



Widening Access to Virtual Educational Scenarios

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D1.2 End-User Specification

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1 INTRODUCTION

This End-User Specification reflects on requirements collected through various types and stages of need analysis. The resulting specification will feed the technical development phase (WP2) as well as the knowledge development phase (WP3) to ensure there is a complete tool kit to share knowledge widely, and will be used as a reference against which to measure quality in WP4.

1.1 Scope of the document

This document describes the way of collecting the user requirements and their format. The collected requirements are summarized here, classified into different categories and weighted according to their importance and relevance to the project objectives. Any UML (Unified Modeling Language) diagrams, API (Application Programming Interface) documentation or wireframes are beyond the scope of this document.

1.2 Applicable concerns: SW development approach

User stories are preferred way to express end-user requirements in case of the agile development techniques and might be also useful in classical approach to SW development. In the latter case they are usually used also as acceptance tests – if “conditions of satisfaction” are expressed in the requirements clearly.

1.3 Applicable concerns: Data protection in EU

Citing from <http://ec.europa.eu/justice/data-protection/>:

In January 2012, the European Commission proposed a comprehensive reform of data protection rules in the EU. On 4 May 2016, the official texts of the Regulation and the Directive have been published in the EU Official Journal in all the official languages. While the Regulation will enter into force on 24 May 2016, it shall apply from 25 May 2018. The Directive enters into force on 5 May 2016 and EU Member States have to transpose it into their national law by 6 May 2018. The objective of this new set of rules is to give citizens back control over of their personal data, and to simplify the regulatory environment for business. The data protection reform is a key enabler of the Digital Single Market which the Commission has prioritised. The reform will allow European citizens and businesses to fully benefit from the digital economy.

2 ON-LINE SURVEY

A 44-item online survey was developed by the project partners and distributed via email, social media, and websites in April 2016. In total, 161 participants from 21 different countries responded to the questions. There were participants from all main target groups of the project - learners, educators, and technologists. The results from the survey are summarized in the appendix of D1.2 (Technical specification for VS player improvements and integration with learning platforms).

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The biggest limitation of the gathered dataset for the purpose of developing the end-user specifications lies in the fact that 32.3% of the responders reported no experience with using any scenario software. Anyway, there were several key-messages identified in the obtained data and these are summarized in the Table 1.

TABLE 1: KEY-MESSAGES FOR END-USER SPECIFICATIONS - IDENTIFIED IN THE DATASET GATHERED DURING THE ON-LINE SURVEY.

KM1	The majority of responders feel that there is not sufficient content available online for learning through scenarios (58.3%), whereas only minority feels the opposite (15.2%).
KM2	Relevance, usability, reputation of the course provider and interactivity are the five most important features of on-line learning activities.
KM3	PC/Mac/Laptop is the most required device to access online learning (94.8%). More than half of responders prefer also smartphones or tablets. Educators and content developers report the need for mobile devices more frequently (61%) than learners (51%).
KM4	Integration with existing systems (e.g. LMS) is a problem that should be addressed. Learners reported the lack of integration as one of the drawbacks of the existing scenario software. Educators as well as technologists pointed out the integration as the most important feature of an online learning platform to be implemented/developed.

3 USER STORIES

User stories were picked from the dataset coming from need analysis. A crucial attention was paid to the answers to the open questions in the on-line survey and to the answers obtained during focus groups.

The stories were rewritten into business language (not technical) in this specific format:

“As a _____, I _____, so that _____.”

(E.g.: As a learner, I want to join a scenario by entering my credentials which I am using at my home institution, so that I can be authenticated without need to create/remember a new account.)

There were 78 user stories extracted from the dataset and classified into 6 different categories, see Table 2.

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TABLE 2: NUMBERS OF USER STORIES IN DIFFERENT CATEGORIES.

User's role	Scope	Category	Number
Learner	SBL	SBL-LEARNER	19
Educator	SBL	SBL-EDUCATOR	24
Technologist	SBL	SBL-TECHNOLOGIST	12
Learner	MOOCs	MOOCs-LEARNER	12
Educator	MOOCs	MOOCs-EDUCATOR	8
Technologist	MOOCs	MOOCs-TECHNOLOGIST	3

SBL – Scenario Based Learning. MOOCs – Massive Online Open Courses.

