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Executive Summary

This deliverable details the Knowledge Centre Service - an aggregator of services developed under the scope of the E-ARK Project¹ and available at <u>http://kc.dlmforum.eu</u>. These services aim to provide a comprehensive, but simple and easily understood, set of services that allow users to understand, contribute to and validate Information Governance good practices. The Knowledge Centre is divided into: The Resources Centre and the Assessment Services.

The Resources Centre is where users can learn more about Information Governance terms, requirements and practice. It is composed of the Vocabulary Manager Service (entitled EVOC) and the Reference Requirements Management Service (entitled REQs). EVOC allows users to (1) learn more about Information Governance terms and definitions, (2) contribute to the development of the current Information Governance terminology, and (3) create their own reference vocabularies based on the existing terms and definitions of the service. REQs allows users to learn more about Information Governance requirements and practices by consulting and analysing reference documents. Additionally, REQs supports the evolution and maintenance of knowledge through a set of functionalities such as revision and feedback management.

The assessment services allow users to assess their Information Governance practices. It is composed by the MoReq Schemas Validator Service, the MoReq Assessment and the Maturity Assessment. MoReq Schemas Validator allows users to validate XML data files according to the MoReq2010 Export Schema. MoReq Assessment supports the process of assessing if record management systems are MoReq2010 compliant. Finally, Maturity Assessment allows organizations to assess their digital archiving maturity level according to the information governance maturity model defined in deliverable D7.5 of E-ARK.

This deliverable describes the goal and intent of each service and functionality as it explains how those can be used. Additionally, it briefly describes how data is stored in the services, which technology is behind them, and which future developments are planned for the next versions of the Knowledge Centre. The deliverable is an updated version of deliverable 7.3 that described the first functional prototype of the Knowledge Centre Service.

¹ http://www.eark-project.com/

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1. Introduction

Nowadays, many business and technical references emerge to guide the processes of ingesting, managing, preserving and accessing information. In terms of designing the processes, standards such as ISO15489² ("Records Management") or ISO30300/1³ ("Management systems for records") already exist. For implementing tools and services references such as MoReq2010 and ISO16175⁴ ("Principles and functional requirements for records in electronic office environments") are well known. For assessing organizations and tools one can refer to ISO16363⁵ ("Audit and certification of trustworthy digital repositories") or ISO18128⁶ ("Risk assessment for records processes and systems"). Also, it is important to note that the examples above are international references. As stated above, due to lack of standardization, several countries have also been defining national practices and procedures that should not be discarded and constitute relevant knowledge to the field. Despite the lack of standardization in such processes, archival management and more broadly Information Governance (IG) has been the subject of extensive research and practice in the past years.

The E-ARK project contributed to the solution to harmonize currently fragmented archival approaches for ingest, preservation and re-use through the definition of the E-ARK SIP, AIP and DIP. However, the proliferation of standards and references together with the recognition that problems should be analysed from different perspectives, motivations and communities has raised the need for a knowledge system that allows stakeholders to get a consolidated view of existing knowledge. The E-ARK Knowledge Centre is the representation of such a system. This deliverable describes the Knowledge Centre. Chapter 2 starts by introducing the idealized architecture of the Knowledge Centre and the services that characterize and compose the system. Chapter 3 describes the Vocabulary Manager (EVOC), and the Reference Requirement Manager (REQs) respectively in Chapter 3.1, and 3.2. The chapter concludes by describing how data is stored in both EVOC and REQs (Chapter 3.3) services. Chapter 4 describes the assessment services namely the MoReq Export Validator Service (Chapter 4.1), the MoReq Assessment (Chapter 4.2) and the Maturity Assessment (Chapter 4.3). Chapter 5 describes the changes from the prototype version (detailed in deliverable 7.3) and presents the sustainability plans for the Knowledge Centre that will be carried by the DLM-Forum after the end of the project. Finally, Appendix A briefly describes the technology behind the developed services.

Note that the E-ARK Knowledge Centre intends to be a "living system", i.e. a flexible system that can only reach its full potential with a strong adoption from the Information Governance community. Furthermore, the services described in this deliverable should be seen as proof of concept, i.e. they demonstrate the utility and value of the services but they should evolve according to community demand and needs. For example, the MoReq Export Validator Service and the MoReq Assessment use MoReq as reference but they are, in abstract, services that validate schemas and supports the assessment of system compliance through test cases. The same flexibility applies to all services provided in the knowledge centre.

² <u>http://www.iso.org/iso/catalogue_detail?csnumber=31908</u>

³ <u>http://www.iso.org/iso/catalogue_detail?csnumber=53732</u>

⁴ <u>http://www.iso.org/iso/catalogue_detail.htm?csnumber=55790</u>

⁵ <u>http://www.iso.org/iso/catalogue_detail.htm?csnumber=56510</u>

⁶ <u>http://www.iso.org/iso/catalogue_detail.htm?csnumber=61521</u>

2. Knowledge Centre Service

The Knowledge Centre (or KC) is an aggregator of services developed under the scope of the E-ARK Project⁷. These services aim to provide a comprehensive, but simple and easily understood, set of requirements for Information Governance. These requirements are elicited from existing reference documents. The KC infrastructure is flexible and extensible, meaning that new services can be easily added. For more details about immediate plans please check Chapter 5. Conclusions and Future Work. The main goals of the E-ARK Knowledge Centre are to provide organizations services to:

- Support the definition of Information Governance practices;
- Contribute to the existing body of knowledge of Information Governance;
- Assess existing Information Governance practices;
- Lastly, provide an access hub for Information Governance products developed under the E-ARK Project scope.

The Knowledge Centre can be used in many ways, including:

By businesses:

- As a reference source for learning more about Information Governance;
- As a guide to the audit of existing Information Governance practices; and
- As a guide to improve existing Information Governance practices.

By academia:

- As a reference glossary for Information Governance terms and their meanings;
- As a teaching resource for academic institutions; and
- To contribute to the existing body of knowledge of Information Governance.

By industry:

- To guide the development of Information Governance tools and techniques; and
- As a reference source for testing and compliance of existing Information Governance tools and techniques;

To achieve the aforementioned goals, the Knowledge Centre services are categorised into the:

- Resources Centre containing services to store, view and manage vocabulary, requirements and requirement based documents.
- Assessment Services containing services for assessment and validation of existing Information Governance practices and tools.
- **E-ARK General Model** a product of the E-ARK project, containing an interactive general model and general reference for the tools and specification developed within E-ARK.

Figure 1 presents an idealized architecture for the KC. The services are supported by a Data Store component, which includes the databases and necessary access management to keep all the data of the services safe and ready for usage.

⁷ http://www.eark-project.eu/

Finally, a View Manager acts as an entrance door to all the services, providing a gateway user interface and API (programming interface) to access them.

A web interface was developed to serve as an aggregator for all the Knowledge Centre services. This is the user interface part of the View Manager component represented in **Figure 1** that is currently available at <u>http://kc.dlmforum.eu</u> and is illustrated in **Figure 2**. This user interface represents the Home page of the Knowledge Centre. The webpage shortly describes each existing service and the benefits that users can get from them.



Figure 1. The E-ARK Knowledge Centre Architecture Model.



Figure 2. The Knowledge Centre Services Aggregator home page.

The Knowledge Centre interface also allows users to register and authenticate using a DLM Forum account, to be able to access further functionalities of the services. This central authentication is available for most of the main services, with the notable exception being the Vocabulary Manager (EVOC), which was developed in the earlier stages of the project with its own authentication database. Migration to the central authentication is planned in future work.

3. Resources Centre

The Resource Centre (**Figure 3**) is the component of the Knowledge Centre containing services to store, view and manage vocabularies, requirements and requirement based documents. Two services were developed: The Vocabulary Manager, to view and manage vocabularies, and the Reference Requirement Manager to view and edit reference requirements documents. The following sub-sections describe the concepts and functionalities of EVOC and REQs.







3.1. Vocabulary Manager (EVOC)

EVOC is a service that allows users to create, manage and view vocabularies. Any type of vocabulary can be created in EVOC as the service allows the definition of different **Vocabulary Types**, i.e., vocabularies characterized by different metadata (Ex. glossaries or acronyms lists). Vocabularies can also have terms in different languages. A vocabulary node is the generic name given to each entry of the vocabulary. A **Vocabulary Type** defines the specific name for the nodes of that type, and the metadata fields that compose each node. A **Node Attribute Type** represents the metadata fields that can be used in one or more **Vocabulary Types**. (Ex. title or definition) They define the name of each metadata field, the type of field (e.g. text area, checkbox, etc.) and the mandatory status of the field (defines if the field is mandatory or not). Using the mentioned concepts a User can create a **Vocabulary Type** entitled "Glossary" with nodes named "Terms", and with "Name", "Definition" and "Language" as fields defined by **Node Attribute Types**. Additionally, **Vocabularies** are organized by **Spaces** and **Groups**. A **Space** represents a context and it can be, for example, an organization, a project, a person, etc. **Spaces** can be divided into **Groups** for better organization of the existing vocabularies.

For example, the E-ARK Glossaries are under the "E-ARK" **Space** and divided into two **Groups**:

- "Deliverables", where all vocabularies from the deliverables are inserted, and
- "Others", where reference vocabularies that were used in the project are inserted (can be seen in Figure 13).

V PUBLIC S	PACES		LOGIN	REGISTER	HELP
Public Spac	ces	2			
Logo	Name	Description	Public Vocabularies	Vocabulary Types	Number Of Nodes
Danger Test area	SYS Playground	Sand box	3	Glossary	268
DIREÇÃO-GERAL DO LIVRO, DOS ARQUIVOS E DAS BIBLIOTECAS	DGLAB		3	MEF	862
E-ARK)	E-ARK	Space for the E-ARK Project	7	Glossary	445
DLM FORUM	DLM Forum Foundation	The DLM Forum is a European membership community of Public Archives and parties interested in archives, records and information management throughout the European Union. Membership is open to all.	2	Glossary	13



The service is composed by a set of views: Public Spaces View, Vocabulary Management View, Configuration View, and Users' View. Each view allows access to a set of functionalities. Users have access to different views depending on their role (the roles are further described in Chapter 3.1.1). The main layout of the application is composed of two main sections (Figure 4):

- 1. The **top toolbar**, common across all the application, providing easy access to its features and views available to the user (which depend on the associated role); and
- 2. The view display, where the selected view is presented.

The **top toolbar** can be used to access the various features and views of the application (**Figure 5**):

- 1. The EVOC logo that allows the user to instantly go to the Public Spaces View;
- 2 to 5. The various views of the application, availability of which depends on the current user's role.
 - 6. The username, when a user is logged in. Can be used to access the User Settings and Logout (Figure 6).
 - 7. Help button, allowing the users to send an email to the EVOC support team.



Figure 6. EVOC User Options Menu.

3.1.1. User Roles and Login

There are currently three user roles available in the EVOC application, each with access to different views and their functionalities:

- **Public** unregistered users who have only access to Public Spaces View and consequently can only consult the vocabularies that are publicly available (see Chapter 3.1.4 Public Spaces);
- Expert registered users who have access to the Public Spaces and Vocabulary Management Views. The latter allows the user to manage their (public and private) vocabularies. Additionally, Expert Users can create new Spaces, Groups and Vocabularies (see Chapter 3.1.5 Vocabulary Management); and
- Admin registered users with administrator privileges who have access to all views including the Configuration and Users Views. The former allows the definition and management of Vocabulary Types. The latter allows to define and management User Accounts (see Chapter 3.1.3 Configuration and 3.1.2 User). The administrators are the maintenance team of EVOC. This is the IST development team for the E-ARK project and, when the project concludes, it will pass to DLM Forum administration.

As mentioned before, EVOC operates currently on a different user management system that the rest of the Knowledge Centre (with plans to change that in the near future). As such, when no user is logged in, the top toolbar presents two other options (**Figure 7**):

- 1. Login button, granting access login menu (Figure 8). Here it's also possible to retrieve lost passwords.
- 2. Register button, granting access to the registration menu (Figure 9).

User logout is available by clicking the username in the toolbar (6 from Figure 5) and selecting 'Logout' (Figure 6).



Figure 7. EVOC Top Toolbar without a user logged.

a	Username		
	Password		
		Login	
legister			Remember Me
orgot p	assword?		

Figure 8. EVOC User Login Menu.

Register	
Username	
Email	
Password	
Confirm Password	
	Register

Figure 9. EVOC User Registration Menu.

