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A European Serious Gaming 3D Environment

Deliverable

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Abstract

This document describes PLAYMANCER's approach to the dissemination of the project's results and knowledge gained during the work. It expresses as far as possible in concrete terms, the dissemination strategy adopted, the actual achievements in dissemination, the dissemination activities envisaged and the material planned to be produced and diffused in order to maximize the project's impact on scientific and industrial community and obtain as much reuse of knowledge and technology as it can from expert parties around the world.

Table of contents

INTRODUCTION	8
1 DISSEMINATION STRATEGY	9
1.1 STRATEGY DESCRIPTION.....	9
1.2 DISSEMINATION PLAN OBJECTIVES.....	10
1.3 IDENTIFIED AUDIENCE	10
1.3.1 <i>User Communities</i>	10
1.3.2 <i>Projects</i>	12
1.3.3 <i>Working Groups</i>	16
2 DISSEMINATION PLAN	18
2.1 DISSEMINATION CHANNELS.....	18
2.1.1 <i>Internet</i>	18
2.1.1.1 <i>Project Web Site</i>	18
2.1.1.2 <i>E-mailing Lists and Newsletters</i>	22
2.1.2 <i>Events</i>	23
2.1.2.1 <i>Organization of public workshops</i>	23
2.1.2.2 <i>Organization of a Networked session at the ICT 2010 event</i>	24
2.1.2.3 <i>Participation in events</i>	26
2.1.3 <i>Press</i>	28
2.1.3.1 <i>Scientific Publications (in conference proceedings and scientific journals)</i>	28
2.1.3.2 <i>Press Release/Press Coverage</i>	29
2.1.3.3 <i>Advertisements</i>	29
2.2 DISSEMINATION MATERIAL	30
2.2.1 <i>Project Logo</i>	30
2.2.2 <i>Project Brochure</i>	30
2.2.3 <i>Project Poster</i>	33
2.2.4 <i>Project Banner</i>	36
2.2.5 <i>Project Presentation Template</i>	38
2.2.6 <i>Presentations</i>	39
2.2.7 <i>Publications</i>	39
2.2.8 <i>Audiovisual Material</i>	56
2.2.9 <i>Press Releases</i>	60
2.2.10 <i>Public Project Documents</i>	61
2.3 DISSEMINATION ACTIVITIES: DISTRIBUTION OF MATERIAL BY DISSEMINATION CHANNEL	64
3 USE PLAN.....	68

3.1	EXPLOITATION VECTORS	68
3.2	EXPLOITATION MODEL	71
3.3	COMPETITORS	71
3.4	EXPLOITATION OBJECTS	72
3.4.1	<i>Individual Objects</i>	72
3.4.2	<i>Composite Objects</i>	73
3.5	EXPLOITATION DIRECTION	76
3.5.1	<i>Internal</i>	76
3.5.2	<i>External</i>	77
3.6	REGIONAL DIMENSION	79
3.7	PROMOTER	80
4	MARKET ANALYSIS	81
4.1	MARKET SEGMENTS	81
4.1.1	<i>Games for Health, and for Psycho-education</i>	81
4.1.2	<i>ICT solutions for Eating disorders, Gambling and other addictions</i>	83
4.1.3	<i>ICT solutions for pain rehabilitation</i>	84
4.1.4	<i>Motion Capture (for Games)</i>	84
4.1.5	<i>Affective Interfaces and bio-feedback (for Games)</i>	87
4.1.6	<i>Speech Recognition (for Games)</i>	91
4.2	RELEVANT R&D PROJECTS	93
4.3	SWOT ANALYSIS	97
4.3.1	<i>Integrated PlayMancer result</i>	97
4.3.2	<i>PlayMancer serious game for mental health</i>	99
4.3.3	<i>PlayMancer serious game for pain rehabilitation</i>	100
4.3.4	<i>User emotion recognition component</i>	101
4.3.5	<i>Multi-sensor Motion capture component (IOTracker system)</i>	103
5	EXPLOITATION STRATEGY	105
5.1	COMMON EXPLOITATION STRATEGY	105
5.2	INDIVIDUAL PARTICIPANT'S EXPLOITATION PLANS	106
5.2.1	<i>Systema Technologies (ST)</i>	106
5.2.1.1	<i>Profile</i>	106
5.2.1.2	<i>Expected use/ exploitation of the project results</i>	107
5.2.2	<i>Netunion (NETUNION)</i>	108
5.2.2.1	<i>Profile</i>	108
5.2.2.2	<i>Expected use/ exploitation of the project results</i>	108

