Information Governance

Current situation analysis and implementation strategy

2014
1. Introduction

Starting from 2012, the development of Estonian public sector services and electronic records management is coordinated by the Ministry of Economic Affairs and Communications (hereinafter MEAC). The first important document developed was the "Green Paper on the Organisation of Public Services" (hereinafter GPOPS)¹ that was approved by the Government of the Republic on 16 May 2013.

The need to direct the course from records management to information governance was articulated in GPOPS because the administration procedures have hitherto not been sufficiently effective nor supported the development of services. There is a lot of duplication of activities, copying of the logic of the paper world, and manual work; at the same time it is difficult to find and use the necessary information fast.

Records management is primarily associated with records in the form of paper or computer file and their management in the so-called records management system. At the same time, nowadays, records are created, processed and managed also in other information systems and environments, whereas such records differ significantly from traditional records.

It was emphasised in GPOPS that in the information governance, all information systems and environments (including social media) where information is created and where records² are processed or made available are taken into account.

In June 2013, the records management, ICT and archiving specialists analysed the needs the records management has not been able to meet, and why it is so. The base concept of information governance was compiled and it was delivered to the Records Management Board³. At the extended meeting of the Board on 14 June 2013, the base concept (see Appendix 1) was discussed and approved.

In November 2013, the Government of the Republic approved the "Digital Agenda 2020 for Estonia"⁴. Based on GPOPS, measure 5.3.1 of the agenda "Development of better public services by using ICT" was planned. One of the priority actions is to implement information governance in the public sector, which would help to cope with the various information channels and flows.

In 2014, MEAC started preparations for the introduction of information governance in the public sector. An analysis of the current situation and international experience, and the strategy for transition to information governance were compiled.

This document contains a summary of the analysis and the strategy. It is based on the MEAC documents "Analysis of the current situation of records management and information governance and international experience. Final Report" and "From records management to information governance. Strategy plan." (2014, PricewaterhouseCoopers Advisors Estonia (PwC Estonia)). The analysis and strategy were

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¹ MEAC. Green Paper on the Organisation of Public Services

² This is based on the definition of record within the context of Archives Act (see § 2 (1)), where a record is “information recorded on any medium, which is created or received in the course of the activities of an agency or a person, and the content, form and structure of which is sufficient to provide evidence of facts or activities” https://www.riigiteataja.ee/en/eli/508042015003/consolidate


conducted and this summary was translated into English within the programme “Provision of Prerequisites for Improving the Quality of Public Services”, financed from the European Social Fund.

2. Analysis of the current situation of records management and information governance and international experience

At the request of MEAC, PwC Estonia analysed the records management and information governance practices in Estonia and elsewhere. For making the comparison, the Estonian base concept was taken into account. A desktop study, group and expert interviews and seminars, and project management group discussions were conducted. In addition to the team of PwC Estonia, 43 individuals representing 14 state and local government institutions, 5 other state institutions, and 7 private companies participated in the analysis. The work was completed in June 2014.

2.1 Information governance analysis – concepts and terminology

As a result of the analysis it was found that the problems begin with different understanding of the concepts related to information governance. For example, there are two different terms in English: document and record, which are translated into Estonian with the same word “dokument”\(^5\). Due to the specific field of information governance, the two English terms have important differences, and it was found that the terms would require more accurate matches in Estonian.

The generally used concept is Information Governance. The descriptions of the concept vary in practice, but in all treatments, the information governance is understood as the set of processes, roles, policies, standards and measures, which together ensure the efficient and effective use of information, and thus the achievement of an organisation’s goals. Several related concepts are also used. The figure below shows the interrelationships between various sub-concepts of information governance. Information governance and information management are so-called umbrella concepts.

\(^5\) The translation problems relating to records management concepts and terminology have been described in the Estonian "chapter zero" of MoReq2, section 2.4 https://www.mkm.ee/sites/default/files/estonian_et_-_chapter_0_english.pdf
Information governance is a complex, multi-component discipline:

- The collection of information in various forms from different sources (data, paper and electronic documents, audio, video, etc.), its secure storage and timely destruction.
- The processing and analysis of collected information.
- The sharing of information with its consumers in a limited or unlimited form via a channel suitable for them (information systems, internal and external web, electronic mailbox, etc.).

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**Figure 1. Concepts used in information governance and the relationship between them.**

**Figure 2. The components of information governance**

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⁶ PwC. Information Governance Framework
The EDRM information governance reference model (IGRM) discusses the information governance from the perspective of business processes and the division of responsibilities:

Well-functioning information governance provides a simple, structured and automated organisation of work, the availability of information at the time it is needed, opportunities for information processing and analyses, preservation of information, and an access only for the persons entitled thereto.

Well-functioning information governance can be achieved by:

- identifying what information is valuable enough to be managed;
- simplifying and automating information capture and storing as much as possible;
- ensuring that information is retained as long as it is needed;
- ensuring that contextual information – metadata, descriptions, etc. – is also retained and linked;
- reducing the amount of unstructured information in favour of structured information;
- reducing the number of traditional (paper, doc, pdf, etc.) documents and records;
- using data of IT systems to mitigate risks connected with providing evidence;
- finding also a way how to capture/retain/reuse information stored in people’s minds and obtained through learning and experience.\(^8\)

2.2. Information governance analysis – problems

The main problem in information governance is that the organisation lacks an overview of its information assets. It is unknown where, how, why and when the information necessary for operations is created. Also, its effects on business process are not understood.

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\(^7\) EDRM. Information Governance Reference Model [http://www.edrm.net/resources/guides/igrm](http://www.edrm.net/resources/guides/igrm)

\(^8\) Records Management Board, 2013. Estonian base concept of information governance. See Appendix 1.
Information governance is related both to the organisation's activities and technology. Also, information governance is not only a public sector concern, but it is also topical for the private sector, where rules for the storage of information also apply and information is used in daily activities to achieve business objectives. Information governance has inherited a big part of its problems from its sub-disciplines: records management, data governance. However, there are problems specific only to information governance.

The main problem derives from the fact that

*organisations are not mature enough for information governance*

There is no coherence necessary for the operation of processes between the different parts of the organisation. Business processes are where information is created and given a value, but often this knowledge does not reach the parts of the organisation dealing with data collection and governance. IT department controls the technical tools that govern information, but it does not know the value of information. Records management and legal departments are aware of the legal conditions, but they also do not know the value of information. Thus, the most common situation is where the value of information is understood in the company's units dealing with business, but its collection is not organised in the units dealing with information management. There is no overview of which information, why, and where is created, and how it is related internally and externally. It is not understood that the limitation of resources prevents having an overview and that investments have to be made in order to ensure working order.

Other important groups of issues are:

- **There are problems with data governance** – the quality of data is low, the data is out of date or unreliable, or not compatible with different systems.

- **The paradigm of the paper world persists in electronic records management** – records management systems are not user friendly, processes are cumbersome, there is no certainty regarding the preservation of digital records.

- **Information does not have an owner** – related documents and records are stored in different systems and they are difficult to find, the owner and people responsible for the preservation of information located in the central information system are unspecified. The problem is particularly characteristic of systems created for local governments.

- **Systems do not communicate with each other** – the systems that manage, govern and preserve information are not able to communicate with each other.

- **The opportunities of social media are not exploited** – social media channels are used only to post messages or to share information, not for two-way exchange of information with the users of services. On the other hand, the amount of social media information is very large and it is very difficult to find and extract important information later.
• **Processes do not form a whole** – the whole is not seen, solutions are being developed for a small number of processes, the needs of users and other systems are not taken into account, the flow of information is not mapped and it is not considered which data can be collected where.

• **Lack of cooperation** – organisations that could and should cooperate, do not, because they see themselves as completely independent functional units.

• **Shortage of smart customers** – in the procurement of information systems, there is a lack of ability to precisely describe one's own or others' needs; developers and analysts are not able to get to know the organisation enough in order to adjust the solution to achieve maximum results.

• **The need for information governance is not perceived** – the managers of organisations (rural municipality mayors in local governments) do not necessarily perceive the need for information governance, as there is no daily contact with administrative matters. The existence of a problem is perceived when there is not enough information to make a decision.

### 2.3 Information governance analysis – maturity model

Several information governance models were analysed. One of them was the information governance maturity model created by the software developer Oracle. The Oracle model describes the bottom-up development of information governance in an organisation, i.e. the process by which information governance begins with divisional cooperation, and is later adopted across the organisation. In some organisations, the model offered by Oracle may be appropriate, but the interviews revealed that this approach has not brought success in Estonia. This may be due to the Estonian cultural aspects; it may also be that the creation of the model was based on large international companies, where the branches have a lot of autonomy.

As a result of the analysis, it was found that in the Estonian context, it is best to adopt the ARMA International information governance maturity model, according to which the development of information government is managed from top to bottom:
2.4 Information governance analysis – social aspects

Information governance mainly means the collection, publication, selection, deletion, and storage of information. This may give the erroneous impression that the field is only pertinent to the organization’s management and technology. However, it must be taken into account that the information being collected has been created by people, and often the information collected concerns them very strongly. It is especially highlighted in the fields that deal with sensitive personal data. Social values are particularly important in the area of healthcare, but it should also be taken into account elsewhere. For example, at first glance it may seem obvious that the content of the employee’s work mailbox belongs to the company. However, practices vary from country to country – in the United States it is indeed the case that the employer has control over the content of the mailbox and the storage of information. In France, by
contrast, the situation is reversed – the work mailbox is the person's private property, and the employer's intervention is a violation of privacy.\textsuperscript{10}

Thus, additional factors need to be taken into account when creating an information governance solution: consent, privacy, autonomy, ownership, confidentiality and mutual benefits.