3.1.2. User Management

The Users View is available only to 'Admin' Users and allows access to the User Management menu (Figure 10):

- List of registered Users in EVOC. The list can be order by 'Username', 'Roles', or 'Email'. Users can be deleted using the cross in the 'Delete' column. Users can be validated using the letter button in the 'Validate' column. Validation sends a User a notification email with the username and instructions on how to recover the password if needed;
- 2. It allows the definition of a new User by defining its 'username', 'email', and 'Role' (for more information on user roles please refer to Chapter 3.1.1 User Roles and Login). If a User is selected in 1, then you can use this menu to edit the selected User. The 'Clear' button will deselect the current selected User. Please also note that the 'Update' button will change to 'Add' if no User is selected in 1.

User Management

Drag a colum	Drag a column header here and drop it to group by that column.					
Username	* Roles	* Email	*	Del*	Validate	*
admin	Administrator			×		
achiggs	Expert	a/19	nggmat con	×		
test_user	Expert	100		×		
rvieira	Expert			×		
goncalo	Expert	-		×		
jonas	Expert			×		
jlb-dummy	Expert			×		
jlb	Expert	P ()		×		
tarvo	Expert	tanci		×		
AndrewC	Expert	4100	and the second se	×		
diogobcp	Expert	6191	and produces	×		
kuldar	Expert	B-100	and the second second	×		-

1



Figure 10. EVOC User Management menu.

Users may also be grouped by a common attribute for convenience, which is achieved by dragging a column header to the designated area in the top of the table. For instance, this allows grouping the users by 'Role' (Figure 11) to easily find out which users have administrator permissions.

User Management

Roles x			
Username	* Roles 🗂	🗶 Email	✓ Del [*] Validate [*]
admin (1)			
• expert (19)			

Figure 11. EVOC User grouping.

3.1.3. Configuration View

As described in Chapter 3.1 Vocabulary Manager (EVOC), **Vocabularies** in EVOC can have different **Vocabulary Types**, i.e., vocabularies characterized by different metadata. A vocabulary node is the generic name given to each entry of the vocabulary. A **Vocabulary Type** defines the specific name for the nodes of that type, and the metadata fields that compose each node. A **Node Attribute Type** represents the metadata fields that can be used in one or more **Vocabulary**

Types. They define the name of each metadata field, the type of field (e.g. text area, checkbox, etc.) and the mandatory status of the field (defines if the field is mandatory or not).

The Configuration View is available only to 'Admin' Users and allows the definition of **Vocabulary Types** through the Vocabularies External Setup menu⁸ (Figure 12):

- It allows the definition of a new Node Attribute Type by defining its 'Name', 'Type', and whether the node attribute type is mandatory or not ('Required'). If a Node Attribute Type is selected in 2, then you can use this menu to edit the selected Node Attribute Type. The 'Clear' button will deselect the currently selected Node Attribute Type;
- 2. List of defined **Node Attribute Types**. The list can be order by 'Name', 'Type', or 'Required'. **Node Attributes Types** can be deleted using the cross in the last column of the list;
- 3. Similarly, to 1, it allows the definition of a new **Vocabulary Type** by defining its 'Name', 'Node Name' and 'Node Attribute Types'. **Node Attribute Types** are selected by dragging from menu 2 to 3. If a **Vocabulary Type** is selected in 4, then you can use this menu to edit the selected **Vocabulary Type** (as illustrated in **Figure 12**). The "Clear" button will deselect the current selected Vocabulary Type;
- Similarly, to 2, it presents the list of defined Vocabulary Types. The list can be order by 'Name', or 'Node Name'.
 Vocabulary Types can be deleted using the cross in the last column of the list.

Please note that menu 3 also contains a 'Has Concepts?' option that if selected allows multiple Terms to be grouped into a Concept. This functionally allows admin users to define that multiple terms are used to describe the same concept.

Vocabularies External Setup		3		2			1	
Name	Node Name	Del	Name Glossary	Name	Туре	Re	Del	Name
Glossary	Term	×	Name Glossary	Name	String	true	×	
MEF	Class	×	Node Name Term	asdada	String	true	×	String •
Concepts	Stuff	×	Has Concepts?	Notas	String	false	×	Required
			Attribute Types:	Ugg	String	true	×	
	4		Vame V Definition	code	String	true	×	Aud
				Definition	Text Area	false	×	
				apply_notes	Text Area	false	×	
			Update Clear	exclusion	Text Area	false	×	

Figure 12. EVOC Configuration View - Vocabularies External Setup.

⁸ For understandability and due to the dependencies between concepts, we describe the definition of a **Vocabulary Type** from the **Node Attribute Type** to the **Vocabulary Type** itself.

3.1.4. Public Spaces View

The Public Spaces view (2 from **Figure 5**) is available to all users. It presents all public vocabularies available in EVOC. The view starts by listing all the spaces with public vocabularies (2 from **Figure 4**), detailing their logo, name, description, number of public vocabularies, the vocabulary type and the number of vocabularies nodes in that space.

Clicking on a space name will open its contents view (Figure 13). On the left side panel of this view (2 from Figure 13) is displayed the list of public vocabularies of the selected space, which may be organized by groups. These are indicated by icons:

- : represents a Group;
- : represents a Public Vocabulary.

Figure 13 show the view presented when a vocabulary group is selected, divided in parts:

- 1. Public Space name, logo and group name;
- 2. The list of Public Vocabularies and their Groups;
- 3. The list of all Terms of the Vocabularies in the selected Group;
- 4. Allows the user to filter the list of all **Terms** (3) by **Vocabulary Type**. Please note that this option exists because a **Group** can contain different **Vocabulary Types**;
- 5. Allows the user to search a selected **Vocabulary Node** for a specific text.

Public Vocabularies	Vocabulary Type: Glossary		
Deliverables	Name 🖌 🔍 🔍	5	
OD3.2 (9)	Name	Definition 2	Vocabulary
O D7.1 (21)	Access Functional Entity	The OAIS functional entity that contains the services and functions which make the archival information holdings and relate	
OD7.2 (2)	Access restrictions management	Procedures conceived to protect confidential Archival records.	
OD5.1 (20)	Access Software or tools	A type of software that presents part of or all of the information content of an Information Object in forms understandable t	
💊 Others	Access Services or Solutions	Services and solutions developed in order to underpin the processes that give Consumers access to Archival records.	
Ø MOREQ2010 (305)	AIP	OAIS: An Archival Information Package, consisting of the Content Information and the associated Preservation Description I	
• OAIS (78)	Asset types	This refers to different content or data types, e.g. geodata, spreadsheets, image files.	
2	Electronic Documents and Records Manageme	Is a type of content management system and refers to the combined technologies of document management and records	
2	Archival records	A document whose long term value justifies its permanent retention.	
	Consumer	The role played by those personsor client systems, which interact with OAIS services to find preserved information of interes	
	Digital material	The term used to describe the digital assets of an archive, contained in Information Packages.	
	Finding Aid	A type of Access Aid that allows a user to search for and identify Information Packages of interest.	
	OAIS	The Open Archival Information System is an archive (and a standard: ISO 14721:2003), consisting of an organization of peop	
	Archive	An Organisation that intends to preserve information for Access and use by a Designated Community.	
	Descriptive metadata	Metadata that describes the data content.	
	Digital Object	An object composed of a set of bit sequences.	
	Information Package	A logical container compared of entirenal Content Information and entirenal accordated Processation Description Information	

Figure 13. EVOC Public Space when a Group is selected.

On the other hand, when a specific Vocabulary is selected, other options are available (Figure 14):

- 1. Public Space name, logo and vocabulary name;
- 2. The list of **Terms** in the selected **Vocabulary**;
- 3. Allows the user to hide or show Vocabulary Nodes from the Terms list (2).

- 4. Allows the user to filter the list of **Terms** (2) based on specific text. Different text can be specified for different **Vocabulary Nodes**.
- 5. Detailed View and Export. By default, when a Vocabulary is selected, the list of Terms (2) is displayed in a compact format with only one line per term and hiding overflowing text in each cell. The 'Detailed View' button expands each cell to show all the text of each field. The 'Export' button exports a vocabulary to XSLX format (Excel file).

E-ARK <i>L</i> / Vocabi	ulary: D7.1 1		
Public Vocabularies	Columns: 🗹 Name 🕑 Definition 🕑 Lang	uage 3 5	Detailed View Export
🔻 🔖 Deliverables	Name 🖌 🔍 🗛	lvanced 4	
OD3.1 (10)	Name 🔦	Definition 2	Language 1
© D7.1 (21)	Archival functional entity	"The OAIS functional entity that contains the services and functions used for the storage and retrieval of Archival Informati	English
O7.2 (2)	Archival Information Package	"An Information Package, consisting of the Content Information and the associated preservation description information (P	English
O D5.1 (20)	Continuous Improvement	"Continuous improvement is an ongoing effort to improve products, services or processes. These efforts can seek "increme	English
🔻 💊 Others	Disaster recovery plan	"Disaster recovery planning and implementation of procedures and facilities for use when essential systems are not availab	English
MOREQ2010 (305)	Dissemination functional entity	"A delivery of media or a single telecommunications session that provides Data to a Consumer. The Data Dissemination Se	English
OAIS (78)	Documentation	"The act or an instance of the supplying of documents or supporting references or records. The documents or references s	English
	Indicator	"a sign that shows the condition or existence of something; a pointer or light that shows the state or condition of somethin	English
	Information system	"A combination of hardware, software, infrastructure and trained personnel organized to facilitate planning, control, coordi	English
	Knowledge Sharing	"An institutional systematic effort to capitalize on the cumulative knowledge that an organization has." # http://www.uky.e	English
	Management	"The organization and coordination of the activities of a business in order to achieve defined objectives." # http://www.busi	English
	Mechanisms	"a process, technique, or system for achieving a result; the fundamental processes involved in or responsible for an action,	English
	Practices	"carry out, apply; to do or perform often, customarily, or habitually; to perform or work at repeatedly so as to become profi	English
	Preservation Description Information	"The information which is necessary for adequate preservation of the Content Information and which can be categorized as	English
	Preservation Planning	"The OAIS functional entity which provides the services and functions for monitoring the environment of the OAIS and whi	English
	Procedures	"A manner of proceeding; a way of performing or affecting something: standard procedure. A series of steps taken to acco	English
	Process	"set of interrelated or interacting activities which transforms inputs into outputs # Note 1 to entry: Inputs to a process are	English
	Process bottleneck	"A bottleneck is a phenomenon where the performance or capacity of an entire system is limited by a single or limited nu	English

Figure 14. EVOC Public Space when a Vocabulary is selected.

Any term in the **Terms** list of a **Vocabulary** can be selected, which will prompt the appearance of a right panel with further details about that term (**Figure 15**). This panel can be collapsed by pressing the arrow button (1 of **Figure 15**). Also note that, the URL of the EVOC application changes depending on the selected vocabulary and term, allowing the sharing of links that point directly to a term or vocabulary. These URLs persist as long has the vocabulary\terms exist.

capularies	Columns: @ Name @ Definition @ Language Expo							
rables	Name 🖌	Name V Q advanced						
(10)	Name 🔨	Definition	Language	^	Disaster recovery plan			
(21)	Archival functio	"The OAIS functional entity that contains the service	English					
	Archival Inform	"An Information Package, consisting of the Content	English					
	Continuous Imp	"Continuous improvement is an ongoing effort to i	English		Definition			
	Disaster recover	"Disaster recovery planning and implementation of	English		"Disaster recovery planning and implementation of procedures and facilities for use when essential systems are not available for a period.			
10 (305)	Dissemination f	"A delivery of media or a single telecommunications	English		long enough to have a significant impact on the business, e.g. when the			
	Documentation	"The act or an instance of the supplying of docume	English		head office is blown up. # Disasters include natural: fire, flood, lightning, hurricane: hardware: nower failure component failure head crash:			
	Indicator	"a sign that shows the condition or existence of so	English		software failure: bugs, resources; vandalism: arson, bombing, cracking,			
	Information syst	"A combination of hardware, software, infrastructur	English		theft; data corruption or loss: human error, media failure; communications: computer network equipment, network storm.			
	Knowledge Shar	"An institutional systematic effort to capitalize on th	English		telephones; security: passwords compromised, computer virus; legal:			
	Management	"The organization and coordination of the activities	English		change in legislation; personnel: unavailability of essential staff, industrial action." # http://dictionary.reference.com/browse/disaster+recovery			
	Mechanisms	"a process, technique, or system for achieving a res	English		······································			
	Practices	"carry out, apply; to do or perform often, customaril	English		Language			
	Preservation De	"The information which is necessary for adequate pr	English		Lightin			
	Preservation Pla	"The OAIS functional entity which provides the servi	English					
	Procedures	"A manner of proceeding; a way of performing or af	English					
	Process	"set of interrelated or interacting activities which tra	English					
	D 1 11		Franklah					

Figure 15. EVOC Public Space when a Term is selected.