5.2.3	<i>University of Patras (UOP)</i>	110
5.2.3.1	Profile.....	110
5.2.3.2	Expected use/ exploitation of the project results.....	110
5.2.4	<i>Technical University of Vienna (TUW)</i>	111
5.2.4.1	Profile.....	111
5.2.4.2	Expected use/ exploitation of the project results.....	111
5.2.5	<i>University Hospital of Bellvitge (IDIBELL)</i>	112
5.2.5.1	Profile.....	112
5.2.5.2	Expected use/ exploitation of the project results.....	112
5.2.6	<i>University of Geneva (UNIGE)</i>	112
5.2.6.1	Profile.....	112
5.2.6.2	Expected use/ exploitation of the project results.....	113
5.2.7	<i>Serious Games Interactive (SGI)</i>	113
5.2.7.1	Profile.....	113
5.2.7.2	Expected use/ exploitation of the project results.....	114
5.2.8	<i>Roessingh Research and Development (RRD)</i>	115
5.2.8.1	Profile.....	115
5.2.8.2	Expected use/ exploitation of the project results.....	115
REFERENCES		116
APPENDICES.....		118
PART B1.....		118
PART B2.....		119

Table of Figures

Figure 1: PLAYMANCER Website – Public Area.....	20
Figure 2: PLAYMANCER Website – Members Area (Project deliverables section)	21
Figure 3: Google analytics for www.playmancer.com	22
Figure 4: PLAYMANCER Project Logo.....	30
Figure 5: PLAYMANCER 3-fold Brochure (Front and Back Pages).....	32
Figure 6: PlayMancer poster -2009 version.....	34
Figure 7: PlayMancer poster -2010 version.....	35
Figure 8: PlayMancer banner.....	37
Figure 9: Official PLAYMANCER Presentation Template	38
Figure 10: Updated version of the project Presentation Template	39
Figure 11: Capture from the first project video.....	56
Figure 12: Capture from the second project video.....	57
Figure 13: Capture from the third project video, a game prototype	57
Figure 14: Capture from the fourth project video, a TV channel report	58
Figure 15: Capture from Euronews TV report.....	59
Figure 16: Capture from a Spanish TV channel report on the project	59
Figure 17: Partial list of the public project deliverables	62
Figure 18: Partial list of the public project research publications	63
Figure 19: Partial list of the public project press releases.....	63
Figure 20: List of the public project presentations	64
Figure 21: Exploitation Vectors	68
Figure 22: Exploitation Model.....	71
Figure 23: The Khemia game for smoking addicts	83
Figure 24: The g.Mobilab+ system for medical signal acquisition	88
Figure 25: The MobiHealth system for medical signal acquisition.....	89
Figure 26: The wild divine bio-feedback game	90
Figure 27: The emwave desktop bundle of bio-feedback hardware and software.....	91

List of Tables

Table 1: EC concertation group meetings that PlayMancer participated.....	17
Table 2: List of periodical events of interest to be attended by Partners.....	28
Table 3: Template A1 - List Of Scientific (Peer Reviewed) Publications	41
Table 4: Template A2- List Of Dissemination Activities	46
Table 5: Dissemination plan per project quarter as number of events per disseminations channel.....	66
Table 6: Relevant to PlayMancer R&D projects.....	93
Table 7: Template B1 - List Of Applications For Patents, Trademarks, Registered Designs, Etc.....	118
Table 8: Template B2 - List Of Exploitable Foreground	119

Introduction

This document is the revised issue of the deliverable D7.3: Plan for the Use and Dissemination of Foreground. The document is updated with project dissemination events and activity including the project month 34. Another revised version of this document is expected to be issued in month 36.