\textbf{2.5 Information governance analysis – technical solutions}

It is common practice among private companies offering ready-made solutions worldwide that information governance systems consist of functional components that are sold separately. Thus, it is possible to buy software for collecting information and separate software for searching it, processing it, etc. The available technical solutions have a modular design, which means that by purchasing several solutions from the same company, it is possible to create a solution that meets the organisation's information governance needs. Examples of such products can be found in the product portfolios of IBM, HP and Symantec. An advantage of such solution is that it enables the customer to put together a system that meets their exact needs and make upgrades module by module. It also means that the company providing the solution has a fairly steady customer, who is related to their products, and there is a possibility for multiple sales.

The solutions offered by different manufacturers are compatible on the technical side, integration tools are standardised and mature. The main reasons for compatibility problems are the differences in data composition, quality and semantics.

Standardised solutions are offered, in addition to the companies mentioned above, by ASG, HP, Iron Mountain, Nuix, Recall, RSD, and SAP. Software specialization is different by field: for example, ASG is more focused on the healthcare sector and Recall more on financial institutions. Some companies such as HP and SAP are not sector-specific, and their products are intended for a wider clientèle.

The situation in practice is that, since information governance is largely dependent on the structure of the organisation itself, it is not possible to find a so-called out-of-the-box solution. This principle is especially true for larger organisations where the structure is long-established and stable. It should also be taken into account that the solutions available have been developed for very large enterprises, and so they can be more burdensome than helpful for small and midsize companies (in the context of Estonia even for large businesses).

\textbf{2.6 Information governance analysis – the situation outside Estonia}

To describe the situation of information governance in the private sector, the AIIM (\textit{Association for Information and Image Management}) study was referenced in the analysis\textsuperscript{11}. In 2013, AIIM conducted a survey on information governance among companies, where 76\% of respondents were from North America, 15\% from Europe and 9\% from the rest of the world.

\textsuperscript{10} AIIM. Information Governance – records, risks and retention in the litigation age \url{http://www.project-consult.de/files/AIIM_IW-InformationGovernance-2013.pdf}

\textsuperscript{11} AIIM. Information Governance – records, risks and retention in the litigation age \url{http://www.project-consult.de/files/AIIM_IW-InformationGovernance-2013.pdf}
The representatives of the participating companies revealed that a large quantity of records is still stored in printed form, and their number is increasing steadily, although there is a trend towards transition to digital records. The biggest numbers of electronic documents that are being stored are:

- text documents, spreadsheets and PDF-files;
- e-mail;
- invoices and delivery notes generated by automated software solutions;
- data in information systems, e.g. ERP\textsuperscript{12}, CRM\textsuperscript{13} and data in project management software.

The most important risk lies in lawsuits, which can be lost due to poor data retention and thus the lack of evidence, followed by the loss of customer trust and intellectual property. The advantages that can be achieved are significant savings of costs, which are currently being spent on the maintenance of infrastructure, the use of existing information in the company’s business processes and faster response to crisis situations. The problems that businesses’ information managers want to solve is coping with the amount of electronic documents and e-mail, the implementation of information governance guidelines, and the aggregation and unified management of information found in a number of systems.

44\% of the companies surveyed had a company-wide information governance policy in place; 21\% of the companies had information governance only in specific departments or areas of activity, and it was not aggregated into a comprehensive whole. Information governance is very often left for the IT department to manage, but it varies by channel. Thus, the responsibility for customer information, for example, could quite equally be divided between IT, administration department, legal and marketing departments. Meanwhile, the IT department is responsible for e-mail, instant messaging, mobile, and cloud data. The marketing department is responsible for a company’s social media and web content. A large number of

\textsuperscript{12} Enterprise Resource Planning software
\textsuperscript{13} Customer Relationship Management software
companies have no one responsible whatsoever for certain channels. Variable areas of responsibility or
the lack of a responsible entity suggests that it is difficult to introduce a single company-wide information
governance.

The strategies of businesses to cope with the increasing amount of information vary. 41% have introduced
records and information management software, 28% have automated the categorisation and deletion of
the unnecessary information. 28% of companies have simply chosen to increase the capacity of storage
media for storing data. In companies with an information governance system in place, the automatic
classification of data works only in 14% of businesses. The lack of automation points to the fact that
solutions are not yet mature in this area. The accessibility of information that is retained and used is also
complicated. Currently over 50% of companies perform data retrieval queries from each channel
separately, i.e. physical records are searched from one place, e-mails from another and press releases
from a third place. 25% make queries in different information management systems, and only 9% of
companies have set up a central system for accessing data, regardless of the type of data or the
information management system.

Two of the most complicated information governance channels were e-mail and social media.

Expenditures to get the information governance under control have continuously increased in businesses.
In 2013, 45% of survey respondents planned to increase the expenditures on information governance
within the next two years. The plans to increase the expenditure were not focused mainly on one medium,
but on a wide spectrum of information governance channels. The most important plans were directed
towards information classification and search tools, followed by the further development of information
management software, and the creation of new applications. Investing in social media governance was
marked.

The general trend is to recognise the importance of information governance and to deal with it, but the
area is still in its developmental stage, and there are problems.

Public sector information governance was analysed using the case studies of two distinctive countries –
Denmark and the UK. Denmark is characterised by the fact that information governance problems have
been perceived there and the problems are being solved in a fairly rigid way – with legislation. England is
the birthplace of information governance – it was the first place where the problems with information
governance were acknowledged and solving them started in an especially sensitive area of healthcare.
Therefore, their information governance is dominated to a great extent by the aspect of confidentiality
guarantees. In both cases, the analysis dealt with information governance across institutions.

In Denmark, the goal is to transform the communication with state institutions into fully electronic
interaction and e-services as it allows saving costs. The term of information governance is not used in
Denmark, but the principles are the same.

The data available about a person is used in the citizen portal borger.dk in order to provide the person the
kind of information that is likely to be the most important to them at the given time. The purpose is that
information is simple to understand, the use of technical or legislative text is avoided. In order to insert
data, citizens are directed to a self-service environment. It is compulsory by law to have a mailbox in the citizen portal and to use some services electronically. The forms have been harmonised across the portal.

Businesses have their own portal virk.dk that is not related to the citizen portal. The various forms there have not been harmonised, i.e. data fields with the same content may have different names. In 2005, an XML repository was created where the basic elements of records were kept. Its aim was to harmonise forms, but unfortunately it is not used in practice.

In the Danish Public Information Act (Lov om offentlighed i forvaltningen) there is a general rule that public sector records must be registered. The compliance with the requirement in state institutions is inspected by the Danish National Archives. Moreover, the records are allowed to be registered in information systems other than records management system, if those systems support work processes better and enable more streamlined workflows.

Also, the data of databases has to be transferred to the Danish National Archives, but at the moment the problem lies in the fact that metadata is not associated with it. Data pairing is considered a security risk. A solution is being sought to this problem, because the addition of metadata retrospectively is difficult.

Thus, there is a landscape of information systems in Denmark, the data in which covers the different aspects of a single person, but is not currently integrated into a whole.

In the United Kingdom, the information governance started at the Ministry of Health. The first principles, known after Caldicott, the chairman of the commission that developed them, were created in 1997. They regulated access to patient information. The principles were developed as the leaders of healthcare institutions wanted to load patient information into systems that were not directly under the control of the institutions, as the solution was outsourced. For the purposes of monitoring so-called Caldicott guards were employed who checked that the institutions follow these principles. The Caldicott principles slowly began to spread and reached social welfare institutions. Over time, the need to harmonise the principles of healthcare and social welfare institutions arose, and an information governance discipline emerged. The principles were criticised because they and information governance were considered too complex, and there was a lack of motivation to engage in it. Another major criticism was that the original principles were used for the purpose of not to exchange the necessary information; there are a lot of requirements, which make the situation of patients, doctors and medical staff insecure. Therefore, it was decided to review the initial Caldicott principles and correct them. In 2012, the Health and Social Care Act 2012 was enacted, which provides, inter alia, for the creation of a transnational healthcare information system.

In 2013, the development had reached the point where the cooperation with other state institutions to share information began. However, it is still in a developmental phase.\(^{14}\) Thus, at the state institution level, the information governance is currently used more in healthcare and social welfare institutions, but as a discipline, it has been adopted more by the private sector, where the aim is to cope with the large amount of information. The field was quickly taken over by ARMA, who made further developments to it, taking

\(^{14}\) Williams, L. 2013 The Information Governance Review Department of Health pp 24–28
also into account the needs of private sector and the general view. The United Kingdom has also started to analyse the possibilities of implementing the Estonian X-Road solution.

### 2.7 Information governance analysis – the situation in Estonia

There is a significant problem in Estonia – concepts – their fuzziness and different usage. The term “infohaldus” (information management/governance) has been in use for some time, but in practice it is used as a synonym for records management. This is probably due to the dual meaning of the term “dokument”. Therefore, for example, records management systems that have long been known in Estonia are introduced as information management software.

The fact that information governance refers mainly to records management, was revealed from materials published on the Web, where the benefits and advantages of information governance were mainly referred to through the concept of records management. The same conclusion could be drawn from the interviews. The interviews revealed, for example, that about 80% of local government representatives equate records management to information governance.

