

**Project Identification**

| | |
|---------------------------------|--|
| Project number | AAL-2013-6-091 |
| Duration | 1 st June 2014 – 30 th November 2016 |
| Coordinator | Univ. Prof. Dr. Manfred Tscheligi |
| Coordinator Organization | AIT Austrian Institute of Technology GmbH, Austria |
| Website | www.pearl-project.eu |



Platform for Ergonomic and motivating,
ICT-based Age-friendly woRkpLaces

Document Identification

| | |
|--------------------------------|--|
| Deliverable ID: | D-5.3 Market Analysis and Exploitation Planning |
| Release number/date | 1.0 / 12 October 2015 |
| Checked and released by | Nikos Kefalakis/SENSAP |

Key Information from "Description of Work"

| | |
|--------------------------------|---|
| Deliverable Description | This deliverable presents a report with a thorough analysis of ICT markets relevant to PEARL. |
| Dissemination Level | PU=Public |
| Deliverable Type | R = Report |
| Original due date | Project Month 15 / 31.August.2015 |

Authorship & Reviewer Information

| | |
|------------------------------|---|
| Editor | John Soldatos, Nikos Kefalakis, Panagiotis Dimitropoulos (SENSAP) |
| Partners contributing | Nikos Kefalakis (SENSAP), Panos Dimitropoulos (SENSAP), John Soldatos (SENSAP), Tunde Kallai (COMARG), Anton Nikolaev Katov (AAU), Simone Boerema (RRD), Sonja Müller (EMPIRICA), Kostas Perakis (SiLo), Margherita Kramer (AIT), Rita Westergaard (RFID-SPE) |
| Reviewed by | Tunde Kallai (COMARG) |

Abbreviations

| <i>Abbrev.</i> | <i>Description</i> |
|-----------------------|---|
| AAL | Ambient Assisted Living |
| AAL JP | Ambient Assisted Living Joint Programme |
| CEO | Chief Executive Officer |
| CIO | Chief Information Officer |
| ESM | Experience Sampling Method |
| HR | Human Resources |
| ICT | Information and Communications Technology |
| NUF | New – Useful – Feasible |
| SME | Small and medium-sized enterprises |

Table of Contents

| | |
|---|-----------|
| <i>Abbreviations</i> | II |
| <i>Table of Contents</i> | III |
| <i>Table of Figures</i> | V |
| <i>Table of Tables</i> | V |
| <i>Executive Summary</i> | 1 |
| 1 About this Document | 2 |
| 1.1 Role of the deliverable | 2 |
| 1.2 Relationship to other PEARL deliverables | 2 |
| 1.3 Structure of this document | 3 |
| 2 Analysis of Exploitable Assets | 4 |
| 2.1 Overview | 4 |
| 2.2 Background Technologies and Knowhow | 4 |
| 2.3 Third-Party Technologies and Platforms | 5 |
| 2.3.1 RRD | 6 |
| 2.3.2 AAU | 6 |
| 2.3.3 SiLo | 6 |
| 2.4 PEARL Project Foreground | 6 |
| 2.4.1 PEARL Platform | 6 |
| 2.4.2 Stand-alone Components and Technologies | 8 |
| 2.4.3 PEARL Solutions | 10 |
| 2.4.4 Preliminary List of IPRs | 10 |
| 3 Market Analysis | 12 |
| 3.1 Analysis of Target Customers | 12 |
| 3.1.1 Introduction - Methodology | 12 |
| 3.1.2 Potential Customers | 12 |
| 3.2 Market Analysis | 14 |
| 3.2.1 Overview | 14 |
| 3.2.2 E-Learning Market | 15 |
| 3.2.3 Cognitive Training Market | 17 |
| 3.2.4 Physical Well Being @work Market | 19 |
| 3.3 Preliminary PEARL Marketing Plan | 20 |
| 3.3.1 Focus of Marketing – Marketing Strategy - Target Groups | 20 |
| 3.3.2 Marketing Activities | 21 |

| | | |
|-------|---|----|
| 3.3.3 | Raising Awareness and Promotion towards Policy Makers | 23 |
| 3.4 | Planning for Commercialization and Market Launch | 24 |
| 4 | <i>Commercial Activities and Compensation for Using Foreground of other Parties</i> | 26 |
| 4.1 | Business Canvas for PEARL | 26 |
| 4.2 | Joint Commercialisation | 26 |
| 4.2.1 | Business Targets | 26 |
| 4.2.2 | Turn-Key Solutions | 27 |
| 4.2.3 | Editions of the Platform | 27 |
| 4.2.4 | Innovation Management and Investments | 28 |
| 4.3 | SWOT Analysis | 28 |
| 4.4 | Individual Partners' Exploitation and Commercialisation Plans | 30 |
| 4.4.1 | AIT | 30 |
| 4.4.2 | RRD | 31 |
| 4.4.3 | SILO | 31 |
| 4.4.4 | COMARG | 32 |
| 4.4.5 | EMPIRICA | 33 |
| 4.4.6 | SENSAP | 34 |
| 4.4.7 | AAU | 35 |
| 4.4.8 | RFID-SPE | 35 |
| 4.5 | Rights and obligations of the Parties | 35 |
| 4.5.1 | Rights of the Parties | 35 |
| 4.5.2 | General Undertakings of the Parties Wishing to Commercialise Products | 35 |
| 4.5.3 | General Undertakings of the Parties Requested to License their Foreground | 36 |
| 4.6 | Use of Third-Party Products by PEARL | 36 |
| 4.6.1 | Overview | 36 |
| 4.6.2 | Mode of Exploitation and Commercialisation | 37 |
| 5 | <i>Conclusions and Outlook</i> | 38 |
| | <i>References</i> | 39 |

Table of Figures

| | |
|---|----|
| Figure 1: Individual (Exploitable) Modules comprising the integrated PEARL Platform | 7 |
| Figure 2: Overview Analysis of Brain Fitness Market (source: sharpbrains.com) | 17 |
| Figure 3: Business Canvas for the Exploitation of the PEARL age-friendly workspaces solutions | 26 |
| Figure 4: Mockup of the Organio calendar which shows the concept of merging analogue pen and paper with digital screens | 31 |

Table of Tables

| | |
|---|----|
| Table 1: Overview of Background Technologies & Knowhow of the Partners | 5 |
| Table 2: Third-Party Technologies used for integrating the PEARL platform | 5 |
| Table 3: IPR Shareholders of the PEARL Exploitable Assets | 11 |
| Table 4: Samples List of Companies providing Cognitive Training Solutions | 19 |
| Table 5: Physical and Mental Wellbeing – ICT on the physical domain | 20 |
| Table 6: Physical and Mental Wellbeing - ICT on the mental domain | 20 |
| Table 7: Editions of the PEARL Platform | 28 |
| Table 8: SWOT Analysis for the PEARL Products and Services | 30 |

Executive Summary

The PEARL project deals with the implementation of a novel platform for configurable age-friendly workspaces, which provides a wide range of functionalities such as e-learning, cognitive training, time management, well-being at work functionalities and more. The project is implemented in the scope of the AAL programme, which foresees a market launch of the projects results within 2-3 years following the successful completion of the project. To this end, the PEARL consortium is already planning exploitation actions, including activities that will lead to the market launch and commercialization of the project's results. In this context, the present deliverable documents the initial exploitation intentions of the partners, while at the same time illustrating a roadmap to the commercialization of the project's results. The deliverable has a dual objective:

- To serve as a basis for the establishment of an exploitation agreement between the project partners, which will be a prerequisite for commercial exploitation especially in terms of the jointly generated foreground.
- To provide a preliminary business plan, including business targets, SWOT analysis and marketing plans.

Towards the establishment of the exploitation agreement, the partners have identified the exploitable assets of the project, the foreground to be generated, along with the contributors to joint foreground. At a later stage (when the project's technical developments will be nearly concluded) the exact IPR shares of each contributor to the generated foreground will be specified. Furthermore, the present document provides an initial outline of the partners' rights and obligations during joint exploitation. These rights and obligations will also become a part of the exploitation agreement.

In terms of business planning, the present deliverables identifies and analyzes the target customer segments i.e. the organization types that are likely to be interested in adopting and deploying the project's age-friendly workspaces solutions. These include private enterprises (in areas such as manufacturing and creative industries), cultural organizations, smart cities and more. Furthermore, an analysis of target markets is provided, driven by the functionalities of the PEARL platform such as e-learning and cognitive training. Based on the analysis of these markets, an initial marketing plan is illustrated aiming at reaching not only target customers, but also other stakeholders that could boost PEARL's sales efforts. Such stakeholders' groups include workspace construction agencies, workspace equipment providers, employers and employees associations, as well as policy makers at various levels. In addition to providing a marketing plan, the deliverable illustrates the main business targets, along with a commercialization roadmap. Furthermore, a SWOT analysis is provided, along with a plan for licensing and reusing third party components. At this stage, the deliverable does not present a financial analysis, yet is already identifies the need for private investments in order to finance additional technical developments and the sales & marketing efforts.

In addition to illustrating joint exploitation aspects, the deliverable illustrates the partners' (individual) plans to exploit the project's results. These plans complement joint exploitation efforts and are in-line with the partners' organizations culture and business/research strategies.

Overall, the present document represents a first step to the definition and execution of the project's commercialization strategy. Its contents will serve as valuable and integral inputs to two important documents that will be produced prior to the conclusion of the project, namely the exploitation agreement and the final/updated business plan of the project.

1 About this Document

1.1 Role of the deliverable

PEARL is developing a platform for building, configuring and deploying age-friendly workspaces, notably workspaces for workers in creative industries (including users who make use of ICT). The consortium has a market orientation and following the end of the project will attempt to exploit, sustain and commercialize the platform and workspaces solutions that will be produced during the project. One of the main objectives of WP5 of the project is to plan for the exploitation of the project's results from the partners, based on both individual exploitation strategies and joint exploitation activities. To this end, the present deliverable was destined to identify and analyse the target markets for the project's exploitable assets and results. Due to the absence of a distinct WP5 deliverable on exploitation planning, the consortium has opted to expand the scope of the present deliverable in order to illustrate the partners' exploitation plans, including plans for the sustainable deployment and replication of the project's results across multiple companies in need of supporting elderly workers on the basis of elderly friendly workspaces.

The expanded scope of the deliverable entails identifying the exploitable assets of the project. The latter assets do not include only the integrated platform, but also the individual components and technologies that comprise it, notably components and technologies that can be deployed and exploited independently. Based on the identification of exploitable assets, the deliverable discusses also their target markets and their IPR shares. Furthermore, the assets drive the specification of the partners' exploitation strategies. Moreover, joint exploitation is discussed in relation to the integrated platform which represents joint foreground of the partners. Key to joint exploitation is the specification and regulation of the IPR shares that are associated with jointly produced foreground. As part of the deliverable the IPR sharing discussion has been initiated and the IPR shareholders to the different assets are identified. Nevertheless, the final specification of the IPR shares will be concluded at the end of the project and will be documented within the partners' exploitation agreement. The latter agreement will be also used to regulate the relationships (including rights & obligations) of the partners during joint exploitation of the PEARL results. As part of the present deliverable elements of this exploitation agreement are discussed.

1.2 Relationship to other PEARL deliverables

The deliverable is related to the following PEARL deliverables:

| <i>Deliv:</i> | <i>Relation</i> |
|---------------|---|
| D4.1 | System Architecture Specification and Implementation: Deliverable D4.1 provides an anatomy of the PEARL platform through presenting its architecture and main components. D4.1 serves therefore as a basis for identifying exploitable assets and technologies as part of the present deliverable D5.3. |
| D5.2 | Dissemination Report: Each release of deliverable D5.2 reports on the dissemination activities of the project, including the planning of future dissemination activities. Given that some of the project's dissemination activities are destined to boost the exploitation and commercialization strategy of the partners, the contents of the present deliverable are expected to influence future versions of D5.2. |

1.3 Structure of this document

The document is structured in five sections. Following this introductory section, Section 2 illustrates the structure of the integrated PEARL platform, along with the partners' background technologies and third-party components that will be used in order to integrate and produce the platform. The analysis of background technologies and components, aims at identifying the exploitable assets of the project, including jointly produced foreground. It also helps in identifying contributors to the production of the joint foreground, which is a prerequisite to identify the IPR shares that should be specified in the partners' joint exploitation agreement. Note that in addition to the integrated PEARL platform, the project will produce several fine-grained components and solutions which are individually exploitable. This is mainly due to the fact that several editions of the PEARL platform are possible, including editions providing subsets of the functionalities of the integrated platform.

