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Project no. 619347

## **EAGLE- EnhAnced Government LEarning**

Objective ICT-2013.8.2 Technology-enhanced learning;  
c) Holistic learning solutions for managing, reaching and engaging  
learners in the public administrations

Small-scale Collaborative Project (STREP)  
FP7-ICT-2013-11

[www.fp7-eagle.eu](http://www.fp7-eagle.eu)

### **Deliverable 5.4**


## **OER User Model**

WP 5 – OER Learning Platform Development  
Lead Participant: LIST

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## Glossary<sup>1</sup>

<b>CAM</b>	Contextualized Attention Metadata
<b>CEDEFOP</b>	European Centre for the Development of Vocational Training
<b>CEF or CEFR</b>	Common European Framework of Reference for Languages
<b>CEN</b>	European Committee for Standardization
<b>CV</b>	Curriculum Vitae
<b>Competence</b>	Demonstrated ability to apply knowledge, skills, and attitudes to achieving observable results
<b>ECV</b>	European CV
<b>ESP</b>	European Skills Passport
<b>IMS LIP or LIP</b>	The Learner Information Profile as defined by the IMS Global Learning Consortium
<b>InLOC</b>	Integrated Learning Outcome and Competences
<b>Knowledge</b>	A body of facts, principles, theories, and practices related to a field; the outcome of the assimilation of information through learning
<b>Skill</b>	The ability to apply knowledge and use know-how to complete tasks and solve problems
<b>LOC</b>	Learning Outcome and Competences
<b>XML</b>	Extensible Mark-up Language


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<sup>1</sup> Partially shared and overlapping with D4.1

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## 1 Introduction

The main objective of this deliverable is to provide an OER user model for EAGLE users. This will allow us to model users as they are interacting and growing with the system, capturing the basic demographic data as well as information related to their learning needs and goals. The model that will be proposed here will also allow us to define the information needed to deliver a culturally adapted and accessible solution, offering users a possibility to track their progress towards their goals using a learning diary.


This deliverable is scoped to *Task 5.5 OER User Services* and *Task 5.6 OER Community Services*. Hence, the presented OER user profile is aimed at satisfying the needs of said tasks and does not include the broader user profile as shown in Figure 1. Nevertheless, other requirements from WP5 have been respected and any parts that seemed relevant to a user model for OER have been integrated.

Therefore, the user model primarily caters how users will interact with OER and how their profile is tied to elements of OER. This leads to the following candidate pillars for the OER User Model in an initial version:

- User demographics including cultural context,
- Skills, knowledge, competences, and achievements, and
- Interaction data such as the contextualized attention metadata (CAM)

One of the main aims of the work done in the tasks related to this deliverable was to find models that could be reused, extended, or adapted to suit our needs. We did not want to create any new models as we were aware, and strongly approve, of the many efforts of standardization in the domain of e-Learning. Nevertheless, we were unable to find one technology that was able to suit all our needs, especially since EAGLE does not aim to provide a standard e-Learning platform but, rather, an open learning platform. Therefore, we used several existing models and combined them to build the EAGLE OER user model. It should be noted that the creation of those models needs continuous validation and refinement, thus, our initial model will be validated throughout the project and possibly improved as part of the development process in EAGLE.

Finally, it is important to note that the model is a preliminary proposition made based on an a priori analysis of requirements and needs. It is possible that, due to technical limitations, or research opportunities, the model may (need to) be adapted. With this in mind, the proposed model has been designed to be modular and flexible, using established standards which may sometimes seem a bit over dimensioned in regard to EAGLE.

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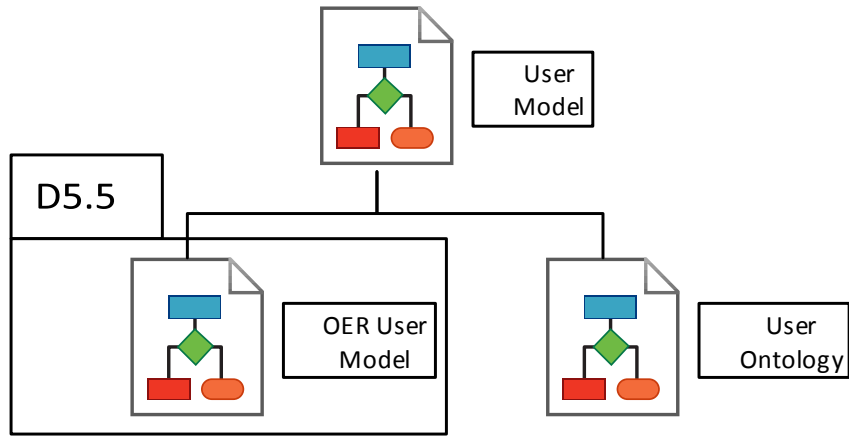



FIGURE 1: SCOPE OF D5.5 IN REGARD TO THE GLOBAL USER MODEL

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## 2 Requirements for the user model

As mentioned in Section 0, the requirements for the user model mainly stem from *Tasks 5.5 OER User Services* and *Task 5.6 OER Community Services*. The objectives of these tasks are to develop learning service support with a focus on user profiles, and community learning services. The following paragraphs will identify the requirements at high level and approach them from two angles: from a system perspective which describes the use model needed to provide EAGLE services, and from a user perspective describing models holding information the user needs to take decisions, for example whether an OER is suitable, as in, allows the user to increase his skills and work towards his goals, when interacting with the EAGLE platform. Furthermore, the last sub-section will address some limitations and specify what the OER User Model is not used for to avoid any ambiguity.

### 2.1 System perspective

One of the first prerogatives of the system is to uniquely identify a user. This identification includes any hierarchical links such as the user belonging to a specific organization, group, company, or other entity. Once a user can be identified and has been attributed a specific set of rights related to access and permissions, the system needs information about a user's skills, competences, knowledge, and achievements as well as a user's learning needs.