On the other hand, information governance has been understood as the management of data created in other systems. The related concept of “infoteadus” (information science) is used within the meaning of librarianship. There has not been a comprehensive approach to information governance so far and there is no clear consistency between the concepts and the content.

**A single description of the role of the information manager** has not been used. Since information governance involves many components, in smaller organisations the various roles and related tasks may be performed by a single person. In larger organisations, on the other hand, tasks may be fragmented between several people. The personnel executing information governance activities may often be found a) in the marketing and communications departments that manage the content of web pages and organise communication with other institutions and the press, b) in administrative departments, that are interested in document circulation and workflow management and archiving, or even c) in information technology departments, where information system managers, personnel responsible for data governance and information system developers operate.

There is no professional standard for information governance professionals in Estonia, and therefore there is no good curriculum that would meet the objectives of information governance. ARMA has developed an *Information Governance Professional* certification program, which could be used as one of the basic materials for creating the Estonian information governance professional standard. ARMA certificate and the curriculum required to obtain it includes the following areas: information governance risk assessment, strategy creation, framework creation, the integration of information governance into business and linking with technology.

The motivation of Estonian public and private sector with respect to information governance is different. In the public sector, information systems are developed mainly in order to meet the requirements of the law, rather than the actual needs of the institution. If the main objective in the public sector is not to fail to

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perform the required operations in the required manner, then the objective in the private sector is to reuse
the information that is created on a daily basis in business activities as efficiently as possible. In the
private sector the main question is how to store and make information easier to use in order to improve
business activities.

In recent years, a change in the paradigm has also started to take place in the public sector. According to
the developers, the customer is becoming smarter and more oriented towards solving problems and
standardising and simplifying processes, rather than ordering perfect special solutions. Better pre-
analysis and optimisation of processes enable the customers to explain their wishes better and to benefit
more from the developments. The share of consultations is increasing both for public and private sector
customers.

The importance of information governance has been recognised in the private sector and organisations
have been looking for solutions consciously for several years already. Information governance is
associated with the concept of knowledge management in particular and the following questions are being
focused on: how does the information move, which information is true, who holds the information, and
how is the information retained? Meanwhile, not only documents are at the centre of attention, but all the
information flows in the business. For a company it is very important that the right information is available
at the right moment. The lack of such information can lead to a substantial and direct financial loss. This
is particularly specific to manufacturing companies.

The private sector has realised that the communication of rules alone is not enough. It is also necessary to
delegate personal responsibility to all employees. In addition to delegating responsibility, this behaviour
helps the employees create a personal relationship with information governance rules. The act of
degregation is certainly not enough, but compliance also needs to be checked. People must feel that they
have the responsibility of the owner for the information they use. Real-time data processing helps to
achieve this as it provides the opportunity to respond immediately, not a week later. It gives a perception
that the information actually affects the company’s operations. The use of data in real-time also helps to
reduce the risk of manipulating data.

In the public sector, data is collected “just in case”. Officials collect information partly to protect
themselves since it is better to collect more information at a time than to break a rule. Another aspect of
collecting too much data is the uncertainty about future perspectives. It is apparent that the information
systems are developing, but it is not known what is needed in future.

The ignorance about the availability of information in the public sector is expressed through the
administrative burden of citizens and businesses – the citizen/business is forced to continuously provide
the same data to different authorities when communicating with the state. The main issue is not whether
the authorities manage to exchange information with each other or not, but rather how can one institution
know that the other institution already has the necessary information available? The existence of the
Administration System of the State Information System RIHA should help to solve the problem, but at the
moment it does not. The main reason is that RIHA is an environment that is described in the language of
the developers. Those officials who are not IT professionals need a so-called 'human readable' RIHA.
Information governance system as a specific software solution does not exist. Each organisation puts together a suitable set of solutions that support their processes which, as a whole, form the information governance system. Therefore, for example, e-mail, internal portal, records management system, but also financial software can be considered to be in the information governance system, when these systems are working in parallel, but not separately.

During the process of contracting for an information management solution, information distortion may occur, so that the request does not reach the developer in the correct form. This is especially the case when the order is submitted by the IT department, who may not know much about the processes that need to be improved, but are familiar with the user interfaces and technical aspects. Thus, the business side project manager and the owner of services should be involved in the procurement process to ensure that the solution is actually directed at solving the problems related to the process.

When implementing any change, the most important initiators are top executives, whose leadership fundamentally changes the organisation’s culture, people’s way of thinking, and people’s courage to initiate change. Bottom-up initiatives in Estonia have ended in failure.

The creation of information governance depends on the structure and size of the organisation. Small and non-hierarchical organisations manage to govern information and knowledge without the use of strict rule-sets. In large and hierarchical organisations, information governance becomes more complicated and requires much more effort.

For automation, it is important that all data that it is possible to be machine-collected, should actually be machine-collected and it should be done in a standardised form.

2.7 Information governance analysis – successes and failures

Failures vary and their severity and causes depend on the organisation’s area of operation. Generally, the stories that concern the public reach the public. Of such stories, the greatest failures are caused by the communication of information, or lack thereof. For example, if personal information has been published, or employees have not been informed of records that need to be retained.

For example, in 2007, the Financial Services Authority of the UK reported that the company Norwich Union Life was fined, as it had failed to protect the confidential information of its customers. People’s personal information leaked out, which led to a number of fraud attempts against them. Namely, Norwich Union Life customers’ names and dates of birth were publicly available and this was taken advantage of by scammers who contacted the company’s call centre and obtained confidential information. There were two essential errors here – first, the storage of sensitive data\textsuperscript{16} publicly, and second, the lack of adequate security measures in the call centres, which could have prevented the release of even more sensitive information.\textsuperscript{17}

\textsuperscript{16} As there is no personal identification code used in the UK, the importance of the date of birth for identifying a person is more important than in Estonia.

\textsuperscript{17} The National Archives (UK). Managing Information Risk \url{http://www.nationalarchives.gov.uk/services/publications/information-risk.pdf}
There are several cases in the United States where companies have been fined for not archiving certain documents well enough. In 2004, the Bank of America was fined 10 million US dollars because it was not able to submit e-mails and other documents to SEC during an investigation. In 2002, five banks were fined 8.25 million US dollars due to the violation of data storage principles. In 2006, Morgan Stanley & Co paid a 15 million US dollar fine because it could not submit e-mails, and backups had been overwritten. This failure consisted of the proper storage of information, or lack thereof.

Media can amplify the need for information that could, in case of a failure, damage reputation. For example, in 2007, students in England were offered cheaper subway cards, but the demand was so great that the web portal collapsed under the pressure and thousands of people were left without tickets. A similar situation happened in England in 2008, when an electronic tax return system crashed on the last day of the declaration submission. In 2007, the BBC reported that the Northern Rock bank is in difficulties and is seeking support from the Bank of England. This was followed by a bank run on the company's online banking system and as the latter collapsed, the bank run continued the next day on the bank's offices. In this case, the negative example is the communication of information to the public or to the correct audience, and the fact that the increased need to use the system was not predicted in advance.

There is less data available about information governance success stories than about problems. This is not caused by the lack of success stories, but by the fact that if a system is working well, then it is considered normal and not significant. Good examples can still be found.

An example of other countries' experiences is the Commonwealth Bank. The bank is one of Australia's leading financial services providers. The bank had a number of customer databases based on the specific products or business units, so it was a decentralised system that was also quite chaotic. A project was carried out, during which customer data was consolidated and a unified overview of a client and their deposits was received. In addition, the data was mapped and profiled according to its quality. Company's internal rules and requirements for data processing and data quality improvement were introduced and data flow solutions were developed. As a result, the bank has been able to use the data available to them to improve the planning of their business activities.

Union Bank of California is the fourth largest commercial bank in the State of California, and one of the 25 largest banks in the United States. The company wants to improve the management of their data quality, and as part of this project, it was decided to create a data warehouse and implement data quality improvement strategies in the company's internal culture. Activities to achieve these objectives were divided into two groups: 1) data quality assessment and 2) a step-by-step plan to improve the situation. The concept of system architecture was created, which aimed at the company's long-term business interests and a business case was prepared, which was used to assess the long-term return on investment. As a result of the analysis, the current situation of data and the degree of difference between
the maturity level to be achieved were determined, and a plan was set in place to get there. Opportunities for quick success were identified to improve the situation.²¹

An example of an information governance success story in Estonia is the behaviour of the travel agency Estravel during the so-called ash crisis caused by the volcanic eruption in Iceland, in which information was delivered quickly and governed efficiently and people were helped to get back home. Both the loyalty of the company’s existing customers as well as the number of new clients increased.

Also, the Estonian income tax declaration²² can be considered a success story as it works very well, unlike, for example, in England where the system crashed under the load in 2008.

Positive examples of the Estonian information governance and records management (cross-organisation solutions):

- Document Exchange Centre²³ which is used to exchange electronic records managed in records management systems (computer files with metadata) in a secure X-Road environment²⁴ both within the public sector as well as between public and private sectors.
- The solution for notaries²⁵ for making inquiries from different registers, which has made the preparation of notarial contracts significantly easier and faster. For example, by finding data in different registers it is identified whether a plot of land to be purchased has been set restrictions that the buyer is not aware of.
- E-Prescription²⁶, with which the Ministry of Social Affairs has been able to get the medicine market under control.

The most successful cross-organisation solutions rely on the Estonian distributed information system and the data exchange capabilities of X-Road.