Section 3 provides an overview of the target markets for the PEARL platform, including markets relating to specific components and solutions that can be supported/deployed based on the PEARL platform. Furthermore, an analysis of the target markets is provided. At this stage of the project we are not providing a detailed quantification of the target market size, but rather an overview of the competition in the target markets. Following the presentation of the target markets, Section 3 illustrates PEARL's marketing plan, including concrete actions that should be undertaken by partners following the end of the project.

Section 4 is devoted to the presentation of the exploitation plan of the project, including business exploitation aspects. It provides both an overview of the partners' joint exploitation actions/plans and information about the exploitation intentions of the partners.

Section 5 is the final and concluding section of the deliverable, which also provides an outlook about future exploitation and premarketing activities planned in the project.

2 Analysis of Exploitable Assets

2.1 Overview

The exploitation planning activities of the PEARL project are organized on the basis of its exploitable assets and outcomes. Indeed, these assets will drive the identification of exploitation modalities and exploitation activities, including target markets and customers associated with the commercialization of the project's results. The exploitable assets of the project correspond primarily to software components and platforms, which can be deployed in order to make the workspaces more suitable and acceptable for elderly employees, notably employees aged 55+ and working for creative industries in a way that includes ICT tools. As illustrated in following paragraphs the main outcome of the project is the integrated PEARL platform, which includes however a range of software components and sub-systems, including components and sub-systems that can be exploited independently. Hence, the latter form exploitable assets as well.

The sub-systems and platforms that are produced in the scope of the project constitute the foreground that is generated by PEARL. In order to produce this foreground, the project makes use of a set of background components and knowhow provided by individual partners. Furthermore, they also use third party libraries and projects (including open source projects), as a means of boosting reuse, accelerating development time and maximizing value-for-money. In following paragraphs, we outline the background technologies and knowhow of the partners used to development and integrate the PEARL platform, along with any third-party libraries used.

2.2 Background Technologies and Knowhow

The following table illustrates the background technologies and knowhow that the partners contribute to the implementation of the PEARL project/platform, with particular emphasis on technologies/IPR that are part of the PEARL platform. The technologies listed in the table will be taken into account in the development of the project's exploitation agreements, notably in the part of components/foreground ownership and IPR sharing. Furthermore, they will serve as prerequisites towards deploying the PEARL platform, which (in several cases) could also have licensing and/or cost implications.

| Partner | Background Technologies & Knowhow |
|---------|---|
| AIT | <ul style="list-style-type: none"> Physical prototyping, e.g. Arduino for a page tracking method based on optical tracking or MakeyMakey for creating tangible interfaces Mobile development (e.g. Android) |
| RRD | <p>Activity and Coaching platform</p> <ul style="list-style-type: none"> Wearable activity sensor (Promove 3D), that can measure physical activity intensities (including sitting still) during the day. Smartphone App, to communicate with the sensor and the online database, for data storage and personal feedback on the measured physical activity data and self-reported measures. And for gathering self-reported data by prompting questions. |

| | |
|----------|--|
| | <ul style="list-style-type: none"> • Online portal for more elaborated personal feedback on the measured physical activity data and self-reported measures. And for gathering self-reported data. • R2D2 (database) Online database for secure storage of data of end-users. |
| SiLO | <ul style="list-style-type: none"> • Systems integration • IT security (data transfer security) • HTML5 |
| EMPIRICA | <ul style="list-style-type: none"> • ASSIST- Cost Benefit software tool and methodology |
| COMARG | <ul style="list-style-type: none"> • e-doceo elearning platform , eLearning LMS, SkillCatch mobile apps to produce learning materials , MOOC (Massive Online Open Courses), digital storytelling. |
| SENSAP | <ul style="list-style-type: none"> • SENSAP™ SBOX: Traceability Server supporting RFID/AutoID technologies |
| AAU | N/A |
| RFID-SPE | <ul style="list-style-type: none"> • API's for verios RFID-readers • RFID-controller for to connect mixable RFID readers |

Table 1: Overview of Background Technologies & Knowhow of the Partners

2.3 Third-Party Technologies and Platforms

The following table illustrates the third-party technologies used in order to build the PEARL platform and its main sub-systems. The listing of these technologies will serve as a basis for identifying any additional licensing and IPR implications, especially during the development of the exploitation agreement of the project.

| Third-Party Technology or Platform | Use in the Scope of PEARL |
|---|---|
| Promove 3D (=Wearable activity sensor) from Inertia Technology. | Physical activity and inactivity monitoring in the Physical wellbeing layer. |
| Achievo, open source project managed by GitHub phpatkframework group | Used as basis for the PEARL Task and Time Management module implementation. |
| myCBR, by German Research Center for Artificial Intelligence (DFKI GmbH), Germany | Used as a similarity-based retrieval engine in the PEARL Decision Support System. |
| Construct game engine | Development of cognitive games |
| RFID- reader interface technology | Used for user interactions, and AutoID |

Table 2: Third-Party Technologies used for integrating the PEARL platform

2.3.1 RRD

RRD has a Promove 3D sensors and smartphones in stock to be used in trials of PEARL. Additional licencing or IPR implications are not applicable for the use of this sensor in the trials.

As the Promove 3D is custom made for RRD for research purposes (and therefore rather expensive), commercial exploitation of the physical wellbeing layer should be done with a commercial available wearable sensor that fulfils the minimal requirements for the sensor, resulting from the final field trials at the end of the project.

2.3.2 AAU

In order to accelerate the development time, while minimizing the cost of the end product, AAU has selected two different third party open source platforms – Achievo and myCBR – that will serve as a basis for the development of the Task and Time management module and the Decision Support System module respectively.

Achievo is web-based Business Support Sevices (BSS) application that has been released under the GPLv2 licence from the Free Software Foundation.

myCBR is is an open-source similarity-based retrieval tool and software development kit. myCBR is a free software that is ditributed under the terms of the GNU Lesser General Public License, as published by the Free Software foundation – either version 3 or any later version. The licence allows the developers and companies to use and integrate the software into their products without being required to release the source code of their own components.

2.3.3 SiLo

Within the context of the development of the cognitive games, SingularLogic will utilise Construct game engine, an HTML5-based 2D game editor allowing quick creation of games in a drag-and-drop fashion using a visual editor and a behavior-based logic system. Construct's primary export platforms are HTML5 based. It claims support across Google Chrome, Firefox, Internet Explorer 9+, Safari 6+ and Opera 15+ on desktop browsers, and support for Safari in iOS 6+, Chrome and Firefox for Android, Windows Phone 8+, BlackBerry 10+ and Tizen. Construct has the ability to export to several platforms that provide offline and native application behavior: Windows, OS X and both 32-bit and 64-bit Linux are supported by exporting to Node-Webkit. Construct is provided under a proprietary license.

2.4 PEARL Project Foreground

2.4.1 PEARL Platform

The main integrated deliverable of the project will be the integrated PEARL platform, which will comprise a range of functionalities for age-friendly workspaces i.e. functionalities tailored to the needs of elderly workers in order to increase their motivation and productivity. Nevertheless, the PEARL platform is not intended to be a “one-size-fits-all” and an “all-or-nothing” value proposition. Rather, it aspires to provide a programmable and configurable platform, which could be flexibly customized to varying requirements of different customers. To this end, the PEARL integrated platform is designed and

developed as a modular platform consisting of different modules each one providing specific functionalities. Moreover, each of the modules corresponds to a specific functional area of the PEARL platform (such as time & task management, cognitive training, physical well-being and more). This segmentation of the PEARL platform functionalities is not done only for organizational and project management purposes (i.e. in order to separate implementation concerns), but also for deployment and exploitation purposes (i.e. in order to facilitate deployment and operations of different modules according to the needs of the customer). Thus, the modules of the integrated PEARL platform are not simply independent technical units; they are also individually exploitable modules of the PEARL platform. The free use and free licensing of jointly-owned Foreground will be the principle within PEARL consortium, which implies unrestricted, unblocked access/licensing of that jointly owned Foreground for Use (commercialisation, further R&D) without the need to get the consent of, or share revenues with, any co-owners. Figure 1 illustrates the technical modules that comprise the integrated PEARL platform, while deliverable D4.1 details how these modules are integrated in-line with the PEARL architecture. A brief description of the modules is also provided in the following paragraph.

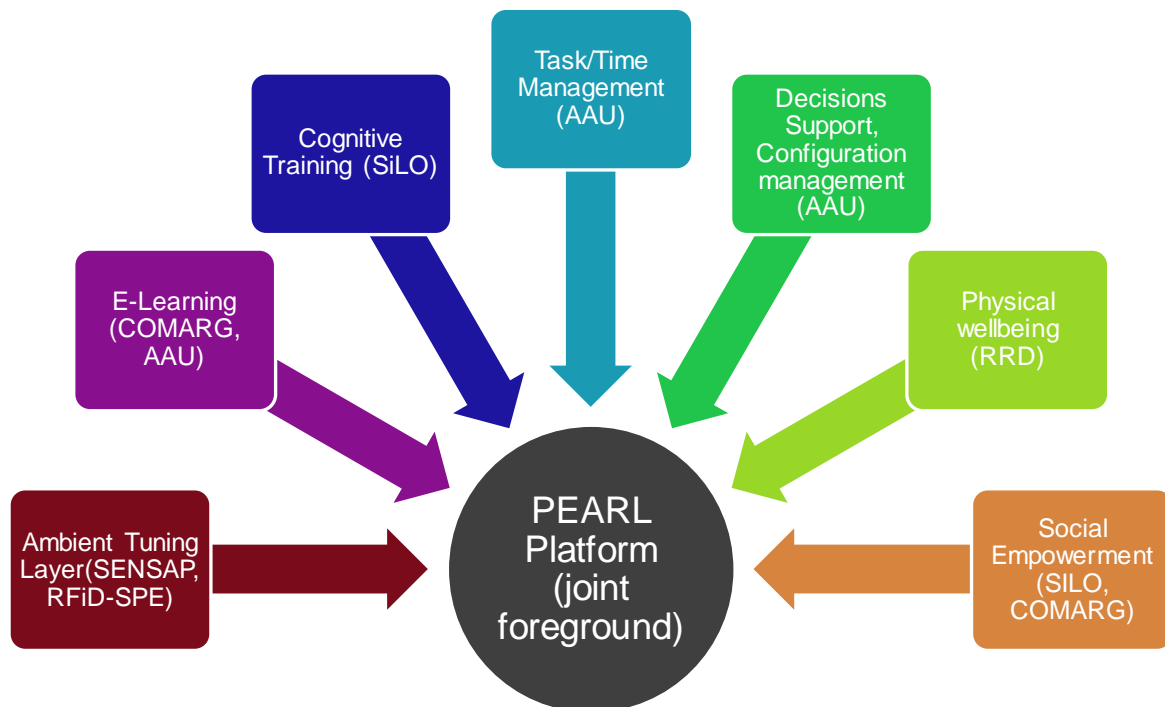


Figure 1: Individual (Exploitable) Modules comprising the integrated PEARL Platform

Note however that the integrated PEARL platform is not a mere integration of existing modules. Rather it includes a wide range of middleware libraries, which enable the provision of additional services, with added-value functionalities beyond those already offered by individual modules. These added-value functionalities stem from the inter-working and collaboration between two or more modules. As a prominent example, the time and task management module interworks with the Wellbeing module in order to enabling the planning of physical activity breaks during worktime. Other combinations will be also possible as part of the final integrated PEARL platform and its exploitable editions. Since the PEARL platform will be joint foreground, the implication of the above-listed added-value functionalities is that IPR shares should not be only defined on the basis of the partners' contribution and role to the development, adaptation and integration of

background components of the partners. Rather, the contribution of its partner to the implementation of the added-value (multi-module) functionalities should be considered as well.

2.4.2 Stand-alone Components and Technologies

2.4.2.1 Cognitive Training

Short Description: This module facilitates the elderly in assessing and in strengthening their cognitive, functional and affective abilities. It provides tools that can be offered to the elderly both within working hours (i.e. during intervals) and off-working hours, and can act as a valuable add-on to the working environment, which shall offer confidence to the elderly in terms of their cognitive abilities and skills (including memory, attention, learning, orientation and more).