3.1 Agile sorting

During the WAVES kick-off meeting (9th June 2016), the group of 15 experts in the field of technology-enhanced learning and medical education was subdivided into three working subgroups. Each subgroup assigned one importance/relevance-label to each user story. There were three importance/relevance-labels to assign: (i) top priority, (ii) nice to have, (iii) not required. During this activity, it was decided to concentrate mainly on the SBL-LEARNER and SBL-EDUCATOR categories. The user stories in the categories MOOCs-LEARNER and MOOCs-EDUCATOR were processed by one subgroup only. See Figure 1 for the pictures taken during the agile sorting activity.

3.2 Scoring

In order to recognize the most important user stories, the number of hits was counted for each story from each subgroup and these numbers were then used to compute the importance/relevance score – as a weighted average. The tables 3-6 show the most important user stories in each category. All stories with their hit numbers and the final scores are in the Appendix of this document.



Figure 1: Agile card sorting activity.

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TABLE 3: THE 10 MOST IMPORTANT USER STORIES IN THE SBL-LEARNER CATEGORY.

Story ^[SBL-LEARNER]	Score
As a learner, I would like scenario based learning to be based upon realistic cases, in order to learn effectively	6
As a learner I want scenario based learning to be as realistic and authentic as possible, so that learners feel engaged	6
As a learner I would like scenario based learning to allow me to experience the consequences of my decisions rather than simply asking me questions, so that I can learn in a safe environment what I will need to apply in my workplace	6
As a learner I want SBL to be realistic and engaging, so that it better prepares me for real life situations	6
As a learner I want SBL to be free from technical barriers, so that I can focus on learning	6
As a learner I want to be able to apply my learning through SBL to my real-life clinical practice, so that the learning has real value to me.	6
As a learner when using SBL I want the decisions I make to matter, so that I can better remember the outcomes.	6
As a learner, I need to see and reflect upon the consequences of my actions, so that I can assess the learning through simulated scenarios as useful	6
As a learner I want SBL to be closely linked with my intended learning outcomes, so that it best prepares me for my assessments	5
As a learner I want scenario based learning to be placed in context including theories and concepts, so that I can thoroughly understand the subject	4
As a learner, I would like to work with other real people in the SBL system, so that I can be involved in simulation of real life discussions	4

TABLE 4: THE 13 MOST IMPORTANT USER STORIES IN THE SBL-EDUCATOR CATEGORY.

Story ^[SBL-EDUCATOR]	Score
As an educator I would like scenario based learning to be integrated with other existing systems, so that I can build complex eLearning environment	6
As an educator I want virtual Scenario Based Learning to be realistic/authentic, so that it reflects the reality the learner will experience in their workplace and so make the learning more engaging and relevant	6
As an educator, I think it not easy to create SBL/VP modules, so I would like to have better support and guidance, so that content can be created more efficiently	6
As an educator, I want the SBL platform to be integrated with the institutional LMS, so that resource fragmentation is prevented	6
As an educator, I intend my developed online content to be accessed on all kinds of devices, so that my learners are able to do instant and self-paced learning	6
As an educator, I prefer to develop decisions, options and apply consequences for them, so that my scenarios can be relevant to real life.	6
As an educator, I need to be guided on how to design SBL, so that I can create my scenarios in a reasonable time and achieve high quality including good -wrong paths- which are usually the hardest thing to develop.	6

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As an educator I would like a method for monitoring learner's progress at a scenario level, so that I can approach my learners individually and provide a kind of personalized learning	5
As an educator I would like to see scenarios designed for different devices dependent upon the activity and the opportunity to learn, so that my learners can take best use of created content	5
As an educator, I would like to see what my students are doing without destroying their safe learning environment, so that my students feel free making errors and I still get a brief overview about the usage	5
As an educator I want to be able to provide instant feedback to my learners through SBL, so that they can immediately understand the consequences of the decisions that they have made	5
As an educator I want to have tools that are simple to use and well-documented, so that I can fully understand how the tools can be used educationally	5
As an educator I want to be able to easily preview my scenario on the fly while creating it, so that I can more quickly and easily understand how my scenario might be interpreted by learners	5

TABLE 5: THE 9 MOST IMPORTANT STORIES IN THE MOOCs-LEARNER CATEGORY.

