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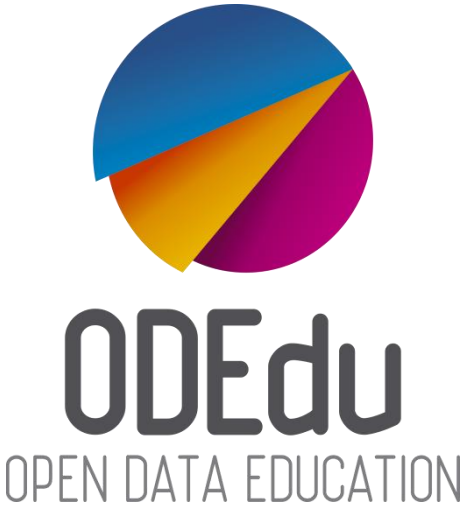

Deliverable 6.4

Interim Exploitation and Sustainability Plan

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Abstract:	The exploitation plan reports the consortium's strategy towards exploiting the project's results. It includes an analysis of the relevant market and current conditions, existing competitors versus own positioning, potential users and collaborators as well as opportunities and barriers at EU level and Member State level. The exploitation and sustainability plan will be constructed and documented in two phases. This initial report provides a preliminary outline of the exploitation and sustainability plan for after project end including relevant exploitation/ sustainability models, partners' involvement in future exploitation activities, plans for promotion and valorisation, solutions to potential financial or IPR/licensing issues encountered, etc.
Keyword List:	Exploitation, sustainability

Consortium

	Role	*Name*	*Short Name*	*Country*
1.	Coordinator, academic partner	University of Macedonia	UOM	Greece
2.	Open Data expert	Open Data Institute	ODI	UK
3.	Problem Based Learning expert	Aalborg University	AAU	Denmark
4.	Technology enhanced learning expert	AcrossLimits	AcrossLimits	Malta
5.	Dissemination partner	Association of Information Technology Companies of Northern Greece	SEPVE	Greece
6.	Open / Linked Data technologies expert	ProXML	ProXML	Belgium
7.	Local Authorities partner	Linked Organisation of Local Authorities	LOLA	Belgium

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V1	31/07/2017	SEPVE	Final editing and submission

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This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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List of Abbreviations

The following table presents the acronyms used in the deliverable in alphabetical order.

Abbreviation	*Description*
EC	European Commission
IPR	Intellectual Property Rights
OER	Open Educational Resources
PCC	Project Coordination Committee
WP	Work Package

Executive summary

The objective of the ODEdu Project is to establish a Knowledge Alliance among academia, business and the public sector, which will boost Open Data education and training. The key to the success of this project is to inform and attract a wide range of stakeholders by appropriate and targeted information diffusion about the objectives of the project, its activities and results.

The main purpose of the present exploitation and sustainability plan is to outline the consortium's strategy towards exploiting the project's results. It includes an analysis of the relevant market and current conditions, existing competitors versus own positioning, potential users and collaborators, as well as opportunities and barriers at EU level and Member State level.

The exploitation and sustainability plan will be constructed and documented in two phases. This initial report provides a preliminary outline of the exploitation and sustainability plan for the period after the end of the project, including relevant exploitation/sustainability models, partners' involvement in future exploitation activities, plans for promotion and valorisation, solutions to potential financial or IPR/licensing issues encountered, etc.

The identified exploitable project results so far are: requirements on Open Data education from academia, industry and public sector, Online repository on Open Data sources and technologies, educational materials for Open Data publication and re-use, Open Data curriculum structure, DD_PBL model, ODEDU platform and Learning analytics tools and techniques for course re-design.

The consortium intends to make the exploitable project results freely available to everyone. Short term and long term results of the project will be made available and released as Open Educational Resources (OER) to ensure their future re-use and improvement according to updated development.

As far as the sustainability of the project results concerned, all project partners will continuously contribute to the utilisation and refinement of project results within their teaching and vocational training environments respectively. Additionally, the ODEdu platform will includes participatory features and will publish all project results as OERs. This also ensures sustainability of the project's activities since participatory technologies' value increases as more people are using them. Hence, if a critical mass is reached within the life-time of the project, then this momentum is expected to keep growing.

Finally, all project partners intend to exploit individually selected project results according to their area of expertise and their competencies.

1 Introduction

1.1 Scope

The objective of this deliverable is to provide resources and a clear roadmap for the management and exploitation of the knowledge generated in the project. Also, exploitation aims to provide and formulate a viable economic model for commercial up-take of the ODEDU developments. The present document will describe the main strategies, guidelines, target groups and deadlines to accomplish the valorisation process, especially focused on exploitation, and help the partners keep the results alive after the project lifetime.

The importance of dissemination and exploitation was already highlighted by the Commission in several events, but all the more so since many EU funded project ultimately end up abandoned.

More specifically, this deliverable describes briefly the exploitable project results includes an analysis of the relevant market and current conditions, existing competitors versus own positioning, potential users and collaborators as well as opportunities and barriers at EU level and Member State level.

The exploitation and sustainability plan will be constructed and documented in two phases. This initial report provides a preliminary outline of the exploitation and sustainability plan for after project end including relevant exploitation/sustainability models, partners' involvement in future exploitation activities, plans for promotion and valorisation, solutions to potential financial or IPR/licensing issues encountered, etc.

1.2 Basic terms

According to DiVa Consortium[1] **exploitation** *is associated with the use of the project's results at different levels, during and after the implementation of the project. It is related with the necessary action that will bring visibility to the project in order to involve the target groups, end-users, stakeholders and transfer the results/products into their professionals'* scope.