3.1.5. Vocabulary Management View

Registered users in the EVOC system (Administrators or Experts) have access to the Vocabulary Management View, where they can explore and edit vocabularies. Note that users only have access to vocabularies they have created, or those which the owner (a registered user) of the vocabulary has granted them access.

The layout of the Vocabulary Management View is divided in two main areas (Figure 16):

- 1. The left panel, listing all the **Spaces**, **Groups** and **Vocabularies** available to the user, as well as the buttons to manage them;
- 2. The right panel, showing all the **Terms** of a **Vocabulary**, **Group**, or **Space** depending on which is selected in 1, as well as the buttons to manage them.

±• 🖉 🞽 👔	Vocabulary: D3.2	2	
DGLAB (5)	+ New Term 🖌 Edit Term 🗙 Remove	Term Import Terms Detaile	l View Export 🗸
DLM Forum Foundation (4)	Name Y	duanced	
🔻 늘 E-ARK (8)		idvanced	
🔻 🔖 Deliverables	Name	Definition	Language
O D3.1 (10)	Archival creator	An organization unit or individual that creates records and/or manages those records during their active use.	English
O D3.2 (9)	Archive	An Organisation that intends to preserve information for Access and use by a Designated Community.	English
O D7.1 (21)	Content type	The delivery-specific content submission type.	English
© D7.2 (2)	Delivering organisation	The organisation delivering the package to the archive. For stating and extending the information use of element "Producer	English
• 05.1 (20)	ERMS	Is a type of content management system and refers to the electronic records management system.	English
@ MOREQ2010 (305)	Information Package	A logical container composed of optional Content Information and optional associated Preservation Description Information	. English
• OAIS (78)	OAIS	The Open Archival Information System is an archive (and a standard: ISO 14721:2003), consisting of an organisation of peo.	English
a SAA (2616)	Submission Information Package (SIP)	An Information Package that is delivered by the Producer to the OAIS for use in the construction or update of one or more	English
🕨 🖕 SYS Playground (3)	Submitting organisation	Name of the organisation submitting the package to the archive. Extends the delivery information since it may be the case .	. English

Figure 16. EVOC Vocabulary Management View layout.

A user can manage **Spaces**, **Vocabularies** and **Groups** in his Vocabulary Management view, through the tool buttons on the top side of the left panel of the screen (**Figure 17**):

- 1. The "Create" menu (Figure 18), with options to create new Spaces (Figure 19), Groups (Figure 20) and Vocabularies (Figure 21);
- 2. The "Edit" button, available when a **Space**, **Vocabulary** or **Group** is selected. allows the editing of the selected item proprieties;
- 3. The "Delete" button, available when a **Space, Vocabulary** or **Group** is selected, deletes the selected item.



Figure 17. Space, Group and Vocabulary management buttons.

+- 🖍 🗙	
New Space	
New Vocabulary	tion (²
New Group	
🔻 🌭 Deliverables	

Figure 18. Space, Group and Vocabulary create menu.

To create a new **Space**, the following metadata needs to be defined (**Figure 19**): 'Name' (required), 'Description', 'Users' who will have access to the space, the confidentiality of the **Space** ('Public' or Private), and an image to serve as the **Space** 'Logo'.

New Space:	
Create	
Name:	
Description:	
	-11
Users:	
Select person	
Public	
Logo: Choose file No file chosen	

Figure 19. Form to create a new Space.

To create a new **Group** (Figure 20), users need to define a name, the **Space** of the **Group** being created, and, if relevant, another **Parent Group**. If a parent group is defined, the new Group will be classified under the parent group. This functionality allows users to define a hierarchy of groups if they wish so.

Now Croup		2
New Group:		
Name:		
Space:		
Select one tag	 Clear 	
Parent Group:		
Select one tag	Clear	
Create		

Figure 20. Form to create a new Group.

To create a new Vocabulary, EVOC allows the following metadata (Figure 21):

- Acronym (required), a small, unique name that will serve to identify the Vocabulary through EVOC;
- *Name* (required) of the **Vocabulary**;
- The confidentiality of the **Vocabulary** *Public* or *Private* (not public);
- *Description* of the Vocabulary;
- External References of the Vocabulary. To be used when the Vocabulary is based on a website, document, or other reference source. External References are shown next to the Vocabulary name. Multiple External References should be separated by a new line (EVOC reads each line as a reference). If Users wish to provide an URL to the External Reference the following syntax can be used <name>____<hyperlink> where <name> should be the name of the External Reference, '____' should be three underscores in succession, and <hyperlink> should be the URL you wish Users get redirected when clicking the External Reference. Figure 22 is an example of a Vocabulary where an External Reference with an URL was defined;
- The **Vocabulary** *Type* (required) to be chosen from the existing **Vocabulary Types** defined in the Configuration View (see Chapter 3.1.3 Configuration View for more details);
- The *Space* (required) and the *Parent Group* of the **Vocabulary** being created; and
- The Import Vocabulary. Instead of creating a Vocabulary from scratch, Users can import a vocabulary from an Excel spreadsheet. In order to do so, the columns of the spreadsheet need to match the Node Attribute Types of the Vocabulary Type selected, and the language of the imported terms needs to be selected (all imported terms will be marked as from that language, but this can be edited once the vocabulary is imported). As an example: for the "Glossary" Vocabulary Type (seen in Figure 12), the spreadsheet would need 2 columns with the first cell of one being named "Name" and of the other "Definition", the Node Attribute Types of "Glossary".

Herr Voous	oulary:
Create	
Acronym:	
Name:	
Public	
Description:	
External Refere	nces:
Space DGLAE	3
Parent Group:	Select one tag Clear
- Import Vo	ocabulary
Excel File:	
Choose file	No file chosen
Import Lang	uage
l. (da - Danish (dansk)

Figure 21. Form to create a new Space.

When a **Vocabulary** is selected in left panel of the Vocabulary Management View, all the **Terms** of that **Vocabulary** are shown in the right panel. The viewing options are similar to those of the **Public Spaces View** (see Chapter 3.1.4 Public Spaces View for more information). **Figure 22** presents the general layout of the right panel when a vocabulary is loaded. Please note:

- 1. The buttons to manage the **Terms** in a **Vocabulary**;
- 2. The **Terms** list. In the Vocabulary Management View selecting a term will give access to different options in the management controls (1 in **Figure 22**); and
- 3. The Export options (Figure 23). Apart from the export functionality already described in the Public Spaces View (Chapter 3.1.4 Public Spaces View), the Vocabulary Management View allows Users to export the Excel Template, i.e. the spreadsheet already matching the Vocabulary Nodes of the Vocabulary Type being edited. This functionality allows to have a spreadsheet file that can be used for future imports.

vocabulary. Moneq2010			
🕂 New Term 📝 Edit Term	X Remove Term Import Terms	tailed View	Export -
Name 🖌	Q advanced		
Name 🔺	Definition 2	Language	^
Compliance, Principle of	(concept) Compliance is a non-functional aspect of a records system that assesses its	s English	
Access	(verb) To interact with an information system so as to perform functions and to brows	English	
Access control	(concept) The concept of managing users' access to entities and to functions in an inf.	English	
Access control entry	(data structure) An individual entry within an access control list that grants one or more	English	
Access control list	(data structure) A list of access control entries associated with an entity that defines w	English	
ACE	(acronym) An access control entry.	English	
ACL	(acronym) An access control list.	English	
Active entity	(noun) An entity that has been created in an MCRS and has never been deleted or des	English	
Activity	(noun) An organised process designed to achieve an outcome. Both human and comp	English	
Administrative role	(noun) A role that applies uniformly, through inheritance, to all the descendants of an	English	
Administrator	(noun) A technical administrator of an MCRS is a person charged with managing the i.	Enalish	~

Vocabulary: MOREO2010 Sources(MoReq2010)

Figure 22. EVOC Vocabulary Management View right panel layout.



Figure 23. EVOC Vocabulary Management View Export options.

There are four buttons to manage terms in a vocabulary (Figure 24):

- 1. The 'New Term' button gives access to the new Term (node) form (Figure 25) to create a new Term. The required metadata to create a Term will vary depending on the Vocabulary Type.
- 2. 'Edit Term' button, available when a **Term** is selected.
- 3. 'Remove Term' button, available when a **Term** is selected. If the **Term** is imported from another **Vocabulary**, then the **Term** is only removed in the selected **Vocabulary**.
- 4. 'Import Terms' button that allows the import of **Terms** from other **Vocabularies** (1 from **Figure 26**).



Figure 24. Term Management buttons.

New Noo	le:	×
Name:		
Definition:		7
Language:	hu - Hungarian (magyar) 🔹	
	Create	

Figure 25. Form to create a new Term.

Selecting the 'Import Terms' button will open the import terms panel (Figure 26). Figure 27 shows a close-up of the controls available in this panel, which are:

- 1. The 'Copy' button, to copy the selected Term from another Vocabulary;
- 2. The 'Copy All' button, to copy all Terms from another Vocabulary;
- 3. The 'Source Vocabulary' combo box, where the **Vocabulary** to import terms from is selected. It includes all the Vocabularies of the current space;
- 4. 'Hide' button, to hide the import terms panel and return to the default right panel layout (Figure 22).

Please note, that you can only import terms from Vocabularies in the same Space and with the same Vocabulary Type.

Vocabulary:	E-ARK Deliverable 7.2 Vocabulary			1		
🕂 New Term 📝 E	Edit Term X Remove Term Import Terms Detailed	View Export -	🗲 Сору 🗲 Сору /	All Source Vocabulary D7.1	•	Hide
Name 🖌	Q advanced		Name 🗸	Q advanced		
Name	Definition	Language	Name 🔺	Definition	Language	^
AIP Class	An AIP class is an aggregation of AIPs that store the same t	English	Archival function	"The OAIS functional entity that contains the services	English	
Documentation	"The act or an instance of the supplying of documents o	English	Archival Informat	"An Information Package, consisting of the Content Inf	English	
Producer SIP	The Information Package submitted by the Producer in the	English	Continuous Impr	"Continuous improvement is an ongoing effort to imp	English	
Skills	"An ability and capacity acquired through deliberate, s	English	Disaster recovery	"Disaster recovery planning and implementation of pr	English	
			Dissemination fu	"A delivery of media or a single telecommunications s	English	
			Documentation	"The act or an instance of the supplying of documents	English	
			Indicator	"a sign that shows the condition or existence of somet	VEnglish	
			Information syst	"A combination of hardware, software, infrastructure a	English	
			Knowledge Shari	"An institutional systematic effort to capitalize on the	English	
			Management	"The organization and coordination of the activities of	English	
			Manhaniana	- and the balance of a state of the solution o	Franklich	¥

Figure 26. Import terms layout.



Figure 27. Import terms management buttons.

When a **Vocabulary** has an imported **Term**, that **Term** will appear in blue text on the **Terms** list (**Figure 28**). Editing an imported **Term** will unlink it from the original **Vocabulary's Term**, making them effectively two separate terms. However, changes on the origin **Vocabulary** will be reflected in all the **Vocabularies** that **Term** is imported to. Similarly, deleting an imported **Term** from a **Vocabulary** will have no effect on the original **Vocabulary's Term**. However, deleting a **Term** in the origin **Vocabulary** will remove it from all the **Vocabularies** that term is imported to.

Name 🖌 🛛 🛛 advanced				
Name 🔨	Definition	Language		
AIP Class	English			
Documentation	Documentation "The act or an instance of the supplying of documents o			
Producer SIP	The Information Package submitted by the Producer in the	English		
Skills	"An ability and capacity acquired through deliberate, s	English		



3.2. Reference Requirement Manager (REQs)

The Reference Requirement Manager (or REQs) is a service that allow **Users** to view and manage reference documents – in this case Information Governance reference documents. The service intends to allow an easy and understandable navigation to the reference documents. Additionally, the service will allow the identification of requirements and the documents so that Users can manage and relate Information Governance requirements. Users will also be able to comment and participate in future revisions of the documents. The final goal is that users can consult and contribute to the body of knowledge of Information Governance.