Story ^[MOOCs-LEARNER]	Score
As a learner I want to be able to complete the MOOC in my own time outside any set dates for the program, so that I can work through a MOOC in my given schedule	2
As a learner I want the MOOC to include content that is relevant to me, so that the value of the resource is clear	2
As a learner I would like a MOOC to be accredited by a relevant recognized authority, so that I can be assured of the quality of the training and qualification I have received	1
As a learner I want the MOOC to include a means of communication between participants so that they untangle complex subjects	1
As a learner I want to be able to dip into elements of a MOOC without having to complete the entire course, so that I can skip irrelevant content and learn the chapters I am interested in	1
As a learner I want the MOOC to present the learning in different forms, so that my learning needs are better addressed	1
As a learner I would like to have alternatives to the often video centered modules, so that repeating parts of previous is more effective than just to review and search in the previous movies	1
As a learner I want MOOCs to provide bite-size information, so that it is easier to maintain momentum and finish the MOOC	1
As a learner, I prefer to access the MOOC on all kinds of devices, so that I am able to do instant and self-paced learning	1

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TABLE 6: THE 5 MOST IMPORTANT STORIES IN THE MOOCs-EDUCATOR CATEGORY.

Story [MOOCs-EDUCATOR]	Score
As an educator I would like to see a range of different tools used in a MOOC (text, video, images, etc.)	2
As an educator I would like to be able to provide a good balance between text and media content so that the course is suitable for all learning styles	2
As an educator, I want the MOOC to be integrated with the institutional LMS, so that resource fragmentation is prevented	2
As an educator, I intend my developed online content to be accessed on all kinds of devices, so that my learners are able to do instant and self-paced learning	2
As an educator, I prefer to have more options in restricting the access to my developed online content, so that it can be freely available as well as limited to authenticated users only – dependent upon specific requirements of the learning activity.	2

4 CONCLUSIONS

The end-user specification is presented here in form of user stories – ordered by score which represents the importance of the requirement and its relevance to the objectives of the project. There are many user stories touching on pedagogical issues, teaching/learning content and content authoring. These have been rephrased into two concluding end-user requirements:

- As a learner I want scenario based learning to be delivered through realistic means and media with impactful consequences so that it is engaging and useful for real life situations.
- As an educator I want an easy to use and powerful SBL authoring toolkit that can integrate realistic authentic means of interaction for impactful SBL educational episodes.

Although the presented specification is focused mainly on pedagogy aspects, some purely technical requirements are expressed loudly as well – these should be considered as important during the development of technical specification:

- As a learner I want SBL to be free from technical barriers, so that I can focus on learning.
- As an educator I would like scenario based learning to be integrated with other existing systems, so that I can build complex eLearning environment.
- As an educator, I want the SBL platform to be integrated with the institutional LMS, so that resource fragmentation is prevented.
- As an educator, I intend my developed online content to be accessed on all kinds of devices, so that my learners are able to do instant and self-paced learning.

4.1 Future work

The user stories with the highest scores will: (i) shape the directions of the developments in the technical work package and tasks (WP2); (ii) be used as a basis for quality control (WP4) – acceptance tests may be derived from them, as there is the satisfaction component expressed clearly.

5 APPENDIX

The whole collection of user stories with their hit numbers of the importance/relevance labels, and with the final importance/relevance score computed.



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D1.2 End-User Specification: Appendix

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STORY					
SBL - Learner	TOP PRIORITY	NICE TO HAVE	NOT REQUIRED	HITS	SCORE
As a learner, I would like scenario based learning to be based upon realistic cases, in order to learn effectively	3			3	6
As a learner I want scenario based learning to be as realistic and authentic as possible, so that learners feel engaged	3			3	6
As a learner I would like scenario based learning to allow me to experience the consequences of my decisions rather than simply asking me questions, so that I can learn in a safe environment what I will need to apply in my workplace	3			3	6
As a learner I want SBL to be realistic and engaging, so that it better prepares me for real life situations	3			3	6
As a learner I want SBL to be free from technical barriers, so that I can focus on learning	3			3	6
As a learner I want to be able to apply my learning through SBL to my real-life clinical practice, so that the learning has real value to me.	3			3	6
As a learner when using SBL I want the decisions I make to matter, so that I can better remember the outcomes.	3			3	6
As a learner, I need to see and reflect upon the consequences of my actions, so that I can assess the learning through simulated scenarios as useful	3			3	6
As a learner I want SBL to be closely linked with my intended learning outcomes, so that it best prepares me for my assessments	2	1		3	5
As a learner I want scenario based learning to be placed in context including theories and concepts, so that I can thoroughly understand the subject	1	2		3	4
As a learner, I would like to work with other real people in the SBL system, so that I can be involved in simulation of real life discussions	1	2		3	4
As a learner I want to know that SBL has been reviewed by lecturers and clinicians, so that I can be sure that the content is reliable and accurate	2		1	3	3,9
As a learner I would like scenario based learning delivered face to face as well as online, so that it can meet different learning styles	1	1	1	3	2,9
As a learner, I would like media to be used carefully and only where useful, so that download time for decorating media can be minimized	1	1	1	3	2,9
As a learner I would like to see gaming in scenario based learning, so that it engages me		2	1	3	1,9
As a learner, I would like to have alternatives to video, so that as a learner type who doesn't like videos I am addressed as well and non indexed videos are also not easy to search content for		2	1	3	1,9
As a learner I want SBL to be supported by lots of high quality media resources, so that it better suits my preferred learning style		2	1	3	1,9
As a learner I want SBL to be more extensively used in postgraduate/clinical education, so that I can learn those skills using scenarios		2	1	3	1,9
As a learner, I prefer to have the content in the form of animated sequences and infographics, so that I feel engaged into the learning process		2	1	3	1,9
As a learner I want scenario based learning to include 3D, so that I feel like I am experiencing the real life situation		1	2	3	0,8
As a learner I want scenario based learning to include virtual reality, so that I feel like I am experiencing the real life situation		1	2	3	0,8
As a learner I want high quality imagery included especially where learning results from a reading of the image, so that I can extract the relevant learning from the image		1	2	3	0,8