The latter are specified by the user themselves as defined by the elaboration on the autonomous learning paradigm used in the EAGLE platform in *D4.4 Proficiency-based Curriculum*. The desired learning outcome(s), while modelled similar to existing skills, competences, or knowledge, need to be kept separate as they model the state a user, wants or needs to achieve.

Another important requirement is that the system keep track of the user's development. What OER have they consumed, what skills gained, what activities participated in, etc. The user's activity will be needed to realise the *Learning Diary* as specified by *Task 5.5.2* as well as allow the EAGLE platform to deduce otherwise not explicitly provided information used by the EAGLE approach, such as user's skill levels, achievements, and learning needs.

### 2.2 User perspective

For users to benefit of the EAGLE platform, they need to have a way to communicate their data to the system. Hence, their most basic requirement is to input their data. This includes their demographic data and cultural context, their skills, knowledge, and competences, as well as any achievements (certificates, awards, etc) they might already have earned. This allows users to specify parts of their *Digital Identity*, as mentioned in D4.4, which in turn allows them to identify with the avatar the system creates to represent the user and uses to manage their learning needs.



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In addition to the typical demographic information, capturing cultural and contextual data allows the user to have content adapted to their needs and desires. For example, metadata about user's preferences and those attached to OER can be matched. On base of the matching processes, the search for OER or recommendations about which OER to use, how to adapt them or which tools to use for adaptation of OER can be tailored, cf. (Richter and Pawlowski 2007).

Cultural factors and related contextualization processes are elaborated in *D7.1* for the EAGLE project.

From a user perspective, it is also important to have a trace of past learning activities, the state of current learning activities, as well as current community or collaboration activities such as forum activity or reviewing processes. It allows them to correctly self-assess their current skills, knowledge, and competences and, thus, communicate them outside of the EAGLE platform by, for example, using OpenBadges <sup>2</sup>as elaborated in *D4.4*.


Beyond the importance of a user's profile is the value of browsing other user's information. Being able to discern the abilities and engagement of their peers is equally important for users as it allows them to find experts and identify communities which operate at their desired level of engagement, expertise, and/or learning outcome(s). While for privacy reasons not all of the user data will be accessible up front, the user, who has control over the accessibility level of their data, needs to be allowed access to enough information to assess other users as well as communities operating on the platform.

### 2.3 Scoping and purpose

The OER User Model is intended to serve the system and user requirements of the EAGLE platform. The model is specific to user's interaction with OER. While this includes allowing the system to set goals and adapt content to the cultural context of users, it does not include the use of these models for any fine-grained personalization or recommendations. However, while recommendations are not part of the current scope, in an effort to prepare for building onto EAGLE's deliverables, the chosen technologies might allow to support recommendations. It is, therefore, seen as favourable should we be able to use model components that fit the initial scope but will also facilitate implementing/supporting recommendations in the future.

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<sup>2</sup> <http://openbadges.org/>

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### 3 State of the Art

As mentioned in the description of work for *Task 5.5*, there are a number of standards such as e-portfolio, CEN InLOC, and Europass that were considered for their use in the OER user model. These standards sometimes operate on different levels, having different goals and scopes, and are, therefore, not usable in the same fashion. The following paragraphs will narrate on the basic of user models before elaborating on different standards and models that can be used to draft complete or parts of user models.

#### 3.1 User models

User models are representations of users through collections of data, typically demographical in nature. Depending on the system the model is instantiated for, it can be more or less granular, static or dynamic. Static user models have predefined sets of data that they cater to and do not change during runtime of the system. Dynamic models are more permissive and allow users to gain or lose certain qualities that had been modelled.

#### 3.2 Europass

Europass is, to quote from their homepage<sup>3</sup>: “[...] *an initiative which aims to help you make your skills and qualifications clearly and easily understood in Europe - whether you are enrolling in an education or training programme, looking for a job, or getting experience abroad.*” The initiative is hosted by the European Centre for the Development of Vocational Training (CEDEFOP). Europass presents standardised documents that will allow individuals to create their Curriculum Vitae (CV), European Skills Passport, and Language Passport that are accepted across Europe. In addition, the initiative offers the possibility to document mobility, certificate and diploma supplements.

All of these documents use XML as their modelling language of choice. This also allows for an intuitive integration of multiple documents. Examples can be found on the Europass website<sup>4</sup>. Looking at the basic CV example, one sees that the CV is embedded in the *Skills Passport* structure as learner information. To showcase the interoperability, looking at the same document, a simplified version of the *Common European Framework of Reference for Languages* is referenced under the *Skills/Linguistic* entry of the CV.


##### 3.2.1 European Curriculum Vitae

The European Curriculum Vitae (ECV) defines a common CV format that is designed to allow users to add “[...] *their qualifications and skills in a straightforward and understandable manner.*”<sup>5</sup> Furthermore, “[...] *other Europass documents can be attached to it.*” This allows adopters to benefit of a common framework while allowing them to attach other Europass documents such as the European Language Passport.

<sup>3</sup> <http://www.europass.ie/europass/> [accessed 20 April 2015]

<sup>4</sup> <http://interop.europass.cedefop.europa.eu/data-model/xml-resources/> [accessed 8 June 2015]

<sup>5</sup> [http://www.europass.ie/europass/euro\\_cv.html](http://www.europass.ie/europass/euro_cv.html) [accessed 8 June 2015]

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### 3.2.2 European Skills Passport

The European Skills Passport (ESP) is an XML-based portfolio to manage your skills and qualifications. Adopters can gather different documents like language accreditations and passports, certificates, attestations, and more under a common roof. The ESP can be used in conjunction with the ECV to give a more complete picture of the adopter. Furthermore, the ESP can easily integrate the European Language Passport or its underlying CEF-based qualifications.