3.2.1. User Roles

There are four user roles available in the REQs service, limiting functions and accessible documents. From the very restricted Public to the all-access DLM Reviewer, the roles and their permissions are the following:

- **Public** unregistered users who can only view and navigate public documents.
- User users registered in the Knowledge Centre, who can view, navigate and comment public documents.
- **DLM User** registered users who can view, navigate and comment public and private documents.
- **DLM Reviewer** registered users who, besides the functionalities of the DLM User, can also review comments and edit documents.

The different permissions of each user role affect the functionalities and interface of the application, as will be seen in the next sections.

3.2.2. Main layout and Top Toolbar

When a user first opens REQs no document is original selected (**Figure 29**). They can then use the top search bar to search and select a document in the database (**Figure 30**). **Figure 31** presents the main layout of the REQs application with a document selected, which can be divided in the following parts:

- 1. The top toolbar, with important quick-to-access functions.
- 2. The document navigation panel, to navigate inside documents'.
- 3. The content panel, to view, edit and comment document' sections
- 4. The PDF view panel, to view the current document in PDF format.

The size of the panels can be adjusted by dragging the separation bars between each of them. More details about the top toolbar follow in this section, while details about the navigation panel are available in section 3.2.3, about the document content panel in 3.2.4, 3.2.5 and 3.2.6, and about the PDF view panel in 3.2.7.

Reqs Do	ocument search	KC	쓭
<no document="" sel<="" th=""><th>-</th><th>🀠 HIDE LINKS</th><th>≁</th></no>	- 	🀠 HIDE LINKS	≁
	(no document selected) Select a document at the top search bar.		

Figure 29. REQs No document selected.

R	Reqs	Mo	KC
<no do<="" th=""><th>ocument sel</th><th>MoReq 2010</th><th></th></no>	ocument sel	MoReq 2010	
		(no document selected)	
		Select a document at the top search bar.	

Figure 30. REQs Document search.

R	Reqs	MoReq 2010	1			×	ŀ	(C	쓭
MoRe	eq 2010		→ Part One - Core Services	Ø HIDE LINKS →	< 12/525	>	Q	Q	Sync ON
 Part Or 	ne - Core Services		Dart One Core Services			Contract - Contract-	412-079	Γ	1212 1351 2369 6400 1236 65% 1827 6620 235823548 276 1995 2226 2248 2754 1734 4248 648 4864 4754
∨ 1. F	undamentals		Part One - Core Services		We ver State ter up Joint 10		en Santa Santa anti-senar	.00	0220 0475 4278 5476 1130 4476 1427 4478 5755 3466 0764 7587 5256 3561 2756 7587 5256 3561 2756 7587 5459 2687 4761 2758
√ 2.S	ystem Services		1. Fundamentals						(22) 220 4342 2217 1838 8444 1444 1446 1437 845 445 1446 1445 145 445 1446 1445 145 145 145 1854 145 1349 145
√ 3.U	ser and Group Servic	e	1.1 Important Information	2					1242 (K14 1411 442) 2465 (K14 1411 442) 5655 (K14 1411 442) 5655 (K14 1411 4411 4411 4411 4411 4411 4411
√ 4. N	lodel Role Service		1.1.1 Intellectual property rights	у					5045 5045 2016 0035 5056 3046 2016 2018 5056 3056 406 2018 2016 2018 406 4041 0120 2019 406 2019
√ 5.C	lassification Service		The MoReq2010® specification is copyright © DLM Forum Foundation, 2010 & amp; 2011, all rights reserved	d, including all Text					2227 Mich 2019 1988 2227 Mich 2019 1988 1884 1965 2009 1988 1884 1965 2009 1989 1978 2019 1997 4920 1970 2019 1973 4920
√ 6.R	ecord Service	2	and original illustrations included with the work.			0670 0004			Table Room a first branch water active and effort class and active and effort states on the Nether Bellin States water active below
√ 7. N	lodel Metadata Servi	ce	Some illustrations make use of royalty free clip art sourced from Microsoft Corporation at http://www.microso	oft.com/.	11. 12	4 46 ¹⁵ 074 5 3849 074	54 6134		
∨ 8.D	isposal Scheduling S	ervice	Reproduction of this work is authorised except for commercial purposes, provided the source is a acknowledgements should be to the DLM Forum Foundation at http://www.dlmforum.eu/	acknowledged. All	1 23	4 094 38 0638 6	904 514 5756 54	86	
∨ 9.D	isposal Holding Serv	ice	Novo paragrafol Editedi			20 2030	4892 -	8683	EL.
~ 10.	Searching and Repor	ting Service	1.1.2 Authenticity		B	34: 8345	6485	900	8 82
✓ 11.	Export Service		The latest undated Version of this document is only available from http://moreg2010.eu/ and http://www.dlmf	forum eu/	5	44 012	2 811	3 12	004
~ 12.	Non-Functional Requ	iirements	The DLM Forum® does not undate support or endorse the MoRen2010® specification on any other well	hsites services or	MoReq2010 ^e				Records Systems
~ 13.	Glossary		distribution mechanisms.		V 1 54	38 00-	9 67	156	2593
~ 14.	Information Model		1.1.3 Citation		Part One				8683
~ 15.	Acknowledgements		This publication should be formally cited as:		Core Ser	vices			9068
A Part TV	vo - Plug-in Modules		DLM Forum Foundation, MoReq2010®: Modular Requirements for Records Systems - Volume 1: Core Servi	ices & Plug-in	29	34 0-		648	1987
~ 101	. Graphical User Inter	rface (GUI)	Modules , 2011, published at http://moreq2010.eu/.		MoReg2010	44 04	00	811	19 1 2 4 6
v 102	. Application Progran	nming Inter	1.1.4 Translations						
v 201	. Hierarchical Classif	ication	Permission must be obtained before any translation of MoReq2010® is published or otherwise distributed	d for any purpose.		4			
✓ 301	. Electronic Compone	ents	President a market a translation of Margarol 100 la subject to allowing an email to secretariat@dim	ntorum.eu.					
			Permission to make a translation of MoReq2010® is subject to allowing the DLM Forum® and its members and distribute the translation for non-commercial purposes and to host the translation on the MoReq2010® w	to treely copy, use vebsite.					

Figure 31. REQs main layout.

The top toolbar provides easy access to many functions of the application (Figure 32):

- 1. The REQs logo and title, can be used to refresh the page.
- 2. The document search bar, where the user can find and select all documents available to him.
- The Knowledge Centre logo, allowing the user to quickly access the Knowledge Centre main page (Figure 2 in Chapter 2 Knowledge Centre Service).
- 4. The user options, providing options to login or register in the application.

R	Reqs	Document search	2	³ ₭ ≝
			Figure 32. REQs Top toolbar logged out.	
When a	user is lo	ogged in, the	bar slightly changes (Figure 33):	

- 1. The current user's username and role (between parentheses).
- 2. The logout button.

R	Reqs	Document search	KC	kc-demo(reviewer_dlm)	
					·

Figure 33. REQs Top toolbar logged in.

3.2.3. Document Navigation

In the navigation panel (Figure 34) the user can navigate between the sections of any previously selected document from the search in the top toolbar (see 3.2.2 Main layout and Top Toolbar). The documents' sections are shown on a tree-list representation, replicating the selected document index. The sections can be expanded and collapsed, showing and hiding their subsections. Clicking on a section in the navigation panel will cause it to expand or collapse, and it will also select the section consequently loading its contents into the content panel. Hovering over a section will show a tooltip with its full title (Figure 34).



Figure 34. REQs Document navigation panel.

3.2.4. Content Panel Layout and Read Mode

After a section is selected from the navigation panel (see 3.2.3 Document Navigation) its contents are displayed in the content panel. The base mode of the panel is read mode and its base layout is (**Figure 35**):

- 1. The content panel header (more details below).
- 2. The title of the current section.
- 3. The textual content of the current section.

🔶 Part One - Core Services > 3. User and Group Service > 3.2 Key Concepts > 3.2.1 MoReq2010® ... 🐠 HIDE LINKS 🐥

3.2.1 MoReq2010[®] Approach to User and Group Management²

Good management of users and groups is essential to the successful Operation of a Records system. All business systems share this same need. As a consequence there are many System tools available that manage users and groups and this functionality is often built directly into computer operating systems. There are also well established standards for management of users and groups and related Directory services, such as X.500, and for User authentication, such as OpenID.

For this reason MoReq2010® does not Mandate the protocols that MCRS solutions should use for User authentication and User and Group management. The User and group service in MoReq2010® is a Set of requirements that act as a wrapper allowing the use of either an External corporate Directory service or a custom Directory service built into the MCRS. Other than the basic concepts of a User and a Group, described below, MoReq2010® is not prescriptive about how users and groups are managed.

Figure 35. REQs Content panel layout.

The header of the content panel provides important functions and information (Figure 36):

1. The show\hide button for the navigation panel (see 3.2.3 Document Navigation), used to trade the navigation panel space for more room for content.

- 2. The path (composed of sections and subsections) to the current section.
- 3. The show\hide links button, used to enable and disable the links navigation and styling in the content.
- 4. The show\hide button for the PDF viewer (see 3.2.7 PDF Viewer), used to trade the PDF viewer space for more room for content.

More options appear in the content panel header when the user has permissions for commenting (see 3.2.6 Comments and Log) and editing (see 3.2.5 Edit Mode).



Figure 36. REQs Content panel header.

Note that if a user selects a high-level section in the navigation panel, the content panel will display the content of the selected section and its respective sub-sections (**Figure 37**). To keep the loading time of large high-level sections short, a dynamic loading technique was employed. Therefore, when a section is selected, only a predetermined size of its subsections' content is loaded to the content panel. As the user scrolls down in the content panel, the remaining content will be loaded.

-,≁ Part One - Core Se	rvices > 3. User and Group Service		🋷 HIDE LINKS	-+←
3. User and G	roup Service			1
3.1 Service Information				
	Service Name	User and Group Service		
	Service Version	1.0		- 1
	Implements Service Identifier (see M14.4.42)	cd532472-85b0-4c1c-82b4-5c8370b7d0e6		۵
3.2 Key Concepts				
3.2.1 MoReq2010® Approa	ach to User and Group Management			
Good management of users and g there are many System tools avail established standards for manage	roups is essential to the successful Operation of able that manage users and groups and this funct ment of users and groups and related Directory se	a <mark>Records system</mark> . All business <mark>system</mark> s sha ionality is often built directly into computer o ervices, such as X.500, and fo <mark>r User</mark> authentic	re this same need. As a consequer operating systems. There are also v ation, such as OpenID.	ice /ell
For this reason MoReq2010® does not Mandate the protocols that MCRS solutions should use for User authentication and User and Group management. The User and group service in MoReq2010® is a Set of requirements that act as a wrapper allowing the use of either an External corporate Directory service or a custom Directory service built into the MCRS. Other than the basic concepts of a User and a Group, described below, MoReq2010® is not prescriptive about how users and groups are managed.				
3.2.2 Requirements for Red	cords Management			
Traditional Directory services do r service is often transient in nature be universal or they may be subje service may not be in a common from an historical perspective to d	ot, by themselves, provide all the functionality rec . There is usually little or no ability to be able to t sect to change, for example, if an External Directo Format that can be easily understood by another letermine which users performed particular action	juired for the discipline of Records managen race past users of a System. The System ide ry service is duplicated or rebuilt. Importani Records system when records are transferre s, who they were and what groups they belon	nent. The Data held within a Direct ntifiers for users and groups may i ly the Data in a Proprietary Direct d. These factors may make it diffic ged to.	ory not ory xult
MoReq2010® therefore requires	that the MCRS keep additional and stable Data	about users and groups including historica	I Information. This includes creat	ing 🔻

Figure 37. REQs Content panel with multiple sections.

The selected reference document can also be navigated through the existing links the content panel. The content of a document section can have linking information attached to any part of its text, which allows the user to swiftly navigate between linked sections. As an example, if the user clicked in the link highlighted in **Figure 38** the content panel would reload to show the contents of the link's target (section "3. User and Group Service" in this case). Also, note that the current document and section selected are reflected at all times in the URL of service. As mentioned before, links can be hidden\shown via the respective option in the content panel header.

