05		0.15		0.2		0.015		0.53	0.1
Use of the list of the design documents that the approvers coordinate									0.1				0.15				0.25	
Use of the document preview inside the EHR system							0.015				0.015		0.015				0.045	

Measure	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	
	PRE-CONSULTING		PREPARATION AND SUBMISSION OF THE APPLICATION		SUPPLEMENTING APPLICATIONS		RECEIVING AN APPLICATION		MANAGEMENT AND PLANNING OF THE PROCEEDING		REVIEW OF THE APPLICATION		PROVISION OF AN APPROVAL / OPINION		FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION		Total impact by measures, (h)		
Data storage policy in EHR							0.05											0.05	
Automatic transfer of applications in EHR to the DHSes of institutions by the means of the document exchange protocol (DHX)							0.03						0.2					0.23	
Use of the checklists							0.015		0.1		0.1				0.1			0.315	
Use of the reference data by the building in EHR											0.25							0.25	
Setup and recording of search filters							0.015		0.05		0.015							<b>0.08</b>	
Entering personal observations within the system							0.015		0.03		0.03				0.025			0.1	
Archiving of irrelevant proceedings									0.2									0.2	
Document signing within the system				0.5											0.25			0.25	0.5
Using an option to select the downloadable files											0.2		0.25					0.45	

Measure	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A
	PRE-CONSULTING		PREPARATION AND SUBMISSION OF THE APPLICATION		SUPPLEMENTING APPLICATIONS		RECEIVING AN APPLICATION		MANAGEMENT AND PLANNING OF THE PROCEEDING		REVIEW OF THE APPLICATION		PROVISION OF AN APPROVAL / OPINION		FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION		Total impact by measures, (h)	
Making observations during on-the-spot visit of inspection directly to EHR system									0.15		0.15						0.3	
Marking the reviewed documents											0.1						0.1	
Simultaneous sending of the single-type proceedings to the approval round									0.15								0.15	
Performance of simplified proceeding in the case of incompetence of the approver and making the final decision always in EHR													0.75				0.75	
Performing inquiries from the Register of Professions by the means of the interface											0.15						0.15	
Delegating the right of signature to the construction specialist															0.25	40	0.25	40
Checking the stage of the proceeding in EHR							0.08	0.05	0.08	0.05	0.08	0.05	0.08	0.05	0.08	0.05	0.4	0.25

<b>Performance of ADS control as the first action</b>							0.25	0.25	
<b>Forwarding the proceeding to the co-worker, if needed</b>	24h						24		

	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	CH	A	
Measure	PRE-CONSULTING		PREPARATION AND SUBMISSION OF THE APPLICATION		SUPPLEMENTING APPLICATIONS		RECEIVING AN APPLICATION		MANAGEMENT AND PLANNING OF THE PROCEEDING		REVIEW OF THE APPLICATION		PROVISION OF AN APPROVAL / OPINION		FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION		Total impact by measures, (h)		
Returning the application only when it is obvious that it is not possible to carry out the proceeding							Qualitative impact												
Use of the list intended for terminating the approvals referred to in recommended practices													Qualitative impact						
Limiting the direct communication between the applicant and the approver													Qualitative impact						
<b>TOTAL</b>	<b>0.5</b>	<b>0.4</b>	<b>0.4</b>	<b>1.6</b>	<b>0.3</b>	<b>0.8</b>	<b>0.25</b>	<b>0.05</b>	<b>0.99</b>	<b>0.05</b>	<b>1.49</b>	<b>0.05</b>	<b>1.8</b>	<b>0.05</b>	<b>0.72</b>	<b>40.05</b>	<b>30.7</b>	<b>43.05</b>	

Explanation of the abbreviations: CH - case handler; A - applicant.

## *Explanation of the impact of the measure*

### *Directing the applicant to submit the application as a follow-up application*

- **PREPARATION AND SUBMISSION OF THE APPLICATION** Use of the follow-up documents help to save the time spent on entering the data. This is the expert assessment on the saving in time, where based on the assessments received from interviews, it is considered that if it usually takes 0.5 hrs to complete the application form, the saving from using the follow-up document would be ca 0.25 hrs that is not spent as the application form is partly completed already. As the application form also includes the information unique to a specific application (e.g. payment of the state fee), the time burden still remains (ca 0.25hrs).
- **SUPPLEMENTING APPLICATIONS** Information is transferred to the follow-up documents automatically to a certain extent that will educe the probability of errors made by the applicant and thereby also the need for multiple supplementations of the procedural form. According to the expert assessment, the saving for the case handler in one proceeding is ca 0.1hrs as less applications should be returned to the applicant for supplementation. Saving for the applicant is estimated of 0.3hrs per proceeding.