Note that often the European Skills Passport is transparent in that users are mainly interested in the complete CV, meaning, listing their demographical data as well as their skills. Hence, mentions of the ECV often include the ESP, more so as on a technical level, the ECV is defined through use of the ESP.

### 3.2.3 European Language Passport

The European Language Passport allows, I quote<sup>6</sup>: “[...] you to describe and detail your language skills and competences. It is a self-assessment document where you can detail your language proficiency regardless of whether that proficiency was attained formally or informally. The Europass Language Passport uses the six European levels of the Common European Framework of Reference for Languages (CEF) to record the level of language proficiency in a standardised format.” As with the other Europass documents, the European Language Passport leverages XML to define a model and maximise interoperability with other systems.

### 3.2.4 Other Europass documents


The Europass portfolio includes further documents which are designed with interoperability in mind. As such, Europass Mobility is a standardised document to document a time period spent abroad for the purpose of a training or learning activity, Europass Certificate Supplement which provides additional information on vocational training certificates, and the Europass Diploma Supplement which also supplies additional information on earned diplomas. The latter two always compliment an existing certificate or diploma as these seldom hold the complete history of the competences, knowledge, and skills gained.

## 3.3 Integrated Learning Outcomes and Competences

Integrated Learning Outcome and Competences (InLOC) is an effort of the European Committee for Standardization (CEN). The specification has been developed to describe and integrate different competence schemes, models, and descriptions. InLOC is an abstract model for competence descriptions which needs to be adapted for different purposes. InLOC models two main kinds of entities<sup>7</sup>:


<sup>6</sup> [http://www.europass.ie/europass/euro\\_lan.html](http://www.europass.ie/europass/euro_lan.html) [accessed 8 June 2015]

<sup>7</sup> <http://www.cetis.org.uk/inloc/Overview%2Band%2BOrientation> [accessed 28 July 2015]

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- a concept of a learning outcome or competence (LOC), taken separately from other ones, is modelled as a *LOCdefinition*
- a structure (e.g. document) that contains several LOCs (learning outcomes and/or competences) is modelled as a *LOCstructure*.

This means that the model does not provide the descriptions of competencies or learning outcomes itself but provides a structure to describe (exchange, share, map) them. Figure 2 shows the main classes of version 18.

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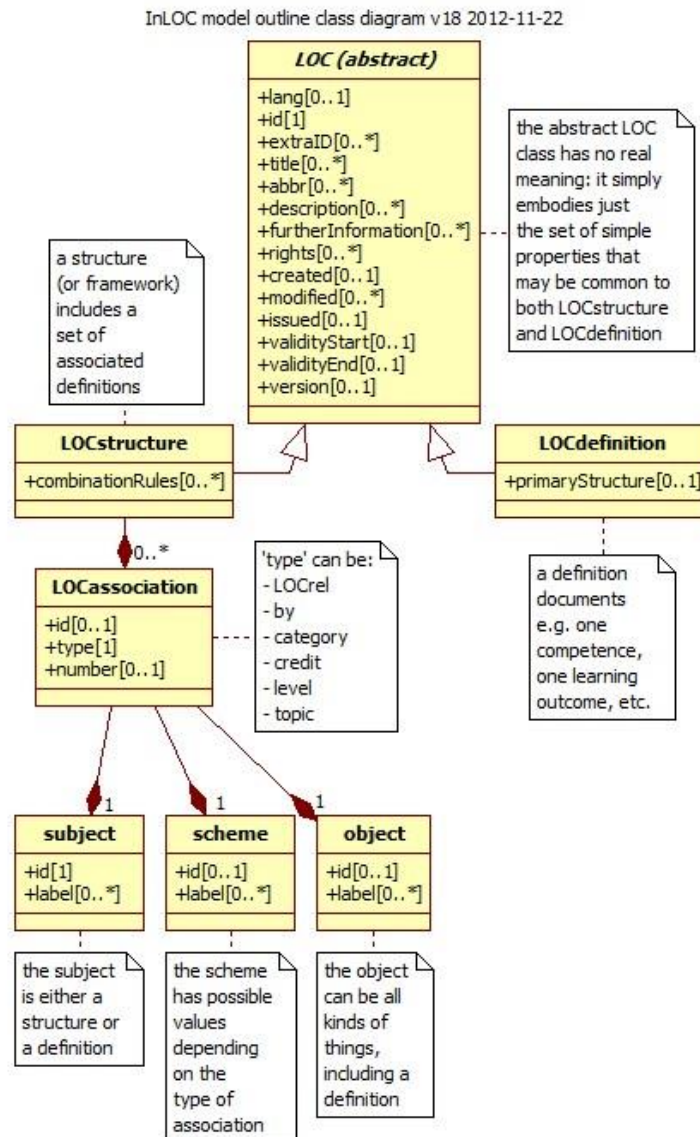



FIGURE 2: INLOC OUTLINE AS A UML CLASS DIAGRAM<sup>8</sup>

### 3.4 Contextualized Attention Metadata

Contextualized Attention Metadata (CAM) provide the opportunity to represent and utilize user behaviour and activities. It is a tool for capturing fine-grained session-specific user interactions. As such, CAM allows to describe user events and objects (tools, learning objects, etc). However, it lacks the broader context related to specific user sessions.