Accordingly to the European Commission (EC) it is very important to exploit, because: *'Although your project is an entity and product in its own right, it is also important to see it as a resource or a tool that you will put in the hands of others'*.

Exploitation is closely associated with the sustainability of the project after its conclusion, since exploitation activities should ensure that the results of the project are used by its target groups and

[1] DiVa Consortium (2011). DiVa Handbook for Dissemination, Exploitation and Sustainability of Educational Projects. https://www.aidlearn.pt/fls/doc/proj/diva_handbook.pdf

possibly are transferred to other contexts (e.g. other countries; other pedagogical areas, other sectors).

Sustainability *is the capacity of the project to continue its existence and functioning beyond its end. The project results are used and exploited continuously*. Sustainability of results implies use and exploitation of results in the long term. A project can therefore be considered as sustainable if relevant results are pursued and products are maintained or developed after the end of the EU funding (i.e. duration of new courses, up-dating of new tools).

1.3 Structure

The structure of the document is as follows:

- Section 2 briefly presents the methodology followed in order to develop the exploitation and sustainability plan.
- Section 3 presents the exploitable project results, their IPR – owners and IPR licencing scheme.
- In Section 4 the sustainability plan, i.e. the actions the consortium will follow after the project completion in order to maintain the project results, is elaborated.
- Section 5 describes the potential buyers/ users, performs a preliminary market analysis on open data and relevant key competences and suggests the target groups for each project result.
- Section 6 includes partners' individual exploitation plans concerning the project results.
- Section 7 concludes the document.

2 Methodological Approach

In order to develop our exploitation strategy and following the guidelines proposed in the relevant literature, we have to address the following six basic questions:

1. **What?** What are the project results that can be exploited? To which sector do they belong (academic, technology, education, institutions etc)?

   In order to answer this question, we have to identify the project results and to select those that can be useful to third parties.

2. **To whom?** Which are target market(s), main target groups or end users suitable for the exploitation of project deliverables

   To answer the question, who to exploit to, it is necessary to understand the different groups that will benefit from the ODEDU project and its results.

   - Direct beneficiaries
   - Indirect beneficiaries
   - Key actors - policy makers, policy implementation bodies, strategy networks, organizations within the themes of the project.

3. **How?** Which mechanisms and strategies are to be used for each type of project outcome and according to which user needs?

   Here, all channels the partners use in order to reach key stakeholders should be identified and analyzed.

4. **Why?** What is the aim of each partner's individual exploitation plan?

   All the partners will individual and jointly perform the exploitation activities of the ODEDU project. The partners will follow the instructions provided in this strategy, and will also take in consideration the guidelines already established in the dissemination plan.

5. **By whom?** Which product(s) /project outcomes can be best exploited by the Consortium as a whole, if any? Which product(s) /project outcomes can be best exploited by individual consortium partners?

   The objective of this plan is to have all the dissemination and exploitation activities together, it is believed that this will create a better overview and help partners in their dissemination activities. It will also be possible for partners to add their own (not- previewed activities) into the plan as well. It is of vital importance that the target group and relevant stakeholders are involved from the beginning of the project.

   In this sense, all partners will use their national and international networks to assure the exploitation and sustainability of the project. It is worth to consider that the first step to do so, is to implement the dissemination plan in a proper way.

6. **When it will be done?**

   The timing of the different exploitation activities has already been developed in the overall time management plan of the project. More detailed timing for the individual exploitation activities have been developed in conjunction with the overall dissemination and exploitation plan.

Based on the above questions, we have followed a methodological approach consisting of 5 steps:

1. Identification of the project results /outputs / deliverables that may be exploited in the academic community, the public sector and the enterprises. Results will be recorded, categorised and elaborated with respect to IPRs, added-value offered, potential exploitation methods, potential customers/adopters, etc,
2. A market analysis, investigating all market segments relevant to the identified results /outputs and exploring the current market situation, existing competitors, opportunities and threats, etc,
3. Exploitation opportunities for each exploitable result /output, taking into account the market analysis findings. The investigation will specify exploitation models, collaboration roles, etc,
4. Intellectual property issues, the licensing schemes (e.g. conditions for free distribution or open source availability of project's results) and other legal considerations pertaining to exploitation and sustainability after project end,
5. Individual exploitation plans for each partner, taking into account each partner's domain and expertise (i.e. research, industry, policy making)

3 Exploitable Results

The exploitable project results and their IPR are presented in this section.

3.1 Project Results

3.1.1 Requirements on Open Data education

These requirements concerns the Open Data related knowledge and skills that university students, private sector employees and public sector employees should obtain in order to enhance their competencies and knowledge on Open Data, entrepreneurship and innovation.

3.1.2 Online repository on Open Data sources / portals

The repository includes national and European sources that provide adequate and qualitative open data.

3.1.3 Online repository on Open Data technologies

The repository includes open data related technologies that are evaluated according to criteria such as ease of use, accessibility, usefulness etc.

3.1.4 Evaluation reports of educational activities

The evaluation of the ODEDU's training activities results in a number of recommendations to the content and systems designer(s), implementer(s) and curriculum designers.

3.1.5 Educational materials

This result concerns the educational material for: (i) the university course that is available in English, Greek and Danish and (ii) the VET course for private and public employees that is available in English, Maltese, Greek and Dutch.

Open Data university course: This deliverable will provide a course model about Open Data for university-level education. The course will use the developed learning platform.