### *Structured manual for the applicant*

- **PRE-CONSULTING** The saving in time is achieved on account of the answers found by the people from the manual available in Internet and do not have to address the case handler. Some consultations may just be skipped. The applicant will potentially save time on account of the time spent on consultation with the case handler (looking for a phone number, e-mail address, and other). This is an expert assessment concerning the savings.
- **PREPARATION AND SUBMISSION OF THE APPLICATION** Major part of time spent of preparation and submission of the application comes from uploading the documents, hence the existence of instructional material primarily impacts the activities that are related to filling the application form and mainly for the person who did not use the system before. This is an expert assessment according to which the applicant can have a potential saving time of ca 0.25hrs per proceeding. The saving in time for the case handler is more modest and may occur due to the fact that applicants address the case handler less during preparation of the application and, if needed, the case handler can direct the applicants to the instructional materials.
- **SUPPLEMENTING APPLICATIONS** The saving in time from supplementing the application may primarily come from the fact that the person uses the manual indicated in the EHR environment for solving the deficiencies highlighted on the application form by the case handler (mainly concerning the activities not performed). Expert assessment is given for the time burden according to which the case handler can save time as the number of applications returned to the applicant for supplementing is potentially reduced. For the applicant, the time spent for supplementing the application may be reduced.

### *Use of the restrictions' map*

- **PRE-CONSULTING** The restrictions' map helps to create saving in time for the pre-consultations as 1) the applicant can find the answers to the questions by using the map and does not have to deal with the pre-consultation; 2) the restrictions' map helps the official to give faster answers during pre-consultation as it is not necessary to look for the information outside the EHR environment. According to the expert assessment the map of restrictions could save ca 0.1 hrs per one proceeding. The applicant will potentially save time on account of the time

spent on consultation with the case handler (looking for a phone number, e-mail address, and other).

- **PREPARATION AND SUBMISSION OF THE APPLICATION** When the applicant is preparing the application, they can have a quick overview of the restrictions on their site by using the map without time consuming searches from different laws and systems that helps to save time upon preparing and submitting the application, which according to the expert assessment is ca 0.3hrs. The case handler can save time because the number of questions during the application is reduced as well as the time spent for answering is shorter as the answers can be found more easily.
- **APPLICATION REVIEW** During the application review, the case handler can check the limitations and restrictions of the proceeded site in one place, which according to the expert assessment helps to save ca 0.15hrs per one proceeding.

### *Regular EHR-related training sessions*

- **PRE-CONSULTING** The training sessions of EHR help to raise the knowledge of the participants in the procedural process that will potentially reduce the case handler's time burden since the counseling officials have the capability to give faster responses and also the number of consultations may drop. Since the EHR-related training sessions are addressing the professional applicants, the applicant may gain the potential saving in time in the same amount as they have to turn to the case handler less and if this is necessary, it is possible to receive answers faster. This is an expert assessment concerning the savings.
- **PREPARATION AND SUBMISSION OF THE APPLICATION** The regular EHR-related training sessions are addressing also to professional applicants beside the case handlers. According to the expert assessment, knowledge obtained from the training enable to save ca 0.2hrs for the case handler in the future. This opinion relies on the fact that the number of questions of the applicant risen during preparation and submission of the application may drop as well as on the fact that the larger knowledge base of the case handlers allows them to give faster responses to the questions. For the applicant, the saving in time comes mainly from the increase in knowledge about the EHR environment that enables to act faster in the system.
- **SUPPLEMENTING APPLICATIONS** Participation in the EHR-related training session increases the skill of the applicants in using EHR that helps to reduce the number of mistakes made upon submission of the application and hence the need for supplementing the application. If the application still needs to be supplemented, the applicants are able to do it faster thanks to the better knowledge of the system. According to the expert assessment, the potential saving in time for the applicant within one proceeding may be ca 0.2hrs. The case handler can save time because the number of applications returned to the applicants for supplementing is potentially decreasing.
- **RECEIVING AN APPLICATION** The time burden is reduces as the result of the training sessions and presumably the case handler's ability to act faster in the system. According to the expert assessment, it is potentially possible to achieve the saving in time of ca 0.015 hrs per proceeding.
- **MANAGEMENT AND PLANNING OF THE PROCEEDING** The EHR-related training sessions presumably increase the case handler's ability to work faster in EHR system which, according to the expert assessment, potentially helps to save the time spent for management of the proceeding ca 0.08 hrs.
- **APPLICATION REVIEW** EHR-related training sessions presumably increase the case handler's ability to work faster in EHR and this will reduce the number of extra clicks and accelerates review of the applications. According to the expert assessment, the review of one application will