Positive examples of Estonian information governance and records management (organisation-wide solutions):

- The records management system of the State Chancellery, with which the number of routine activities of employees and the amount of time spent on them was reduced, also costs were reduced as the administration was made paperless.
- The hobby groups management solution of Harku municipality that automatically checks the children's right to grants. As a result of the implementation of the solution the municipality budget was 15-20% in surplus, which was used to increase the amount of the grant (greater grant for each child).

²⁴ Information System Authority. Data Exchange Layer X-Road https://www.ria.ee/x-road/
- The communication of Värska municipality and Great-Värska Society in social media. The Society’s Facebook page is a grass roots initiative, which Värska local government is actively involved in by sharing information and answering questions.

- Tallinn Department Store intranet, which has allowed the company to improve the organisation of its information and to make everything necessary better available for the employees. Employees can also communicate within intranet and are more involved in the activities of the company.

- International intranet of Aeroc International, which has given Aeroc a faster and more convenient access to corporate inside information, including real-time sales, production and financial reports, staff contact information and necessary documents.

### 2.7 Analysis of information governance – creating strategies

In order to begin to understand the strategy, a paradigm shift has to take place within an organisation with regard to information governance. The following table illustrates the need for change in an organisation:

<table>
<thead>
<tr>
<th>The old paradigm</th>
<th>The new paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>The old attitude that “if the system allows me to do it, then it’s all right.”</td>
<td>Prevent the users from creating poor quality information and start the transition to a culture that values high quality information.</td>
</tr>
<tr>
<td>The employee knows the organisation’s rules by heart and applies them when appropriate.</td>
<td>Define the rules, changes and reference system principles and ensure their use.</td>
</tr>
<tr>
<td>Information is stored locally on the computer or it is in a format that is not apparently part of the company’s business process.</td>
<td>Collect information at the source of its origin and increase the speed of information flow in the organisation.</td>
</tr>
<tr>
<td>Everyone is obliged to scrupulously follow the organisation’s information governance rules.</td>
<td>Automate the compliance with organisation’s rules with regard to information governance both in databases and work processes as well as in the user interface.</td>
</tr>
<tr>
<td>In the course of business, the necessary procedures for governing information have to be started manually.</td>
<td>Integrate the work process into one comprehensive whole, and eliminate the need to perform each step manually.</td>
</tr>
</tbody>
</table>

A general guide for creating information governance strategy has been developed through the practice of PricewaterhouseCoopers (PwC) (see Table 3).

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27 PwC. Information Governance Framework
<table>
<thead>
<tr>
<th>Key activities</th>
<th>Mapping of current situation</th>
<th>Development of information governance model</th>
<th>Creation of business case</th>
<th>Information governance implementation plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Analysis of scope, approach and objectives.</td>
<td>Analysis and assessment of main practices to identify opportunities and risks.</td>
<td>Analysis of information governance costs now and on the implementation of the strategy.</td>
<td>Prioritisation of objectives.</td>
</tr>
<tr>
<td></td>
<td>Identification of the focus.</td>
<td>Assessment of alternatives and creation of a vision for the future of information governance.</td>
<td>Detection of quantitative benefits.</td>
<td>Tactical plan for the use of opportunities for rapid improvement of the situation and setting long-term goals.</td>
</tr>
<tr>
<td></td>
<td>Analysis of currently effective information governance through interviews and workshops to identify the earliest opportunities to rapidly improve the situation.</td>
<td>Creation of information governance framework and strategy.</td>
<td>Preparation of business case.</td>
<td>Setting indicators for the project.</td>
</tr>
</tbody>
</table>

|---------|-----------------------------|---------------------------------------------|--------------------------|--------------------------------------------|

<table>
<thead>
<tr>
<th>Achieving results rapidly</th>
<th>Collection and evaluation of opportunities for rapid improvement of the situation.</th>
<th>Identifying the barriers that hinder the implementation of the opportunities for rapid improvement of the situation.</th>
<th>Evaluation of rapid corrective measures.</th>
<th>Priorities for achieving fast victories, achieved with self-financing.</th>
</tr>
</thead>
</table>
3. Strategy for the transition of the Estonian public sector from records management to information governance

After the completion of records management and information governance analysis, MEAC commissioned a strategy that would describe the necessary measures and actions for the introduction of information governance in the public sector. The objects of the contract were the development process of the strategy, the draft strategy, and the communication plan. The work was carried out by PwC Estonia. Five working groups were formed. The groups consisted of representatives from several areas (IT, service development, records and archives management, legislative drafting, PR) both from the public and the private sector as well as civil society representatives. Each working group met twice and discussed the strategy versions and the proposals made by other working groups. A total of 63 people participated in the working groups and 262 proposals were made for the strategy. Information governance project steering group continued in the same composition that had also contributed to the completion of the analysis. The steering group made decisions on the proposals of the working groups, and reviewed and approved the final draft strategy. The draft strategy was completed in November 2014.

3.1 Information governance strategy – concepts

The concepts explaining information and its structure were discussed in the analysis that the strategy is based on (see Chapter 2), and therefore, these were not duplicated in the strategy document. The key concepts used in the strategy are:

- **Information governance** – the set of processes, roles, policies, standards and indicators, which together ensure the efficient and effective use of information, and thus the achievement of an organisation’s goals.

- **Public sector organisation (PSO, organisation)** – constitutional institutions (such as the Chancellor of Justice, the National Audit Office and the courts), ministries and the state authorities within their area of government, other state institutions, local governments, legal persons governed by public law (for example, Estonian Public Broadcasting, the National Library, Bar Association, the Chamber of Notaries), and public law foundations (such as the Cultural Endowment and the Environmental Fund).

- **Public service** – service that the state, local government, or a person in private law performing public duties provides at the will (including presumed will) of a person for the performance of their legal obligations or the exercise of their rights. For such services, communication between the person and PSO is minimal – for example, the PSO

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28 MEAC. Green Paper on the Organisation of Public Services
informs the person of the available grant or other benefit (e.g. childbirth allowance), or of a new obligation (for example, notice of the arrival of a vehicle inspection deadline). The number of proactive services is small during the preparation of the strategy, an example of which is the automatic designation of a child’s health insurance at birth.

- **Service owner** – decisive role with regard to a service that is performed by the person managing the service’s basic process. The task of the service owner is to simplify the service processes and to search for possibilities of making the services easier, more efficient or more effective. Another task of the service owner is to provide the owner of the service provision channel (service desk, self-service environment, e-mail or other channel through which the service is provided) with the correct input information. The service owner is responsible for ensuring that the content and functionality of his services are correct, relevant and up-to-date. Their task is the further management of the service. The service owner is also responsible for the accuracy of the results of the business analysis and the correct operation of the completed service and the accuracy of the testing results. In the context of information governance, the owner of the service is the person under whose guidance the required information (including documents) is identified, collected, processed, distributed, archived and disposed of.

- **Service catalogue** – a dataset or database that contains a list of operational services and their descriptions in a standardised structure.

- **Management of service catalogue** – the process of preparing the catalogue and updating the data it contains. Often it is simply referred to as mapping of services.

- **Service portfolio** – a view of the service catalogue at a point in time with regard to the present as well as the desired future state. Unlike the service catalogue, which contains only the active, operational services, the portfolio contains all services across their life cycle, including services that are in the planning stage and those that have already been removed.

- **Service portfolio management** – the process the purpose of which is to optimise the portfolio and increase the total gain of services. In the course of portfolio management the readiness and level of individual services is assessed, which also includes their comparison, and suggestions are made for further development. Portfolio management enables the creation of a comprehensive view of public services and the analysis of the benefits derived from the whole optimisation.

- **Portfolio manager** – person who manages the service portfolio in an organisation.

- **Information asset** – information that is necessary for the operation of the organisation (data, documents, records, web content, social media messages, etc.).

- **Disposal** – deletion or destruction of data or documents/records in the course of a regulated procedure in a manner that does not enable them to be restored.

- **ISKE** – the Estonian three-level IT baseline security system. The goal of the implementation of ISKE is to ensure the security of the data processed in information systems.

### 3.2 Information governance strategy – main objectives

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30 Information System Authority. Three-level IT baseline security system ISKE [https://www.ria.ee/iske-en](https://www.ria.ee/iske-en)
The overall objective of the Estonian Information Governance Strategy is to support the development of public services in order to ensure a better quality of services and user satisfaction.

Given the aging population and other needs, the aim of the information governance strategy is to ensure:

1. **20% more efficient performance of the public sector.** In 2020, the state must cope with a budget reduced by a fifth, and offer at least the same volume of at least the same quality public services.

2. **Improvement of retrieval and sharing of data.** The creation of and adding a content to the central portfolio of public services, so that all target groups could easily find the data used by public services. In order to improve data retrieval, proper semantics needs to be set up for describing data.

3. **Determination of roles and responsibilities.** At national and PSO level, the roles and responsibilities needed for the implementation of measures and actions have been assigned.

The strategic objectives support the "Smarter governance" objective of the Digital Agenda 2020 for Estonia in three ways:

1. **The development of public services** in order to ensure a better quality of services and the continuous growth of users' awareness and satisfaction.

2. **The estimation of the cost of providing public services** over the extent of their life cycle and across different operations, taking into account the impact of services on PSO workload and customer administrative burden.

3. **The development of public services and administration** to ensure the paperless official communication target level of 95% by 2020.