This issue of the Plan for the Use and Dissemination of Foreground describes PLAYMANCER's approach to the dissemination of the project's results and knowledge gained during the project's lifetime. It expresses as far as possible in concrete terms, the dissemination strategy adopted, the actual achievements in dissemination, the dissemination activities envisaged and the material planned to be produced and diffused in order to maximize the project's impact on scientific and industrial community and obtain as much reuse of knowledge and technology as it can from expert parties around the world.

Progress and results of the project have been and will be promoted through the project's Web site, newsletters and e-mailing lists, organization and participation into events and working groups and the press. In addition, the project will contribute to as well as to standardisation activities and will take part in national and European concertation events, with emphasis being placed on promoting clustering activities with other research projects that exploit advanced technologies for the provision of health care in the mental health and kinetic rehabilitation domains.

The dissemination material that has been or will be produced as part of the project's work is also presented in this document along with issues to be addressed concerning the selection/production of the appropriate dissemination material for better supporting the various dissemination activities and reaching the widest possible audience. This revised version of the document covers dissemination activities that have been conducted after the release of the first issue of D7.3.

In addition to the dissemination strategy there is a great interest in the direct or indirect utilisation of foreground in further research activities – other than those covered by the project – or for developing, creating and marketing a product or process, or for creating and providing a service. A description of the participants' plans for the use of foreground has been added to this document within the last year of the project, i.e. after obtaining concrete project outcomes.

1 Dissemination Strategy

1.1 Strategy Description

In order to provide a clear dissemination strategy so that each PLAYMANCER partner can work towards promoting the project in the most effective and efficient manner, the PLAYMANCER Dissemination Schema has been developed to serve the project goals and objectives.

The PLAYMANCER Dissemination Schema involves activities that belong to three discrete groups:

1. **Community Dissemination Activities:** Activities for the dissemination of project results to the health care community, which includes primary (clinics and rehabilitation centres) but also secondary (carers, social workers, family) and tertiary (computer game players and citizens at large) users, assistive technology industry, SME's in partner countries, and the public.
 - Constituency: medical associations/ networks, associations of psychiatrists and rehabilitation experts, health care associations, health care institutions (care homes, residential and day-care homes for older persons), housing associations, home automation, assistive technology manufacturers, ICT industries, serious computer game publishers, governmental organizations, and general public.
2. **Scientific Dissemination Activities:** Activities for the dissemination of the developed project knowledge and results to the research and scientific community.
 - Constituency: Universities and academia, research institutes, scientists and researchers, R&D in industry
3. **Clustering Dissemination Activities:** Activities for the dissemination of the developed project knowledge and results to allied and related ICT Projects in the Area of ICT & Networked Media (especially in the area of User-Centered Media).
 - Constituency: EC and FP7 relating Projects and Clusters

Activities in each group will be geared towards the production and support of specific dissemination material that PLAYMANCER is going to use to promote its results to the concerned target audience through a variety of dissemination channels. The specific dissemination material along with the dissemination channels the PLAYMANCER consortium plans to exploit to disseminate the findings and results are presented in chapter 2 of the document.

1.2 Dissemination Plan Objectives

The main aim of the PLAYMANCER Dissemination Plan is to make the target and general audience aware of the PLAYMANCER project, its findings and results, and to open a dialogue and orchestrate discussions with all the relevant stakeholders. Specific objectives of the PLAYMANCER dissemination plan are:

- Widen scope of application by collecting more requirements/wishes from interested user parties
- Create a wide community that adopts and promotes the PLAYMANCER system and concept.
- Validate the project's results and obtain feedback by expert groups, scientists, representatives of SMEs in the partners' countries, and interested user communities.
- Maximize reuse of knowledge and technology by making PLAYMANCER achievements visible and importing state-of-the-art findings of other communities.
- Promote emerging or contribute to launching new standards through synergies with appropriate working groups.