potentially accelerate ca 1h.

- **PROVISION OF AN APPROVAL / OPINION** The training sessions would increase the knowledge of the approvers about what's happening in LGs, more specifically, who is checking what and what kind of competencies they have. This in turn would reduce occurrence of conflicts where one party double checks the already performed work. According to the expert assessment, the potential saving in time is ca 0.15 hrs per one proceeding.

#### *Sharing the inhouse knowledge with colleagues (e.g. tips, best practices, instructional materials)*

- **PRE-CONSULTING** Sharing of tips and knowledge inside the company helps to increase the knowledge of case handlers (primarily the new ones) about performing the proceeding and they are able to give necessary answers to the applicants faster. According to the expert assessment, implementation of this measure helps to reduce the time burden of pre-consulting potentially by 0.1 hrs for the applicant as well as the case handler.
- **RECEIVING AN APPLICATION** According to the expert assessment, sharing of inhouse tips and knowledge helps to save potentially 0.015 hrs upon reception of applications per one proceeding. The impact is primarily applied on new case handlers who with the help of the colleagues increase their capability to act faster.
- **MANAGEMENT AND PLANNING OF THE PROCEEDING** According to the expert assessment, the time is saved on account of the increased knowledge of the case handlers resulting in capability of the case handlers to act faster in EHR environment.
- **APPLICATION REVIEW** According to the expert assessment, the time is saved on account of the increased knowledge of the case handlers (primarily the new ones) resulting in capability of the case handlers to act faster in EHR environment.
- **PROVISION OF AN APPROVAL / OPINION** For the saving in time, it is an expert assessment according to which the approvers are currently aware of the specificities that the procedural sites may have and therefore less time is spent for the approval process.
- **FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION** It is potentially possible to achieve saving in time in respect of the procedural decision via tips and knowledge that favor faster actions.

#### *Use of the list of the design documents that the approvers coordinate*

- **MANAGEMENT AND PLANNING OF THE PROCEEDING** The list of approvers favors saving in time because the list enables the leading case handler to get a quick overview about the authorities to be involved in a specific proceeding. This first and foremost impacts the time burden of new case handlers. According to the expert assessment, the potential saving in time per one proceeding is ca 0.1hrs.
- **PROVISION OF AN APPROVAL / OPINION** The time is saved on account of the fact that the unsuitable proceedings are not sent to the approvers/authors of opinion for approving/providing an opinion. The need for simplified proceedings, preparation of which takes ca 10 min, is reduced.

#### *Use of the document preview inside the EHR system*

- **RECEIVING AN APPLICATION** Upon receiving the application, the preview helps the case handler to identify quickly whether the correct

application form is submitted by avoiding the time burden for opening the document fully. Time saving is an expert assessment based on the fact that opening of one document in EHRs preview would save total of 0.015hrs.

- **APPLICATION REVIEW** Upon review of the application, there may be need to have a quick look on a document for finding some specific information and the preview helps to save time that would otherwise be spent on opening the document fully.
- **PROVISION OF AN APPROVAL / OPINION** The preview creates an opportunity for the approver/author of opinion to make sure whether the proceeding has been sent to the correct approver/author of opinion so that the recipient of the document should not wait for full opening of the files. According to the expert assessment, the saving in time for document downloading and opening is ca 0.015hrs per proceeding.