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→ Part One - Core Services > 1. Fundamentals > 1.4 Primer > 1.4.4 Entities and services
1.4.4 Entities and services
A MoReq2010® Compliant Records system manages records as entities. Records are only one of the Entity types defined by the specification. In addition to records, MoReq2010® also defines a number of other entities of different types. For example, MoReq2010® defines a User Entity type that represents the users that Access the Records system, and a Class Entity type for each Entry in the records system's Classification scheme, and so on. A full list of Entity types may be found in 14.2 Entity Types.
Even though the entities managed by an MCRS are of different types, MoReq2010® attempts to make them as uniform as possible in the way that their Metadata is represented and their Event history is managed, in their Access controls and in their Entity Lifecycle. Unlike the entities in other Information systems, entities in an MCRS are destroyed, rather than deleted, leaving a Residual entity that remains in the MCRS. Residual entities are an important concept in records systems as they indicate entities that were once present in the System. Without them it would not be possible to reconstruct the full context of an historic Record.
Within an MCRS, entities of different types are nominally described as being managed by different services according to a "service based architecture" (see 2. System Services):
 A User and group service manages User entities and Group entities (see <u>3. User and Group Service</u>); A Role service manages roles (see <u>4. Model Role Service</u>);
A Classification service manages classes (see 5. Classification Service);
A Record service manages records and aggregations of records (see 6. Record Service);
A Metadata service manages Metadata and Metadata templates (see 7. Model Metadata Service);
A Disposal scheduling service manages disposal schedules (see 8. Disposal Scheduling Service); and
A Disposal holding service manages disposal holds (see 9. Disposal Holding Service).
Other services are purely Process based and do not manage entities, including:
A Searching and reporting service (see 10. Searching and Reporting Service), and
An Export service (see 11. Export Service).
While it uses the Lenguage and economics the edention of a Consider based architecture. MaDec001000 asimouladase that bistorically rescarde austema have not 🗵

Figure 38. REQs content panel links.

Sections in REQs may have special types assigned to them, indicating that the section have an extra meaning besides the one innate to the document's hierarchy. When this happens, an extra field can be seen when the content panel is in read mode (1 in **Figure 39**) besides the usual content (2 in **Figure 39**).

\rightarrow Part One - Core Services > 3. User and Group Service > 3.4 Functional Requirements > R3.4.03	E LINKS	→←
Type: Functional Requirement 1		
R3.4.03 2		
The MCRS must support a Process for updating the Title and Description of an active User Entity, and any Contextual metadata, to reflect changes to the MoReq2010® does not define how this mechanism should be implemented and it may be performed externally to the MCRS and be later synchronis changes to User Metadata must Generate an Event in the Event history of the User, under R2.4.15, subject to R2.4.13. Function Reference: F14.5.191	user's de ed to it, ŀ	tails. 10weve

Figure 39. REQs Sections with special types.

3.2.5. Edit Mode

After a section is selected from the navigation panel (see section 3.2.3 Document Navigation) and the user has enough permissions (see section 3.2.1 User Roles), the edit\read mode toggle button will be available in the header of the content panel (Figure 40).



Figure 40. REQs Edit\read mode option.

When the edit mode is activated, a new button will appear at the header of the navigation panel (Figure 41). This allows the user to edit the currently selected documents properties (Figure 42):

- Name (required), the full name of the document;
- Alias (required), a simpler id of the document to be used in URLs;
- Resource URL (optional), a base URL were the images of document can be found;
- A Public checkbox, to mark whether the document is available to everyone or restricted to DLM users.

	Edit Document Properties
ISO-15489-2	Document Name
Foreword	ISO-15489-2
Introduction	Document Alias
1 Scope	ISO-15489-2
 2 Policies and responsibilities 	Q
2.1 Introduction	Resources URL
2.2 Records management policy	Public
2.3 Responsibilities	
 3 Strategies, design and implementa 	SAVE CANCEL

Figure 41. REQs Edit document button.

Figure 42. REQs Edit document properties.

-,← P	art Two - F	lug-in Modules > 101. Graphical User Interface (GUI) > 101.2 Key Conc	M HIDE LINKS	🗐 READ MODE	-≁					
Edit	Mode	т	ype: -sele	CT TYPE- 🗸	0					
101	I.2.1 N	Aain features of a Graphical User interfac	e∕3	1	2					
≡ 5	A Graphical provided on such as keyl through a So	user interface or GUI is the most common way for users to interact with modern computer technologies. A any Information system that has a Screen and one or more input devices. Information is typically transmit woards, mice, tablets, pens/styli, touch screens and microphones that transmit voice commands. Feedback reen or Display, however some audio and other supplementary Feedback is sometimes provided.	A Graphical use ted to a GUI thr k from a GUI is	r interface may ough input devi primarily visual 4	be ces					
=	The key feat	ures of most Graphical User interfaces are:								
=	• They allow users to run more than one Application at a time and to follow links and to switch between applications, for example, a User reading an email in an email client may click on a link that opens in a Web browser;									
	• =	They allow users to see more than one item or piece of Information at a time and to see some Informat as images, icons or graphics;	tion as Text and	other Informati	ion					
	• E They allow users to manipulate and Perform actions on items by clicking with a mouse, tapping with a finger or typing on a keyboard;									
	• =	They allow users to Navigate visually between items by providing multiple item displays such as list vie	ws and Tree vie	:WS;						
	•	They allow users to see the relationships between items:			•					

Figure 43. REQs Edit mode content panel view.

When in edit mode, the view of the content panel changes to the one in **Figure 43**. This view has many important features to allow the user to edit the currently selected section of the document (**Figure 43**):

- 1. The type combo box, for changing the special type of the current section.
- 2. The clear type button, to clear the special type of the current section.
- 3. The edit section properties button, which allows the editing of the section's properties: name and, again, type (Figure 44).
- 4. The section's content elements, which represent all the textual data. Adding, removing and editing these elements is what allows the modification of the textual content in a section of the document.
- 5. The content element's option menus, with options to delete the element or add new ones before or after the element (Figure 45).

Edit Section Properties	5	
Section title 101.2.1 Main features of a Gra	phical User ir	? nterface
Type:		0

Figure 44. REQs Edit section properties.

Ī		A Graphical user interfac Delete	e or GUI is the most common v ion system that has a Screen a tablets, pens/styli, touch scree ay, however some audio and o	way for users to interact with modern computer technologies. A Graphical user interface may be and one or more input devices. Information is typically transmitted to a GUI through input devices ens and microphones that transmit voice commands. Feedback from a GUI is primarily visual ther supplementary Feedback is sometimes provided.
=	^	ADD BEFORE >	Paragraph	
	~	ADD AFTER >	Numbered Bullet List	plication at a time and to follow links and to switch between applications, for example, a User
_		reading a	Unnumbered Bullet List	ick on a link that opens in a Web browser;
		Though	u usara ta asa mara than ana it	am as place of information at a time and to ace some information as Tast and other information

Figure 45. REQs Element menu.

To edit the actual text of a content element, the user simply needs to click the desired element (**Figure 46**) and the text editor for that element will appear (**Figure 47**). Note that multiple elements' text editors may be opened at the same time.

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Figure 46. REQs Selecting an element for editing.

The text editor of each element provides important features to edit the element's contents (Figure 47):

- 1. Bold function, to style the selected text bold.
- 2. Italic function, to style the selected text italic.
- 3. An improved add link function, to insert links in the selected text. This links can either be: external links to anywhere on the web; or internal links to specific entities (sections with special types assigned to them) of the current document (Figure 48). In this case, it is also possible to mark if the target entity's title text should replace the selected text when in read mode.
- 4. Clear formatting function, to clear all style format of the currently selected text.
- 5. Undo and redo functions.
- 6. A toggle HTML function, allowing an advanced user to edit the HTML of the content directly.
- 7. Word and characters counters.
- 8. The editor's text box, where the element's text can be edited or selected to use with the other functions.
- 9. Save and publish button, to save and automatically publish the changes made.
- 10. Cancel button, to discard any changes made and revert to the original state.

≡	в 1	<i>І</i> 2	° З	ø 4	C	5	6	Words: 86	Characters: 54	9	
	A <u>Graphical user interface or GUI is the most common way for users to interact with modern computer technologies.</u> A <u>Graphical user interface may be</u> provided on any <u>Information system that has a <u>Screen and one or more input devices.</u> <u>Information is typically transmitted to a <u>GUI through input</u> devices such as keyboards, mice, tablets, pens/styli, touch screens and microphones that transmit voice commands. <u>Feedback from a <u>GUI</u> is primarily</u> visual <u>through a <u>Screen or Display</u>, however some audio and other supplementary <u>Feedback</u> is <u>sometimes provided</u>.</u></u></u>										
	SAV	/E AN	9 D PUE	BLISH		10 canc	EL				
=	The	key fe	eature	s of m	ost Gr	aphica	l User i	nterfaces are:			
≡	•	=	۲ r	They al eading	llow us 3 an er	sers to nail in	run mo an ema	re than one <mark>Ap</mark> il client may cli	plication at a time ck on a link that c	and to follow links and to switch between applications, for example, a User pens in a Web browser;	

Figure 47. REQs Editing a content element.

External Link		
Target URL:		
Target Entity:		refresh
R2.4.01		×

Figure 48. REQs Add link dialog.

3.2.6. Comments and Log

After a section is selected from the navigation panel (see section 3.2.3 Document Navigation) and the user has appropriate permissions (see section 3.2.1 User Roles), the show\hide comments and log toggle button will be available in the header of the content panel (**Figure 49**). Each section of a document has comments and log associated to it. Comments are a practical tool for users to discuss a section of a document and possible changes to it. On the other hand, log entries provide an automatic registry of changes made to a section and its contents.

→ Part One - Core Services	✓ SHOW COMMENTS & LOG	🎻 HIDE LINKS	🖋 EDIT MODE	≁

Figure 49. REQs Show\hide comments and log option.

When the comments and log button is activated, a panel will appear at the top of current section's content (**Figure 50**). This panel allows the user to view, edit or add comments to a section. Log entries, like reports of adding a new paragraph to the section, are added automatically when such actions are performed. The comments and log panel has a few main features (**Figure 50**):

- 1. The list of comments and log entries.
- 2. The filter of the list, which allows selecting the type of comment\log entry the list will show.
- 3. The comment entry's context menu, with options to edit the comment, mark it private, public or hidden (Figure 51). Only the comment's owner or the DLM Reviewers have access to this menu.
- 4. The new comment text editor, with basic styling options for the comment as well as the option to submit a comment as private. Private comments are only seen by their owners and DLM Reviewers.

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→ Foreword			ENTS & LOG	M HIDE LINKS S	→ +
Comments and	Log 1 2	Show	All		•
#1 ⊗ Created: 2	013-9-9 17:34				
kc-demo State: public	Added: Paragraph New: "The object is a car"				
#2 ⊗ Created: 2	013-9-9 17:34 Last edited: 2017-1-19 13:33				
mtest State: private	Hmmm I don't know, nut s <i>omething</i> is missing			3	≡
#3 ⊗ Created: 2	014-9-9 17:34 Last edited: 2016-9-15 12:47				
achiggs State: public	Hi! I suggest a change: car to vehicle				
#4 ⊗ Created: 2	015-9-9 17:34 Last edited: 2017-1-19 13:34				
kc-demo State: public	Right! Accepted				
#5 ⊗ Created: 2	015-9-9 17:34				
kc-demo State: public	Edited: Paragraph Older: "The object is a car" New: "The object is a vehicle"				
#6 ⊗ Created: 2	016-9-9 17:34				
kc-demo State: public	Deleted: Paragraph Older: "The object is a vehicle"				
B I % Ø	C 5 Words: 0 Characters: 0				
Submit a comment					
SUBMIT	4 Mark as private (only you and the reviewers will be able to see it)				
Forewor	d				





Figure 51. REQs Log entry menu.

Comments and log entries have important areas with information (Figure 52):

- 1. A top bar with the entry ID number, its created and its last edited dates.
- 2. A header with the username of the entry's creator.
- 3. A main body area, with the contents of the log.

Entries also have distinct appearances for an easier recognition in the list. The comment entry has a pink and white background (Figure 52), while the element creation log entry has a green styling (Figure 53), the element removal red (Figure 54) and the element editing blue (Figure 55).