3.1.6 Open Data curriculum structure

This result is about the curriculum structure for the university course and the VET course for private and public employees.

3.1.7 DD_PBL model

This result is an innovative, active, problem-based learning model and corresponding methods (i.e. new educational and VET practices and processes) that capitalize on the principles of Open Data, as they are being studied by the focus groups in WP1. These methods will capitalise on the existing PBL model and extend it into a novel, data-driven learning approach to identify and address learning needs.

3.1.8 ODEdu platform

The educational and training platform provides functionalities that allow the structure of the developed curriculum and the engagement in the problem-based learning processes. Additionally, platform is augmented with learning analytics tools to monitor the education/training progress and with ICT participatory opportunities to allow contribution from all target groups.

3.1.9 Learning analytics tools and techniques

This result is about the innovative and engaging learning processes that are in accordance with the PBL methodologies and the identified requirements. Moreover, the learning processes will be designed by presenting the active, innovative practices based on the data-driven problem based learning methods and so as to incorporate the Open Data technologies identified.

3.2 IPR of the Exploitable Results

The consortium is well-aware of the importance Intellectual Property Rights (IPR) in order to, on the one hand prevent conflicts between partners, and on the other hand facilitate the longevity and re-usability of project results.

Therefore, the consortium has concluded to the following agreements contained in the Consortium Agreement:

- Pre-existing know-how will be made available to the consortium members in favorable conditions if it is necessary to perform the research in this project.
- Foreground knowledge is owned by the partner generating such information or result. Each partner shall make available its foreground knowledge, on a royalty-free basis, to other contractors to the extent that such information is necessary for the production of their own foreground knowledge within the project.

The PCC will be responsible for resolving any issues that may arise related to IPR and innovation activities.

As regards the developed knowledge resources the consortium intends to make them freely available to everyone. Short term and long term results of the project will be made available and released as Open Educational Resources[2] (OER) to ensure their future re-use and improvement according to updated development.

Open educational resources are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others. OER include full courses, course materials, modules, textbooks, streaming

[2] https://www.oercommons.org/

videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge. OER give educators the ability to adapt instructional resources to the individual needs of their students, to ensure that resources are up to-date, and to ensure that cost is not a barrier to accessing high-quality standards aligned resources.

The key distinguishing characteristic of OER is its intellectual property license and the freedoms the license grants to others to share and adapt it. If a lesson plan or activity is not clearly tagged or marked as being in the public domain or having an open license, it is not OER. It's that simple. While custom copyright licenses can be developed to facilitate the development and use of OER, often it can be easier to apply free-to-use standardized licenses developed specifically for that purpose, such as those developed by Creative Commons or – for software – those approved by the Open Source Initiative.

Additionally, the project's results and progress will be disseminated in highly relevant platforms such as Open Education Europa and ePSI platform.

More specifically, regarding the main results of the Knowledge Alliance:

- All educational and training materials will be available in the ODEdu platform that will be developed within the project's lifetime.

- All educational and training materials will be provided to all partners as Open Educational Resources for publication in their respective online environments and future reuse by all visitors.

- Any data that will be published as Open or Linked Data during the educational and training activities will be uploaded in existing European and national Open Data portals (e.g. EU Open Data portal, data.gov.gr, publicdata.eu/be, cz.ckan.net/ etc).

- Webinars will be made available in media channels such as YouTube.

- The pedagogical model will be made available as an Open Education Resource in external OER repositories.

- Social networking websites will be put to practice in sharing the results with interested stakeholders.

The release of the project's results as Open Educational Resources is essential for the promotion of their sustainability and allows new education and training providers to re-use and expand on them (e.g. new MOOCs on Open Data, online training sessions etc). Moreover, the project's results can be re-used anytime, anywhere, anyhow from individuals from different backgrounds and countries that want to learn Open Data. This way, they can become lifelong learners and continue to exercise their knowledge and skills in their own time to increase their employability.

Finally, open access to the OERs will boost the European Open Data ecosystem, where stakeholders from across Europe will have access to materials, processes, data, applications and technologies to assist them in becoming a part of a self-sustaining Open Data Knowledge Alliance.

3.3 Categorization of Exploitable Project Results

Table 1 ODEdu Exploitable Project Results

	Exploitable Asset	Category	Exploitation Type	Background IPR Owners & Contributors	Foreground Interest in Shared Exploitation
1	Requirements on Open Data education	Requirements	Non-commercial	ProXML, UOM, AAU	UOM, AAU
2	Online repository on Open Data sources / portals	Repository	Non-commercial	ProXML	UOM, AAU
3	Online repository on Open Data technologies	Repository	Non-commercial	ProXML	UOM, AAU
4	Evaluation reports of educational activities	Lessons Learned	Non-commercial	UOM, AAU, ODI, SEPVE, LOLA	UOM, AAU
5	Educational materials for Open Data publication and re-use	Educational Material	Non-commercial	ODI, AcrossLimits	UOM, AAU, ODI, Acrosslimits, SEPVE, ProXML, LOLA
6	Open Data curriculum structure	Curriculum	Non-commercial	ODI, AcrossLimits	UOM, AAU, ODI, Acrosslimits, SEPVE, ProXML, LOLA
7	DD_PBL model	Model	Non-commercial	AAU	UOM, AAU ODI, UOM
8	ODEdu platform	Software	Non-commercial	AcrossLimits, UOM	UOM, AAU, Acrosslimits, SEPVE, ProXML, LOLA
9	Learning analytics tools and techniques	Software	Non-commercial	AAU, UOM	UOM, AAU, ProXML

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4 Sustainability of the Project Results

The main goal of the sustainability plan of the ODEDU project is to ensure the continuity of the project results after the project is finalized.