<sup>8</sup> Source: <http://www.cetis.org.uk/inloc/UML%2Bdiagram>

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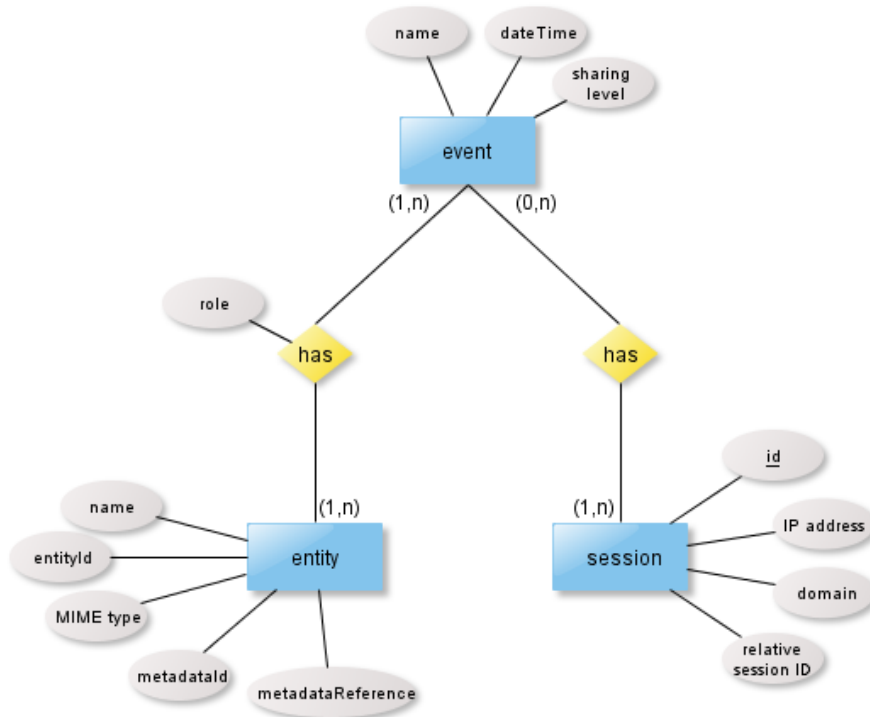


FIGURE 3: CAM SCHEMA<sup>9</sup>

In the context of EAGLE, it should be discussed how this information would be used as EAGLE does not provide tools which usually utilize this type of data (e.g. recommender systems). Therefore, this specification should be considered at a later stage when EAGLE services might be extended during the exploitation phase after end of the project. In particular, CAM is useful for recommender systems: It should be a base if EAGLE decides to implement these services, such as recommending specific tools or learning resources depending on (previous) user interactions and profiles.


### 3.5 HR Open Standards and HR-XML

The HR Open Standards Consortium<sup>10</sup> focuses on integration and business needs and primarily caters to the Human Resources community. As such, their standards and tools, most notably HR-XML, are coined towards this community. An overview of their target domains can be seen on their homepage<sup>11</sup>. While assessment is one of the target domains, the specification is rather large and focuses on domains that, while essential to HR, are of little to no use to EAGLE. These specifications, for example, extend to payrolls, recruiting, and contingency staffing.

<sup>9</sup> Source : <https://sites.google.com/site/camschema/>

<sup>10</sup> <http://www.hropenstandards.org>

<sup>11</sup> <https://hr-xml.site-ym.com/?page=DownloadLandingPage>

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### 3.6 IMS-LIP

The specification Learner Information Profile (IMS LIP) of the IMS Global Learning Consortium includes a comprehensive specification of learner characteristics, qualifications, preferences, and other categories. Figure 4 shows the main categories.

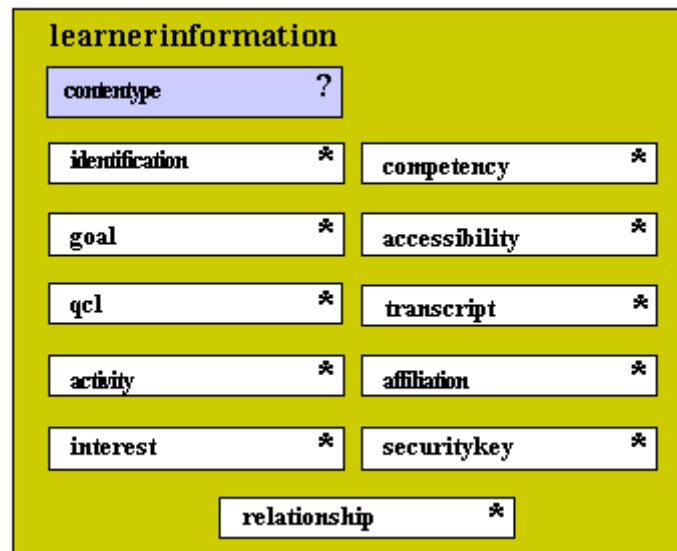


FIGURE 4: IMS LIP<sup>12</sup>

Even though the specification covers a broad range of information on learners, the specification is rarely used in practice. One of the main reasons is the complexity of the specification. Even though only parts of the specification can be used, most system developers have not used this specification. Therefore, the specification has failed to achieve its main goal: providing interoperability between different systems.


For the context of EAGLE, it might be useful to re-use some of the categories and attributes. However, the EAGLE OER user model should provide a more intuitive approach to avoid the acceptance problem in the developer and user communities.

### 3.7 e-Portfolio

An e-Portfolio is a digital notebook of personal achievements, and personal identities and therefore called “e-dendity” (Ittelson 2001) sometimes. It is a sort of book or documentation “[...] with which an individual can share information about himself or herself in order to negotiate relationships and receive services.” (Cambridge 2010).

<sup>12</sup> Source: <http://www.imsproject.org/profiles/lipinfo01.html>



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The use of an e-Portfolio is to document personal learning steps and outcomes, either for personal reflection and uses or for institutional means and monitoring of activities (Cambridge 2010).

e-Portfolios are not only based on text; multimedia can be used for the setting of goals, personal presentation as well as more formal “formative and summative assessment” (Ittelson 2001, Cambridge 2010).