Services’ development is an important goal in the Regulation (EU) No 1304/2013 of the European Parliament and of the Council of 17 December 2013, which established investments in institutional capacity and in national, regional and local public administration and public services efficiency as a priority, with a view to reforms, better legal regulation and good governance.

3.3 **Information governance strategy – related initiatives**

The strategy "From records management to information governance" is not a standalone initiative, but compatible with earlier activities and analyses carried out by MEAC. The strategy is a key component that shows how to apply the created tools in a way that contributes to the achievement of "Digital Agenda 2020" objectives. (See Figure 4)
Figure 4. Information governance strategy – context and links to other initiatives
The studies, analyses, guidelines and tools are available on the MEAC website, some of them also in English. Below is a brief description of each document in the context of information governance:

- **The Green Paper on the Organisation of Public Services (GPOPS)** gives the definition of public services, provides a concentrated overview of the problems of citizens and enterprises, encountered upon the use of public services, and the problems encountered by the state and local governments in providing such services, suggests possible solutions for the problems defined, and lists the measures for the achievement of the solutions. The Green Paper has been translated into English.

- **E-services design handbook** aims to assist civil servants in updating the services and shaping these to give them more focus on clients’ needs in both physical and e-environment. The use of the described model should help to enhance the value and user-friendliness of the services, while optimising the administrative burden and expenditures that accompany public services. The suggested model was tested during a re-design process of three e-services provided by the Estonian Road Administration.

- **Process analysis handbook** suggests the methodology for process management and mapping, based on the world’s best possible practices that would also match the requirements of Estonian public sector. The handbook gives PSOs the guidance on implementing a process-based management model that will contribute to the transparency of organisations, help develop a system for measuring the performance and improve the monitoring of expenditures and utilisation of resources.

- **Administrative burden calculator** helps to assess the burden that the planned service will put on consumers, and the administrative expenditures born by providers of services. The results are converted into money to give a better overview of the influence of administrative burden.

- **Integrated Portfolio Management of Public Services** framework will help adopt decisions about the development of public services and use of channels and their value for society in general, including the greatest benefits for customers and providers of public services. Public service portfolio management will help to: channel the available resources properly, take the objectives of governmental and other authorities into consideration and to consider the needs of the customers. During framework development, the models for public service description and measurement were elaborated, the distribution of an organisation’s roles and responsibilities was described, and the central architecture for the public service portfolio was offered. The summary of the framework has been translated into English.

- **Indicators for measuring usability** helps with ordering and developing software. It provides guidelines for defining usability and measuring the results later.

- **Framework for self-service environments.** During the framework preparation, the existing public sector self-service environments were analysed and as a result the principles for the creation of customer-focused and convenient self-service environments were developed. The framework has been translated into English.

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- **Records management and information governance analysis.** The basis for the strategy document was the analysis of the current situation of records management and information governance and international experience. English summary of the analysis is available in Chapter 2 of the present document.
- The goal of the **e-State Charter** is to bring together best practices for administration and form a basis for better application of good administration principles. The charter is evolving in time and developed together under the leadership of the National Audit Office. The charter gives people information about their rights, state organisations their development goals and the National Audit Office the basis for future audits. The charter is also available in English.
- **A detailed analysis and the elaboration of the concept of 20 public sector e-services.** As part of the pilot project, a concept was developed for 20 public e-services. Its goal was to increase the quality of business processes of the existing public services and help with planning new customer-friendly services. Through training, business process mapping and services design, the service owners were imparted the knowledge of how to evaluate, improve and create more efficient e-services. Also, the participants of the project were given an overview of modern and freeware tools and methodologies for designing services. During the project, a lot of different benefits were revealed, confirming the necessity for service-based management.

### 3.4 Information governance strategy – development methodology

The strategy was prepared on the basis of the "Analysis of the current situation of records management and information governance and international experience", the contents of which are summarised in Chapter 2.

It was taken into account that in order to achieve the objectives, the problems of information governance described in Section 2.2 must be solved. The most important is to make the search and use of necessary information as easy as possible, allowing users in any role – citizens, businesses, customer service representatives, heads of institutions, other officials – to make the right decisions quickly and thus ensure the effective achievement of the objectives of the PSO and the state. The purpose is not to aggregate all the information generated in an institution or institutions in the future into a central information governance system, but to find solutions that will enable to manage and use this information conveniently.

The strategy is based on the ARMA maturity model (see also Figure 3). As the Estonian state information system architecture and X-Road allow the collected data to be used repeatedly and exchanged securely; the ARMA model was adjusted according to the context of Estonia (see Appendix 2). The model consists of eight categories, for each of which a level of maturity can be determined. The model categories are: accountability, transparency, integrity, protection, compliance, availability, retention and disposition. The five maturity levels are: sub-standard, in development, essential, proactive and transformational.

The maturity level of the organisation depends on the lowest category criteria it meets. In certain categories the maturity level may be high, but the overall maturity is limited by the maturity level of the least developed category. National maturity level can be evaluated on the basis PSO weighted scores. For
example, if a PSO has reached the fourth or even fifth level, but the maturity of majority is on the first level, then the state’s information governance maturity level is 1+.

The elaboration of the Estonian strategy was based on the assumption that the information governance objectives can be achieved in a situation where the state’s comprehensive maturity has reached the essential or third level. To achieve the overall maturity, development has to take place in all PSOs. The measures identified in the strategy are built on the principle that they will help PSOs to move from a lower to a higher level. National measures create preconditions for the PSO measures to be implemented.

Figure 4 presents the measures that support the information governance of the state as a whole to reach the 3rd maturity level.

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**Figure 4. Information governance strategy – state and PSO measures**

State measures and activities were assigned priorities based on the scale of the expected impact. The basis for setting priorities was the table of the severity of IT processes (see Table 3).
Table 3. Table of priorities

<table>
<thead>
<tr>
<th>Importance of the measure</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crucial</td>
<td>Measures and actions, without which it is impossible to achieve the objectives of the strategy.</td>
</tr>
<tr>
<td>Critical</td>
<td>The success of the measure and action will affect the achievement of the objectives of the strategy to a significant extent.</td>
</tr>
<tr>
<td>Important</td>
<td>Measure and activity can be compensated in another way.</td>
</tr>
<tr>
<td>Irrelevant</td>
<td>The practical need for the measure or action is low.</td>
</tr>
</tbody>
</table>

3.5 Information governance strategy – state measures

The measures, recommendations and indicators proposed in the strategy are based on the studies and analyses made in the area, on discussions that took place in the working groups and on further analysis of the source material.

In order to achieve the goals set, actions need to be taken at the state and organisation level. The state deals with legislation, funding, responsibility, cross-PSO coordination and public sector recruitment policy. The actions targeted on PSOs focus on the internal organisation of work and processes. State actions are supportive and structure creating in nature, but in order to achieve a higher maturity level, each organisation must make an effort.

In areas related to information governance (including the provision and development of public services, ICT, records and archive management, internal and external communication, legislation, portfolio architecture and responsibility) a number of cross-organisation or organisation-wide measures need to be implemented, which is not possible for each PSO without the support of the state (see Figure 5).
The main state measures are the modernisation of legislative environment, changing over to service-based responsibilities, implementation of new recruitment and training policies, and establishing additional requirements for the funding of ICT developments.

3.5.1 Legislation must support the development of services

The implementation of information governance in the public sector requires a supportive legal environment.

The modernisation of regulations needs to be considered, so that legal instruments would support the opportunities of electronic procedure more clearly. As an important aspect, it is worth providing the option for making administrative procedures fully electronic in certain cases, so that the checks of register data as well as operations necessary for routine administrative decisions are performed automatically. This allows to establish clearer understanding of the current law and to reduce the number of different interpretations of various institutions on the collection and use of data.

In order to ensure fast and effective proceeding for the person through effective information governance and records management, PSOs and persons should be directed to use electronic means for administration; above all, user-friendly systems need to be developed that enable to collect and store the necessary information in relevant databases (automatically).
Legislation must not establish the document format requirements. In order to simplify the work of PSO, sample forms may be used, but these should not be included in the legal instruments. It must be possible to collect or present the required data through the state portal eesti.ee or the X-Road data exchange layer. Legislation must, at minimum, provide the general data composition, which will be specified at the executive level, if necessary. Asking for data that has already been collected must be avoided.

The restrictions in legal instruments on exchanging information electronically must be reviewed (including the obligation to forward certain types of documents only by mail). In a situation where it is possible to send documents to a person securely (e.g. in Estonia through the information gateway eesti.ee), it should not be limited by legislation, however, the wishes and opportunities of citizens must be taken into account. The state cannot force people against their will to communicate through a channel that requires a certain investment (e.g. requires a person to purchase a home computer and guarantee Internet connection).

If necessary, guidelines for the use of digital stamp and digital signature have to be developed for institutions. Institutions assess the records prepared by them in the course of proceedings, distinguishing administrative acts that need a digital signature from other records produced in the course of the proceedings (announcements, invitations, correspondence, etc.) for which the institution's digital stamp is usually sufficient. At the same time, the issue of digital signatures on administrative acts that have been prepared without an official's discretion but are based on the state information system data needs to be resolved.

When preparing an amendment proposal for the legislation, then the effects of the amendments must be analysed. The analysis must take into account changes in information systems, work processes and data usage. The analysis must not be limited to the assessment of impact on the state level, but new obligations and additional pressure on the budgets of LGs must also be taken into account.