#4 ⊗ Created:	2015-9-9 17:34 Last ed	ited: 2017-1-19 13:34			
kc-demo 2 State: public	Right! Accepted	3			
	Figure 52. REQs	Comment entry.			
$#1 \otimes Created:$	2013-9-9 17:34				
kc-demo State: public	Added: Paragraph New: "The object is a car"				
Figure 53. REQs Element creation log entry.					
	Figure 53. REQs Eleme	ent creation log entry.			
#6 ∀ Created:	Figure 53. REQs Eleme	ent creation log entry.			
#6 ≥ Created: kc-demo State: public	Figure 53. REQs Eleme 2016-9-9 17:34 Deleted: Paragraph Older: "The object is a vehicle	ent creation log entry.			

$\#5 \otimes Created:$	2015-9-9 17:34
kc-demo State: public	Edited: Paragraph Older: "The object is a car" New: "The object is a vehicle"

Figure 55. REQs Element edit log entry.

3.2.7. PDF Viewer

Documents in the REQs database can have PDF files associated to them. In this case, it is possible to view the PDF of the document directly in the REQs interface, side-by-side with the REQs version, using the PDF viewer in the far right of the interface (**Figure 56**). The PDF viewer shows the open PDF file and a toolbar with a few tools and information (**Figure 57**):

- 1. Previous page button.
- 2. Current displayed page number / total number of pages in the PDF.
- 3. Next page button.

- 4. Zoom in tool.
- 5. Zoom out tool.
- 6. Information about the sync mode on the viewer.

The PDF viewer has a sync mode flag that indicates if the current document has syncing capabilities with the PDF viewer. Some documents in the REQs database will synchronize automatically with the PDF viewer, meaning that when the user changes sections in the navigation panel, the PDF viewer will automatically switch pages to show the current section's page. The configuration of this sync mode is not yet available, thus the number of synced documents is still limited.



Figure 56. REQs PDF viewer.





3.3. Data Store

This section describes how data is stored in both Resources Centre services: EVOC and REQs. Both services data are stored in MongoDB databases (more technology details in the **Appendix A – Technological Specifications**).

3.3.1. EVOC

The data domain model of EVOC is presented in **Figure 58**. The Vocabulary Class is central to the service data' structure as it connects the remaining Classes. A Vocabulary needs to be classified under a Space. Additionally, it can also be classified under a Group. Space have a one or more Users associated representing those who can access and edit that space and the vocabularies within.

Vocabularies have associated Nodes that define the contents of each vocabulary. A node can belong to more than one vocabulary. Vocabularies have a Vocabulary Type associated which determines the name of the nodes associated with the vocabulary and what Attributes those nodes can have. This, and the other characteristics of a node attribute can have, is given by the associated Attribute Type. Nodes also have a language associated with them.





3.3.2. REQs

The data domain model of REQs is presented in **Figure 59**. All Documents have an associated Structure. To better capture all the details inherent to a document, this structure is broken down, up to small text parts. First, there are the Sections, which can have other sections inside and contain Blocks. These blocks can be Images, Paragraphs, Bullet Lists (which are made of paragraphs) or Tables (which are made of Table Elements, or cells, that can contain other blocks). Paragraphs are also divided into Sentences and those into Text parts, which can have different formatting attributes associated with them, like being in bold or having a Link associated with them.

Also, note that a section may have a *specialType*, which indicates that section has additional meaning to the application (for instance, a functional requirement of the document). The application can then take this information and act accordingly, displaying or offering special interactions with the section. Each section also has its own Log, containing any Log Entries that have been associated with the section.

Finally, from the sections to the texts, all parts of a document's structure are called Components. The generic property of a component is the fact that it 'knows' who its children components are and the order in which they are supposed to appear. This is essential to show the components in the correct order and it allows forming a unique URI path to any component of the application (starting with a document's *uri_base* attribute).



Figure 59. REQs Data Domain Model.

4. Assessment Services

The Assessment Services (**Figure 60**) is the component of the Knowledge Centre containing the services for assessment and validation of existing systems and businesses. Currently, three services have been developed to achieve these objectives: The MoReq⁹ Schemas Validator, which implements a specific case of schema validation; the MoReq Assessment service; and the Maturity Assessment questionnaire.



Figure 60. Assessment Services Page

4.1. MoReq Export Validator Service

The MoReq Export Validator Service was developed for the purpose of assisting records management developers to validate their MoReq2010 Compliant Export Services. According to MoReq2010, an authorised user can export entities from a MoReq Compliant Records Systems (MCRS) to an XML¹⁰ data file that can be validated using the MoReq2010 XML Schema¹¹. Therefore, the MoReq Export Validator Services implements an automatic process that validates data files

⁹ MoReq2010, Modular Requirements for Records Systems, Volume 1, Core Services & Plug-in Modules, Version 1.0. More information at <u>http://moreq.info/</u>.

¹⁰ The Extensive Markup Language (XML) is a markup language which establishes a set of rules for encoding documents in a format that is both human and machine readable.

¹¹ Requirement R11.4.1 from Section 11 – Export Service in MoReq2010.

according to the MoReq2010 XML Shema¹². The mentioned schema is defined as an XSD¹³ that defines the structure of how entities in a MCRS must be exported.

The main layout of the MoReq Export Validator Service can be seen in **Figure 61**, and is described in the following list:

- 1. A set of MCRS exports examples that can either be run or downloaded for further analysis;
- 2. The validation form that allows the user to perform the validation through the controls describe below;
- 3. The 'Browse" button, which triggers a dialog box that allow users to select an XML file to be submitted for validation;
- 4. A text box where the selected XML File' name will be displayed;
- 5. The "Submit" button starts the validation of the selected XML File;
- 6. A checkbox which allows the user to select if the results of the validation are to be displayed in the same page or in a new window.

The MoReq Validator was developed under MoReq®, MoReq2® and MoReq2010® are The MoReq® specification is produced the project <u>E-ARK.</u> registered community trademarks by the <u>DLM Forum</u>
EARK) MoReg 2° MoReg 2010°
MoReq Export Validation
This services aims to validate data files according to the XML Export Schema as defined <u>here</u> .
The requirements of the Export Service define how entities must be exported by a MoReq-Compliant Records System (MCRS). These requirements are agnosti about the technical representation of the data, but meanwhile the DLM Forum also defined the MoReq2010 XML Schema, which is the reference XSD for thi service.
This service therefore accepts the upload of an XML file, analysis it according to this XSD, and provides a report.
Examples for testing are availale here 🖸 1
Select file to validate: 2
Browse ³ 4 Submit ⁵ Ø Open result in new window ⁶

Figure 61. MoReq Export Validator Service main layout

To facilitate understanding of what constitutes a MoReq2010 Compliant Export XML File the service provides a set of valid and invalid examples. Those examples can be accessed by selecting 1 in **Figure 61** resulting in the panel presented in **Figure 62**, where the user is presented with:

- 1. A short description of the example case;
- 2. The possibility of downloading the selected example to analyse it; and
- 3. The possibility of performing a validation of the selected example.

¹² The MoReq2010 XML Schema is available at <u>http://moreq.info/files/export/export.xsd</u>.

¹³ The XML Schema Definition (XSD) is used to express rules to which XML document must comply so as to be considered valid according to the schema which is being used to perform the validation.

Example Description	Download	Try it
¹ Success Example Export - Classification Service with Hierarchical Classification	2	3 ►
Success Example Export - Record with Electronic Component	*	
Error Example Export - Classification Service with Hierarchical Classification - Syntax error	*	
Error Example Export - Record with Electronic Component - Schema fields erased	*	

Figure 62. Examples panel layout

Report ¹ ⊖ Print Report ² <u>▲ Get as CSV</u>		Close Window
File Properties	4	
Imported File Name: ex_suc1.xm1		
Number of lines: 992		
Imported File Size: 68 KB		
Errors Report	5	
No errors were found in the submitted file		
Structure Analysis Report	6	
XML Header: Found		
Expert Comment: Found		
Export Commencing: Found		
2 child nodes		
Implements Services: Found		
9 child nodes		
Implements Modules: Found		
3 child nodes		
Contextual Metadata Definitions: Found		
1 child nodes		
Services: Found		
4 child nodes		
Events: Found 20 child nodes		
Expert Completed: Found		
Export Completed. Found		
7 child nodes		

Figure 63. Validation Report layout

Once the system has performed a validation on an XML file, a report is automatically generated (**Figure 63**) with the following structure:

- 1. The Print Report button allows users to get a printable version of the validation report;
- 2. The <u>det as CSV</u> button allows users to download a version of the validation report in .csv format;
- 3. The Close Window button closes the window in which the validation report is being displayed;
- 4. The File Properties section focuses on the imported file properties, specifically in its file name, number of lines and size;
- 5. The Errors Report section lists any XSD validation errors that may have occurred during validation, providing details regarding the line and column number and message of each error (see **Figure 64**). An error can be:
 - Fatal Error: if the XML contains entities that do not belong and consequently disrupt the mandatory structure required;
 - Error: if a mandatory element is missing in the XML;
 - Warning: if optional elements are missing (for example, no "<!DOCTYPE ...>" defined or references to an undefined parameter entity);
- 6. The Structure Analysis Report section displays a simple structure analysis based on the MoReq2010 Export Schema. It simply signals if a given element is present on the file that was subjected to validation.

Line Number	Column Number	Error Message
20	14	Error: cvc-complex-type.2.4.a: Invalid content was found starting with element 'Compliance'. One of '{"http://moreq.info/files/export":ExportCommencing}' is expected.
643	4	FATAL ERROR: The element type "Export" must be terminated by the matching end-tag "".

Figure 64. Example of a list of errors that occurred during XSD validation

4.2. MoReq Assessment

The MoReq Assessment tool allows system developers to test their products' compliance with the MoReq 2010 specification. The testing of the product uses the MoReq2010 test cases that consist of a set of steps that can be performed in the system to assure that the behaviour is as expected. Each test case has a pre-condition state, a set of steps and post-condition state that indicates the expected result. MoReq2010 test cases were developed along with MoReq2010 and were published by the DLM-Forum at http://www.moreq.info/testing-and-certification. The MoReq 2010 testing script has diverse Test Cases, organized in Test Modules, to which users with testing permissions (testers) can associate evidences and explanations of their product's conformity. This evidences and explanations may then be reviewed, approved or contested by expert users with reviewing permissions (Reviewers).

4.2.1. User Roles

There are two main roles a user can have in the MoReq Assessment tool, which determine what the user can do within the application:

• **Tester** – registered users, with an associated ERMS product in the app, for which they can edit the details. They can submit evidences and explanations of the product compliance with the test cases for reviewer's approval. Has access to the Dashboard and Product Profile views.

• **Reviewer** – A reviewer can see all the testers' products and can see the evidences and explanations they submitted for each test case. They may approve test case compliance or request more explanations. Has access to the Dashboard and Product Profile views.

Anonymous users or users without one of these roles will only be able to see the home view of the app. One very important reviewers' feature is the product search bar (appears in top toolbar, as seen in **Figure 65**), giving them the ability to search from all the existing products in the database using a custom query.



Figure 65. MoReq Assess reviewers' top toolbar.

4.2.2. Home and Main Layout

The tool presents a simple home screen when the users first open the tool (**Figure 66**). Here we can see the main layout of the entire application:

- 1. The top toolbar present in all the views.
- 2. The view display, where the current view is displayed.



Figure 66. MoReq Assess Home.

The top toolbar provides means of navigation between the tool's views, as well as other functions (Figure 67):

- 1. The Assess Tool logo and title.
- 2. Navigation buttons to switch between the different views (for an authorized user, see 4.2.1 User Roles).
- 3. The Knowledge Centre logo, allowing the user to quickly access the Knowledge Centre main page (**Figure 2** in Chapter 2 Knowledge Centre Service);
- 4. The logout button, next to the current user's username and role (between parentheses).
- 5. The E-ARK logo, which links to the E-ARK Project main website.



When a user is logged out, he will not have access to the Dashboard or the Product Profile from the top toolbar, but will have a user options button near the KC logo, so he can login or register (Figure 68).



Figure 68. MoReq Assess top toolbar logged out.