Depending on the use of e-Portfolios, different types can be distinguished. Among these are (Kumar 2009):

- **Course portfolios:** tasks of student assembled *for one* course
- **Program portfolios:** shows work students have done, serves as a show-case for employees
- **Institutional portfolios:** personal development planning tools- individual records, plans, extra curricula
- **Career portfolio:** shows employment history, career objectives, educational background, verifications and licensure, skills and competencies
- **Assessment portfolios:** discover, refine and represent strengths and abilities of users; access real-time feedback from others; learn how projects and activities connect to bigger goals and achievements; reflect on what they have learned throughout an individual unit or an entire year

Depending on the type, the contents of an e-Learning portfolio diverge. Screening showcases<sup>13</sup> a short biography (CV), landing page and personal introduction, overview of the coursework / sample of work, contact information, list of competences/skills, and reference to social network sites are presented. Additionally, a specification by the IMS Global Learning Consortium has been developed, see Figure 5, which allows to describe the general portfolio in an interoperable format.

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<sup>13</sup> [http://efoliomn.avenet.net/index.asp?SEC=3C5B39EB-A498-4835-862A-5FE27C88E434&Type=B\\_BASIC](http://efoliomn.avenet.net/index.asp?SEC=3C5B39EB-A498-4835-862A-5FE27C88E434&Type=B_BASIC)



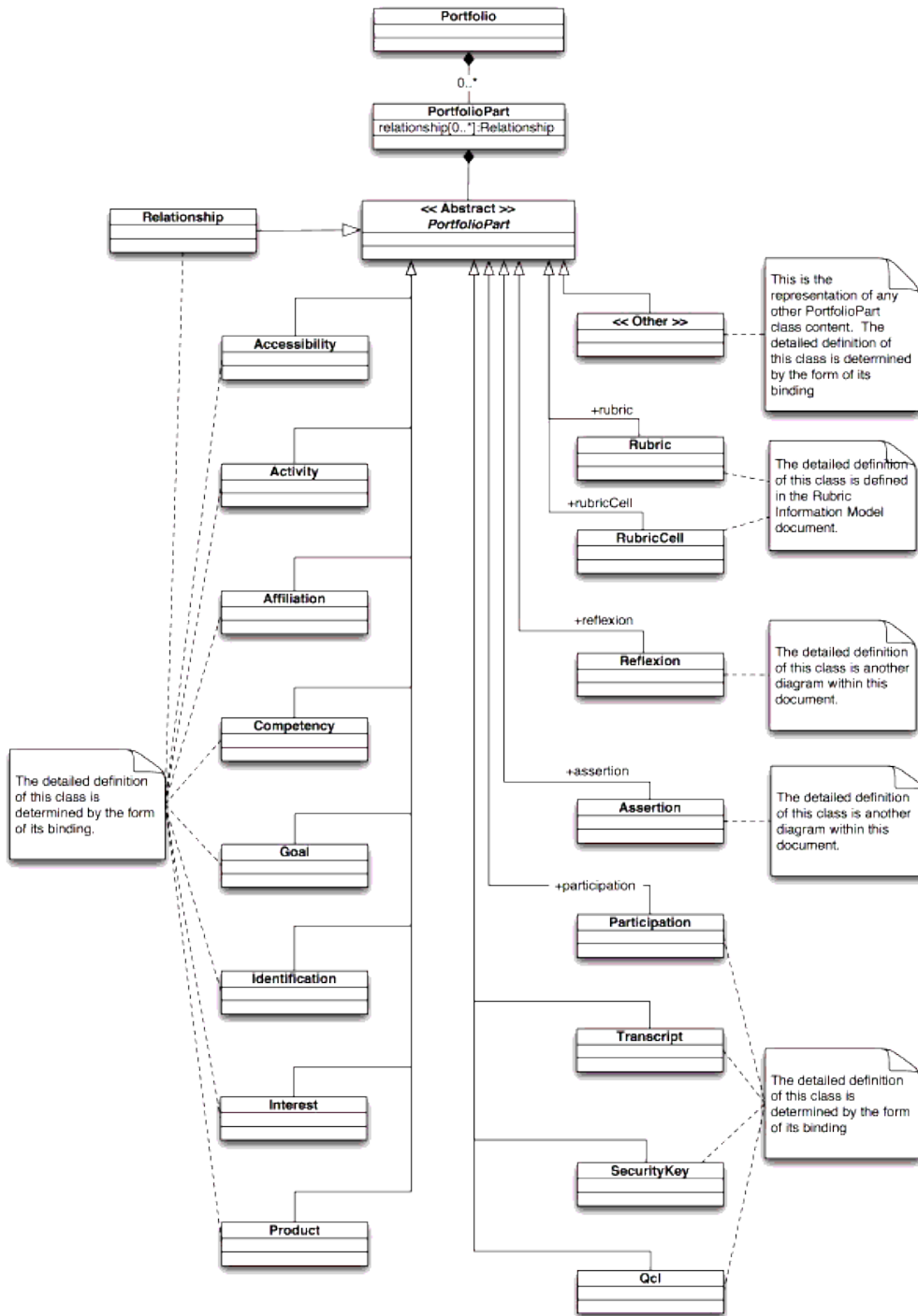



FIGURE 5: IMS E-PORTFOLIO<sup>14</sup>

<sup>14</sup> Source: [http://www.imsglobal.org/ep/epv1p0/imsep\\_infov1p0.html](http://www.imsglobal.org/ep/epv1p0/imsep_infov1p0.html)

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Therefore, e-Portfolios can describe the full history of activities, qualifications and achievements which have been realized by a learner. This can be for a life-time period but also for achievements in shorter periods such as a training course or a study program.

In EAGLE, e-portfolios can be used for different purposes:

1. Capturing user achievements and outcomes
2. Providing documentation of user achievements
3. Sharing learning experiences between learners.