Target End-Users and Market:

The product could possibly target the B2B segment, addressing companies that are looking for profile management solutions and C2C (Consumer-to-Consumer interaction) as the effect and result of social networking and collaborative consumption, where C2C means more “Community to Community” in the eLearning network

2.4.2.2 Task and Time Management

Short Description: The goal of the task and time management layer is to enable management and organization of tasks, activities and projects on daily, weekly and monthly basis. The platform will provide a scheduling assistant that supports the time planning throughout the day and provides transparent synchronization with other calendar tools, such as Google Calendar and Microsoft Outlook Calendar. The scheduler will also be responsible for initiating periodic reminders that encourage user’s physical activity. Another notable feature will be the private digital noteboard that provides easily accessible summary of the daily tasks and appointments. A key aspect of the platform will be the ergonomic user-interface that meets the needs of the elderly.

Target End-Users and Market:

The task and time management tool can be offered, not only to senior employees, but also to people and SMEs interested in office automation, that are looking for a simplified, ergonomic product for agenda and/or task management. The tool can be offered as a standalone web-based application or in combination with the digital paper calendar solution, developed by AIT.

2.4.2.3 E-Learning

Short Description: It is based on the e-doceo LMS and is conveniently called ELMG. It is used to create 1. elearning modules in user friendly e-doceo web based environment 2., MOOC modules using e-doceo’s SkillCatch application on mobile devices (iPhone, Android) 3. an online educational PEARL community to share and improve the learning capabilities of each type of users, both the tutors or educators, and active seniors.

Target End-Users and Market:

This development results also in an ageing workforce and lifelong learning is the key to maintain the employability of senior citizens also to support the competence development of training institutions and trainers who work in the field of training older adults by using ICT. The group of senior learners (focus group) can be considered very heterogeneous within PEARL. It includes several age groups and diversity in personal interests, competences, physical fitness, life situations, or the general learning motivation. This heterogeneity requires a flexible design of our learning programs for this age group. In any case, the learners' prior knowledge, expectations by the personal interviews, and the establishment of appropriate links to existing experiences of learners need to be taken into account for pedagogical approaches suitable for training seniors.

2.4.2.4 Decision Support and Configurations Management

Short Description: The PEARL Decision Support and Configurations Management module will be comprised of a rule engine and a case-based reasoning (CBR) matchmaker. The matchmaker will be responsible for retrieving the platform configuration setup that matches most closely the user preferences defined in the PEARL Data Layer. The PEARL Rule Engine will incorporate the case adaptation logic required whenever a retrieved solution does not suit the initial user requirements in order to come up with personalised automated suggestion for optimal configuration plan.

Target End-Users and Market:

The product could possibly target the B2B segment, addressing companies that are looking for profile management solutions.

2.4.2.5 Physical Wellbeing (RRD)

Short Description: The physical wellbeing layer is a telemonitoring service to: (A) Get more insight into physical activity and sedentary behaviour patterns and mental state of wellbeing (B) Promote wellbeing by coaching users on their physical and mental behaviour. This telemonitoring service and web-based exercise service are not built from scratch, but are based on an existing platform developed by Roessingh Research and Development, called C3PO.

Target End-Users and Market:

Employers that want to provide services to help their employees to work on their physical and mental wellbeing can offer this module to their employees as part of PEARL or as a stand-alone solution. Also physicians specialized in occupational diseases can use this module as part of training or reintegration for patients. Finally, retailers of ergonomic office supplies and software can offer PEARL as a service to their customers.

- Yes: Business-to-Business
- Maybe: Business-to-Healthcare Insurer
- Not likely: Business-to-Customer

2.4.2.6 Social Empowerment

Short Description: The Social Empowerment is responsible for delivering social empowerment tools, i.e. tools boosting the social interaction between the employees of a company.

Target End-Users and Market:

Reflection activities will be proposed and demand for collaboration and interaction among senior learners (by a Forum and FAQ) on the e-doceo elearning platform and it will be considered as a positive result because this gives them the possibility to construct their own understanding of a subject matter. The PEARL concept of collaborative knowledge construction (via SkillCatch mobile application) takes also into account both the interaction between participants and the importance of learners' experience, and can therefore be seen as appropriate for training senior learners..

2.4.2.7 Ambient Tuning Layer

Short Description: AutoID equipment (i.e. small RFID devices), task switcher devices, status indicators and workspace environment configurators will be tied together in an ambient tuning layer mainly by utilizing the SENSAP's S-BOX platform as a key middleware component.

Target End-Users and Market: The target group for using RFID readers as AutoID for employees, companies and organizations who want to update the information flow to the high security level as open information technologies require. By making it easily for employees to protect the company's information flows and by offering employees the comfort and an working environment that is technologically updated.

2.4.3 PEARL Solutions

The PEARL customers (such as private enterprises) are not expected to be interested in the PEARL platform per se, but rather on turn-key solutions that can be built based on the PEARL platform. The configurable and programmable nature of PEARL is facilitating the configuration and deployment of such solutions. Among the exploitable assets of the project will therefore be the range of turn-key solutions that will be deployed at the project's trial sites (RRD, COMARG, SiLO), which will represent specific instantiations and configurations of the PEARL platform.

2.4.4 Preliminary List of IPRs

The following table lists the IPR shareholders for each one of the modules that comprise the integrated PEARL platform. This list of shareholders will be used as input for the definition of the IPR sharing section of the project's exploitation agreement.

| Component or Module | IPR Shareholders |
|---|------------------------|
| Cognitive Training Games | SiLo |
| Task and Time Management | AAU, SiLo |
| E-Learning (e-doceo web based eLearning tool and LMS) | COMARG |
| Decision Support and Configuration Management | AAU, RRD, SiLo, SENSAP |
| Physical Web Being (Webportal, Smartphone App, | RRD |

| | |
|---|------------------------|
| Activity sensor algorithms) | |
| Social Empowerment | AAU, RRD, COMARG, SiLo |
| Ambient Tuning Layer | SENSAP, RFID-SPE |
| Integrated Platform (PEARL Platform as a whole) | All Partners |

Table 3: IPR Shareholders of the PEARL Exploitable Assets

On the basis of the above table, the partners will agree on the IPR shares of each partner in each one of the jointly generated components. The shares of each partner will be agreed taking into account its actual contribution in the generation of the foreground in terms of effort (person-months) and in terms of the background module or know-how that it will have contributed to the production of the final version of the component/IPR. It is therefore not possible at this stage to define the specific shares of each partner. This will take place as part of the final exploitation agreement that will be prepared and endorsed by all partners.

3 Market Analysis

3.1 Analysis of Target Customers

3.1.1 Introduction - Methodology

A preliminary description of the target customers and markets for the PEARL outcomes was included in the previous paragraph. In the sequel, we illustrate potential customers focusing on customers of both the integrated platform and of individual components. This initial identification of target customers have been based on a variety of modalities including:

- **PEARL's Exploitation Session/Workshop:** During the project's meeting in Bucharest, the project planned an exploitation session/workshop, with the participation of all business partners. Partners were asked to identify exploitable products/assets associated with the PEARL project along with their target markets. In addition to the brainstorming discussions each partner fill-in a short questionnaire about exploitation intentions and target markets. This information (discussions, questionnaires) have been used towards identifying the customer segments listed below.
- **Review of the State-of-the-art and state-of-practice:** A review of the state-of-the-art has been also conducted (including internet search), with emphasis on products for age-friendly workplaces and their target markets. The customers listed in the following paragraphs, have been identified based on the types of organizations that deploy age-friendly workplaces as revealed by our review.
- **Stakeholders' Interviews:** The process of identifying customers and target markets has taken advantage of stakeholder interviews that have been conducted as part of WP2 of the project. While the primary purpose of these interviews was to identify requirements for the development of the PEARL system, some initial information about commercialization issues was also derived (e.g., on the types of organizations that they expect to see those systems applied).

3.1.2 Potential Customers

3.1.2.1 Private companies

The PEARL platform (and its components) will facilitate the development of age-friendly workplaces. Such workplaces are usually built and deployed by private enterprises, as part of their age friendly and corporate social responsibility policies and plans. Private enterprises, notably within the creative industries are primary customers for the PEARL solutions. The PEARL partners will employ direct marketing and B2B sales towards private enterprises.

3.1.2.2 Public sector

Similar to private enterprises, public sector organizations may be also interested in deploying PEARL-based solutions for age-friendly workplaces. This can become an important market segment, especially in cases where laws or regulations will oblige or direct public sector enterprises to offer elderly friendly workplaces. To this end, PEARL will consult with and disseminate its results towards policy makers, in addition to public

organizations. However, the sales and marketing approach towards public sector organizations will be different from private organizations due to constraints imposed by public procurement processes.

3.1.2.3 Large Manufacturing and Production companies

Large manufacturing and production companies can be seen as a specific case of private enterprises, which might have a special interest in PEARL solutions. This is due to the fact that they could benefit from ergonomic solutions for configuring the workplace environment, but also for preserving the well-being and cognitive health of the aged employees. Business opportunities in this market are likely to emerge due to the fact that the manufacturing & production environment tends to be harsh for aged employees. Note that the age-friendly workspaces tend to be an integral element of the next generation of manufacturing plants that are built as part of the Factories-Of-the-Future (FoF) trends. The notion of FoF includes hyper-efficient plants, which are able to adapt both the workplace (e.g., safety zones, visualization screens) and the production process (e.g., sequence of operations) to the age and skills of the workforce.

3.1.2.4 Smart City

Age-friendly workplaces can be seen as a special case of smart workplaces. The latter are part of the emerging smart city environments, where human capital and technologies are combined in order to ensure sustainable development and quality of life for the citizens. The PEARL workplaces can therefore become part of the smart city environment. To the extent that these environments are controlled and deployed by local authorities and governments (e.g., municipalities) they can be considered a special case of public sector organizations and considerations outlined above apply. However, other smart city stakeholders (e.g., Non-Governmental Organizations, Private Enterprises) can be considered in this environment. PEARL will consider the development of a smart workplace edition as turn-key solution for smart cities and smart environments.

3.1.2.5 Event managers

Managers and organizers of events, notably those that manage workspaces and venues could be also target customers for the PEARL platform and services. The marketing of PEARL towards them should be based on functionalities relevant to the event venue or space.

3.1.2.6 Culture organisation

PEARL can offer a unique sample how seniors can be involved in the documentation and communication of cultural heritage. The PEARL's participatory approach in the digital creativity and aspects such as what senior citizens perceive as heritage, how they related to it, and what benefits they can gain from PEARL platform and its tools. Internet and other digital technologies allow new ways for seniors to access, explore and add to cultural heritage content. But the benefits of PEARL and the collaboration with cultural organizations should be demonstrated by a pilotes or study the best practices (.e.g. One example should come from Sassi of Matera (Italy), a UNESCO World Heritage site representing the most complete surviving rock-cut settlement in the Mediterranean region. The Italian National Research Council's Institute for Technologies Applied to Cultural

Heritage developed a platform for their citizens at any age how the history of this site will be brought alive online. The communication platform is developed as part of Matera's candidacy as a European Capital of Culture of 2019. The residents also the seniors actively contribute views and visions of their home town to the project. The platform is not intended to replace the local guides who are residents telling their stories of what it means to grow up and live in this unique town.¹⁾

3.1.2.7 Health care professionals/organizations

Healthcare services providers are among the likely customers for PEARL workspaces, given their experience and involvement in offering similar services, such as the physical well-being and cognitive training services that are part of the PEARL platform. PEARL will therefore prioritize healthcare professionals and organizations in the list of target customers. The PEARL consortium includes already providers of such services, which could facilitate contacts and networking to other healthcare services providers.

3.1.2.8 Small-Medium Enterprises (SMEs)

SMEs can be seen as special segment of private organizations. However, SMEs are likely to focus on small scale practical solutions comprising a limited subset of the functionalities of the PEARL integrate platform. The project will consider cut-down instantiations of the PEARL platform, which could be more suitable for SMEs.