### *Data storage policy in EHR*

- **RECEIVING AN APPLICATION** Storing all data related to the proceeding in EHR helps to decrease the time burden by the time spent on registration of the received application in the authority's document management system (DHS) by ca 0.05hrs according to the expert assessment.

### *Automatic transfer of applications in EHR to the DHSes of institutions by the means of the document exchange protocol (DHX)*

- **RECEIVING AN APPLICATION** The use of the document exchange protocol would help to save time that would be spent on transferring the documents from EHR to the inhouse DHS which, according to the expert assessment takes ca 0.03 hrs.
- **PROVISION OF AN APPROVAL / OPINION** Use of the protocol would potentially help to reduce the time spent of approval/provision of an opinion by the time spent on copying the documents from one system to another by 0.2hrs according to the expert assessment.

### *Use of the checklists*

- **RECEIVING AN APPLICATION** Use of the checklist estimably reduces the time spent on identifying whether all activities to be done for the proceeding were actually performed. According to the expert assessment, the list helps to save ca 0.015hrs per proceeding. This primarily concerns the new case handlers.
- **MANAGEMENT AND PLANNING OF THE PROCEEDING** This will first and foremost improve the service quality but also the time of the case handlers spent on searching the relevant section of the law is reduced since the checklist already includes relevant references. According to the expert assessment, the potential saving in time is ca 0.1 hrs per one proceeding.
- **APPLICATION REVIEW** Similar to the previous stage, this has mainly the service improvement impact. Additionally, according to the expert assessment, the potential saving in time is ca 0.1 hrs per one proceeding.
- **FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION** Similar to the previous stage, this also has mainly the service improvement impact. Additionally, according to the expert assessment, the potential saving in time is ca 0.1 hrs per one proceeding.

### *Use of the reference data by the building in EHR*

- **APPLICATION REVIEW** Use of the reference data belonging to the construction work helps to save time spent for involvement of the land owner of the immovable property. During the interviews, it was found out that today it takes 0.25hrs for finding the data for one proceeding which is potentially achievable time gain upon implementation of this measure.

### *Setup and recording of search filters*

- **RECEIVING AN APPLICATION** The case handler can set up and save the filter in a way that highlights the proceedings relevant for them. According to the expert assessment, use of the filter helps potentially to save ca 0.015hrs of time spent on finding the arrived proceeding.
- **MANAGEMENT AND PLANNING OF THE PROCEEDING** According to the expert assessment, saving the filter settings saves ca 0.05 hrs of the management related time per proceeding.
- **APPLICATION REVIEW** Saving the filters creates efficiency as the saved filters should not be set up again. The case handler will find the proceeding of interest ca 0.015hrs faster than without implementing this measure.

### *Entering personal observations within the system*

- **RECEIVING AN APPLICATION** Making personal observations directly to EHR will reduce the time spent on creating a separate document for observations upon reception of an application by ca 0.015hrs according to the expert assessment.
- **MANAGEMENT AND PLANNING OF THE PROCEEDING** When the application is reviewed, the observations on the proceeding are more readily available and the time spent on finding the observations outside the system is reduced (switching between EHR, Excel or Word). According to the expert assessment, switching between several systems caused additional cost of ca 10 sec per one observation. Provided that ca 12 observations are made per one proceeding, the time gain for review of one proceeding is ca 0.03hrs. Making observations inside the system also helps to reduce fragmentation of information and hence increase quality.
- **APPLICATION REVIEW** Similar to the stage of management and planning of the proceeding, the observations made about the application review are more readily available and so the time spent on finding the observations outside the system will be reduced.
- **FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION** Similar to the previous stages, also formulation of the procedural decision gives potential saving in time on account of the time spent on switching between the systems.

### *Archiving of irrelevant proceedings*

- **APPLICATION REVIEW** The interviews showed that estimably the archiving of irrelevant proceedings would accelerate finding the relevant proceedings and save 5% of the daily working time (0.4%). Considering that an option of setting up and saving the search filter already helps to

eliminate a number of proceedings from the results, the expert assessment says that archiving of irrelevant proceedings would potentially save 0.2hrs per proceeding.