In particular for the third category, learning diaries can be used. These capture experiences as a starting point for discussions and discourse between learners themselves but also with course moderators and trainers.

### 3.8 LEAP2A

LEAP2A is a specification which has been developed in the UK to provide interoperability of e-portfolios. Here, e-portfolio refers to the general idea of collecting information about personal achievements and their evidence (and not to the IMS e-portfolio specification). The key categories represented are:

- ability
- achievement
- activity
- affiliation
- meeting
- organization
- person
- plan
- publication
- resource
- selection

Thus, it is possible to represent artefacts, activities, relations and further information on a person's learning history. The specification, however, is only taken up in very few contexts (e.g. Mahara). Thus, the development of uptake should be closely observed. Once it reaches a higher uptake (outside the UK as the country of origin), a mapping of the EAGLE ontology to Leap2A would be possible.

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## 4 Chosen approach

As stated in the introduction, there are several dimensions of information to consider for the EAGLE OER user model. Most notably:

- User demographics including cultural context,
- Skills, knowledge, competences, and achievements, and
- Interaction data such as the contextualized attention metadata (CAM)

Considering the requirements and the state of the art, the most intuitive to encompass the required, desired, and necessary elements in the EAGLE OER user model while reusing as many relevant models as possible, is to integrate existing models into an encompassing EAGLE OER user model.

This approach has many benefits. Firstly, it will allow us to use already mature models that have, on many occasions, proven their worth. It will also allow us to import and export views, sub-parts, of the EAGLE OER user model of these other models that are coherent and usable in other, already established systems. An example of this would be the use of Europass to specify demographic data.

The following sections will elaborate on the overall technical realization in regard to the tree information dimensions given above. The last section will tackle learning diaries and how they will harness data from the EAGLE OER user model to be build.

### 4.1 Demographic data and cultural context


Demographic and cultural data is relevant to defining the user, not only personally in order to identify the user and attribute data from *Section 4.2*, but also to provide the user with contextualized information that suits his needs such as language.

This kind of data is captured exhaustively by the Europass, namely the European Curriculum Vitae (ECV) and the European Language Passport which is used by the ECV. Hence, we will use and integrate the ECV into the EAGLE OER user model to benefit from it.

### 4.2 Skills, knowledge, competences, and achievements

Since we already determined that we will use the ECV from Europass, it seems obvious to use Europass' other facilities, namely the European Skills Passport (ESP). The ESP includes all four data dimensions we would want to use but cannot be used on its own. The ESP draws on an existing catalogue of data elements to specify, for example, skills and achievements. While it is possible to add these in an informal manner, the EAGLE system requires that these are formalized.

Hence, we will use InLOC to specify the learning outcomes and competences from *Deliverable 4.1 – Learning Needs Specification and Construct Map Design* such that they can serve as formal definitions to be linked from, for example, the ESP.

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### 4.3 Contextualized interaction data

As mentioned before, CAM can be used in later development stages to capture fine grained interaction and behaviour data of EAGLE users. Currently, CAM is implemented in version 1.5. If – at a later stage – EAGLE implements recommendation services, this schema should be added to the user model. Additionally, web services are already defined to store and retrieve CAM data from a database (see CAM collaboration site<sup>15</sup>).

### 4.4 Learning Diaries

Learning Diaries are a tool, respectively a service, to capture learning activities and in particular use those for both self- and collaborative reflection. There are different opportunities to realize those diaries. The main goal of a Learning Diary is reflection which can be implemented in a very simple way: The technical realization and the usage of a learning diary is rather straight forward. There are clear objectives for this service. Several assumptions and options can be stated:


- Main objectives: The main objective is to provide a tool for learners to 1) reflect on their learning process, 2) discuss and share their progress and achievements.
- Usability and Ease of Use: it should be avoided to manually upload qualifications, transcripts or competence descriptions. These need to be generated through the system.
- Complexity: The system for learning diaries should not be complex and already familiar to the users. Thus, simple options should be chosen

As a good practice, many portals use simple blogs for the above mentioned purposes (for example efolio project<sup>16</sup>). These are straight-forward to be used. In addition to a simple blog, a structure should be pre-defined allowing including specific information taken from existing metadata. This could include thematic focuses, competences, qualifications and experiences. If at a later stage, the learning history and evidence of a user is active, a user could choose actions and outcomes of the learning history / e-portfolio to a learning diary entry.

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<sup>15</sup> <https://sites.google.com/site/camschema>

<sup>16</sup> <http://efoliomn.avenet.net>

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## 5 EAGLE OER User Model

The EAGLE OER user model is a conceptual model that allows to structure and express information required and used by the EAGLE platform. The data is expressed using many known models and standards in an effort to reuse and combine rather than to add another model into the mix.

The following sections will give a visual representation of the EAGLE OER user model and a rough overview before diving into the core concepts of the model and providing explanations as to what each part is used for, what it builds on, and what requirement it satisfies or issue it addresses. Finally, this section will conclude with a narration on known issues of this preliminary model.

### 5.1 Global View

The EAGLE OER user model is composed of different parts which are grouped under a common header. The root component is the EAGLE OER user model itself. The model, as shown in Figure 6, contains two sub-components: the European Skills Passport as defined by Europass, and – for future developments – the EAGLE CAM model which is an instance of the general CAM model.