Currently, the problem is legislative fragmentation in information governance and records management. In Estonia, the area is currently regulated by at least 25 different legal instruments, and 44 additional instruments that regulate databases. The expectation of the effectiveness of administrative activity has been set out in the General Principles of the Administrative Procedure Act – administrative proceeding shall be purposeful, efficient and straightforward and conducted without undue delay, avoiding superfluous costs and inconveniences to persons. However, legal instruments are still often focused on records management and deal with the principles of information governance minimally. The common principles of information governance may be established by issuing a new regulation, or alternatively, by substantially supplementing the regulation of the Government on the Common Principles of Administrative and Records Management Procedures.

While carrying out the above-mentioned possible legislative amendments, the European Union Directive 2013/37/EU on the re-use of public sector information must be taken into account among other things, and the legal and administrative provisions provided in it must be transposed into national law by July 2015.
3.5.2 Responsibility must become service-based

There are a number of measures recommended in the strategy that support new basis of responsibility, such as:

- To change the law so that the current function-based (“silo tower”) responsibility will be replaced with service-based responsibility. It is of particularly critical importance if the service is provided in several PSOs.

- Make the development and measurement of public services compulsory. Almost every service can be measured and optimised.

- Appoint a central public services portfolio manager. The institution/unit that is appointed as a portfolio manager will be engaged in portfolio management, leadership, training, standardisation and promotion.

- Create a portfolio management information system, based on public service reference model.

- Create the position of business architect in each ministry to coordinate the public services in the area of government. Services in the area of government of one ministry may concern several PSOs, which is why it is necessary that all related PSOs develop the services equally and that it would be included in work plans and budgets as a priority. Otherwise, one organisation develops a part of its services, but the benefit expected from it will not be reaped, because it is not a priority for the other party. The business architect will deal with the services inside of a ministry’s area of government.

- Create a governing body between the areas of government. Some services may concern the areas of government of various ministries. In such cases, problems that cannot be solved by one ministry’s business architect arise when setting priorities. The coordinating body will help to solve the issues of prioritisation across ministries. A body consisting of business architects of ministries would fit for this purpose as they can, if necessary, take the issues that need to be solved to the government for resolution.

- Designate an organisation responsible for the development of the official national communication channel. Responsibility also includes the necessary legislation.

3.5.3 Recruitment and training policies need to support the development of services

A new approach to recruiting and training of officials is considered important in order to achieve service-based management.

- Changing the state recruitment policy. Top managers are expected to have service-based management experience and relevant knowledge. Service-based management requires knowledge of the mapping of services, analysis, optimisation, pricing; the person must also understand and support collaboration across the public sector organisations.
The creation of a training program. Awareness of the links between information governance and service-based management and its effects is low. In order to enable leadership and implementation, a training program needs to be set up that would teach the understanding and use of principles of information governance and service-based management. The program is targeted at senior and middle managers. The training program is created in a reusable form, for example, in the form of a series of video lectures.

The compiling of a service-based management handbook. The activity is aimed at supporting the implementation of the training program and service-based management. Of the tools already created (see Section 3.3 "Strategy and related initiatives"), a comprehensive handbook that is evolving over time must be created that contains, inter alia, information governance components.

3.5.4 Additional requirements for the financing of ICT solutions

One of the strategy measures is to set the following additional requirements for the financing of ICT solutions:

- Indicators must be added to services. Only through service-based management will we understand where the money is spent. For this purpose, during the redevelopment of a service, indicators must be added to it. The initial set of indicators must include: the service capacity (how much is consumed), the duration of a single service incident, satisfaction, and cost over time. As a result of the PSO and service maturity growth, the end goal must be the implementation of activity-based costing. In the context of information governance, it is important to understand the impact the existence, quality and availability of the information necessary for the service delivery has on the indicators.

- A so-called business analysis must precede the development of services. The aim is to help a PSO identify their own needs and the needs of the service consumers and third parties, so that prior to the redevelopment of services and the development of information systems it would be clear, what are the effects of the planned change and what is the best way to carry it out. The preliminary analysis of the service also includes the analysis of the information required for the service – its existence, quality and availability.

- Better regulation of the financing measures. Financing applications must be accompanied by a business case that must contain an analysis of effects on the economy, target groups, the state and the PSO budget. Financing application must clearly demonstrate how the PSO service currently works and how it will improve.

Other important state measures recommended in the strategy are the following:

- maintenance of the data in the Administration system for the state information system RIHA so that in addition to IT professionals also other officials would easily find information about which data can be asked from another institution (increasing the reuse of data);

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• aggregation of all the descriptions of the state public services in the information gateway eesti.ee, along with the provision of access to the e-services;
• greater involvement of LGs in the development of information systems, and the creation of central components for performing the uniform tasks of LGs and submitting data to the state;
• sample projects of services across areas in order to support a thorough preliminary analysis, create better so-called life cycle services and provide recommendations for the management of services across PSOs.

It is recommended to consider launching a centrally funded program, which is based on the UK success story and which is to be carried out either with purpose-specific fixed-term internal resources or partner agreements. The program would consist of creating a team of three to four members, each of whom would operate in a focused way in a different PSO for a certain period of time (e.g. two weeks). During this, the team will map the services, redesign one or two services, and proceed to the next PSO. This approach allows for a quick launch of service management and sharing of knowledge in many PSOs and each PSO does not need to seek help independently or organise service design procurements separately. Team competencies should include business technology, prototyping, information governance, service design.

3.6 Information governance strategy – public sector organisation measures and indicators

In order to create an information governance strategy within a PSO, current situation has to be mapped, information governance model has to be developed, business case has to be created and information governance implementation has to be planned (this also includes the planning of quantitative and qualitative indicators for data quality). Also, activities that help to achieve well-organised information governance must be provided for (see the list in Section 2.1)

In order to assist PSOs, the information governance strategy included descriptions of specific measures based on the maturity model categories, and indicators to evaluate the success of the measure. One principle that has been followed is the interlinking of activities of the organisation of public services and the transition to information governance.

The transition to information governance must take place sparingly, using the existing organisation of work, rule set and information as much as possible.

Figure 6 shows measures necessary for the PSO at the maturity level 1 and 2 to proceed to the next level.
In order for a PSO to advance from the first maturity level of information governance to the second, the following measures need to be taken: launching of service-based management, regulation of responsibilities, notification of employees, amendment of rules. The measures leading from the second level to the third include the development of the principles of public services’ portfolio management and information governance. Both the advancement from first level to the second and from the second to the third is supported by the measure of eliminating legal obstacles.

### 3.6.1 Service-based management

The measure is taken to launch the service management in a PSO in order to map public services, responsibilities and information assets. Given the large volume of public services, it is necessary for the PSO to have the independent capability to map and analyse services. The goal of service-based management is the optimisation of services. Activities of the measure are:

- **Preparation of a list of services provided.** Preparation of a list of services enables to form a comprehensive view of the services offered. (The tool\(^{34}\) to be used: Integrated Portfolio Management of Public Services).

- **A comparison between the services provided and the functions.** From the organisation's point of view, it is important to compare whether the functions assigned by law and the services provided are

\(^{34}\) The tools created for service developers are introduced in Section 3.3
compatible with each other. Functions and services may have become disconnected, and consequently a service that should not belong to the specific PSO is provided.

- **Defining responsibilities.** It is checked whether each service has an owner. In case of absence of a service owner the PSO determines the owner. The service owner is responsible for the service description. (The tool to be used: Integrated Portfolio Management of Public Services).

- **Mapping of services.** Mapping of services provides an overview of the organisation's principles of operation, the division of responsibilities and the use of resources. Service mapping provides the prerequisites for the development of a functioning system of measures, and increasing organisational efficiency. The activity will provide insight into what triggers the service, when is the accuracy of the data checked, who decides on its delivery, who confirms it, how is the service recipient informed, and what kind of actions are taken to perform it. (The tool to be used: Public sector processes).

- **Mapping of the governed information.** The activity is carried out during the mapping of services. The information assets in the organisation are mapped – data, documents/records, metadata, and data sets. It is specified which data and documents are original and which are derived. (The tool to be used: Public sector processes).

- **Analysis of the necessity of the information assets.** PSOs collect a lot of data, but they do not use all of it in the decision-making or proceeding process. As a result of the analysis, collecting unnecessary data will be stopped.

- **Optimisation of services.** As a result of getting the overview it is possible to find activities that are redundant for the provision of a service or that are performed in different ways in the case of similar services. Optimisation may point to situations where the data are checked by several persons, although the checks could be automated and performed as a single step. In this phase, the possibility to standardise and consolidate services may also occur. Making the service proactive depends primarily on the nature of the service. (The tool to be used: E-services design handbook).

Indicators of the maturity model:

- Service-based management has been launched.

- Information assets and service provision processes have been optimised.

Indicators of the measure impact:

- **Shortening the service provision time, cost savings.** Service optimisation results in reduced service time, because it is possible to omit unnecessary steps, or automate them. It could also mean a reduction in the service provision costs, because less work must be done to provide the service.

- **The number of invisible and proactive services and the change in their number.** A PSO will presumably find a few services that can be standardised and/or made proactive or invisible. The indicator is the change in the technological maturity of the service.
3.6.2 Regulating responsibility and informing

The measure will ensure that the PSO assigns a person generally responsible for the development of services, and persons responsible for the management of various information assets. An understanding of the importance of the development of information governance and services will be taken to all employees. Activities of the measure are:

- **Management’s responsibility for the development of services.** At least one member of the management takes responsibility for the general management of public services. This helps to bring the responsibility and initiative to the level of the necessary authorisations and thus, a leader with enough power to keep the activity in focus is created. To initiate the activity, a government regulation is used which provides that the development of public services is a natural part of the activities of a public sector organisation.