The ODEDU Consortium will take the following actions:

- All project partners will ensure the continued utilisation and refinement of project results within their teaching and vocational training environments respectively.
- Partners' lasting interest in Open Data, entrepreneurship and boosting societal benefits additionally ensures their active involvement in this research field and guarantees project results' utilisation in similar contexts/domains for further research purposes.
- The Knowledge Alliance formed during the project lifetime will continue to pursue knowledge and expertise exchange through European efforts, events, workshops, contests, scientific publications as well as through continuous communication with the public bodies participating via letters of intent etc.
- -The models designed and the training materials will be maintained, re-used, configured and refined by consortium members and by any interested stakeholder since they will be available as OERs during and after the project lifetime.
- The learning analytics tools will be further used by the academic partners, where they will used to enhance and redesign their courses.
- The local authorities' organizations will continue to provide to their members guidelines on proper Open Governmental Data publication techniques and will use the identified portals to publish the results.
- The ODEdu platform will includes participatory features and will publish all project results as OERs. This also ensures sustainability of the project's activities since participatory technologies' value increases as more people are using them. Hence, if a critical mass is reached within the life-time of the project, then this momentum is expected to keep growing.

Apart from the above, ODI and ProXML will take the following actions:

- ODI's network of 26 international ODI franchises enables ODI to have an international impact and acts as a source of new ideas and techniques to drive the domain forward.
- ProXML will also promote the re-use of the training materials during the open data days and related events of the Flemish government. The Open Data team of the Flemish government also sponsors hackatons to build apps based on the published open data. During these hackatons other subjects such as licensing, business development etc are treated. Paul Hermans of ProXML is also visiting lecturer at the University of Leuven and Gent on (Linked) Open Data, where he tries to motivate students to explore open data. ProXML's reach is also

on the publishing side mainly the Flemish regional and local governments with some extensions to the Belgian and Dutch national levels. On the consuming part mainly programmers and students at the Flemish level.

5 Market Analysis

5.1 Target Groups – potential byers

The main target groups that are expected to be interested in the results of the project are:

1. Public organizations, at regional, national or EU level, being directly involved in the development of open data / open content
2. Universities and research institutions with a strong interest in open data technologies which have a direct interest in the outcomes of the project
3. Universities and other educational institutions interested in using Open Data in their training activities.
4. Private Enterprises and start-ups with a strong interest in the use (and re-use) of open data

5.2 Preliminary market analysis

A preliminary market analysis has shown that Open Data initiatives worldwide are boosting with an aim to increase transparency and contribute to economic growth. A recent study by the McKinsey Global Institute estimated "*the global annual economic potential value of Open Data to $3 trillion*"[3] whereas another study by Deloitte measures the value of Open Data to consumers, business and the public sector in terms of $ billions[4]. The successful publication and re-use of Open Data is also one of EU's main priorities[5]. The inventor of the World Wide Web stated that *"opening up data is fundamentally about more efficient use of resources and improving service delivery for citizens*"[6].

This has led to national and European initiatives that have brought forth abundant datasets from different fields (statistics, finance, environment, health, transport etc)[7] paving the way for the creation of new services and the growth of new markets[8]. However, **these opportunities require competent workforce with in depth knowledge on Open Data** as well as high-level cognitive and entrepreneurial skills that will enable them to mash up existing data in unforeseen ways, foster their innovative use and exploit their economic potential.

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[3] http://www.mckinsey.com/insights/business_technology/open_data_unlocking_innovation_and_performance_with_liquid_information

[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/198905/bis-13-743-market-assessment-of-public-sector-information.pdf

[5] Digital Agenda for Europe: Open Data http://ec.europa.eu/digital-agenda/en/open-data-0

[6] European Public Sector Information Platform, Open Data and EU Funding, June 2013 http://www.epsiplatform.eu/sites/default/files/150100928-2013-06-Public-Funding-and-Open-Data.pdf

[7] http://data.gov.uk, https://open-data.europa.eu/en/data, http://publicdata.eu/, http://data.gov.gr

[8] Open data An engine for innovation, growth and transparent governance http://eurlex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=EN&type_doc=COMfinal&an_doc=2011&nu_doc=882

Moreover, **the available data is still under-exploited** and often published and consumed only by governments or public bodies[9] [10] [11]. EU's funding on Open Data research projects covers a range of application disciplines (e.g. ICT, Environment, Transport, Health etc); nonetheless, thus far limited efforts have been funded towards providing knowledge regarding Open Data for non-experts (e.g. citizens, scientists, SMEs, entrepreneurs, etc)[12], leaving only limited IT experts and the Open Data research community to benefit from the field. The provision of free and accessible training on Open Data to non-experts from different application fields is a perquisite for its effective use so that anyone can properly understand it, process it, visualize it and produce informative usage out of it.

Currently, EU and expert organizations carry out training initiatives mostly in the form of seminars and workshops that usually include content in slides and occasionally quiz tests that allow self-reflection (e.g. Europa portal, Open Data Support, Open Knowledge Foundation etc). However, these are not structured based on pedagogical models that would foster engaging learning activities and do not employ advanced learning systems and analytics technologies to provide flexible and adaptable learning. Thus, a new paradigm of Innovative Open Data education and training is required, built through strong and balanced collaboration of academia, business and public administration and based on novel pedagogies and advanced technologies.