4.2.3. Dashboard as a Tester

The Dashboard view, for the user with Tester permissions, is where he can provide evidences and explanations to prove his product complies with the test cases. The test case status determines the stage of the evaluation of the test case for a user product. A test case status may be:

- None The initial status of a test case.
- **Approved** The evidences and explanations for that test case have been approved by a reviewer.
- **Pending review** The tester has submitted evidences and explanations for the test case and is awaiting a review.
- **Pending explanation** The reviewer has given feedback for a test case, and is waiting for further explanations from the tester.

In the Dashboard view, these concepts are always present in the main layout (Figure 69):

- 1. The test case navigation panel, where test cases are organized by modules (in red) and have different colours for different states: white for none, green for approved, blue for pending review and yellow for pending explanations.
- 2. An info message, about the selected test case's status, in its correspondent colour.
- 3. The test case details panel (collapsed here, can be seen expanded in **Figure 71**), where all the necessary information about the selected test case is displayed.
- 4. The test case log (collapsed here, can be seen expanded in **Figure 72**), displaying explanations and feedback from the users and reports of changes in the evidences.
- 5. Test case evidences (collapsed here, can be seen expanded in **Figure 73**), a table displaying all evidences associated with the selected test case.
- 6. All available evidences (collapsed here, can be seen expanded in **Figure 74**), a table displaying all the evidences the tester has uploaded.

When a test module is selected in the navigation panel, a warning message appears to alert the user (Figure 70).

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Test Cases 1	This Test Case has	s been app	proved! 2				
Module: 1. Users and Groups				2			
1.1 Initial error check	Test Case: 1.1 Initial	error cneck	(ి			
1.2 Initial compliance check	Test Case Log					✓ SHOW LOG	
1.3 Browse available service	Test Case Evidences			-			
1.4 Modify the metadata of t	Test Case Evidences			SHOW		V SHOW TEST CASE EVIDENCES	TEST CASE EVIDENCES
1.5 Browse the event history	All Available Evidences	ADD EVIDENCE	ASSOCIATE SELECTED \checkmark	DELETE SELECTED		✓ SHOW ALL AVAILABLE EVIDENCES	
1.6 Find and inspect Usr.1.1,							
1.7 Browse the entity types i							
1.8 Browse the function defi							
1.9 Modify the metadata of							
1.10 Browse the event histor							
1.11 Check that the "Functio							
1.12 Inspect own metadata							
1.13 Modify own metadata							
1.14 Modify another user's							
1.15 Create new users							
\sim Module: 2. Model Roles							



Test Cases	A Test Module is currently selected
A Module: 1. Users and Groups	
1.1 Initial error check	select a Test Case from the left navigation panel.
1.2 Initial compliance check	
1.3 Browse available service	
1.4 Modify the metadata of t	
1.5 Browse the event history	
1.6 Find and inspect Usr.1.1,	
1.7 Browse the entity types i	
1.8 Browse the function defi	
1.9 Modify the metadata of	
1.10 Browse the event histor	
1.11 Check that the "Functio	
1.12 Inspect own metadata	
1.13 Modify own metadata	
1.14 Modify another user's	
1.15 Create new users	
✓ Module: 2. Model Roles	

Figure 70. MoReq Assess Dashboard with test module selected.

The detail panel (Figure 71) displays all the pre-condition, steps and expected results a tester should follow and achieve for a test case to be approved for his product.

Test Case: 1.1 I	nitial error o	check	A HIDE DETAILS
PRE-CONDITIONS	STEPS	EXPECTED RESULTS	
 Test system is opping the system is opping the system is a system is and R2.4.16 - in other is and R2.4.16 - in other is and R2.4.16 - in other is the system is and R2.4.16 - in other is a system is a system	rational endix 1.A Test of tem uses an AP rness for API int as been configu vords, all functic as been configu ner words, all fur ervice is implem just administrati lt vice is implemen 2.1 Role entities	data) are loaded onto test system 1 then a suitable test harness has been provided terfaces) red, under R2.4.13 such that performing any fun on definitions must have their Generate Event Fla- red, under R2.4.20 such that the events generata nction definitions must have their Retain On Des- tented then the test system has been configured ve roles - in other words, the Include Inherited R- nted then the test system must deliver an equiva-	d (see the Test Framework: Overview and Instructions, inction system wide will generate an event under R2.4.15 ag (M14.4.34) set ed by all functions system wide will be retained by struction Flag (M14.4.88) set d, under R4.5.8 such that every access control list is set oles Flag (M14.4.43) for all access control lists for all alent level of functionality to that provided by the roles

Figure 71. MoReq Assess Test case details.

In the test case log (**Figure 72**), the tester may submit a new explanation for the current test case and mark it 'Ready for review' when he wishes to receive feedback from a reviewer. The log entries have various colours according to its type of message:

- White, for tester's explanations.
- Blue, for reviewer's feedback.
- Green, for association of evidences.
- Red, for disassociation of evidences.

Test Case Log	IIDE LOG
#1 ⊗ kc-demo on 2017-1-17 13:24 edited:	
User associated evidence with ID: 1	
#2 ⊗ kc-demo on 2017-1-17 13:28 explained:	
Evidence with ID 1 if proof for this Test Case. Awaiting review.	
#3 ⊗ mtest on 2017-1-17 13:30 gave feedback:	
l agree, approved.	
B I % Ø C D Words: 0 Characters: 0	
Enter a message	
SUBMIT EXPLANATION Ready for review	

Figure 72. MoReq Assess Test case log – *tester*.

The evidences list (**Figure 73**) show all the evidences currently associated to the selected test case. This list presents the IDs, filenames, file types and description of the evidences, as well has buttons to download and disassociate each evidence.

Test Case Evidences					S	
□ ↑	Filename	Туре	Description		÷	×
2	dummy2.pdf	application/pdf	A nice second evidence.		*	×
3	dummy3.pdf	application/pdf	This evidence is strong!		*	×

Figure 73. MoReq Assess Test case associated evidences.

The All Available Evidences table (**Figure 74**), displays all the evidences the user uploaded to the tool, either if they have been associated with a test case or not. Evidences associated with the test case currently selected in the navigation panel will be displayed with a green background. This panel also provides functions for evidence management:

- 1. Add evidence button, opens a dialog (Figure 75) for the user to create a new evidence.
- 2. The associate evidence options, allow the user to associate currently selected evidences with test cases.

- 3. The delete selected button, for removal of selected evidences.
- 4. Checkboxes to select evidences to be used with the previous functions.
- 5. Details about the evidences: ID, filename, file type, test cases associated with it and description.
- 6. Download buttons for the evidences' files.

When evidences are selected in the table, the 'Associate Selected' and 'Delete Selected' functions become available (Figure 76).

	vailable E		ASSOCIATE SELECTED V		∽ HIDE ALL AVAILABLE EV	IDENCES
Sel.	₪ ↑	Filename	Туре	Associations	Description 5	6 ±
	1	dummy1.pdf	application/pdf	1.1, 1.2,	A first evidence.	*
	2	dummy2.pdf	application/pdf	1.4,	A nice second evidence.	*
	3	dummy3.pdf	application/pdf	1.4,	This evidence is strong!	*
	4	dummy4.pdf	application/pdf	1.3,	Fourth	*
	5	dummy5.pdf	application/pdf	1.5,	A big evidence with number 5.	*
	6	dummy6.pdf	application/pdf	1.6, 1.7,	The sixth evidence.	*

Figure 74. MoReq Assess All available evidences.

Add New Evidence	
Evidence Description *	0
File*: Choose file No file chosen	0
SAVE	CANCEL

Figure 75. MoReq Assess Add evidence dialog.

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All A	vailable Evid		ASSOCIATE SELECTED V DELETE SELECTED	A HIDE ALL AVAILABLE EVIDENCES
Sel.	□ ↑	Filename	T With current Test Case	Description 🛓
~	1	dummy1.pdf	a With multiple Test Cases	A first evidence.
	2	dummy2.pdf	application/pdf 1.4,	A nice second evidence.
	3	dummy3.pdf	application/pdf 1.4,	This evidence is strong!
	4	dummy4.pdf	application/pdf 1.3,	Fourth 🛓



4.2.4. Dashboard as a Reviewer

The Dashboard from a reviewer's perspective is very similar to that of the tester (see section 4.2.3 Dashboard as a Tester). After a product has been selected, in the top toolbar (see section 4.2.1 User Roles) we can see that most features are similar with minor differences (**Figure 77**):

- 1. Current product and owner information.
- 2. Status of the selected test case.
- 3. Test case details, equal to tester's view (see Figure 71).
- 4. Test case log, with entries' display similar to tester's view, but allowing the reviewer to send feedback instead of explanations, as well as approving or requiring more explanations for the test case (**Figure 78**).
- 5. The evidences associated with the selected test case, similar to tester's view (see **Figure 73**), but without the function to disassociate evidences.
- 6. The test case navigation panel, equal to tester's view.

Note that when no product is selected, the reviewer's dashboard shows a warning message (Figure 79).

Test Cases	Current Prod	uct: Dream Product fro	m user <i>kc-demo</i>
 Module: 1. Users and Groups 			
1.1 Initial error check	Test Case Status: approved 2		
1.2 Initial compliance check	Test Case: 1.1 Initial error check	0	
1.3 Browse available services (or		<u> </u>	C UNON DETAILU
1.4 Modify the metadata of the u.	Test Case Log		✓ SHOW LOG
1.5 Browse the event history of t.	Test Case Evidences	F	V SHOW TEST CASE EVIDENCES
1.6 Find and inspect Usr.1.1, Usr.		0	
1.7 Browse the entity types in the			
1.8 Browse the function definitio			
1.9 Modify the metadata of a fun.			
1.10 Browse the event history of .			
1.11 Check that the "Function De			
1.12 Inspect own metadata			
1.13 Modify own metadata			
1.14 Modify another user's meta.			
1.15 Create new users 6			
A Module: 2. Model Roles			

Figure 77. MoReq Assess Dashboard overview – reviewer.

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Test Case Log
#1 ⊗ kc-demo on 2017-1-17 13:24 edited:
User associated evidence with ID: 1
#2 ⊗ kc-demo on 2017-1-17 13:28 explained:
Evidence with ID 1 if proof for this Test Case. Awaiting review.
#3 ≫ mtest on 2017-1-17 13:30 gave feedback:
l agree, approved.
B I % Ø C D Words: 0 Characters: 0 Characte
Enter a message
Desite Factoria
SUBMIT FEEDBACK O Approve

Figure 78. MoReq Assess Test case log – reviewer.

Test Cases	No Product Selected
A Module: 1. Users and Groups	
1.1 Initial error check	Please select a product from the top search bar.
1.2 Initial compliance check	
1.3 Browse available services (or	
1.4 Modify the metadata of the u	
1.5 Browse the event history of t	
1.6 Find and inspect Usr.1.1, Usr	
A THE REPORT OF A PARTY	

Figure 79. MoReq Assess No product selected.

4.2.5. Product Profile

The third view of the MoReq Assessment tool is the Product Profile (**Figure 80**). All users with tester permissions have one product associated with them and this is where they can see the information about their product. Reviewers see the information about the product they have currently selected.



Figure 80. MoReq Assess product profile.

Testers can also edit their product's information (Figure 81, only name is required) and change their logo (Figure 82).

Edit Product Inform	ation	
Name *		0
Dream Product XL		
Version		0
1.7D		
Producer		0
Dream Night Industries		
Contacts		0
info@di.xyw		
Website		Ø
dream.di.xyz		•
	SAVE	CANCEL

Figure 81. MoReq Assess Edit product information.

Change Logo		
Choose image (max size 1MB): Choose file No file chosen		
	SAVE	CANCEL

Figure 82. M0oReq Assess Change product logo.

4.3. Maturity Assessment

The maturity assessment was developed within the Knowledge Centre as a self-assessment questionnaire which consists of a set of questions that are used to determine the maturity level of information governance practice in organizations. This questionnaire assesses the maturity levels for each of the three dimensions of the maturity model detailed in D7.5 and D7.6. Each question is detailed with the following fields:

- 1. **ID:** Which identifies the number of the question in the overall questionnaire;
- 2. Title: Which depicts the main topic the question refers to;
- 3. Question: Which details the question itself;
- 4. **Objective:** Which details the objective of that question, what knowledge the question intends to capture;

- 5. **Notes:** Which either clarifies some aspects and/or terms of the question or details examples of evidence to substantiate the answer for the question;
- 6. **Terms:** Terms associated with the question that might require clarification. Terms are defined as a hyperlink to the corresponding definition in EVOC. EVOC is the vocabulary manager which makes part of the Knowledge Centre;
- 7. **Answers:** Which depicts five possible answers to the question.
- 8. Comment: A field for respondents to put comments that can be used to substantiate their answer.