3.2 Market Analysis

3.2.1 Overview

The rising longevity combined with stagnating or falling birth rates leads to the ageing phenomenon, which represent one of Europe's major socioeconomic challenges. The 65+ population as a percentage of the population aged 15-64 is projected to increase from 26% in 2010 to 53% in 2060. In terms of the labour market, this means while in 2010 we had four people with 'working age' of 15 to 64 for every person aged 65+, in 2060 this number will be reduced by half (i.e. two people). Furthermore, the retirement of the ageing workforce combined with insufficient new recruits will lead to a shortage of workers in various segments of the economy (such as healthcare). Overall, the labour market is shrinking and this is rapidly a set-back to future. According to Accenture, by increasing the number of older people in the workforce and making productivity-enhancing investments in human capital, governments and businesses could boost economic growth and job creation. According to a study, in Germany alone such measures to harness the "Silver Economy" have the potential to boost GDP by €61 billion and lift employment levels by 1.5 million by 2020. Overall there is a clear need for age-friendly solutions at work including elderly-friendly workspaces. However, it is quite difficult to estimate the size of this market and provide credible factual/research data. To this end, our market analysis focuses on other age-related market/segments, notably segments relating to the individual functionalities of PEARL rather than on the platform as a whole. The analysis of these markets provides an overview of PEARL's potential growth and penetration, while at the same time having practical impact (e.g., competitors' analysis) in the case of markets that

¹ Sassi of Matera, Italy, UNESCO World Heritage site, <http://www.materacittanarrata.it>

are directly addressed by PEARL's individual fine-grained solutions (such as cognitive training, e-learning, physical well-being and more).

3.2.2 E-Learning Market

The E-Learning market is clearly expanding year-on-year, even though it's difficult to compare market data coming from different sources. (For example, the growth numbers of Gaming and Gamification tools within the E-Learning market are more impressive than in other areas.) The main aspect is the demographic changes and the growing importance of lifelong learning. Due to a higher life expectancy and a decreasing birth rate, the average age of the European population is growing steadily. Especially the age group 65+ will increase during the next 20 years in Europe. To support the employability of the ageing workforce demand for the consideration of learning programs suppose to consider specific needs of older learners. Western Europe is the world's second largest buying region for E-Learning products and services after North America. This is set to change in the upcoming forecasted period. Asia is predicted to outspend Western Europe in E-Learning terms by 2016. "Despite being a mature market, 2013 was nevertheless a transitional year for E-Learning in Western Europe. It was a year the buzz about MOOCs in higher education and about a coming shift to mobile."² The revenue forecasts covers five types of Self-paced eLearning products and services including: packaged content, custom content development services, cloud-based authoring tools and learning platform services, installed authoring tools, and installed learning platforms. "The eLearning product type that will generate the highest revenues in Western Europe throughout the forecast period is packaged content. There is a surge in demand for cloud-based authoring tools and platforms in Western Europe. The growth rate is 13.6%, the highest of all products in the region." The growth rate for Self-paced eLearning in Western Europe is 5.8% and revenues will reach \$8.1 billion by 2016, up from \$6.1 billion in 2011.³

The three biggest **MOOC platforms** on the web – **Coursera**, **EdX** and **Udacity** – provide almost 700 **online education courses** to over 8.5 million students from more than 225 countries and territories. And that's just the top three! Other popular MOOC platforms include Iversity, Open Learning, Alison, Udemy, Canvas Networks, FutureLearn, NovoEd, CourseSites, Miriada X and Open2Study.

| TOP 3 Companies | Web site |
|-----------------|---|
| Coursera | https://www.coursera.org |
| EdX | https://www.edx.org |
| Udacity | https://www.udacity.com |

² E-Learning Market Trends & Forecast 2014 - 2016 Report 31 A report by Docebo | March 2014. <https://www.docebo.com/landing/contactform/elearning-market-trends-and-forecast-2014-2016-docebo-report.pdf>

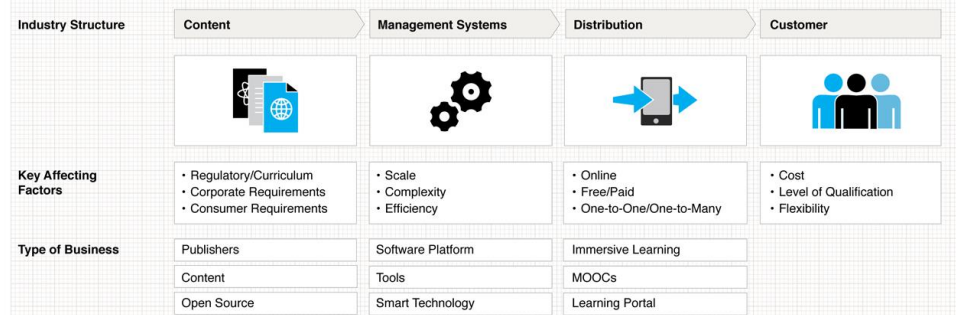
³ Ambient Insight report called, "The Western Europe Market for Self-paced eLearning Products and Services: 2011-2016 Forecast and Analysis." <http://www.prnewswire.com/news-releases/western-europe-elearning-market-to-reach-81-billion-by-2016-171122561.html>

IBIS Capital | Global e-Learning Investment Review

10 Things You Should Know About e-Learning

- \$4.4tn**
2012 global education expenditure
Supported by 1.4bn students and 62.5m educators
- The e-Learning market is the fastest growing market in education, standing at \$91bn in 2012
23% CAGR forecasted out to 2017
- 700m** individuals of the world's population will lack basic literacy skills by 2015
- The cost of education has risen 84% since 2000, 37% higher than CPI, which has led to situations like the US student loan debt accumulation to over \$1tn. e-Learning is a cost effective alternative
\$1tn loan debt
- Internet users have grown 870% since 2000 massing over 2.4bn users globally and causing an evolutionary shift in how people can engage with the world
2.4bn internet users
- IBIS Capital's near term view on e-Learning:
In Europe alone there are **3,000+** e-Learning companies
Consolidation will be the theme as businesses seek to expand geographic reach, scale and service offering
- 257%**
US student tablet ownership grew 257% last year and in 2011 technology adapted training has penetrated over 40% of the Global 500 Fortune companies
- Current industry hype about new ideas and consumer learning requirements are disrupting the whole education eco-system
- The US⁽¹⁾ to push forward with Project Tin Can which will set **industry-wide e-Learning standards** for software
- IBIS Capital's hot picks for e-Learning for 2013: next generation content and its creation tools, adaptive learning, collaborative learning, Learning Record Stores (LRS), re-purposable learning, Massive Open Online Courses (MOOCs) and Open Education Resource (OER) management

Industry Overview



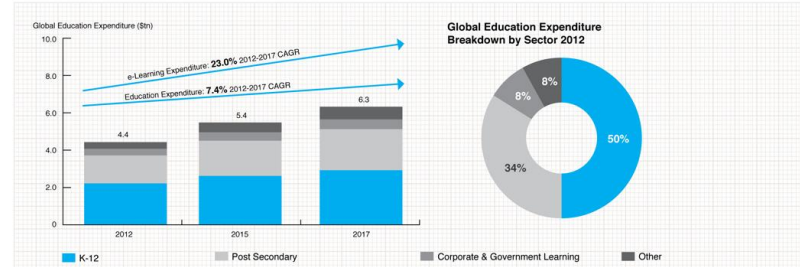
IBIS Capital's 5 Disruptive Businesses

| Company | Overview | Sector | HQ | Investors |
|-------------------|------------------------------------|--------------------|----|--|
| UDACITY | Free online university courses | Distribution | US | Andreessen Horowitz, Charles River Ventures |
| LORE | Social learning management system | Management Systems | US | Founder Collective, IA, Shasta, The Social-Capital Partnership |
| KHANACADEMY | Free education for anyone anywhere | Distribution | US | Google, Bill & Melinda Gates Foundation and other funding |
| Quipper | Quiz-based e-Learning apps | Content | UK | Benesse, Atomico Ventures, Globis Capital Partners |
| ELLANGUAGELAB.COM | Immersive learning | Distribution | UK | Avonmore Developments, Huda Associates, Private Investors |

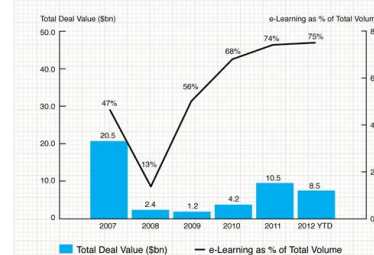
Education Giants

| Company | 2011 FY Revenue \$bn | Education Revenue as % of Total Revenue | HQ | Market Cap. \$bn |
|-----------------------------|----------------------|---|-------|------------------|
| PEARSON | 9.1 | 75% | UK | 15.2 |
| McGraw Hill | 6.2 | 37% | US | 15.7 |
| Benesse | 5.0 | 74% | Japan | 4.2 |
| THE WASHINGTON POST COMPANY | 4.1 | 58% | US | 2.8 |
| APOLLO GROUP | 4.7 | 100% | US | 2.3 |

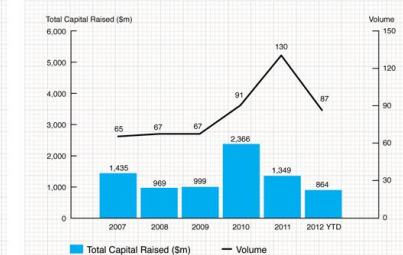
Global Education vs. e-Learning Expenditure Forecasts 2012-2017



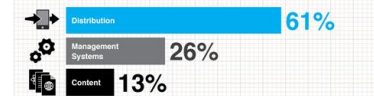
Global Education M&A Activity⁽²⁾



Global Education Fundraising Activity⁽³⁾



e-Learning Breakdown by Sector from 2007 to 2012 YTD (Volume)



e-Learning Breakdown by Sector in 2012 YTD (Volume)



Recent M&A Transactions

| Transaction Date | Target | Acquirer | Target Sector | Transaction Value \$m |
|------------------|---------------------|---------------------|--------------------|-----------------------|
| Nov 12 | CPAexcel | John Wiley & Sons | Distribution | 24 |
| Oct 12 | Embarcadero-Compass | Pearson | Management Systems | 650 |
| Oct 12 | Deltak | John Wiley & Sons | Management Systems | 220 |
| Aug 12 | Kenexa | IBM | Management Systems | 1,307 |
| Aug 12 | campuslabs | Higher One Holdings | Management Systems | 38 |

Recent Fundraisings

| Transaction Date | Target | Investor | Target Sector | Transaction Value \$m |
|------------------|---|---|--------------------|-----------------------|
| Nov 12 | GENERAL ASSEMBLY | VegasTechFund | Distribution | 9.8 |
| Oct 12 | Tareas Plus | Academic Partnerships | Distribution | 1.8 |
| Oct 12 | UDACITY | Charles River Ventures, Andreessen Horowitz | Distribution | 15.0 |
| Oct 12 | IBUSULL.COM | PR/O founders Capital | Distribution | 4.6 |
| Oct 12 | Bill & Melinda Gates Foundation, Retro Venture Partners | Bill & Melinda Gates Foundation, Retro Venture Partners | Management Systems | 3.3 |

Note: ⁽¹⁾ Client of IBIS Capital
All market data as at 10 December 2012 and using historical exchange rates where relevant | Source: IBIS Capital analysis, Learning Light, GBV Education report, Ambient Insight, Microsoft, Consumer Financial Protection Bureau, Annual Survey of Colleges, The College Board, Integrated Postsecondary Education Data System (IPEDS), U.S. Department of Education, National Center for Education Statistics, Babson Survey Research Group, Internet World Stats, McKinsey, Educause, ASTD, Kompas

(1) The Advanced Distributed Learning company is sponsored by the US Secretary of Defense and is contributing significantly to Project Tin Can
(2) Includes transactions above \$20m since 2007 and excludes transactions with undisclosed values. Includes the McGraw-Hill/Apollo transaction, which is still pending
(3) Includes fundraisings above \$1m since 2007 and excludes fundraisings with undisclosed values

Figure 2 Global eLearning Investments review

(Source: <https://onlineeducationbrode.wordpress.com>)

3.2.3 Cognitive Training Market

In recent years we are witnessing a proliferation of the cognitive training and brain fitness products and services. This is driven by the growth in aging population, accessibility of tests, global research environment and increased healthcare spending. Apart from healthcare professionals and organizations, adopters of cognitive training and assessment solutions including educational institutions, end consumers and other verticals, which are typically motivated by their needs monitor, assess, train, or enhance cognitive functions of individuals. According to MarketsAndMarkets the cognitive assessment and training market is estimated to grow from \$1,711.2 million in 2013 to \$5,721.2 million in 2018, at a Compound Annual Growth Rate (CAGR) of 27.3% from 2013 to 2018.