The market analysis will be elaborated in the final exploitation plan.

5.3 Exploitation potential of project results

Taking into account:

- The exploitable project results,
- The ODEDU's target groups and
- The existing market opportunities,

we developed a preliminary generic exploitation plan for the project results.

In general, we expect that the target groups will benefit from the project's results in the following ways:

1. For Public organizations, at regional, national or EU level:

[9] EU open data policy and actions, DG CONNECT, EoE Dublin-Open Data session, 2013, http://www.eyeonearth.org/enus/Documents/Marta.Nagy_Rothengass.network.5.3.13.pdf
[10] Digital Agenda for Europe Action 3: Open up public data resources for re-use http://ec.europa.eu/digital-agenda/en/pillar-i-digitalsingle-market/action-3-open-public-data-resources-re-use
[11] http://www.epsiplatform.eu/content/open-data-natural-hazards-management#sthash.GGBKlrPe.dpuf
[12] EUCLID Project: http://euclid-project.eu

- Public authority executives will become more efficient in tackling and solving organizational or legal issues, regarding the publication of Open Governmental Data.
- Public employees will increase their efficiency and develop skills that will enable them to perform high quality operations.
- Public employees will also learn how to publish governmental data that will ensure the authorities' transparency and accountability and will provide means to other stakeholders to use the data in ways that will solve societal and economical challenges.
- Associations will improve the quality of their services towards their members by providing them with training materials and practical experimentation on the field of Open Data.

2. For Universities and other research institutions:

- Researchers in the open data area will can gain insight on how can stakeholders be familiarized with open data sources and technologies and how open data can be exploited for commercial purposes
- Researchers will also improve their knowledge skill-set for further research and endeavours in EU's future calls on the field.

3. For Universities and other educational institutions:

- Institutions will be introduced to the newly developing field of Open Data that can and should be incorporated in existing curricula.
- Institutions will create new models of innovative learning strategies to foster sustainable learning outcomes.
- Teachers will improve the educational methods currently used by adopting DD_PBL and will utilize multidisciplinary content and learning activities. Moreover, they will monitor students' performances and re-design their courses by employing learning analytics techniques.
- Tutors will become learning coaches and extent their teaching competencies, learn how to re-design their courses based on learning analytics results and adopt novel data-driven learning methodologies that will shift the power to the learners and enhance lifelong learning skills through practical application of knowledge.
- Learners will increase their knowledge on Open Data and will be equipped to apply this knowledge in multiple disciplines. Moreover, they will increase their transversal skills by using DD_PBL (e.g. critical thinking, creativity, problem solving, entrepreneurship etc), improving their employability and learning how to identify and develop unforeseen services, products or start-ups.
- Learners will also achieve deeper learning by collaborative group work and elaborated discussions; will be motivated to attend courses and trainings. Consequently, they will

develop competencies not limited to the domain and valuable in labour market, e.g. entrepreneurship, creativity, self-management, critical thinking etc.

- Tutors and learners will be exposed to multimodal and diverse OERs, which will broaden their knowledge and skills.

4. For Private Enterprises and start-ups:

- Private company owners will improve the company's validity and expand their economic activities by tackling new products, services or partnerships based on their exploitation of available Open Data.
- ICT and IT private employees will increase their knowledge on Open Data and develop transversal and entrepreneurship skills.
- Employees will also increase their efficiency and develop lifelong learning skills that will boost their competitive advantage and allow them to adopt to changes in the economic world.
- Start –ups and small businesses will be able to address key problems around how they build their business and create impact.

This generic exploitation plan is also presented in a tabular way. In the vertical columns there are the potential buyers of the exploitable results that are presented on the horizontal rows of the table.

Table 2 Generic Exploitation Plan

	Exploitable Asset	Public Organizations	Research Institutions	Educational Institutions	Private Enterprises
1	Requirements on Open Data education			√	
2	Online repository on Open Data sources / portals			√	√
3	Online repository on Open Data technologies			√	√
4	Evaluation reports of educational activities		√	√	
5	Educational materials for Open Data publication and re-use	√		√	√
6	Open Data curriculum structure	√		√	
7	DD_PBL model		√	√	
8	ODEdu platform	√		√	√
9	Learning analytics tools and techniques		√	√	

6 Partner individual exploitation plans

As far as individual exploitation plans concerned, only few partners specified their exploitation plans so far.

6.1 UOM

UOM aims to enhance existing and future Open Data courses by applying a well-established and structured problem-based learning approach enriched with Learning Analytics (LA). The Open Data courses in UOM are currently mostly delivered in a traditional offline setting, where lectures are delivered in classrooms by educators and students are assessed either with only a final test at the end of the semester or with a few assignments throughout the academic semester. Thus, UOM is committed to introduce the project's new solutions to the institution's courses in order to contribute to students developing Open Data –based and transversal skills that are essential in the modern age.