#### *Document signing within the system*

- **PREPARATION AND SUBMISSION OF THE APPLICATION** Signing the documents within the system would help the applicant to take the signatures of the necessary parties directly in EHR environment that helps to reduce the time spent on exchanging the emails for receiving signatures. According to the expert assessment, the potential saving is ca 0.5hrs.
- **FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION** Time is saved upon collecting signatures. When currently the linear signing process is applied, the in the TO BE vision, EHR enables to do it in parallel. An average of 1-3 signatures are needed for completing the proceeding and according to the expert assessment, the potential time-saving is ca 0.25 h per person.

#### *Using an option to select the downloadable files*

- **APPLICATION REVIEW** The TO BE EHR enables to select the downloaded files and hence the process becomes more effective. According to the expert assessment, the saving is ca 0.2 h per proceeding.
- **PROVISION OF AN APPROVAL / OPINION** When the relevant authority give approval/opinion, they can download only the files that contain information necessary for giving approval/opinion. According to the expert assessment, this opportunity creates the potential saving in time of ca 0.25hrs per proceeding.

#### *Making observations during on-the-spot visit of inspection directly to EHR system*

- **MANAGEMENT AND PLANNING OF THE PROCEEDING** Making comments on on-the-spot visit of inspection directly in EHR creates saving in time as information reaches the EHR environment more operatively that creates an opportunity for the leading official to direct the proceeding to the next stages faster than before. According to the expert assessment, the saving in time here is potentially ca 0.15hrs per proceeding.
- **APPLICATION REVIEW** According to the expert assessment, it is possible to gain potential saving in time by ca 0.15hrs per proceeding upon application review. The saving comes from eliminating the need for duplicate entering.

#### *Marking the reviewed documents*

- **APPLICATION REVIEW** The interviews showed that review of applications in the case of big document volumes may create situations where the same document is worked through for several times as there is no clear record of the already worked through documents. According to the expert assessment, the potential saving in time can be achieved here by diminishing the repeated controls that would mean reduction of time spent on application review by 0.1hrs.

#### *Simultaneous sending of the single-type proceedings to the approval round*

- **MANAGEMENT AND PLANNING OF THE PROCEEDING** The future vision enables the EHR to send the single type proceedings for approval to

several parties at the same time and so reducing the time spent on forwarding the procedural documents. According to the expert assessment, the saving in time will be ca 0.15hrs per proceeding.

#### *Performance of simplified proceeding in the case of incompetence of the approver and making the final decision always in EHR*

- PROVISION OF AN APPROVAL / OPINION Procedural acts should not be performed in the internal systems of the approvers for the simplified proceeding which, according to the expert assessment, potentially helps to save 0.75hrs in average per one proceeding.

#### *Performing inquiries from the Register of Professions by the means of the interface*

- APPLICATION REVIEW The interviews showed that today the competence checks are performed in the Register of economic activities and/or Register of Professions which takes ca 0.2hrs in average, depending on the proceeding. Interfacing EHR with the Register of Professions, this time could potentially be reduced significantly according to the expert assessment and the saving in time would be ca 0.15hrs per proceeding.

#### *Delegating the right of signature to the construction specialist*

- FORMULATION AND SUBMISSION OF THE PROCEDURAL DECISION Majority of the LGs uses today the solution where the procedural decision is confirmed on the session of the rural municipality that take place once a week or once is two weeks in average. By delegating the right of signature to the construction specialist, it is potentially possible to save the time between the proceeding sessions that is 40 working hours in average (depending on the moment of formulating the procedural decision). The whole procedural process is shorter thereby. For the case handler, the saving in time is occurs primarily on account of placing the proceeding to the session and making the decision during the session that takes ca 0.25hrs according to the information received from the interviews.

#### *Checking the stage of the proceeding in EHR*

The interviews highlighted that from time to time the case handler receives the calls with the aim to understand in which stage the proceeding currently is. In the future vision, EHR enable to see the stage of the proceeding and hence it is possible to save the time of the case handler as well as the applicant. The prerequisite is that in each stage of proceeding, the applicant contacts once the case handler and discusses the course of the proceeding for 5 minutes. According to the information from the interviews, the expert assessment is that the saving in time for the case handler is 0.08 hrs and for the applicant it is 0.05 hrs. Implementation of this measure would raise the transparency of the proceeding for the applicant.