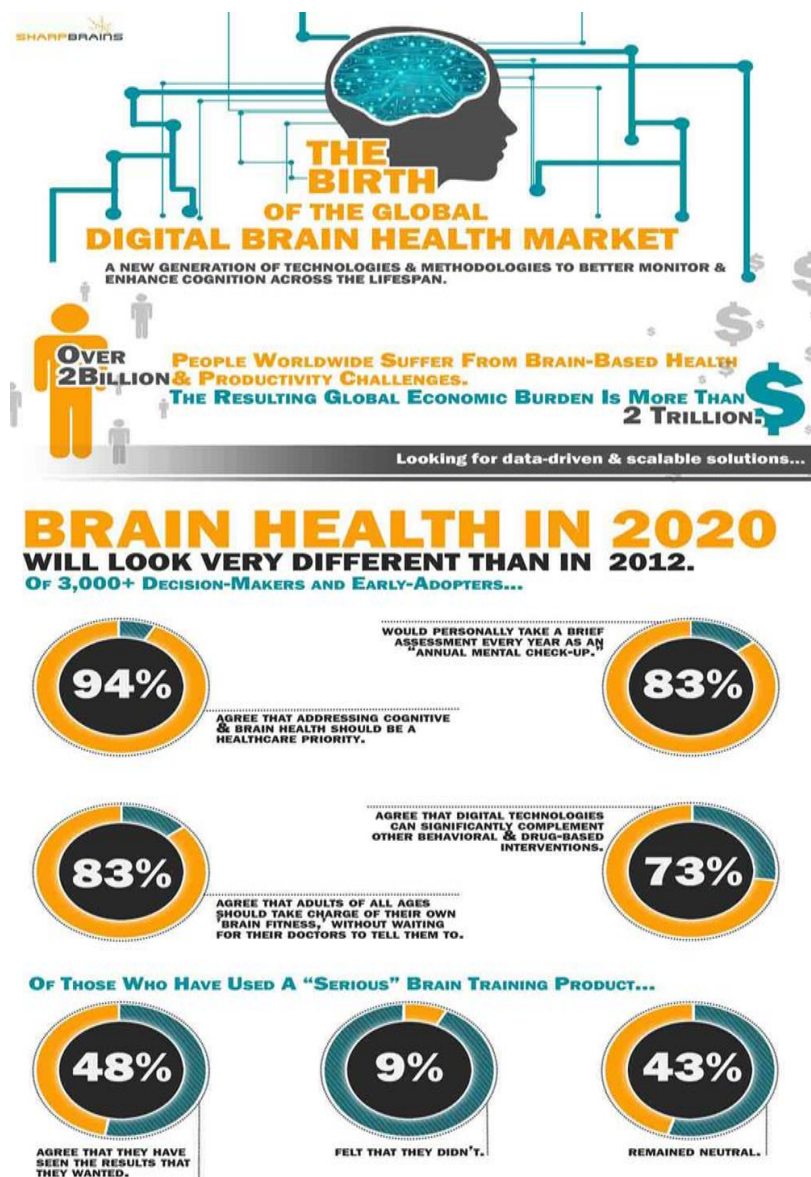


Figure 2: Overview Analysis of Brain Fitness Market (source: sharpbrains.com)

Without dwelling on each individual company providing cognitive training products or services, we herewith make some general remarks about the size of this market:

- Most of the above companies/organizations are based in the United States, which shows that the brain training market is almost ripe in this country;
- Most of these companies offer products for all the different areas of the brain training market: consumer, healthcare, therapeutic, insurance providers, education, military, sports, etc.;
- The providers of brain training services specifically dedicated to the cognitive problems of the elderly (Cognitive Fitness and Innovative Therapies, e-hub e-mental Health Research & Development, LearningRx, Memory Training Centers of America) are mainly clinical, research or non-profit organizations;
- In Europe we notice signs of increased interest for brain training technologies in the United Kingdom, both for the presence of a supplier in the list below (Ultrasis, provider of computer delivered, interactive healthcare products, including “MyBrainSolutions”, dedicated to organizations for improving employee health and wellbeing), both for the activities of the National Health Service that, as reported by SharpBrains 2010, has included the cognitive training in the Cognitive Behavioural Therapy (CBT), used to treat a number of different mental health conditions;
- A further signal of the growing market of brain training in the UK is represented by the recent birth (2011) of a new company, New Brain Technologies (www.newbraintechnologies.co.uk), that develops and distribute interactive software for improving memory, attention, mental processing speed, listening, decoding, motor performance and praxis, visual-motor efficiency;
- Another country where the brain training market is growing is Germany, where there are several companies offering solutions for brain training on ICT devices (PC, smartphone, tablet, ... - see www.plejaden.net, www.freshminder.de, www.memofit.net, www.cogpack.de); from a quick analysis based on information contained in the corporate websites, the solutions proposed so far seem oriented primarily to the local market or at German-speaking countries;
- The Austrian Schuhfried company (see www.schuhfried.at), specialized in computer-based psychology, although not specifically focused on mental disease of the elderly has a complete series of products for psychological assessment and cognitive training and operates internationally with 6 distributors and sales in 67 countries. Another major European company is the French Scientific Brain Training (SBT); SBT defines itself as “the European specialist for cognitive engineering dedicated to the fields of preventive healthcare and human resources”.

A non-exhaustive but indicative list of cognitive training solution providers is presented in the following table.

| Company | Web site |
|--|---|
| Applied Cognitive Engineering (USA) | http://www.intelligym.com/ |
| Arrowsmith School (Canada) | http://www.arrowsmithschool.org/ |
| Cognicity (USA) | http://cognicity.org/ |
| Cognitive Fitness and Innovative Therapies (USA) | http://www.sbcfit.org/ |
| e-hub e-mental Health Research & Development (Australia) | http://www.ehub.anu.edu.au/ |

| | |
|--|---|
| Houghton Mifflin Harcourt (USA) | http://www.hmhco.com/ |
| LearningRx (USA) | http://www.learningrx.com/ |
| Lexia Learning (USA) | http://www.lexialearning.com/ |
| Marbles: The Brain Store (USA) | http://www.marblesthebrainstore.com/ |
| Medinteract (USA) | http://medinteract.com/ |
| Memory Training Centers of America (USA) | http://www.memorytrainingcenters.com/ |
| Mind60 (USA) | http://www.mind60.com/ |
| NeoCorta (USA) | http://www.neocorta.com/ |
| Neurotrax (USA - Israel) | http://www.neurotrax.com/ |
| NovaVision (Australia) | http://www.novavision.com/ |
| Scientific Learning (USA) | http://www.scilearnglobal.com/ |
| Ultrasix (UK) | http://www.ultrasix.com |
| United BioSource Corporation (USA) | http://www.unitedbiosource.com |
| Telos International (USA) | http://www.telosinternational.org/ |
| VibrantBrains (USA) | http://www.vibrantbrains.com/ |

Table 4: Samples List of Companies providing Cognitive Training Solutions

PEARL relies on Cognitive Training technology by partner SiLO (www.cognitivetraining.eu). This technology is not among the market leaders in terms of annual turn-over or market share. However, it provides several unique features/capabilities in terms of ergonomics and user-friendliness, such as the support for multi-touch surface tables and mixed reality.

It should be also noted that the vast majority of the cognitive training solutions in the market are developed for use at home or within a care center (with or without the involvement of a health professional). PEARL is one of the first efforts to address the customization of cognitive training for the work environment and in conjunction with other age-friendly functionalities.

3.2.4 Physical Well Being @work Market

3.2.4.1 Office ergonomics

The market for ICT supporting physical and mental health at work is rapidly developing, but has no clear market leaders yet. It originates from ergonomics focussing on domains like monitor placement, adjustable chairs, desktop placement, keyboard and mouse placement and lighting. These physical (static) settings of the office workplace can help in the prevention of physical injuries such as neck pain or RSI. On this domain, ICT support predominantly focusses on computer use with software such as Workrave and CtrlWork that suggests taking a break after a certain period of computer usage. Other software packages such as Ergopoint, support the ergonomics specialist in his tasks by providing Online training on ergonomics, self-assessment for end-users and a management tool for the ergonomics professional. Finally, ICT can support in the actual physical behaviour of deskworkers by measuring their daily steps (e.g., the Fitbit).

| Company | Website | Focus on End-user | Focus on Professional |
|---------|---------|-------------------|-----------------------|
|---------|---------|-------------------|-----------------------|

| | | | |
|-----------------|---|---|---|
| Workrave | http://www.workrave.org/ | ✓ | |
| CrtIWork | https://www.ergodirect.nl/ | ✓ | |
| Humantech, Inc. | https://www.ergopoint.com | ✓ | ✓ |
| Myotel | http://www.myotel.eu/ | ✓ | |
| Fitbit.com | http://www.fitbit.com/ | ✓ | |

Table 5: Physical and Mental Wellbeing – ICT on the physical domain

Mental wellbeing has gain ground in office environments and care of the mental state of employees is a new domain that can be supported by ICT. Relevant occupational related diseases are stress complaints, concentration problems and more disabling diseases such as burn-out. ICT solutions on this domain can apply relaxation techniques (such as yoga exercises) and can support self-awareness of e.g. stress symptoms and its initiators (mindfulness) or can even help people function even better by applying positive psychology (positive design⁴). In the Netherlands even Healthcare insurers such as VGZ offer a mindfulness self-help App for free.

| Company | Website | Focus on End-user | Focus on Professional |
|---------------------------|---|-------------------|-----------------------|
| VGZ Healthcare insurer | https://www.vgz.nl/mindfulness-coach-app | ✓ | ✓ |
| iLBSOft | https://itunes.apple.com/nl/app/relax-melodies-sleep-zen-sounds/id314498713?mt=8 | ✓ | |

Table 6: Physical and Mental Wellbeing - ICT on the mental domain

As can be read from the previous two paragraphs, there are many opportunities for ICT to support physical and mental wellbeing at work. However, sound business plans have not yet been developed to a mature level.

3.3 Preliminary PEARL Marketing Plan

3.3.1 Focus of Marketing – Marketing Strategy - Target Groups

PEARL is planning to disseminate its exploitable assets and solutions to target customers, notably the different types of organizations outlined above. In-line with the business targets of the consortium, the marketing strategy will primarily target organizations that are likely to purchase and deploy PEARL's turn-key solutions for age-friendly workplaces. Secondary audiences for the project's marketing activities include: (A) Construction companies and developers of workplaces (e.g., office buildings), which might have an interest in equipping their developments with capabilities for age-friendly solutions; (B) Human resources experts (both individuals and companies), which are usually in charge of advising about employees working conditions; (C) Aged workers, which could raise the

⁴ Desmet, P. M. A., & Pohlmeier, A. E. (2013). Positive design: An introduction to design for subjective well-being. *International Journal of Design*, 7(3), 5-19.

demand for age-friendly workplaces, towards their employers; (D) Policy makers at various levels, including employers' organizations, professional associations and local/central governments, which might play a key role in boosting the development and adoption of age-friendly workplaces. (E) Clusters & trade unions, trade associations, industry organisations, Local Enterprise Partnerships are involved in the creative and digital industries, as the largest ever collaboration, and successfully levered public investment to match their own contribution to support skills and talent development and ensure their continuous growth and global competitiveness at senior/silver age.

The marketing activities towards the above audiences will take place following the end of the project i.e. as part of the execution of PEARL's business plan. The project will also attempt to reach those audiences earlier on, as part of its dissemination activities in the scope of WP5 of the project. Note however, that the dissemination activities of the project can hardly have a marketing character and orientation, especially prior to the completion of working deployments of the project's results.

3.3.2 Marketing Activities

Various activities (supported by the project proposal) will be undertaken in order to reach the above target groups. The goal will be to raise awareness on the PEARL workplan solutions, to generate word of mouth and viral effect, as well as to increase the prospective customers' databases of the partners. The activities include:

- **Direct Marketing - Participation in Exhibitions:** The PEARL partners will aim at demonstrating the project's solutions in exhibitions where potential customers and interested parties participate. In particular, exhibitions associated with workplaces, office/buildings construction and automation and novel manufacturing technologies will be targeted. A set of specific exhibitions will be specified in an updated version of this marketing plan, closer to the end of the project.
- **Digital communication:** Modalities to be employed include: (A) **Website and blog:** A website will provide information about PEARL and it will show its use in practice through demos and videos (i.e. depicting the deployments at RRD, SiLO and COMARG). The web site will also give the opportunity to the public to access videos/images of the solutions, along with testimonials of success cases. The regular content publication in the PEARL blog will help position the PEARL solutions as a reference in the turf of age friendly workplaces solutions. Its content will be dedicated to the client (i.e. employers, organizations of different types, smart cities etc.) in order to bring added value to stakeholders; (B) **Search Engine Optimization (SEO) and Search Engine Marketing (SEM):** PEARL will benefit from the use of SEO techniques towards maximizing the discoverability of its website, blog, YouTube channel and social networks thanks to internet search engines. The actions that could be included in a SEO/ SEM package are preparation of the website structure, establishment and continuous improvement of the website keywords, tags and traceability by the search engines, placement of links to other related or commonly-visited websites. SEO experts will be consulted towards achieving the best results. SEM entails PEARL solutions-related ads being shown to a specific individual, professional or user, who is researching on keywords relevant to the project's solutions characteristics. (C) **Advertisements in popular social networks and social media (such as Facebook, twitter, YouTube):** The promotion of PEARL in social networks will be done in two ways, with promotions on the sites of the social media and with the updating of the PEARL personalized pages on the social media. The he PEARL videos launched on

YouTube will be promoted organically (in-bound marketing) and through advertisements; (D) **Advertisements in (third-party) Websites**: through banners and news sponsorships to drive traffic to the PEARL website or other closely related content (i.e. landing pages, social networks, YouTube, etc). This may incur considerable costs, depending on the final selection of the third-party web sites where PEARL will be advertised.