As a general overview of exploitation, UOM is interested in developing the following general exploitable results in both an educational/teaching and a research context:

- *Requirements on Open Data education*. The requirements on Open Data education, focusing on the needs for university students, will be constantly consulted by UOM during the course design process. This way, UOM courses will be updated and enriched based on the knowledge and skills required from each course's target group.
- *Online repository on Open Data sources / portals*. UOM will consult the repository on Open Data sources and portals in order to design their assignments and PBL-based projects. This will ensure that students will work and experiment with existing open data available in the respective portals, leading to the development of real-world meaningful solutions. UOM will also enrich the repository with new sources when appropriate.
- *Online repository on Open Data technologies*. UOM will consult the online repository on Open Data technologies when designing their courses in order to decide which technologies are more suitable for usage based on the chosen materials. UOM will also enrich the repository with new technologies when deemed appropriate.
- *Evaluation reports of educational activities*. UOM will carry out research analysis of the evaluation results that will be recorded during the trials. This research will aim to draw conclusions on the projects' results' efficiency in enhancing Open Data education and will be disseminated to interested stakeholders through scientific channels.
- *Educational materials for Open Data publication and re-use*. UOM will maintain, re-use, configure and refine the training materials that will be developed during the project's lifetime, aiming to integrate them into their courses and re-use them in any external training programmes they carry out.
- *Open Data curriculum structure*. UOM will consult the curriculum structure when deciding which units of learning should be included in each of their courses or external training

programmes. Faculty of UOM will further re-use and apply the curriculum structure in different modules. This will lead to an overall DD_PBL-based re-design of the studied field' curriculum towards fostering transversal competencies and the creation of an Open Data educational domain.

- *DD_PBL model available for extension*. UOM will re-use the DD_PBL model in their courses and in external training programmes in order to design participatory and problem-based learning processes that will engage students' participation and lead to their skills development. Additionally, UOM aims to re-visit the model's concepts and extend them when necessary, based on the lessons learnt from each model's application in real-world educational and training settings.
- *ODEdu platform*. UOM will re-use the e-learning platform created for the purpose of the project, in order to design and deliver their courses. More specifically, UOM will employ the PBL and LA tools that are available in the environment and will exploit all LA visualizations and data generated in order to monitor and scaffold the learning process.
- *Learning analytics tools and techniques for course re-design*. UOM will further use the LA tools, in order to enhance and re-design their courses.

Target groups will include:

- University students in UOM or any other external programmes that will participate in the project's trials.
- Public employees of the Municipality of Thessaloniki that will participate in the project's trials.
- University students that will participate in all future Open Data courses after the project's end.
- Public employees that will participate in future Open Data trainings performed within the Municipality of Thessaloniki.
- The researchers and the staff of UOM who will gain knowledge on Open Data and entrepreneurial skills.
- Government officials and public employees that will be made aware of the key organisational and technical problems in need to be addressed with Open Data.

The target groups will benefit from the project's results in the following ways:

- UOM educators will create new models of innovative learning strategies to foster sustainable learning outcomes.
- UOM educators will become learning coaches and extent their teaching competencies, learn how to re-design their courses based on learning analytics results and adopt novel data-driven learning methodologies that will shift the power to the learners and enhance lifelong learning skills through practical application of knowledge.
- UOM students will achieve deeper learning by collaborative group work and elaborated discussions; will be motivated to attend courses and trainings. Consequently, they will

develop competencies not limited to the domain and valuable in labour market, e.g. entrepreneurship, creativity, self-management, critical thinking etc.

- Public employees of the Municipality of Thessaloniki will learn how to publish governmental data that will ensure the authorities' transparency and accountability and will provide means to other stakeholders to use the data in ways that will solve societal and economic challenges.
- The Municipality of Thessaloniki will improve the quality of their services towards their members by providing them with training materials and practical experimentation on the field of Open Data.
- Public employees of the Municipality of Thessaloniki will increase their efficiency and develop skills that will enable them to perform high quality operations.

UOM will reach the target groups through the following communication channels:

- University courses
- Academic papers or conferences
- Networks within other Open Data related research projects
- UOM webpages (www.uom.gr, www.islab.uom.gr , departmental sites, news and events)
- UOM press –the internal publishing house of the University
- Posters available at the University premises
- Spill over via publications and conferences.

Faculty and students of UOM as well as staff of the private and public partners also intend to utilise the results produced for further advancing their research in the field of Open Data and their innovative publication and re-use. UOM will also collaborate with business and public bodies (e.g. National Centre for Public Administration and Local Government, City of Thessaloniki etc.) towards its general objective of contributing to the Open Data European ecosystem and assisting in the improvement of relevant national initiatives.

6.2 ODI

ODI focuses on the following opportunities:

1. Oppourtunity 1: Using the ODEdu PBL VET course model and insights from the research and evaluation

   The ODI will look to exploit and sustain the outputs of the ODEdu project in several ways. Current ODI courses feature principles from existing PBL frameworks, however, the extensive stakeholder analysis and insights from the research and evaluation conducted in project, in combination, provide a unique opportunity to improve ODI training and forward the mission of creating lifelong learners, and improving skills across the data lifecycle in Europe, during and after the project's lifetime.

In the first instance, the stakeholder needs analysis highlights training needs that are currently unaddressed by the ODI. New material will be created through the project that will be utilised by the ODI during the trials, with additional partner delivery opportunities and beyond the life of the project for the ODI's private and public clients. The ODI will continue to add to this, in-line with emerging stakeholder needs. The ODI learning material is openly licensed, meaning that others from across the ecosystem and project partners can access, use and share them. Curriculum modules and feedback gathered through ODEdu will help to catalyse and further shape the ODI's data literacy training.