#### *Performance of ADS control as the first action*

The interviews showed that the ADC control is performed rather at the end of the proceeding in LGs. According to the assessment of the interviewees, the saving in time for the whole proceeding may potentially be ca 1 working day per proceeding if the ADS control is carried out as the first action of the proceeding.

#### *Forwarding the proceeding to the co-worker, if needed*

An option to forward the proceeding impacts the length of the whole procedural process. The to be EHR will enable the officials to forward the proceeding to the competent colleague. According to the expert assessment, the potential achieved saving may be ca 3 working days per proceeding.

*Returning the application only when it is obvious that it is not possible to carry out the proceeding*

- RECEIVING AN APPLICATION According to the expert opinion, establishment of the cases of rejecting specific applications would allow to achieve qualitative impact.

*Use of the list intended for terminating the approvals referred to in recommended practices*

- PROVISION OF AN APPROVAL / OPINION According to the expert assessment, implementation of the measure will increase the quality of the proceedings as the approvers select the correct approval operation and so the number of errors at approval is reduced.

*Limiting the direct communication between the applicant and the approver*

- PROVISION OF AN APPROVAL / OPINION The direct communication between the applicant and the approver (without EHR) in today's practice creates situations where all involved parties do not have the same version of the documentation. This, in turn includes cases where one approver approves the document where the most recent updates have not been entered. Limiting the communication with only EHR will help to ensure that all approvers grant their approval to the document with the same content and, according to the expert assessment, this will potentially contribute to the increased quality of the service.

## Annex 5: Cross-tabulation of measures and proceedings

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Directing the applicant to submit the application as a follow-up application		X	X	X		X	X	X					50%	0.05	Since today the relevant practice is present in some LGs, we presume that directing the follow-up documents will impact estimably ca 50% of the proceedings per year.
Structured manual for the applicant	X	X	X	X	X	X	X	X	X	X	X	X	50%	0.20	We presume that today there are case handlers and applicants who have sufficient experience for submission and checking the applications. Hence it is assessed that the measure impacts ca 50% of the annual proceedings.
Use of the restrictions' map	X	X	X	X		X	X	X					100%	0.35	Restrictions must be checked for all proceedings, hence the measure impacts all proceedings.

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Regular EHR-related training sessions	X	X	X	X	X	X	X	X	X	X	X	X	85%	0.63	We presume that today there are expert users of EHR among the case handlers and hence the measure estimably has impacts on smaller number of proceedings. General feedback from the interviews was that there are too few training sessions and the case handlers find that the knowledge base is weak and they need training sessions.
Sharing the inhouse knowledge with colleagues (e.g. tips, best practices, instructional materials)	X	X	X	X	X	X	X	X	X	X	X	X	10%	0.05	We presume that the measure impacts most the new employees. The estimated annual staff turnover is 10% is taken as the basis.
Use of the list of the design documents that the approvers coordinate	X	X				X							10%	0.03	LGs are most impacted by this measure as their knowledge on the competencies of the approvers is currently smaller. We presume that the measure impacts most the new employees. The estimated annual staff turnover is 10%.

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Use of the document preview inside the EHR system	X	X	X	X	X	X	X	X	X				100%	0.05	We presume that for the proceedings within EHR, the documents must be reviewed and hence the measure impacts all proceedings.
Data storage policy in EHR	X	X	X	X	X	X	X	X	X				100%	0.05	This measure impacts all proceedings. It was found out from the interviews that all LGs use their inhouse systems for storing document in addition to EHR.
Automatic transfer of applications in EHR to the DHSes of institutions by the means of the document exchange protocol (DHX)		X	X	X	X	X	X	X	X		X		100%	0.23	This measure estimably impacts all proceedings.
Use of the checklists	X	X	X	X	X	X	X	X	X				10%	0.03	This measure impacts most the new case handlers whose experience in conducting proceedings is smaller and so just some of the proceedings are impacted. The estimated annual staff turnover is taken as the basis.
Use of the reference data by the building in EHR		X	X	X		X	X	X					100%	0.25	This measure estimably impacts all proceedings.