The questionnaire starts by providing an introduction. This introduction provides details on the purpose of the questionnaire, how it will be analysed, and clarifies concepts being constantly used throughout the questionnaire. For each question there is a field that respondents can use to provide additional comments, clarifications or a justification to the answer. These comments can be used by the maturity model development team when reviewing the maturity model.

M	Maturity	Model Survey	(EARK Pilo	ts) 🕋 intro	QUESTIONS	pilot1 📀 🏼 🌉		
Managemer	nt: 18 / 18 🔿	Processes: 35 / 35	 Infrastr 	ucture: 13 / 13 👁	General: 9 / 9 🛇	Total: 75 / 75 Finish 원		
"A process is processes ar	a set of acti re "glued" tog	vities that are inter ether by means of	related or that such input out	t interact with on tput relationship:	e another. Processe s." In ISO 9001:2008	s use resources to transform inputs into outputs. Processes are interconnected because the output from one process becomes the input for another process. In effect, Quality management systems – Requirements.		
🛇 P2.01 - Is	there a proc	edure to negotiate	the terms of	deposit betweer	n the Producer and	the Archive?		
Purpose: The and the Archin Notes: An exa	e purpose is to ve regarding t ample of evide	identify if the Archiv ne information being ence to demonstrate	e can negotiat ingested, amo is the docume	e the terms of dep ong other example ntation of the pro	posit with Producers. es. cedure to negotiate th	Terms of deposit might include the specification of the metadata that must be included at the time of deposit, the schedule and method of deposit, the responsibilities of the Producer is terms of deposit between the Producer and the Archive.		
No: There is	s no procedure	to negotiate the term	s of deposit					
Yes, before	the E-ARK pro	ect: There is a proced	ure to negotiate	the terms of depo	sit			
Yes, after the second secon	he E-ARK proje	et: There is a procedu	e to negotiate t	he terms of deposi	t			
Comment:								
🛱 P2 02 - Is	there a proc	adure to provide a	propriate res	monses to the P	roducer at the arre	and noists during the longet process?		
Purpose: The Notes: Examp	purpose is to ples of eviden	identify if the organ ce to demonstrate th	zation provide is can be subr	s responses to the nission or deposit	e Producer at the agr agreements, process	ed points of energies process: ed points to ensure that are no faults in communication that might lead to loss of a SIP. documentation, operating procedures, or evidence of responses such as reports, memos, or emails.		
No: There is	s no procedure	to provide appropriat	e responses to t	he Producer/depos	sitor, at the agreed poir	ts, during the Ingest process		
Yes, before	the E-ARK pro	ect: There is a proced	ure to provide a	ppropriate respons	es to the Producer/dep	ositor, at the agreed points, during the Ingest process		
Ø Yes, after the second sec	he E-ARK proje	ct: There is a procedu	e to provide app	propriate responses	s to the Producer/depo	sitor, at the agreed points, during the Ingest process		
Comment:								
🛇 P2.03 - Is	there a proc	edure to generate	an AIP from a	SIP?				
Purpose: The	purpose is to	identify if the organ	zation can ger	erate and AIP fro	m a SIP. The organiza	tion must ensure that the AIP correctly represents the SIP.		
Notes: Examp	ples of eviden	ce to demonstrate th	is can be the c	outputs of the enh	ancement of the Proc	ucer SIP; documentation detailing the enhancement procedures in place; a comparison between the original producer SIP and the enhanced one, among others.		
No: There is	s no procedure	to generate an AIP fr	om a SIP.					
Yes, before	Yes, before the E-ARK project. There is a procedure to generate an AIP from a SIP.							
Yes, after the second secon	he E-ARK proje	ct: There is a procedu	e to generate a	n AIP from a SIP.				
Comment:								
Currently SIF	P and AIP are id	entical. We are in the	privileged situa	tion that we can ma	ake requirements for S	P delivering parties.		

Figure 83. On-line Self-Assessment Questionnaire

The questionnaire is available on-line at http://earkmaturitysurvey.dlmforum.eu/. The questionnaire is presented in a set of four tabs, one for each of the dimensions of the maturity model and one for general questions that are used to assess maturity levels 4 and 5 of the other dimensions. Then in each tab a short description of the dimension is presented followed by the questions, objective, notes, terms, answers and a field for comments (shown in Figure 83).

After an organization fills the questionnaire a report is issued for that organization, depicted in Figure 84. This report presents the results of the assessment through a spider chart and specifies the results for each dimension by detailing the number of questions answered and the maturity level for that dimension. It also provides a detailed breakdown of the results for each dimension which includes the number of questions answered for each maturity level, the number of questions answered with "Yes" and "No" and the unanswered questions. Organizations can then build on these results

and develop an improvement plan to cover the weak point found by this assessment with the ultimate goal of improving their information governance practice.

Maturit	y Model Survey (EA	RK Pilots) 🛛 🛣 🛛	INTRO	? QUESTIONS						pilot1 G	
Management: 18 / 18 🛇	Processes: 35 / 35 🛇	Infrastructure: 13 / 13	3 💿 🛛 G	General: 9 / 9 🛇							Total: 75 / 75
Thank you for participating in this survey!											
Results											
		Management				Sec	ction	Answered	Maturity Level		
						Mar	nagement	18 of 18	2		=
						Pro	cesses	35 of 35	1		
						Infra	astructure	13 of 13	5		
						Gen	neral	9 of 9	Applied to the others.		
	Infrastructure	9		Processes							

Breakdown

Management								
Level	No. Questions	Yes	No	Unanswered				
2	2	2	0	0				
3	12	11	1	0				
4	2	2	0	0				
5	2	2	0	0				

Figure 84. Example of Maturity Assessment Results.

5. Conclusions and Future Work

The current version of the Knowledge Centre contains the services planned to gather, contribute and assess Information Governance good practices. At the moment, the service focus on Archival Management (the focus of the project) but it is capable of being extended to other related fields. The feedback received through the last year of the project in conferences and presentations about the Knowledge Centre is quite positive. Nonetheless, there are still opportunities for improvements to be carried by the DLM Forum as the future owner of the Knowledge Centre after the end of the project. Therefore, this section describes the main changes since the first prototype of the knowledge and the potential future work.

5.1. Changes from the prototype of the Knowledge Centre service

The first prototype of the Knowledge Centre was published in January 2016 and described in deliverable 7.3. From that date until the time of writing of this deliverable the prototype was promoted through conferences, presentations at national and international events, newsletters, workshops, among others. Consequently, users of the service were able to provide feedback to the developers to ensure that the services align with their expectations. That allowed us to define new requirements and prioritize developments. The main goal in the end was to have fully functional services that can without significant effort improve through use and demand. The following improvements were made:

- In the prototype version, the REQs service was capable of structuring reference documents into specific sections
 and chapters, link specific terms to their definitions to EVOC, and define shortcuts between text or chapters.
 The main goal was to promote a simpler way to use and navigate through the reference documents present in
 the system. In the current version, users are also able to contribute to the evolution of the reference documents
 by providing feedback in the document. Users can now comment specific sections of the text and, if the
 reference document owner is registered in the Knowledge Centre, he has the capability to react to the feedback
 provided by editing the document or replying to the provided comment.
- A new service, MoReq Assessment, was developed. The service guides users through the requirements defined in MoReq2010 in order to assist records management systems providers on the process of assessing if their systems are MoReq2010 compliant. The service uses the test cases defined for MoReq2010 and allows the submission of evidences of compliance. Evidences can be of any type: simple text, video, sound, images, etc. The service is described in Chapter 4.2 MoReq Assessment.
- The maturity assessment service was updated to incorporate the changes on the E-ARK maturity model since the prototype version. Additional, the service is now capable of providing immediate feedback in the form of charts and tables to the respondents of the survey in the service.
- To allow a simple use of the Knowledge Centre and to accommodate the necessary migration of the service to the DLM-Forum, the authentication system was centralized and integrated with the one on in the DLM-Forum website (<u>http://www.dlmforum.eu/</u>). Therefore, all previous registered users in DLM-Forum can use their accounts within the KC and a simple login in one of the services provides access to all other services in the Knowledge Centre. The notable exception being the Vocabulary Manager (EVOC), which was developed in the earlier stages of the project with its own authentication database but migration to the central authentication is planned in future work.
- To allow integration and use of the content on the Knowledge Centre by other tools, services or systems, an API was developed. Proper documentation of the API is still missing but the development team of the service is available to assist any effort of integration and use.

- A new section of the Knowledge Centre was developed focused specifically on E-ARK outputs. At the moment, it only includes the E-ARK General Model. In the future, it will include other outputs and developments of the project such as the E-ARK specifications.
- Through the use of the services, several minor bugs or unexpected behaviours were discovered that were corrected through the course of development.

5.2. Existing Services Improvements

Despite the extensive effort since the prototype version until now, there are still room for improvements in the Knowledge Centre. It is expected that with the migration of the service to the DLM-Forum and the establishment of the DLM Archival Standards (Maintenance) Board (entitled DAS Board), further developments will occur after the end of the E-ARK project. Therefore, the following represents a non-exhaustive list of possible improvements:

- The capability to relate terms within EVOC to define, for example, that a specific term is a specialization, generalization, similar, or equivalent to another;
- The expansion of the MoReq Export Validator Service to incorporate other schemas such as EAD/EAC, E-ARK specifications, etc.
- The functionality of associating multiple evidences to test cases within the MoReq Assessment service; and
- The capability of comparing maturity assessment results between users of the Maturity Assessment.

Appendix A – Technological Specifications

The Knowledge Centre was developed using the JavaScript programming language¹⁴. The main technology stack, and the current versions, used across the services is (**Figure 85**):

- Node.js¹⁵ (v0.10.33) the execution environment for the server-side application.
- MongoDB¹⁶ (v2.6.10) open-source document database. Interfaced with using the Mongoose ODM¹⁷ (v4.3.4).
- Express.js¹⁸ (v4.5.1) the web application framework that runs on Node.js.
- Angular.js¹⁹ (v1.4.8) the JavaScript framework for the client-side application.



Figure 85. Base technology stack.

This technology stack follows the MVC²⁰ (Model-View-Controller) pattern. Mongoose is used to build the data model to be stored in the MongoDB (server-side), while Angular.js takes care of the views and controlling them (client-side). The bridge between the server (model) and client (view) sides is controlled by Express.js, while Node.js gives the foundations to build the application upon. The project libraries are managed using NPM²¹ (Node Package Manager), server side, and Bower²², client side, package managers.

Using Angular.js as the base framework, some important libraries were used to develop the user interface for the frontend of the Knowledge Centre services:

¹⁴ https://www.javascript.com/

¹⁵ https://nodejs.org/en/

¹⁶ https://www.mongodb.org/

¹⁷ http://mongoosejs.com/

¹⁸ http://expressjs.com/

¹⁹ https://angularjs.org/

²⁰ https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller

²¹ https://www.npmjs.com/

²² http://bower.io/

- Bootstrap²³ (v3.3.6) styling framework for responsive applications.
- Font Awesome²⁴ (v4.5.0) application icons toolkit.

Additionally, the following notable libraries were used in specific services of the Knowledge Centre.

EVOC and Maturity Assessment:

- js-xlsx²⁵ (v0.8.0) Excel spreadsheet parser and writer.
- socket.io²⁶ (v1.4.4) real time engine.

EVOC:

• node-jsonwebtoken²⁷ (v5.5.4) – JsonWebToken²⁸ implementation for node.js.

REQs:

• mongoose-schema-extend²⁹ (v0.2.0) – mongoose inheritance extension.

REQs, Maturity Assessment and MoReq Assessment:

- mongoose-deep-populate³⁰ (v2.0.3) mongoose plugin to enable deep population of nested models.
- angular-material³¹ (v0.11.2) (front-end) material design implementation for angular.

²³ http://getbootstrap.com/

²⁴ https://fortawesome.github.io/Font-Awesome/

²⁵ https://github.com/SheetJS/js-xlsx

²⁶ http://socket.io/

²⁷ https://github.com/auth0/node-jsonwebtoken

²⁸ https://jwt.io/

²⁹ https://github.com/briankircho/mongoose-schema-extend

³⁰ mongoose-deep-populate

³¹ https://material.angularjs.org/latest/