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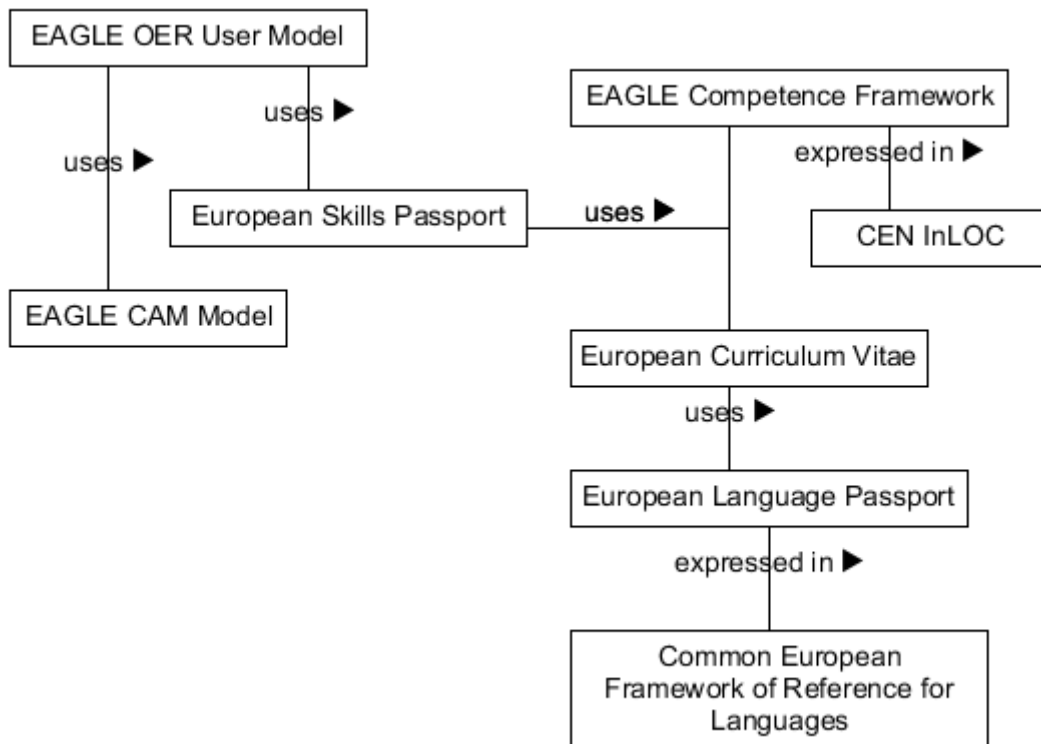


FIGURE 6 : PRELIMINARY EAGLE OER USER MODEL – OVERVIEW


The European Skills Passport will in turn rely upon the EAGLE Competence Framework, expressed using CEN’s InLOC notation, and the ECV as given by Europass. The ECV makes use of the European Language Passport expressed using CEF.

Using this model, one can define new learning outcomes and competences by adding them to the EAGLE Competence Framework and referring to this new version from the ESP. This allows the system to grow and adapt to new needs without breaking the model. Similarly, the EAGLE CAM Model can be extended to capture new metadata if needed. Meanwhile, the ECV should be broad enough to cope with most current needs. However, should a new version be released, updating to this version will be transparent to users and require little effort on the system side if done correctly.

## 5.2 European Skills Passport

The main purpose of the European Skills Passport (ESP) is to document user’s demographic data, including their skills, knowledge, competences, and achievements. The pure demographic data along with its cultural context will allow the system to customize the user’s experience with EAGLE and allow the system to accurately track, document, and disseminate a user’s progress, that is, it will allow us to formulate a coherent Learner Diary.

To fulfil this purpose, the ESP relies on two other models, notably the EAGLE Competence Framework, and the European Curriculum Vitae (ECV).

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### 5.2.1 EAGLE Competence Framework

The EAGLE Competence Framework is based on the work of *WP4 Task 4.1*, specifically on the competences identified in *Deliverable 4.1*. The first implementation of the EAGLE Competence Framework uses CEN's InLOC as a meta-model. This allows for a coherent design and, possibly, for reuse of the identified competences in other settings and projects. It also allows for a formal definition of the competences which facilitates many tasks such as linking to these competences through the EAGLE system using a multitude of different technologies.

```
<LOCdefinition id="http://eagle-learning.eu/inloc/ict/collaborate">
  <title>Collaborating through digital channels</title>
  <description>To use technologies and media for team work,
    collaborative processes and co-construction and co-creation of
    resources, knowledge, and content.</description>
</LOCdefinition>
<LOCassociation type="http://purl.org/net/inloc/LOCrel">
  <subject id="http://eagle-learning.eu/inloc/ict" />
  <scheme id="http://purl.org/net/inloc/hasLOCpart" />
  <object id="http://eagle-learning.eu/inloc/ict/collaborate" />
</LOCassociation>
```


FIGURE 7 : EXAMPLE DEFINING AN ICT RELATED COMPETENCE.

An example of a competence defined using the EAGLE Competence Framework can be seen in Figure 7, which provides the title and description of a collaboration competence in the ICT domain (as given by the *LOCassociation* node). The framework is designed to cater to the three domains identified in *D4.1*, Information Literacy (IL), ICT literacy (ICT), and Change Management (CM). For each of those domains, the framework will give skills and competences in a format that they formalize the definitions of *D4.1*, making them accessible and referable by the EAGLE platform and any associated tools.

The final version of the EAGLE Competence Framework will be provided with the final milestone of the project as well as proposed as addendum to *D4.1*.

### 5.2.2 European Curriculum Vitae

The ECV is used in the EAGLE platform to provide information about the user in relation to his interaction with OER, that is, focussed on his background, competences, achievements, etc. Note that the XML Schema used to verify the ECV is a slightly modified version which extends the original XSD in a few major points. See (CEN Workshop on Learning Technologies 2013) for examples and explanations regarding the modifications. Firstly it allows for multiple skills to be listed under skill elements that previously did not allow doing so. This is necessary to be able to clearly reference multiple skills. Furthermore, the extended XSD allows for the use of references in those skills as well, enabling us to reference elements from the ECV's skill element clearly to their counterpart in the EAGLE Competence Framework. **Fehler! Verweisquelle konnte nicht gefunden werden.** shows an example of how (the extended) ECV uses CEF to specify language proficiencies.