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Setup and recording of search filters	X	X	X	X	X	X	X	X	X				100%	0.08	This measure estimably impacts all proceedings.
Entering personal observations within the system	X	X	X	X	X	X	X	X	X				100%	0.10	This measure estimably impacts all proceedings.
Archiving of irrelevant proceedings	X	X	X	X	X	X	X	X	X				100%	0.20	This measure estimably impacts all proceedings.
Document signing within the system	X	X	X	X	X	X	X	X	X				100%	0.25	This measure estimably impacts all proceedings.
Using an option to select the downloadable files		X	X	X		X	X	X					100%	0.45	This measure estimably impacts all proceedings.
Making observations during on-the-spot visit of inspection directly to EHR system		X				X							1%	0.003	Estimably 1% of proceedings are conducted on on-the-spot visits of inspection and the measure impacts specifically these proceedings.
Marking the reviewed documents	X	X	X	X	X	X	X	X	X				100%	0.10	This measure estimably impacts all proceedings.

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Simultaneous sending of the single-type proceedings to the approval round		X				X							-	-	The number of the yearly single type proceedings in the same time window that could be sent to approval simultaneously is not known and hence it is difficult to estimate the yearly impact percentage of the measure.
Performance of simplified proceeding in the case of incompetence of the approver and making the final decision always in EHR		X				X							10%	0.08	Ca 10% of proceedings are completed by simplified procedure.
Performing inquiries from the Register of Professions by the means of the interface		X		X		X		X					100%	0.15	The competencies are assessed in all proceedings and hence the percentage of the impact of the measure is 100%.
Delegating the right of signature to the construction specialist		X				X							97%	0.24	The interviews showed that 1-2 LGs currently delegate the rights to the construction specialist.
Checking the stage of the proceeding in EHR	X	X	X	X		X	X	X					95%	0.38	We presume that the measure largely impacts the yearly measures.
Performance of ADS control as the first action	X	X	X	X		X	X	X	X	X	X	X	100%	0.25	This measure estimably impacts all proceedings.

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Forwarding the proceeding to the co-worker, if needed		X	X	X		X	X	X					0.5%	0.12	There are estimated of 0.5% of proceedings a year that this measure impacts.
Returning the application only when it is obvious that it is not possible to carry out the proceeding	X	X	X	X	X	X	X	X	X				-	-	This measure has a qualitative impact.
Use of the list intended for terminating the approvals referred to in recommended practices		X				X							-	-	This measure has a qualitative impact.
Limiting the direct communication between the applicant and the approver		X				X							-	-	This measure has a qualitative impact.
<b>Number of proceedings</b>	<b>3876</b>	<b>7950</b>	<b>652</b>	<b>5864</b>	<b>4882</b>	<b>4926</b>	<b>362</b>	<b>3256</b>	<b>1538</b>	<b>32041</b>	<b>9793</b>	<b>3110</b>			
Time interval for one proceeding (h)	3	21.3	2	19.17	0.5	23.3	0.5	21.0	0.5	0.25	0.3	0.25			
	5	49.3	4	44.4	0.75	50.3	2	45.3	0.75	0.35	0.5	0.35			
Suhtarv	0.113	1.000	0.085	0.900	0.018	1.042	0.035	0.938	0.018	0.008	0.011	0.008			
An impact for one measure (h)	0.311	4.318	0.325	3.575	0.035	4.502	0.135	3.727	0.039	0.010	0.015	0.010			
Annual impact (h)	1207	34330	212	20967	171	22176	49	12136	61	309	152	30			

Measure	DS	BP	BN	BN*	CCN	UAOP	UAON	UAON*	CDN	RAE	ABN	OCWA	Percentage of the impact of the measure to proceedings per year	Impact corrected with percentage	Explanation of the percentage of the impact of the measure
Total annual impact by proceedings (h)	<b>91798</b>														
Total working hours in 2018	2023														
Full time equivalent (FTE)	<b>45.38</b>														

Explanation of the abbreviations:

DS - design specifications; BP - building permit; BN - building notice; BN\* - building notice (with building design documentation); CCN - Construction commencement notice; UAOP - use and occupancy permit; UAON - use and occupancy notice; UAOP\* - use and occupancy notice (with building design documentation); CDN - Complete demolition notice; RAE - Register amendment entry; DSN - Data submission notice; OCWA - Organization of construction work's address.

***www.pwc.ee***