Insights gathered through the evaluation of the model, and delivery of the pilot training events will inform the revision and development of ODEdu's course material for the public and private sector, but will also provide the insights for the ODI's other materials and courses. Improving the learners journey as we discover more about needs, usability of content and the successes or challenges of delivering an open data PBL VET course. These insights will help to shape and progress the ODI's data literacy training for the public and private sector, improving skills and employability for employees and university graduates

The ODI will look to further incorporate PBL into their courses to encourage critical thinking and problem solving to address real life challenges in the sectors that it works within, including; sport, finance, agriculture and retail. In particular, the design pathway created in WP2, will continue to provide a framework for the ODI to apply PBL practices to new clients and partners in the private and public sector.

Impact and relevance: The ODI's expected impact from this activity is to increase data literacy skills across sectors, by improving the way that data is understood across all levels of data maturity, and throughout the open data lifecycle the ODI has delivered training to more than 7,500 people from the public and private sectors, thereby fueling data-driven innovation and making Europe more competitive. In this context, the expansion of the ODI's course and content offer is important to continue serving industry demands as effectively as possible.

2. Opourtunity 2: Progressing innovative open data education in Europe

Through the ODEdu project and other funded programmes, the ODI have accessed a wide network of partners and projects across Europe. This has substantially increased the ODI's exposure to new communities and commercial sectors, offering an opportunity to expand the ODI's European network and supporting both the ODI's and ODEdu's mission to progress innovative open data education in Europe. Through this exposure and by developing continuous relationships with small, medium-sized and large companies, the opportunities to enable private and public organisations to adopt lifelong learning, and help them influence innovation processes, new services and products will be maximized. These engagements will be underpinned by the insights the ODI developed in collaboration with partners through the ODEdu project.

Impact and relevance: The ODI will use its extended network to focus on addressing the data literacy skills gap identified from the stakeholder needs analysis, as well as adapting content in line with the insights produced from the evaluation of the pilots. Additionally, we plan to explore new options for delivering data literacy training to the private and public sector. This ongoing work is in line with ODEdu's goal of improving skills and knowledge of open data lifecycle within both the public and private sector. The ODI will continue to strengthen its offering to its global network providing tailored training, incorporating PBL principles, thus, increasing the innovative use of data within Europe.

6.3 AAU

Faculty and students of AAU will further utilize the project results by re-using and applying them in different modules. This will lead to an overall DD_PBL-based re-design of the studied field curriculum, towards fostering transversal competencies and the creation of an Open Data educational domain. The project team will reach out to the rest faculty through the university channels and relevant events organized.

Faculty and students also intend to utilize the results produced for further advancing their research in the field of Open Data and their innovative publication and reuse.

AAU will reach the target groups through participation in the NoEL-network (network on e-learning) since both the ICT and Learning Design (ILD) and e-Learning Lab (eLL) groups are members of the network. Also, AAU will participate in the Alumni network of Master in ICT and Learning and will reach out to the current students in the MIL programme. AAU will also collaborate closely with the Municipality of Aalborg towards its general objective of contributing to the Open Data European ecosystem and assisting in the improvement of relevant national initiatives and with UCN towards developing multidisciplinary courses which make use of open data.

6.4 Acrosslimits

Acrosslimits will exploit the results of the ODEDU platform and the curriculum to the sector that includes SME's, micro companies, Entrepreneurs and self-employed people. The target market of these sectors will be spread all over the 28 EU member states where Acrosslimits have good networking contacts and even partners from other previous EU funding projects.

AcrossLimits will re-use project results in future research and commercial works to involve IT companies in managing and exploiting Open Data.

6.5 SEPVE

SEPVE will adopt the training results produced and will continue to host training sessions in order to educate their members in exploiting Open Data to expose its economic value.

In particular, SEPVE intends to exploit the following project results:

- Educational materials for Open Data publication and re-use,
- Open Data curriculum structure and
- ODEdu platform

More specifically, SEPVE intends to conduct short – terms seminar for its members, i.e. ICT private companies and their employees, about open data publication and reuse. The seminars will mainly focus on available open data sources and technologies and development of innovative applications using open data. The applications developed within the ODEDU's educational and training activities will be taught as a paradigm of successful use of open data.

6.6 ProXML

ProXML has interest in offering trainings on exploratory data analysis, data wrangling and machine learning for non-data scientists. The following channels will be engaged:

1. Channel 1: BeCentral/BeCode; targetgroups: unemployed, digital illiterates

   ProXML negotiates with BeCentral/BeCode to offer these courses to their targetgroups. BeCentral's goal is to make advances in technology accessible for everyone, from young children to digital illiterates. More info on BeCentral can be found at http://www.becentral.org/. BeCode is a free coding school that wants to offer a second chance to people that are currently unemployed and left behind.

2. Channel 2: Open Knowledge Belgium; targetgroups: people interested in open data

   Other distribution channels evaluated are via Open Knowledge Belgium. OKB is an organisation that consists of people, mainly volunteers, passionate about openness, trying to enable people to use and share data and knowledge in Belgium and beyond.

3. Channel 3: own networks; target groups: civil servants

   Together with project partner Lola we will target the same courses to our respective networks of public administrations on all levels in Belgium (Federal, Flanders, local).

4. Channel 4: SAI and university network; target group: university students

   SAI (www.sai.be) is an association of the departments of business ICT of the universities of Louvain, Antwerp and Ghent that organizes courses for their allumni. ProXML is adviser of SAI and will propose the data courses developed to be included in SAI's course agenda. ProXML is invited for guest lectures on 'open data' by these departments. We will include the developed material in these courses.

ProXML also intends to reuse the Linked Open Data software components build during this project in other projects and with other data sets. ProXML has interest in offering trainings on exploratory data analysis, data wrangling and machine learning for non-data scientists.