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```

<ForeignLanguage>
  <Description>
    <Code>en</Code>
    <Label>English</Label>
  </Description>
  <ProficiencyLevel>
    <Listening resourceRef="
http://purl.org/net/inloc/cefr/cefr-understanding-listening-A1" number="10">A1</Listening>
    <Reading resourceRef="
http://purl.org/net/inloc/cefr/cefr-understanding-reading-B1" number="30">B1</Reading>
    <SpokenInteraction resourceRef="
http://purl.org/net/inloc/cefr/cefr-speaking-interaction-C1" number="50">C1</SpokenInteraction>
    <SpokenProduction resourceRef="
http://purl.org/net/inloc/cefr/cefr-speaking-production-C2" number="60">C2</SpokenProduction>
    <Writing resourceRef="
http://purl.org/net/inloc/cefr/cefr-writing-B2"
    number="40">B2</Writing>
  </ProficiencyLevel>
  <VerifiedBy>
    <Certificate>
      <Title>Cambridge Proficiency</Title>
    </Certificate>
  </VerifiedBy>
</ForeignLanguage>

```


FIGURE 8: MODIFIED ECV USAGE OF CEF TO SPECIFY LANGUAGE SKILLS AND PROFICIENCY

#### LEVELS

Due to the use of ECV, importing and exporting documents that are compatible with ECV is technically supported with a few minor tweaks to cater to the extensions regarding the use of InLOC. While it currently is outside of the scope of the platform to support importing and exporting of said documents, using existing standards will make it easier to support these features in the future.

Figure 8 shows how learning outcomes and competences defined in the EAGLE Competence Framework are referenced by the modified ECV's *LearnerInto/Skills/Computer* node. Note that the representation of level in the EAGLE Competence Framework using the InLOC notation is still under evaluation and not final as of yet. The model will be updated accordingly if necessary but no major modifications should be needed.



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```

<Computer>
  <Skill resourceRef="
http://eagle-learning.eu/inloc/ict/interact">
    <Description>Interacting through technologies</Description>
    <ProficiencyLevel resourceRef="
http://eagle-learning.eu/inloc/ict/interact/level/medium"
      number="2">
      <!-- The representation of the level might not be
        final. -->
    </ProficiencyLevel>
    <Documentation>
      <ReferenceTo idref="CAT_11"/>
      <ReferenceTo idref="CAT_31"/>
    </Documentation>
  </Skill>
  <!-- Selecting a competence with a certain skill level should
    automatiacally add all related knowledge and skills. -->
</Computer>

```


FIGURE 9: MODIFIED ECV LEARNERINFO NODE RELATING TO COMPUTER SKILLS USING THE EAGLE COMPETENCE FRAMEWORK TO REFERENCE RESOURCES FROM D4.1.

### 5.3 EAGLE CAM Model

As the current version of the EAGLE tools will focus on competences, skills, and knowledge, the next step within the development process should be the contextualization and recommendation of learning resources to the users. For this purpose, it is necessary to understand the preferences and characteristics of the user (represented in the models above) as well as the actual behaviour of the user (which resources and tools have been used). CAM provides the opportunity to capture this. Due to the development status, it is recommended to include a node for the CAM scheme to the user profile. However, as the services developed in EAGLE doesn't aim to implement recommendation services, this part of the user model will only be used after the project and thus serve as a placeholder for developments which can be expected in the future.

### 5.4 Issues

As of now, the proposed conceptual model is a first proposition. Its value must be determined during the implementation phase. Many of the model's components are, according to the EAGLE ontology, readily available in the system. Other components such as the EAGLE Competence Framework must be translated from *D4.1* and integrated into the platform such that OER automatically target at least one of the elements from the framework.

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Furthermore, at this point, the user learning diary is in its conception phase. As such, many of the elements might be used by the learning diary and be redundant should the diary be using a separate model. These conceptual issues need to be addressed in the final version of the EAGLE OER user model that is to be delivered with the final milestone.

## 5.5 Recommendations

During the initial investigations and the definition of the InLOC model for EAGLE specific LOCs, we have encountered several limitations that are imposed by the current state of the art. However, we have also come across some promising attempts to address these limitations, for example the modified XSD<sup>17</sup> for Europass as proposed by CEN (CEN Workshop on Learning Technologies 2013). In the context of EAGLE we have come to the realisation that the proposed modifications will allow us to use Europass more easily and would like to encourage CEDEFOP to formally investigate the modifications and adopt them if possible. As such, the EAGLE Consortium will formalize their request to CEDEFOP and discuss it during their plenary in October.

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<sup>17</sup> [http://mvancoillie.free.fr/europass/EuropassSchema\\_V3.0-InLOC-AP2.xsd](http://mvancoillie.free.fr/europass/EuropassSchema_V3.0-InLOC-AP2.xsd) [accessed 2 March 2015]


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## 6 Conclusion

The aim of this deliverable was to present a preliminary OER user model that is able to accommodate existing technologies and standards in order to support OER users in specifying their platform-related data as well as offer them desired services.

The proposed model integrates standards such as InLOC as developed by CEN, Europass' European Curriculum Vitae, and CEF which enables the OER user model to build upon established and tested premises. Furthermore, it allows the system to offer a range of services that have become de facto standard like CV, experience, or skill management in a way that users are most likely familiar with. While not covered by the scope of the project, using the abovementioned technologies, with only minimal adaptations, allows for a straight-forward integration of import and export facilities in the future.

The OER user model as it is now will be put to scrutiny during the developments leading up to milestones 6 (*MS6*) and seven (*MS7*) and improved for its final release in *M27* during *MS7*.

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