- **Direct Marketing**: We will pursue direct marketing activities, aiming at attracting customers. The PEARL partners will use their existing database of contacts in the target markets (e.g., SiLO, COMARG, SENSAP maintain a list of industrial organizations in the creative industries). The relevant lists of potential customers will be addressed via regular mail and/or e-mail and/or phone. The following actions will be undertaken: (A) **Newsletter/ Client Attraction Emails**; (B) **Newsletter/ Retention or Activation focused E-mails to end Consumers**.
- **B2B Videos**: The PEARL partners will create and launch separate videos directed to corporate clients (i.e. organizations of the types identified earlier in this section) in order to demonstrate in an effective, motivating and illustrative way how the PEARL solutions could benefit aged workers at the workplace in general, as well as how individual functionalities (e.g., e-learning, cognitive training, well-being at the office) boost specific skills of the elderly. The videos will be a great tool to engage with a specific audience. For increased effectiveness, circulation and viral effect, each video will be promoted through social networks. Note that the videos will be developed by a professional marketing agency.
- **Cross-Marketing**: PEARL will pursue cross-marketing actions in collaboration with partnering companies. The latter could include banners or articles in their web sites, in exchange of the placement of similar banners or articles in the PEARL web site.
- **Advertisements in Specialized Magazines**: We will place advertisement in magazines read by: (A) Human Resources Professionals; (B) Construction Agencies; and (C) Aged Employees. These advertisements will inform both decision makers of companies and the aged employees themselves about the PEARL solutions, with emphasis on their scope and functionalities.
- **Marketing Alliances**: PEARL will pursue marketing alliance with other players/parties in the value chain of its services (e.g., ICT software/hardware vendors) as an effective means for untapping growth potentials that cannot be realized by any single player. In the PEARL case, market alliances with giant vendors of ICT software and hardware will be pursued. These stakeholders could have a direct benefit from PEARL sales, given that they could also increase the sales of their own software / related services.
- **Advertisements in popular social networks**: The promotion of the PEARL solutions in social networks, like Facebook or similar, will be carried out on an annual basis with specific campaigns that promote hits in the web site and video downloads and create viral effects.
- **Industry focused events**: In collaboration with clients in specific industries, PEARL will attempt to organize sectorial events in order to raise awareness within specific sectors and organization types (e.g., manufacturers, software industry, cultural organizations smart cities etc). Based on the level of success of these events, PEARL will repeat some sectorial/thematic events annually in its core markets. These events could create word of mouth and consumer anticipation on an annual basis, which will reinforce the PEARL brand in a cost effective way.

- **Digital marketing:** Further advertising through digital media, namely adwords campaigns, banners and external apps, will be pursued.

The marketing activities outlined above will be specified in more detail as part of the final business plan of the partners in terms of the exploitation of the project's results. The detailed specification of the activities will also include the selection of exhibitions and events, alliance partners, social media packages, web site content, media partners and more. This will also permit the estimation of the costs for these activities, which will be included in the financial plan.

3.3.3 Raising Awareness and Promotion towards Policy Makers

In order to raise awareness and associated demand for the PEARL solutions, the project intends to disseminate and communicate the project's results towards policy makers, including policy makers in the employment, healthcare and education (lifelong learning) sectors, but also local and regional governments. To this end, PEARL will organize workshops and targeted communications towards policy makers. PEARL is relevant to the following policy measures:

- **On-the-job training and lifelong learning:** The PEARL e-learning module supports on-the-job training and lifelong learning for the elderly, which is relevant to several employment policies.
- **Access to new technologies:** PEARL facilitates the elderly in improving their computer skills and Internet literacy, thus alleviating the digital divide.
- **Corporate Social Responsibility (CSR):** The PEARL age-friendly workspaces facilitate elderly individuals to work and live longer, thus boosting CSR policies.
- **Maintaining skills and experience of older workers:** PEARL facilitates the elderly in maintaining/sustaining their skills, thus ensuring their ability to remain valuable at work.
- **Providing professional training and assisting in job searches:** PEARL support the digital skills and lifelong learning of the elderly, thus offering them with possibilities to acquire new jobs despite their age.
- **Collaborative consumption:** The most valuable digital asset of PEARL platform is the strong impact of the collective integrity and trust in the sharing economy for elderly individuals. In the mass economy we've been used to, people bought from large and stable corporate brands, whose behavior was made more reliable by government regulation. But now, there is a new trust calculus, powered by both social and economic forces what we have to consider in the PEARL awareness activities. This a new economic model. The collaborative consumption is transforming business, consumerism and the way we live for a more fulfilling and sustainable quality of life. We have to teach and learn more about who's involved and how.⁵

⁵ What does Collaborative consumption means? <http://www.collaborativeconsumption.com/about/>

3.4 Planning for Commercialization and Market Launch

The commercialization strategy of the project will be realized on the basis of the following steps:

- Completing the development of the PEARL integrating platform, but also of its deployments at the trial sites (RRD, SiLO, COMARG).
- Validating, evaluating and fine-tuning the platform as part of the activities foreseen in WP5 of the project.
- Establishing and finalizing an Exploitation Agreement (EA) between the partners in terms of the commercial exploitation of the project's results. The exploitation agreement will (as a minimum) cover the following topics:
 - Identification of exploitable assets and foreground (finally) generated during the project. Section 2 of the present document will be exploited.
 - Specification of the IPR shares of the various partners in the jointly generated foreground. This includes regulation of the IPR shares in the integrated platform, but also in other jointly generated components i.e. components developed with the participation of two or more contributors.
 - Specification of the entities or entity that will undertake the commercialization. The partners will consider the potential benefits of (jointly) establishing a new legal entity, which could be dedicated to the commercialization of the project's results. Nevertheless, they are also considering the possibility of each partner to engage in the commercialization of the platform individually and on the basis of ad hoc collaboration with other partners as needed.
 - Specification of the rights and obligations of the partners as part of joint commercialization efforts. This may include obligations associated with annual investments and participation in marketing efforts, as well as rights associated with shares on sales.
 - Specifications of the rights and obligations of the partners as part of their individual exploitation efforts. Special emphasis will be put on illustrating rights and obligations associated with individual exploitation efforts involving jointly produced foreground.
 - Specification of provisions for the use of the project's results for other R&D efforts (including their (re)use in the scope of international research projects).
- Completion of a credible business plan, which will exploit, extend and detail the preliminary business plan that is presented in this document (e.g., the business targets, the SWOT analysis, the marketing plan and other parts of the present document). The business plan will include a financial analysis and plan, which is not included in the present document.
- Execution of the sales and marketing activities outlined in the previous paragraphs, with a view to raise awareness within potential customers, but also to pursue sales.
- Pursuing direct sales towards the above listed customer segments. As part of the business plan the target customers will be prioritized based on the country/market and type/industry sector. At this stage, the partners will target sales in their countries, where they have already established partnerships, sales channels and contacts with potential customers. Some of the partners maintain presence in other countries as well (i.e. they

have a multi-national presence), which broadens the scope of the target countries (including Austria, Switzerland, Netherlands, Romania, Denmark, Germany, Greece, Bulgaria and Cyprus).

- Establishing partnerships with stakeholders (e.g., workers' associations, policy makers, hardware and software vendors) that have direct access and collaborations with large numbers of target customers.

On the basis of the above steps, PEARL will realize the market launch of its solutions, leading to sales and productive deployments.

4 Commercial Activities and Compensation for Using Foreground of other Parties

4.1 Business Canvas for PEARL

The main business activities and resources needed for the commercialization of the PEARL platform and solutions are outlined in the Business Canvas Model [DeReuver13], which is presented in the following figure.








| | | | | |
|---|---|---|--|---|
| <p>Key Partners</p>  <p>PEARL Consortium Members, notably providers of individual technological components and integrators of PEARL solutions</p> | <p>Key Activities</p>  <p>Development and validation of the PEARL turn-key solutions Fine-tuning and improvement, towards increasing robustness and enhancing TRL level</p> | <p>Value Proposition</p>  <ul style="list-style-type: none"> •Personalized workspaces for individuals aged 55+ and working in creative industries •Ergonomic, motivating solutions for time management and training •Blending of well-being and cognitive training aspects | <p>Customer Relationships</p>  <p>Frequent contacts and discussions with organizations employing aged workers.</p> <ul style="list-style-type: none"> •Arrangement of presentations and demonstrations. | <p>Customer Segments</p>  <p>Private companies, Public sector, Big Production companies, Smart City, Event managers, Culture organisation, Health care professionals/org anizations, SMEs</p> |
| <p>Cost Structure</p>  <ul style="list-style-type: none"> •Solutions development costs. •Sales and marketing costs. •Expensive resources include experienced solution architects, as well as competent sales managers. | | <p>Revenue Streams</p>  <ul style="list-style-type: none"> •Fixed Licensing cost, along with annual maintenance and operations management fees. •Pay-as-you-go fees according to a (private) cloud-based model. | | |

Figure 3: Business Canvas for the Exploitation of the PEARL age-friendly workspaces solutions

As illustrated in the business canvas model, PEARL will primarily attempt to sell turnkey solutions, to the target customers-organizations identified in Section 3. The monetization strategy will either involve licensing of the solutions or their provision according to a utility based model (pay-per-use). A hybrid model (involving an upfront licensing fee and pay-as-you go fees) will be also considered. The main costs associated with the market launch of the PEARL solutions, include development and integration costs, which may extend beyond the scope of the AAL project in an effort to increase the maturity and robustness of the proposed solutions. Following paragraphs elaborate on various aspects of the exploitation and commercialization of the project’s results.

4.2 Joint Commercialisation

4.2.1 Business Targets

The main business targets of the PEARL consortium include:

- The development of an exploitation agreement and a final detailed business plan close to the end of the project, when the technical development and validation will be at their latest stages. The business plan to be developed will be an updated version of the business plan that is listed in the present document.

- The establishment of close and strong relationships with target customers (notably private companies in the creative industries, cultural organizations, smart cities) in the all the countries where the partners' have established presence and sales/marketing channels. As already outlined, the PEARL consortium partners have established presence in almost ten (10) EU countries.
- The establishment of close relationships with other organizations that could participate in co-marketing and joint sales of the PEARL solutions. Such organizations include vendors of hardware and software solutions for office automation, including ICT solutions. The project will establish relevant partnerships in order to pursue win-win market alliances.
- The establishment of close relationships with integrators of ICT and AAL solutions in countries other than those where the consortium has already established presence. Such relationships will facilitate the establishment of commercial agreements, which will enable the PEARL consortium to penetrate more counties – other than those where it has established presence.

4.2.2 Turn-Key Solutions

The commercialization of the PEARL results will be based on the design, integration and provision of turn-key solutions i.e. solutions deployed in a workplace based on the PEARL platform. These solutions will address specific customer needs, notably fulfilling a set of customers' and end-users' requirements about age friendly workspaces. The PEARL partners will sell, deploy and support/maintain turn-key solutions rather than individual technological modules or the PEARL platform itself. The reason for this is that the customers will be interested in turn solutions without delving into lower level details of their technical/technological implementation.