As a learner, I would like to have control what data can be seen by my educators, so that i have control about my data and keep a private learning environment		1	2	3	0,8
SBL - Educator					
As an educator I would like scenario based learning to be integrated with other existing systems, so that I can build complex eLearning environment	3			3	6
As an educator I want virtual Scenario Based Learning to be realistic/authentic, so that it reflects the reality the learner will experience in their workplace and so make the learning more engaging and relevant	3			3	6
As an educator, I think it not easy to create SBL/VP modules, so I would like to have better support and guidance, so that content can be created more efficiently	3			3	6
As an educator, I want the SBL platform to be integrated with the institutional LMS, so that resource fragmentation is prevented	3			3	6
As an educator, I intend my developed online content to be accessed on all kinds of devices, so that my learners are able to do instant and self-paced learning	3			3	6
As an educator, I prefer to develop decisions, options and apply consequences for them, so that my scenarios can be relevant to real life.	3			3	6
As an educator, I need to be guided on how to design SBL, so that I can create my scenarios in a reasonable time and achieve high quality including good - wrong paths- which are usually the hardest thing to develop.	3			3	6
As an educator I would like a method for monitoring learner's progress at a scenario level, so that I can approach my learners individually and provide a kind of personalized learning	2	1		3	5
As an educator I would like to see scenarios designed for different devices dependent upon the activity and the opportunity to learn, so that my learners can take best use of created content	2	1		3	5
As an educator, I would like to see what my students are doing without destroying their safe learning environment, so that my students feel free making errors and I still get a brief overview about the usage	2	1		3	5
As an educator I want to be able to provide instant feedback to my learners through SBL, so that they can immediately understand the consequences of the decisions that they have made	2	1		3	5
As an educator I want to have tools that are simple to use and well-documented, so that I can fully understand how the tools can be used educationally	2	1		3	5
As an educator I want to be able to easily preview my scenario on the fly while creating it, so that I can more quickly and easily understand how my scenario might be interpreted by learners	2	1		3	5
As an educator I would like a flexible system for designing a full scenario that connects activities, so that my scenarios can be relevant to real life	1	2		3	4
As an educator I would like to see more flexibility in the type of feedback available – e.g. for answers which are not 100% best, so that my learners can be more engaged into the content	1	2		3	4
As an educator I want to be able to provide structured questions that feed back into the scenario, so that the questions are not seen to be unnecessary additions	1	2		3	4
As an educator I would like an easier way to connect OpenLabyrinth with other systems, so that resource fragmentation is prevented	2		1	3	3,9
As an educator I would like to see the use of coaches/mentors to support scenario based learning, so that learners can have guidance especially through more complex scenarios	2		1	3	3,9
As an educator I want to be able to create SBL resources that are aesthetically pleasing, so that they provide assurance of their quality	2		1	3	3,9
As an educator, I prefer to have more options in restricting the access to my developed online content, so that it can be freely available as well as limited to authenticated users only – dependent upon specific requirements of the learning activity.	2		1	3	3,9
As an educator I would like to see a way that different methods of delivery of scenario based learning (e.g. face to face, online) could be integrated, so that I create a more effective learning experience	1	1	1	3	2,9
As an educator I would like to see drag and drop functionality in the SBL software (OpenLabyrinth), so that the time required to create scenarios is decreased		1	2	3	0,8