- **The appointment of persons responsible for the management of information assets.** Persons responsible for information assets need to be assigned. The organisation has to decide who is responsible for managing a specific type of information asset (data set, records management system, website, etc.). These can be service owners as well as records management professionals. The measure is specifically directed towards the management of the life cycle of information assets. The existence of responsibility contributes to the quality of information.

- **The introduction of the launching of service-based management.** The aim of the activity is to support the launch of service-based management and demonstrate the benefits that result from it. The management and staff need to understand the advantages of information governance and why services and information assets need to be mapped and developed.

Indicators of the maturity model:

- Responsibility for the development of services is shared at the management level.
- The persons responsible for the management of information assets have been determined.
- Service-based management has been introduced to the organisation.

Indicators of the measure impact:

- PSO strategy has specified the activities intended for the development of services. A leadership within the organisation’s management has evolved and employees understand the importance of service-based management. Thus, the activities related to the development of services are reflected in the PSO strategy documents.

3.6.3 Amendment of rules

The measure aims to amend the PSO internal procedures and rules and remove weaknesses from them in accordance with information governance needs. The measure focuses on taking the principles of integrity, protection, compliance, availability, retention and disposition from the first maturity level to the second.
The implementation of rules must be supported by technical means to make breaking the rules as difficult as possible. Activities of the measure are:

- **Creating or amending the information governance procedure and rules.** At the first level of maturity, the information governance procedures and rules may be insufficiently provided. For example, the rules on information retention and disposal may be unregulated with regard to some data sets, there may be no disposal procedures, and it may not be possible to prove that the disposal procedure has taken place.

  The existing information management rules and regulations are complemented and, if necessary, new ones are created. This includes creating or specifying the principles of cooperation between PSOs and between the departments of PSO, information governance, staff coaching, supervision and auditing.

  It must be based on PSO objectives, legislation, services, procedures, existing documentation, the logic of PSO work and services, information governance performance, efficiency, etc. It is necessary to avoid the situation where only the common principles of one legal instrument, for example the records management procedures, are transferred to the PSO rules, whereas the legal instrument does not cover information governance as a whole. If necessary, the rules and regulations of various areas of information governance may be distinguished, for example knowledge management, data management, document management, records management. To make it possible to comply with the rules, activities and responsibilities should also be accompanied by the transfer of resources.

  Compliance with the rules established in the course of the measure will be checked by designated persons responsible.

- **Creation of the policy paper of information availability.** The rules for information storage, management, protection, archiving and disclosure need to be provided. It must be possible to easily identify the location of original versions and latest versions of publications (work documents). Computer systems and the infrastructure have to ensure the availability of information.

  It is advisable to establish a policy paper of availability, which includes organisational activities, development projects of systems or interfaces and other components, including in relation to services across areas.

**Indicators of maturity model and measure impact:**

- **Indicators for different areas of the maturity model**, such as: integrity – the number of decision errors; protection – information security audit results; compliance – legislation audit results; availability – no access obstacles to the provision of services, including cross-PSO services.

**3.6.4 The removal of legal barriers**

The measure aims to remove obstacles from the PSO legislation to enable more efficient and effective delivery of services. Activities of the measures are general in nature:
- **Change in legislative thinking.** Some legislation may contain provisions that prevent efficient work. PSO may be aware of it, but continue to work in the old way, without attempting change the preventive legislation. Activity must create a working culture where PSOs are willing and able to make proposals for legislative amendments, as well as contribute to the initiation and conduct of legislative amendments at the PSO level, as required.

- **Electronic exchange of information.** It is recommended that the legislation permits and, in some cases, even obliges that the exchange of information and documents take place by electronic means. Electronic information and document/record exchange could be targeted at PSOs and parties outside governance. It is important to observe whether legislation facilitates the reuse of data.

- **Digital signatures and digital stamps.** It is the task of PSOs to decide when to use a digital signature and when to use digital stamps. During the service development process it is possible to identify which activities need an official's discretion (digital signature), and under which circumstances it is possible to create an automatic decision (digital stamp when a decision needs to be sent outside of the system).

- **An analysis of the comprehensive impact of the amendments.** Also, as in the case of legislative amendment proposals at the state level, an analysis of the complete impact of the amendments proposed by PSO needs to be carried out, taking into account the changes in information systems, work processes and data usage.

  Indicators of the maturity model:

  - **The number of legal obstacles.** The number of obstacles found during the analysis of the legal area that would be reasonable to be removed through the initiation and completion of legislative amendment. The analysis should be repeated periodically, the target level of the indicator is 0.

  - **The share of realised proposals.** The proportion of the number of legislative amendment proposals in the number of obstacles above. The indicator should be re-evaluated periodically; the target level is 100%.

  Indicators of impact:

  - **A comprehensive assessment of the impact of the amendments as a whole.** A comprehensive assessment can be based on the analysis of the impact of the amendments made as a result of the PSO proposals.

3.6.5 **Development of public service portfolio management**

The measure is an extension to the mapping of services. Creating a portfolio of services involves describing the services in a standardised format. This allows to develop them in a more balanced way and to assess the effects of the development. It is also easier to find duplicated services and easier to link the public services provided by various organisations. Activities of the measure are:
The integration of the governance of the information necessary for the provision of services with strategic planning. PSO strategy will include service management as one of the priority directions. The goal is the standardisation and integration of services, reduction of duplicated services and the development of services. (The tool to be used: Integrated Portfolio Management of Public Services).

Preparation of the services portfolio. The services portfolio allows managing the life cycle of services and optimising them effectively. For each service, it must be decided whether it needs to be maintained, updated, modified or withdrawn. During the creation of the portfolio, each service is assigned an indicator of technological maturity. (The tool to be used: Integrated Portfolio Management of Public Services).

The organisation develops service-based information flow diagrams and principles. This is an information flow diagram that describes the movement of data, adding of metadata, the use, processing, generation of new data and eventually the deletion of data. The result of the activity enables to prove the authenticity and origin of the information. In case of errors, the place of error occurrence can be easily detected.

The PSOs use a single public services description language for describing the services. With regard to portfolio management, it is important for the connection of services that services would be described in a similar way so that it would be possible to compare them to each other. (The tool to be used: Integrated Portfolio Management of Public Services).

The optimisation of services portfolio. The PSOs are able to identify the services in their portfolios and the activities in the services that are duplicated or the overlap of which is large enough to be combined or standardised, where possible.

Indicators of the maturity model:

- The institution's strategy includes the management of public services.
- The existence of the services portfolio.

Indicators of impact:

- Manifestation of the real benefits of the business case. As a result of the management of services as a portfolio, the planned benefits will actually start to unfold. Benefits are measured continuously, and the measurement is used as a basis of prudent development decisions.
- The number of services described in the portfolio from all services of the PSO. In the course of the development of the service-based management a list of services was compiled. On the completion of this measure, these services will be added to the portfolio.
3.6.6 Further development of information governance principles

When taking the PSO information governance from the second level to the third, the courses of action, plans and projects initiated at the previous level should be used as a basis. Activities of the measure are:

- **The assessment of the comprehensive impact of services.** It is assessed how the functioning of the PSO has been influenced by the activities taken in Level 1, including the organisation of processes and the amendment of the rules of the PSO. It helps to understand the effects of service management. Since the PSO is usually not yet mature enough for the accurate measurement of impact at this level, it can rather be considered an assessment. Based on this assessment, corrective actions are planned, if necessary. The potential economic impact of the further development of services (including organisational activities, development projects of systems or interfaces, etc.) is assessed. These assessments are used for the prioritisation of projects and activities. It is highly recommended to create a continuously working system for assessing the impact of measures and activities, the output of which (impact assessments) acts as an input for the restructuring of processes and services.

- **The realisation of the availability policy paper.** The comprehensive progressive realisation of the availability policy paper created at the maturity level 1 will take place on the second level. The goal is to ensure the timely, efficient and accurate availability of the necessary information both within the PSO and across organisations. The full realisation of the availability policy paper at the second maturity level may be inexpedient, difficult or unrealistic. It is necessary to choose and realise the priority actions proposed during the impact assessment.

- **The evaluation and amendment of rules and regulations.** At the first maturity level, the supplementation of the internal rules and regulations was provided for. At the second level, the compliance, monitoring, evaluation, and supplementation of the rules and regulations will continue, if needed.

- **The conduct of the inspection and notification procedures.** It should be checked regularly that the retention, quality and disposal procedures of information are followed, employees need to be informed of the problems, if necessary, and these problems have to be solved. In addition to informing the employees within the organisation, the external users should also be informed of the services and their use.

- **Supplementation and implementation of the system of indicators.** The purpose of the activity is to improve the services as well as ensure the supervision by the public of the development of the services by the PSO. The indicators planned at the first maturity level will be supplemented and implemented. The indicators must be publicly available and calculated, preferably automatically updated. Indicator values must be updated at least once a year. The Service Level Agreements (SLAs) of public services should also be considered as indicators that can be used to measure the speed of the service, or other parameters. SLA can be different from what is provided in legislation and helps to measure to what extent the service exceeds expectations. Introduction of the SLA may be one of the quality management indicators of the PSO.
Indicators of the maturity model:

- **The percentage of realised activities of the availability policy paper.** The activities of the availability policy paper can be costly, but most part of the activities should to be attempted to be implemented.