4.2.3 Editions of the Platform

As already outlined, the PEARL platform and solutions are not an “all-or-nothing” value proposition. Rather it will enable the provision of different functionalities (as capability sets or service bundles) based on different deployment configurations of the platform. The latter capability sets and deployment configurations can give rise to different editions of the PEARL platform, which could be marketed as different turn-key solutions tailored to the varying needs of the target customers. From a business perspective, the availability of different editions of the PEARL platform could facilitate marketing efforts through better addressing the varying needs of the customers. Furthermore, they could provide opportunities for different prices and pricing models. At the same time, the different editions can serve as a risk diversification mechanism. Currently, the consortium has not decided the detailed features of each edition, since these should match technical capabilities and features with market needs/demands. However, an initial assumption for possible editions is provided in the following table. This assumption stems from the grouping of relevant functionalities, which are associated with given needs of the customers. The project will attempt to acquire market feedback regarding the utility and potential market success of these editions (e.g., on the basis of a “willing to buy” question to target customers).

| PEARL Platform Edition | Components & Functionalities |
|----------------------------|--|
| Basic | Ambient Tuning+ Decisions Support + Configuration management |
| Time & Physical Management | Physical wellbeing, Time management |
| Training | E-learning, cognitive training |
| Professional | Basic Edition + Training |
| Ultra | ALL |

Table 7: Editions of the PEARL Platform

4.2.4 Innovation Management and Investments

At the time of writing this deliverable the exact financing needs of the consortium towards market launch are not specified in detail. These needs will certainly extend beyond the AAL project and respective co-financing of the project partners, for the following reasons:

- The need to support the marketing plan outlined above (Section 3).
- The need to fine-tune the development of the platform, based on feedback received from the marketing activities but also from the trials to be organized in the scope of the project.
- The need to implement additional features and functionalities.
- The need to support a strong sales and marketing team.

The partners will commit the resources needed to pursue their individual exploitation plans listed in the following sections. However, they will also engage in innovation management activities aiming to attract/raise additional funds i.e. the funding needed to support the above-listed activities. In this direction appropriate (“slide-deck”) presentations will be developed, which will reflect the main points of the exploitation agreement and the business plan. Additional grant funding may be also pursued, including EC funding (e.g., as part of the H2020 SME instrument and/or Fast Track to Innovation (FTI) Pilot programmes). Also presentations to private investors (including Venture Capitals) will be pursued.

4.3 SWOT Analysis

The following table provides a SWOT analysis for the PEARL products and services:

| | |
|--|--|
| <p><u>Strenghts:</u></p> <ul style="list-style-type: none"> • Novelty: The PEARL solution is novel and differentiated from other solutions/products available in the market. • Technology Knowhow: The consortium partners possess a strong knowhow associated with the project’s technologies, | <p><u>Weaknesses:</u></p> <ul style="list-style-type: none"> • Lack of strong presence in the target markets: The PEARL partners (even the industrial ones) do not have a strong presence in the market of age-friendly workplaces solutions. Hence, they will initially have to struggle for |
|--|--|

| | |
|---|---|
| <p>which is a sound basis for the provision of high quality solutions and (support) services to prospective customers.</p> <ul style="list-style-type: none"> • Risk Diversification: Rather than an “all-of-nothing” value proposition, PEARL will be exploited on the basis of different editions of the integrated platform, but also different individual exploitable modules. This diversification reduces the risk of commercial failure. • Programmability and Replicability of the PEARL solution: PEARL is a programmable and configurable platform that can be flexible customized to different needs of the end customers. This facilitates wider deployment and use. Likewise, the PEARL deployments can be flexible replicated across different companies possessing “similar” infrastructures. • Real-Life Deployment and Showcases: PEARL is deployed and demonstrated on a range of different settings, which will provide a set of readily available showcases towards attracting potential customers. | <p>branding and good reputation.</p> <ul style="list-style-type: none"> • Complex Integration: The integrated PEARL platform comprises a wide range of modules, which are based on heterogeneous technologies and platforms (including background technologies from the partners and third-parties). Hence, the production of the PEARL turn-key solutions requires a very intense integration effort. Nevertheless, the consortium partners comprise experienced integrators of complex systems and other better positioned than other groups towards completing this integration task. • Reliance on third-party products: As explained in Section 2 the PEARL solutions is based on a range of background solutions of the partners and on solutions from third-parties (including open source solutions). This could create complications associated with the provision of support for the PEARL turn-key solutions, especially in relation to the third-party products involved. |
| <p><u>Opportunities:</u></p> <ul style="list-style-type: none"> • Rising numbers of aged workforces: In coming years a proliferation of the number of elderly workers is expected. This will subsequently increase the demand for age friendly workspaces solutions like PEARL. • EU/National Policies for aged workers: The emergence of policies for the support of elderly workers is expected to provide opportunities for the market uptake of solutions like PEARL. Such policies are being developed at both national and EU levels. • AAL co-funding: The AAL grant provides a unique opportunity for the partners to develop and integrate novel solutions through reduced own investments. | <p><u>Threats:</u></p> <p>Lack of standards: Currently there is a lack of standards (including ICT-based standards) for the development and deployment of age-friendly workspaces solutions. This can be a serious threat for the technological longevity and wider penetration of the PEARL ICT-based solutions.</p> <p>Limited impact of ICT based services on elderly workers: Most of the PEARL solutions are ICT-based and therefore may not be widely accepted by workers with limited technological knowledge and expertise.</p> <p>Emergence of Competing Solutions: The emergence of solutions similar/analogous to PEARL could diminish its competitive advantages. However, the PEARL consortium is much</p> |

| | |
|--|---|
| | better positioned (and advanced) when compared to other groups starting a similar effort. |
|--|---|

Table 8: SWOT Analysis for the PEARL Products and Services

4.4 Individual Partners' Exploitation and Commercialisation Plans

The partners will pursue individual exploitation actions in-line with their business and research strategies. These activities are outlined in the following paragraphs.

4.4.1 AIT

Within the project, AIT developed prototypes for the Organio (see Figure 4 unterhalb), a digital pen-paper calendar system, and the PrivBoard, a digital second screen for to-do's. Both were developed to satisfy common needs of older knowledge workers at the workplace. Studies with end users of those tools confirmed the acceptance of such technologies by 55+ employees and showed the benefits the entire working environment can gain from such a tool through options of better digital integration of this predominately analogue cohort, which is used to conventional pen and paper calendars. Potential for individual exploitation lies in the core of the concept – digitising handwritten notes into a digital system in a specific context. Such context can be found in different industries and markets, such as big enterprises with the need to increasingly integrate aging employees into digital processes, medical environments, where from a doctor-patient–interaction perspective working with pen and paper allows for a faster and more personal scenario (e.g., clipboards on the patients bed, prescriptions etc.). Additionally it can be a bridge technology for digitising processes in different environments (e.g., production facilities).

Further exploitation will capitalize on developing a modular version of the calendar system, in order to increase the market potential for the solution. This can be pursued in collaboration with qualified project partners (within the MoU) and potential commercial partners after securing funding for this step in the first year after the end of the PEARL project. For the application within a medical environment, further collaborative projects with medical infrastructure providers such as KAV (Krankenanstaltenverbund) will be targeted for the next logical step of development.

The economically most promising way is joint development (with solution providers) and technology licencing in cooperation with commercial partners and ultimately sales partners, which have access to the most relevant market segments. Such collaborations will be aspired and actively sought within the project consortium and amongst other qualified technology and solution providers.

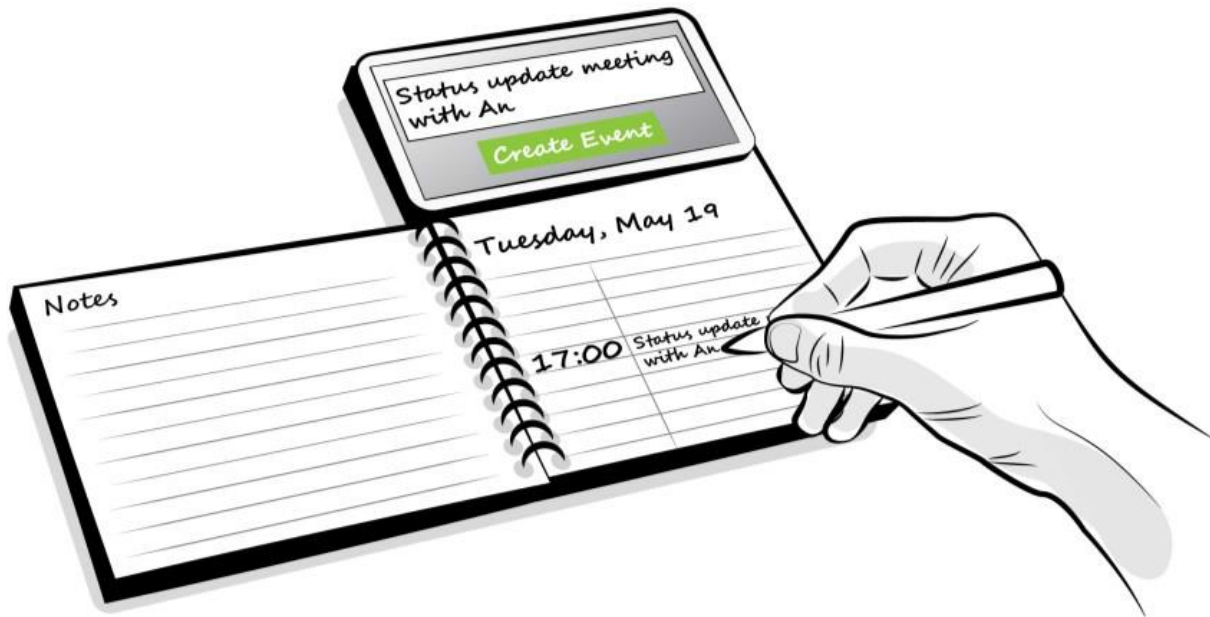


Figure 4: Mockup of the Organio calendar which shows the concept of merging analogue pen and paper with digital screens

4.4.2 RRD

Role in the project: As a tele-care expert and based on its experience in working with elderly users, RRD will contribute end-user (i.e. elderly workers) related knowledge across all the phases of the project's implementation lifecycle. It will participate in the elicitation and analysis of end-user needs, as well as in the specification and evaluation. Also, RRD will have a very active role in the project's trials through the involvement of real-users in lab trials on the basis of an appropriate lab environment to be setup at its premises. Furthermore, RRD will have an active role in evaluation activities in the field, notably activities involving the various stakeholders.

Additional RRD has contributed to the PEARL platform by adding their Physical Wellbeing Module. This module is based on a webportal with wearables that is currently being exploited commercially in healthcare, to be used by general practitioners, physiotherapists and specialists in hospitals to remotely guide patients towards a better physical condition. The PEARL module on physical and mental wellbeing of office workers is a new development of this webportal and its wearables.

The results from the field trials regarding the Physical Wellbeing module will be leading in efforts towards future exploitation of the Physical Wellbeing module as a stand-alone product. Furthermore, RRD will contribute to the exploitation of PEARL as a whole (modular product service system).

4.4.3 SILO

SiLo is currently considering two business models regarding the individual exploitable outcomes (cognitive training platform and games): 1) delivering the holistic solution under a licensing scheme. The licensing fees will be decided during the business planning phase. 2) Delivering the cognitive training platform as an open source platform, and commercialising the set of games that will be delivered, also offering an API to third party developers to develop additional serious games that can be delivered through the

platform. This could create an ecosystem of clients. The clients will pay fees to the company to deliver serious games through the platform, and they will acquire fees from the customers who will buy these games.

The goal of the company is to solidify slowly but steadily its position in two markets: the eHealth / assisted living market, delivering a solution targeting mainly individuals with mild cognitive impairments, and the serious games market, developing an initial set of serious games which it aspires to expand in the future.

4.4.4 COMARG

The year following the completion of the project will involve establishing the operations and sustainable funding streams necessary for short, mid and long term impact. During this period, communication, dissemination and mainstreaming of PEARL outputs (under a joint-ownership or MoU agreement, maybe a registered “PEARL®” brand) will continue. It is important to reiterate that the most effective mainstreaming interventions will be the work in our own country and PEARL seniors` communities.

The Objectives of COMARG of the first year of post project exploitation:

1. Obtain further recognition and support for PEARL’s achievements, and the short, medium and long term potential of the PEARL toolkits and newly created training materials (which are MOOC based), from those stakeholders not directly involved in the project, like policy makers, NGOs of seniors, leading national/regional ICT suppliers and training institutions.
2. Coordinate the activities of a group of the PEARL`s friends or communities; to create a Pan-European PEARL network engaged in using and promoting PEARL Tools and resources through senior organisations and Age Platform of the EU (<http://www.age-platform.eu>).
3. Establish a pan-European network of PEARL providers and, through collaboration and research, deliver a set of training materials and guidelines for wider adoption in senior organisations across Europe to increase the quality of training in the use of ICT in the silver economy.
4. Expand the scope and scale of the PEARL MOOC training provision, including training delivered through regional and national authorities, and targeting wider groups, including AGE Member directory, ICT suppliers and resellers, and existing ICT tutor networks for active Seniors @ work in Europe and beyond.