Apart from the above, ProXML is connected the Flemish Open Data team and is involved in the organisation of multiple events such as the yearly Flemish Open Data Days and Open Data seminars organised on a regular basis. These events are mainly aimed at government institutions (national, regional, local), the potential publishers of Open Data. The training materials will be directly used and applied during these events. ProXML also works regulary for the Dutch government and has a good relationship with the open data team, which can be exploited to organise events in the Netherlands.

6.7 LOLA

LOLA is a network organization which is active globally and consists out of many different member organizations. Exploitation activities may differ among its members. However, LOLA adheres to a shared vision of enabling public sector ICT managers and workers and, allowing them to deliver-the most cost-effective public services. Open Data is an essential part of this vision, which aligns with the Citadel Statement. Therefore, each of LOLA's members will benefit from ODEdu's **educational materials for Open Data publication and re-use**, and use these as a means to provide training and insights towards their local government members. This can be done in the following ways:

- Each of LOLA's member organizations is active in hosting national public sector ICT conferences, during which the materials may be disseminated.
- Some of LOLA's member organizations provide in-situ training for local governments, consisting out of hands-on consultancy, workshops, or projects.
- Some of LOLA's member organizations provide training activities ("classroom" events) targeted towards public governments. ODEdu's OERs will serve as the basis for such educational events.

LOLA will promote the re-use of the training materials in future trainings of its members with the utilization of the produced materials and will encourage the local authorities to release their governmental data their national and European portals.

7 Conclusions

The main purpose of the present exploitation and sustainability plan is to outline the consortium's strategy towards exploiting the project's results. It includes an analysis of the relevant market and current conditions, existing competitors versus own positioning, potential users and collaborators as well as opportunities and barriers at EU level and Member State level.

The identified exploitable project results so far are: requirements on Open Data education from academia, industry and public sector, Online repository on Open Data sources and technologies, educational materials for Open Data publication and re-use, Open Data curriculum structure, DD_PBL model, ODEDU platform and Learning analytics tools and techniques for course re-design.

The consortium intends to make the exploitable project results freely available to everyone. Short term and long term results of the project will be made available and released as Open Educational Resources (OER) to ensure their future re-use and improvement according to updated development.

As far as the sustainability of the project results concerned, all project partners will continuously contribute to the utilisation and refinement of project results within their teaching and vocational training environments respectively. Additionally, the ODEdu platform will includes participatory features and will publish all project results as OERs. This also ensures sustainability of the project's activities since participatory technologies' value increases as more people are using them. Hence, if a critical mass is reached within the life-time of the project, then this momentum is expected to keep growing.

An initial market analysis indicated a gap in the availability of different forms of open data (statistics, finance, environment, health, transport etc) and the existence of applications that use these data in order to offer to the stakeholders valuable information. The analysis suggested also that, in order to utilize the vast amount of the available open data, competent workforce with in depth knowledge on Open Data as well as high-level cognitive and entrepreneurial skills is required. The results of the ODEDU project aim to cover this gap.

The main target groups of the ODEDU projects are public organizations at national or EU level, universities, educational institutions, research institutions and private enterprises.

Public authority executives will become more efficient in tackling and solving organizational or legal issues regarding the publication of Open Governmental Data. Public employees will increase their efficiency and develop skills that will enable them to perform high quality operations. Public employees will also learn how to publish governmental data that will ensure the authorities' transparency and accountability and will provide means to other stakeholders to use the data in ways that will solve societal and economical challenges.

Educational Institutions will be introduced to the newly developing field of Open Data that can and should be incorporated in existing curricula and will create new models of innovative learning strategies to foster sustainable learning outcomes.

Tutors will improve the educational methods currently used by adopting DD_PBL and will utilize multidisciplinary content and learning activities. Moreover, they will monitor students' performances and re-design their courses by employing learning analytics techniques. Furthermore, tutors will become learning coaches and extent their teaching competencies, learn how to re-design their courses based on learning analytics results and adopt novel data-driven learning methodologies that will shift the power to the learners and enhance lifelong learning skills through practical application of knowledge.

Learners will increase their knowledge on Open Data and will be equipped to apply this knowledge in multiple disciplines. Moreover, they will increase their transversal skills by using DD_PBL (e.g. critical thinking, creativity, problem solving, entrepreneurship etc), improving their employability and learning how to identify and develop unforeseen services, products or start-ups. Learners will also achieve deeper learning by collaborative group work and elaborated discussions; will be motivated to attend courses and trainings. Consequently, they will develop competencies not limited to the domain and valuable in labour market, e.g. entrepreneurship, creativity, self-management, critical thinking etc.

Private company owners will improve the company's validity and expand their economic activities by developing new products, services or partnerships based on their exploitation of available Open Data. ICT and IT private employees will increase their knowledge on Open Data and develop transversal and entrepreneurship skills. Employees will also increase their efficiency and develop lifelong learning skills that will boost their competitive advantage and allow them to adopt to changes in the economic world. Moreover, start –ups and small businesses will be able to address key problems around how they build their business and create impact.

Researchers in the open data area will gain insight on how can stakeholders be familiarized with open data sources and technologies and how open data can be exploited for commercial purposes Researchers will also improve their knowledge skill-set for further research and endeavors in EU's future calls on the field.

All project partners intend to exploit individual selected project results according to their area of expertise and their competencies.

The exploitation and sustainability plan will be continuously revised and updated. Its final version will be delivered by the end of the project.