- **The results of rules audit.** In the course of an internal audit, it is reasonable to check the content of the rules regularly, and to see whether they correspond to reality.

Indicators of impact:

- **The number of services exceeding the rules and the expectations.** The maximum service provision time is usually determined in PSOs, e.g. 30 days. However, many offer the service within a shorter time, for example a passport is received within a maximum of one week. Setting the service levels allows to set realistic goals to services; keeping or exceeding them shows that the organisation is continuously engaged in the development of services and meets the satisfaction goals of citizens and businesses.

- **The proportion of invisible and proactive services.** Many services can be automated, so that the recipients do not have to perform unnecessary activities.

### 3.7 Information governance strategy – indicators and monitoring

General indicators, with which it is possible to assess the impact of national measures and the strategy as a whole.

- **Paperless official communication.** The strategy and the Digital Agenda 2020 have defined the paperless official communication level as one of the indicators (target level of 95% by 2020).

- **Maturity model achievement level.** Many PSOs have been able to move to a higher level in the information governance maturity model. The indicator is based on the maturity level indicators in the PSO measures. The methodology and indicator of the state's information governance maturity level must be developed. One of the possible solutions is the weighted average maturity of all the PSOs.

- **The proportion of invisible and proactive services.** Services which can be made invisible have to be made invisible in order to minimise the burden on the citizens and officials. The base level can be set if there is an understanding of the volume of the state public services portfolio.

- **The share of e-services available through the information gateway.** The PSOs have an obligation to include the service descriptions in the information gateway. It is important that the e-services can also be used from there. Thus, a suitable indicator would be the share of e-services that can be used through the information gateway.

- **The satisfaction of citizens, businesses and officials with the services.** Indicators are needed to evaluate the quality of services, user awareness and satisfaction. So, the indicators used have included the service operability during a time period as a percentage, the response time of the service provider in case of an error, etc. The starting point here is the study of Integrated Portfolio Management of Public Services and the evaluation model of public services and channels developed within its context, recommendations derived from the recommendation indicator project, and others.
Appendix 1. The base concept of information governance

FROM RECORDS MANAGEMENT TO INFORMATION GOVERNANCE35

Approved by the Records Management Board36 on June 14, 2013

Postulates developed and agreed at the interdisciplinary (records management, archiving, ICT) meeting on June 13, 2013.

Background:

In May 2013, the Government of Estonia approved the Green Paper on the Development of Public Services, issued by the Ministry of Economic Affairs and Communications. One of the challenges described in the document is the necessity of adopting holistic information management, as records management and administrative procedures have not been effective enough and do not support the development of services. There is still much duplicated and manual work done, paper-based logic is yet being copied to the electronic environment. At the same time, the necessary information is difficult to find and use.

DLM Forum37, a pan-European community acting under the observance of the European Commission have also taken direction towards Information Governance across Europe and beyond. For achieving the objective, cooperation between various disciplines is seen as of key importance.

The term information management has been in use for some time already, but often as a synonym for records management. EDRMSs long known in Estonia (e.g. Amphora, Postipoiss, DocLogix, and others) have been advertised as information management software. On the other hand, information management has been interpreted solely as data management in information systems. A related term information science has been used in the meaning of library science. Holistic approach has been missing. No breakthrough has been seen.

Replacing one term with another without changing principles is not a solution!

Information governance IS NOT a synonym for records management! Nor is it a synonym for data management, internal communications, or any other separate field of activity!

35 In Estonian, there exists no suitable linguistic equivalence for Information Governance. To convey the meaning, terviklik infohaldus (holistic management of information) is used.
36 The Records Management Board operates at the Ministry of Economic Affairs and Communications which is responsible for the development of state information systems, information society services and records management in the public sector of Estonia. The Board comprises representatives of two departments of the ministry (State Information System Department and Department of Information Society Services Development), National Archives, Estonian Information System’s Authority and developers of records management in local governments, and records management officers of all the ministries and the Government Office.
37 Among members of DLM Forum, there are 22 national archives, authorities regulating records and/or archival management (incl. Ministry of Economic Affairs and Communications), universities, software vendors, etc. For further information, see DLM Forum’s website http://www.dlmforum.eu/
**Information governance** is a support function/activity/process that helps to cope with information flows.

Information governance of an agency is a “roof” over content management, records management, data processing in information systems, etc. Information governance of the state is a “roof over roofs”.

**Well-functioning information governance** is creative information governance where:

- information in any form, from any source, sent/received via any channel is covered;
- information is filtered/organised/stored and preserved according to its value, while its quality is ensured;
- information is separated, gathered together, systemized and presented according to the needs of the particular user – an official/partner (citizen/entrepreneur/another agency).

**Well-functioning information governance** makes finding and using information as easy as possible and thus:

- enables an official/partner to quickly make right decisions and thus
- ensures the achievement of objectives of the agency/state.

**How to achieve it?**

- identifying what information is valuable enough to be managed;
- simplifying and automating information capture and storing as much as possible;
- ensuring that information is retained as long as it is needed;
- ensuring that contextual information – metadata, descriptions, etc. – is also retained and linked;
- reducing the amount of unstructured information in favour of structured information;
- reducing the number of traditional (paper, doc, pdf, etc.) documents and records;
- using data of IT systems to mitigate risks connected with providing evidence;
- finding also a way how to capture/retain/reuse information stored in people’s minds and obtained through learning and experience.

**Information governance will be applied** according to rules agreed – it will be regulated as little as possible, but as much as necessary. In a common service environment, certain rules apply to the private sector as well.

It is important to have good cooperation between various disciplines, and to promote and apply the principles of information governance consistently.
## Appendix 2. Information governance maturity model in the Estonian context

<table>
<thead>
<tr>
<th>Principle</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accountability</strong></td>
<td>Responsibility for the development of services has not been assigned and information assets are not governed.</td>
<td>Responsibility at the management level exists. Responsibility in the organisation has been implemented partially.</td>
<td>The service owners responsible for the development of services have been specified. Responsibility and authorisations are balanced.</td>
<td>All levels of responsibility act in accordance with the goals of the PSO.</td>
<td>Public service management is an important input in shaping the goals of the PSO.</td>
</tr>
<tr>
<td><strong>Transparency</strong></td>
<td>Business and support processes are neither described nor regulated.</td>
<td>Processes and activities are partly described in critical areas.</td>
<td>Business and support processes are described and regulated. Public services are described on a uniform basis.</td>
<td>Transparency is an important part of the organisation, business and support process descriptions are updated regularly.</td>
<td>Transparency is an important part of the business, and software that helps to ensure and manage information has been created.</td>
</tr>
<tr>
<td><strong>Integrity</strong></td>
<td>It is not possible to verify the authenticity of the information.</td>
<td>Metadata is partially used to ensure the authenticity of the information.</td>
<td>The authenticity of the information is ensured, metadata is used.</td>
<td>There are clear requirements and regulations for adding metadata and ensuring authenticity.</td>
<td>The processes to ensure authenticity are continually reviewed and preventive actions are carried out.</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>The distribution of access restrictions is random and data protection is of low importance.</td>
<td>Security rules address only the most important information, access restrictions are set by services.</td>
<td>Safety regulations are comprehensive and access restrictions are set on a transparent basis. Security audits are performed.</td>
<td>Regular security trainings and audits are carried out.</td>
<td>Security risks are reacted to proactively, regulations are supplemented and audits are carried out regularly.</td>
</tr>
<tr>
<td>Principle</td>
<td>Level 1</td>
<td>Level 2</td>
<td>Level 3</td>
<td>Level 4</td>
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<tr>
<td><strong>Compliance</strong></td>
<td>Sub-Standard</td>
<td>In Development</td>
<td>Essential</td>
<td>Proactive</td>
<td>Transformational</td>
</tr>
<tr>
<td>There is no clear understanding of the information to be managed in order to ensure regulatory compliance.</td>
<td>Regulations have been identified on the information that is needed to achieve compliance with all applicable regulations.</td>
<td>Compliance with regulations has been established and it is identifiable. The business code of ethics has been created.</td>
<td>Regulatory compliance is ensured and improvements are made on a regular basis. Compliance audit procedures are effective and efficient.</td>
<td>Compliance assurance procedures are constantly improved.</td>
<td></td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>Information flow within an organisation is disrupted, including between departments.</td>
<td>The locations of information are partially documented.</td>
<td>Guidelines on the collection and retention of data have been created; information assets can easily be given an overview of and shared with external parties.</td>
<td>The making of information queries is automated.</td>
<td>It is possible to measure the information governance return on investment, and changes can be planned proactively in accordance with actual needs.</td>
</tr>
<tr>
<td><strong>Retention</strong></td>
<td>There are no retention guidelines or periods.</td>
<td>Retention periods and guidelines partly exist, but there is no comprehensive overview.</td>
<td>There is an established procedure for the retention of information across the institution.</td>
<td>Retention guidelines are regularly reviewed and updated as necessary.</td>
<td>Retention processes are a natural part of information governance.</td>
</tr>
<tr>
<td><strong>Disposition</strong></td>
<td>Disposal procedures are unregulated and undocumented.</td>
<td>Information disposal procedures are regulated, but there is no overview of their implementation.</td>
<td>Information disposal procedures are regulated and implemented.</td>
<td>Information disposal procedures and compliance with them have been harmonised across the whole organisation.</td>
<td>Disposal procedures and technology is continuously improved.</td>
</tr>
</tbody>
</table>