1.3 Identified Audience

The following sections present initial areas sought for obtaining contacts and opportunities for collaboration and target groups for dissemination and exploitation of the PLAYMANCER project findings and results

1.3.1 User Communities

PLAYMANCER project covers a range of potential user communities: binge eating patients, gamble addicts, individuals suffering from chronic pain, their associations/ networks, health care associations, health care institutions (physiotherapy centres, care homes, residential and day-care homes, special hospital units), as well as computer game publishers, game developers, research centres.

IDIBELL, a partner expert in mental health issues and pertinent eating disorders and gambling addiction, participating in PLAYMANCER as a partner, represents one of the two communities of end users. The project has developed a serious game and assorted peripheral equipment in order to support clinical therapy for mental health patients. Apart from IDIBELL, within PLAYMANCER, RRD, being a scientific research centre in rehabilitation technology, is representing the community of end users suffering from chronic pain. Furthermore, NETUNION acts as an intermediary organisation in the domains of technology for care/welfare and sustainability, bridging the worlds of technology development and those of end-users and service/care providers. The PLAYMANCER

consortium has contacted additional end-user groups or experts (expert medical personnel, health care associations, health care institutions, etc) from various European countries with the aim to establish a user group that will be kept up to date with the project development and will be invited to attend the various PLAYMANCER showcase and dissemination events providing valuable feedback and experience.

Systema Technologies (ST), a research intensive solutions integrator and serious games promoter, is also participating in PLAYMANCER. ST has been building unique expertise in capitalising research results, more precisely in the areas of HCI, simulation visualisation, multimodal interaction, serious games, and health care systems aiming at new technology and respective Market niches.

Serious Game Interactive (SGI) is a serious game developer that has a deep understanding of the use of serious games in education. The company has established a network of clients in the domain of primary and secondary education, through the development and promotion of related products such as the Global Conflict series of games.

The PLAYMANCER consortium has contacted further medical and industry representatives who are invited to participate in the requirements phase of the project, attend the events organised by the project, and provide target sector consulting and knowledge. So far, the following distinguished domain experts have provided feedback on the mental health project results:

- **Prof. Dr. Janet Treasure**, Professor of Psychiatry, King's College London (*UK*): One most World relevant leaders on Eating Disorders.
- **Prof. Dr. Mariano Alcañiz Raya**, Polytechnic University of Valencia (*Spain*) and Director of Humanlab: expert on Virtual reality, Cyberpsychology and E-Health
- **Prof. Dr. Katherine Halmi**, Professor of Psychiatry and past-president of World Psychiatry Association, section for Eating Disorders, New York (*USA*). World leader on Eating disorders and Psychiatry.
- **Prof. Dr. Cristina Botella**, President of Cyberpsychology and Behaviour Association, Psychology School, Jaime I University, Castellon, (*Spain*): expert on New Technologies in mental disorders.
- **Prof. Dr. Ulrike Schmidt**, Professor of Psychiatry, The Maudsley Hospital, London (*UK*): expert on New Technologies and Eating Disorders.
- **Prof. Dr. Conxa Perpinya**, Psychology School, University of Valencia (*Spain*): expert on Virtual Reality therapy.

- **Prof. Dr. Rosa Baños**, Psychology School, University of Valencia (*Spain*): expert on Virtual reality, Cyberpsychology and E-Health

Physiotherapists of Roessingh centre of rehabilitation helped with the development of the exercises, presented in the Playmancer game. Experts on eating disorders and obesity also provided valuable feedback on the research track of the project while project representatives were presenting scientific results in relevant conferences. These people continued to watch closely the project progress through the available project dissemination channels.