As an educator, I would like to address all types of learners, so that I can address the needs of all my students		1	2	3	0,8
As an educator I would like to see scenario based learning use 3D graphics to show explicitly what is happening			3	3	-0,3
MOOCs - Learner					
As a learner I want to be able to complete the MOOC in my own time outside any set dates for the programme, so that I can work through a MOOC in my given schedule	1			1	2
As a learner I want the MOOC to include content that is relevant to me, so that the value of the resource is clear	1			1	2
As a learner I would like a MOOC to be accredited by a relevant recognized authority, so that I can be assured of the quality of the training and qualification I have received		1		1	1
As a learner I want the MOOC to include a means of communication between participants so that they untangle complex subjects		1		1	1
As a learner I want to be able to dip into elements of a MOOC without having to complete the entire course, so that I can skip irrelevant content and learn the chapters i'm interested in		1		1	1
As a learner I want the MOOC to present the learning in different forms, so that my learning needs are better addressed		1		1	1
As a learner I would like to have alternatives to the often video centered modules, so that repeating parts of previous is more effective than just to review and search in the previous movies		1		1	1
As a learner I want MOOCs to provide bite-size information, so that it is easier to maintain momentum and finish the MOOC		1		1	1
As a learner, I prefer to access the MOOC on all kinds of devices, so that I am able to do instant and self-paced learning		1		1	1
As a learner I want a MOOC to include opportunities to meet fellow participants face to face where possible, so that there is a stronger sense of community			1	1	-0,1
As a learner on a MOOC I would like more text-based information, so that it makes it easier to compare and critically evaluate the information provided			1	1	-0,1
As a learner, I prefer to have the content in the form of animated sequences and infographics, so that I feel engaged into the learning process			1	1	-0,1
MOOCs - Educators					
As an educator I would like to see a range of different tools used in a MOOC (text, video, images, etc.)	1			1	2
As an educator I would like to be able to provide a good balance between text and media content so that the course is suitable for all learning styles	1			1	2
As an educator, I want the MOOC to be integrated with the institutional LMS, so that resource fragmentation is prevented	1			1	2
As an educator, I intend my developed online content to be accessed on all kinds of devices, so that my learners are able to do instant and self-paced learning	1			1	2
As an educator, I prefer to have more options in restricting the access to my developed online content, so that it can be freely available as well as limited to authenticated users only – dependent upon specific requirements of the learning activity.	1			1	2
As an educator I would like to see MOOCs that run between fixed dates but also could be accessed by learners outside those dates		1		1	1
As an educator, I would like to see interactions between learners, so that they are really involved in the learning process.		1		1	1
As an educator I see my job in education of my university students and not the entire world with MOOCs, so that my time at university is best used.			1	1	-0,1

SBL - Technologist					
As a technologist I would like an easier way to connect different systems, so that i can offer a wider range of services in an economically reasonable way.					N/A
As a technologist I would like SSO (single sign on) for the entire infrastructure of my institution, so that amount of support issues for authentication can be reduced					N/A
As a technologist I would like to address all kinds of devices, so that I support an economical reasonable range of users devices					N/A
As a technologist I would like to use all kind of devices whenever the type of content makes sense for this kind of device, so that I support an economical reasonable range of users devices					N/A
As a technologist I would like to have the most important content at least optimized for web browser + tablets and then if possible and useful for smartphones, so that i support an economical reasonable range of users devices					N/A
As a technologist I would like to use standards to connect systems, so that investment into individual and proprietary integration solutions can be reduced					N/A
As a technologist I would like to be able to address data protection issues, so that privacy laws are hold					N/A
As a technologist I would like to see SBL/VP systems to be integrated easily into my IT structures, so that access issues can be reduced					N/A
As a technologist I would like to support web accessibility, so that content is compliant to people with disabilities					N/A
As a technologist, I would like to see the SBL platform to be compliant with existing standards, so that the content can be shared (namely SCORM, LTI and MedBiquitous Virtual Patients)					N/A
As a technologist, I would like to see the SBL platform to be compliant with existing standards (namely LDAP, AD), so that the systems can be integrated and have the single-sign-on feature					N/A
As a technologist, I prefer responsive web-design solutions, so that the SBL learning activities are accessible from all kinds of devices					N/A
MOOCs - Technologist					
As a technologist, I would like to see the MOOC platform to be compliant with existing standards (namely LDAP, AD), so that the systems can be integrated and have the single-sign-on feature.					N/A
As a technologist, I prefer responsive web-design solutions, so that the MOOC learning activities are accessible from all kinds of devices.					N/A
As a technologist, I would like to see the MOOC platform to be compliant with existing standards, so that the content can be shared (namely SCORM, LTI and MedBiquitous Virtual Patients).					N/A