MOOC as open learning for seniors: commercialisation plan: The necessity to build a sustainable business model is evident: how to find an effective way to generate revenue from PEARL MOOC as new product that using a the Internet giveaway. It will include the pricing structure, the exit strategy, the revenue models such as content licensing, and commercialisation plan depend on several factors. It is very strategic and forward thinking of PEARL to realize that his business model is not viable in terms of partnering with traditional e-learning platforms as we see the need to attend to the skills gap in the silver economy. It must be study the potentiality to establish a new start.-up company.

A new B2C initiate, which should generate regular income from PEARL MOOC can be the payment for certificates of completion that verify the identity of the senior users in their job employments (e.g. Signature Track, which is one of Coursera`s Business to Consumer (B2C) initiatives and this is currently the biggest money maker in the MOOC space.

We are still in the active exploration phase but MOOCs offer a great opportunity for active seniors communities where their future and growth depend on the expansion of certain skills sets and the continued aggregation of this user community.

The “PEARL MOOC moment” is helping to redefine the relationship between technology and vocational and educational training (VET) in the silver economy in respect of the shared economies and new trends in the collaborative consumption.

4.4.5 EMPIRICA

Empirica's primary responsibility in PEARL is the development and implementation of the techno-economic evaluation, which includes a detailed cost-benefit analysis. Results of this work can feed into political decision-making processes as well as facilitating the decision-making processes within the companies themselves. Furthermore, Empirica supports the requirement elicitation and analysis in the initial phase of the project. These include the development/ adaptation of survey instruments that guide the pilots responsible for implementing the requirements analysis and the subsequent evaluation of the results for usage in the subsequent work packages.

The developed and adapted tools for cost-benefit analysis in PEARL are initially used to facilitate decision making processes and testing of new, ICT-supported services in the PEARL pilot enterprises. In a subsequent step, it is envisaged that results can be incorporated into national and European decision-making processes and made available to policy-makers, employers and employers' organizations.

Empirica has many national and European contacts with relevant companies and policy makers such as:

- Federal Institute for Occupational Safety and Health
- Institute for Occupational Safety and Health
- Federal Employment Agency or the Institute for Employment Research (IAB)
- Federal Association of Integration Offices
- Federal Institute for Vocational Training (BIBB) - Germany
- German Association for Public and Private Welfare, Berlin
- Forum Social engineering design, Baden-Württemberg
- Federal Association of Supported Employment (BAG UB) eV
- IG Metall, DGB, ver.di
- SAP, German Bank, Continentale Insurance, Barmenia, LVM Versicherung
- Zurich Group Germany
- German Telekom
- European Commission
- Eurostat
- Euro Found
- Organisations representing older people such as BAGSO in Germany and AGE at European level.

These long-standing relationships (mainly established in previous projects) will be used for the exploitation of the results of the project PEARL. One of the main goals is the exploitation of the results of the requirements and cost-benefit analysis in the development of consultancy services and instruments for occupational health management.

Specific measures are:

- Develop recommendations to employers and policy-makers at national and European level, based on the results of the cost-benefit analysis
- The results of the cost-benefit analysis serve as a basis for planning relevant adaptation and change management processes in the companies.
- Ensuring the exploitation of the results of the cost-benefit analysis in the development of consultancy services and instruments for occupational health management
- Feed the results and findings of the project in national, regional and European policy processes.

4.4.6 SENSAP

SENSAP is involved in the project with the responsibility of developing the platform's RFID/AutoID modules, notably the modules that support the ambient tuning layer of the platform. While these modules are highly relevant to the company's RFID and IoT (Internet-of-Things) product lines (such as the S-BOX traceability platform), the PEARL target markets do not coincide with the main markets addressed by the SENSAP products and services. In particular, SENSAP is currently focusing in the manufacturing market, where it offers factory automation and quality control services. As a result, the exploitation strategy of the company will focus on the following directions:

- Promoting and selling the PEARL solutions as an add-on to its manufacturing solutions. This can take two forms: (A) Sale of a separate product and (B) Injection of the PEARL solution as part of the company's manufacturing solution.
- Establishing PEARL as a separate business case within the company, to be addressed in other target markets (as specified in Section 3).
- Participating in the joint exploitation (i.e. in collaboration with other partners) with the role of offering support for ambient tuning layer.

The selection of one or more of the options above will depend on the maturity of the platform to be produced and on its applicability to shopfloor related scenarios.

SENSAP will certainly exploit the project's results in order to enhance its S-BOX product and validate it in a new application domain. As already outlined, the final results may lead the company to commence a new product-oriented activity relating to age-friendly workplaces, while also moving to the direction of adapting the production processes (in manufacturing) to the environment and the needs of aged workers.

In order to support a new business case and associated activity, SENSAP will attempt to raise funds from national and EU projects (as grant funding).

4.4.7 AAU

CTIF will exploit the project in order to strengthen research and education activities within the university, including – but not limited- to intelligent and adaptive office automation tools. At the same time, it intends to introduce the PEARL platform to a number of potential organizations. That will be achieved through synergies at national level and of course by collaborating with PEARL partners too. CTIF will also exploit the project results for technology/knowledge transfer at a regional and national level, while also pursuing the release of some core libraries as open source. Finally, CTIF will investigate the possibility of launching a spin-off under NOVI center, an incubator which is co-located in the premises of the university.

4.4.8 RFID-SPE

RFID spec will use the results from the PEARL project to expand their products to AutoID solutions for office jobs, there is today no major players in the market for AutoID office processes and use of new technologies to make the surroundings of technological level with the technologies used in the work processes, especially in Scandinavia, we see a market for office automation.

RFID spec has a strong position in the market for industrial AutoID solutions, solutions for office automation will be a horizontal expansion of the market, and we see the market potential as much bigger than just older employees, we see that the solutions developed for the PEARL project also will be very relevant to other younger employees too

4.5 Rights and obligations of the Parties

4.5.1 Rights of the Parties

In general, all partners will be offered with the option of participating to the joint exploitation efforts, regardless of the level of their contribution to the development and integration of the PEARL platform. The exploitation agreement will define the IPR shares of all the partners to the integrated platform, but also to individual components that will be developed in the project. All partners will be able to exploit the integrated turn-key solutions as soon as they respect the exploitation agreement and they pay the licensing fees that other partners are entitled to according to the EA.

All partners will be also given the opportunity to exploit PERAL components for future R&D (e.g., in the scope of new research projects) on the basis of privileged conditions.

IPR shareholders will be offered the rights to provide (technical) support and updates (e.g., updated releases) for the components that they own. Other partners will have the right to benefits from this support and/or updates at a fee. Note however that partners will be offered with opportunities of deploying, enhancing and extending components developed from other partners, as soon as they respect the licensing arrangements quoted in the exploitation agreement.

4.5.2 General Undertakings of the Parties Wishing to Commercialise Products

The exploitation will offer two options for partners wishing to commercialize the PEARL results:

- An option to individually exploit the PEARL turn-key solutions, in a way that respects the contributions and efforts of other shareholders.
- An option to jointly exploit the projects results on the basis of bi-lateral (or multi-party) agreements that will respect the main lines of the exploitation agreement.

The first option will allow partners to sell PEARL solutions in their territories, based on the minimum involvement of other partners (i.e. licensing agreements). The second option will allow partners to engage in joint commercialization or joint-ownership based on new agreements that respect, yet extend beyond licensing arrangements.

4.5.3 General Undertakings of the Parties Requested to License their Foreground

As already outlined, partners wishing to engage in the commercial exploitation of the PEARL results (i.e. sales of turn-key solutions), should respect the exploitation - in form of joint-ownership - agreement in terms of the use of components and IPR produced by other partners. In particular, it is expected that partners selling and deployment PEARL will pay a licensing fee to IPR shareholders of the components to be deployed on the basis of an agreed “wholesale” price, which will be listed in the exploitation agreement.

4.6 Use of Third-Party Products by PEARL

4.6.1 Overview

A main third-party product that will be licensed and used as part of the PEARL exploitation and commercialization activities is the e-doceo Learning Suite, which is described below.

4.6.1.1 The e-doceo Learning Suite

The e-doceo Learning Suite is a global blended learning solution produced by e-doceo, within which all or part of its LCMS and LMS.

The LCMS, e-doceo content manager provides access to five Functional Modules.

The Document Management and Storage Module provides for:

- submission of Resources and management of validation workflows; and
- access to collaborative functionalities.

The “Face-to-Face” Module allows for:

- the creation of teaching kits of on-site activities;
- the creation of trainer guides; and
- the use and personalization of on-site educational games.

The Rapid Learning Module enables:

- the creation of TvLearn programs;
- the conversion of files from PowerPoint to Flash;
- the creation of screen movies and courseware;

The E-Learning Module enables:

- the creation of educational scenarios and storyboards;
- the creation of interactivity from a gallery of more than 35 activities; content mediation, thanks to a wide variety of functionalities;
- content localization, thanks to multilingual functionalities; and
- exports to Flash and HTML5 technologies, in accordance with SCORM or AICC standards.

The Steering Module allows for:

- access to Super Administrator functions;

- project creation and management;
- team creation and management; and
- distribution of the Packages to the teams.

The LMS, e-doceo learning manager (hereinafter referred to as “elmg”), provides access to four Functional Modules.

The Delivery Module is used to:

- track online training;
- create training paths; and
- use community tools.

The Organization Module provides for:

- access to Super Administrator functions;
- account, group, session and site creation and management;
- team creation and management; and
- report creation.

The Catalog Module enables:

- the creation of a training catalog; and
- the sale of catalog items, via online payment systems.

The Synchronous Module allows for:

- the use of audio and video conferencing tools;
- the use of chat functions; and
- the use of a white board and survey tools

4.6.2 Mode of Exploitation and Commercialisation

COMARG: In accordance with the service agreement, between COMARG and the whole PEARL project consortium, Beaugreg-arts SA as the owner of e-doceo platform and learning management system owns all intellectual property rights necessary to assign the operating and usage rights under the service agreement. But this service agreement guarantees freedom to operate without infringing the intellectual property rights of third parties portions of the use of its software or services.

This agreement is effective upon signature and is valid until the end of the PEARL project (six months additional as right reserve). The terms of use of data, software and content after the end of the contract are stipulated in the preceding articles. By signing the Service agreement, the PEARL consortium accepted to:

- access rights to the e-doceo’s servers,;
- right of use of the Software Suite, and
- a set of services, namely Data hosting, Maintenance and updates to the Software Suite.

Data are the property of the PEARL consortium and their use is under their responsibility.

5 Conclusions and Outlook

This deliverable has dealt with a number of issues that are prerequisites for the market launch and commercial exploitation of the project's results. These issues related to two main areas:

- Issues associated with the establishment of an exploitation (joint-ownership) agreement between the partners. These include the identification of exploitable assets, the identification of contributors to the project's foreground, as well as an outlined of the partners' rights and obligation during exploitation.
- Issues associated with business planning and market launch, including a preliminary business plan. These include the identification of potential customers and market segments, the production of preliminary marketing plan, a SWOT analysis, as well as an analysis of target markets.

At the time of writing of this deliverable, there are several technical/technological issues pending, including issues that will be decisive for the PEARL solutions' market launch (e.g., final list of functionalities, specification of the different editions of the platform and more). As a result the provided business plan will be updated at a later stage, when concrete responses to all pending issues will be available. Likewise, the exploitation (joint-ownership) agreement will be also completed and endorsed (by all partners) following the successful integration and validation of the PEARL platform. Nevertheless, the present document provides a sound basis for developing the project's exploitation agreement and final business plan during subsequent stages of the project.

References

[DeReuver13] De Reuver, Mark, Harry Bouwman, and Timber Haaker. "Business model roadmapping: A practical approach to come from an existing to a desired business model." *International Journal of Innovation Management* 17.01 (2013)

[Yu13] Yu Weiping, Zhuang Ailing, Zhang Xiao: The Influence of C2C Virtual Community Interactive Characteristic on the Network Purchasing Behavior , *Service Sciences (IJCSS)*, 2012 International Joint Conference. Shanghai, Bus. Sch., Sichuan Univ., Chengdu, China