The above mentioned user communities will consist the target of the PLAYMANCER dissemination activities.

1.3.2 Projects

A major target of the PLAYMANCER dissemination plan is collaboration with other projects working on similar disciplines. It is expected that knowledge and experience will freely flow among parties, whereas, in some case, there would be opportunities for exchanging technological solutions. The PLAYMANCER consortium will strive to arrange a common event together with similar EU funded projects, which would be held in conjunction with one of European Conferences or PLAYMANCER related event such as those listed in 2.1.2.3.

An indicative list of similar EU funded projects PLAYMANCER has identified and contacted is the following:

- **MobiHealth**

Description/Objectives:

MobiHealth aims at developing and trialing new mobile value-added services in the area of healthcare, thus bringing healthcare to the patient.

The MobiHealth system allows patients to be fully mobile whilst undergoing health monitoring. The patient wears a lightweight monitoring system – the MobiHealth BAN (Body Area Network) – which is customized to their individual health needs. Physical measurements such as blood pressure or ECG are measured by the MobiHealth BAN and transmitted wirelessly from the BAN to their doctor, the hospital or their health call centre. Therefore, a patient who requires monitoring for short or long periods of time doesn't have to stay in hospital for monitoring but with their MobiHealth BAN can be free to pursue daily life activities.

MobiHealth significantly contributes to addressing the healthcare sector's increasing problems of resource management and is expected to decrease disease and care

related costs. Moreover, it helps to satisfy patients' growing need for mobility and personalized care. For industry and a range of other organizations active in healthcare, MobiHealth offers the opportunity to gain experience with mobile services and creates new business opportunities.

Synergies with PlayMancer:

PlayMancer has contacted the company that originated from MobiHealth (the purpose of this company is to commercialise the MobiHealth results). This led to collaboration in providing to PlayMancer research team the actual Mobi8 device and MobiHealth software for physiological human body monitoring.

[\(http://www.mobihealth.org/\)](http://www.mobihealth.org/)

- **ICT ALPHA: Architectures for fLexible Photonic Home and Access networks**

Description/Objectives:

The ALPHA project addresses the challenges of building the future access and all types of in-building networks for home and office environments. The project supports the evolution towards a cognitive network by dynamically utilising the resources of an optical network infrastructure to support a heterogeneous environment of wired and wireless technologies.

The project investigates innovative architectural and transmission solutions based on the manifold of optical fibres (single-, multi-mode and plastic) as well as wireless technology to support both wired and wireless services in a converged network infrastructure. The focus is on using the newest physical layer achievements and adequate management and control algorithms to reach a yet unprecedented end-to-end provisioned capacity for access and in-building networks at a fraction of the price of today's technologies and to simultaneously include the transport of existing 2G/3G and Beyond 3G (B3G) signals whether they are Internet Protocol (IP) or non-IP-based.

The project starts with analysing the potential future bandwidth and quality-of-service (QoS) requirements which can be posed by future services in the scope of access and in-building networks such as Ultra HD Video, Local Storage Area Network, remote medical applications and others, and mapping those requirements into network specifications. The questions on the best applicable media, necessity for optical layer dynamics, compatibility of network types at the physical layer, foundations for better QoS

provisioning and embedding of 2G/3G and B3G signals into the networks are then addressed within the project.

The project pursues experimental validations of close-to-maturity technologies in laboratory tests and field trials by intensively exploiting the three project testbeds. The project also includes long-term research activities targeting to improve the existing technologies, and follows an intensive dissemination and standardisation strategy.

Synergies with PlayMancer:

Representatives from ICT-ALPHA contacted PlayMancer and asked the completion of an ALPHA questionnaire on next generation home network supporting multi-player computer games. After that, the two projects have had discussions on organising mutual events, but unfortunately this idea was not realised.

[\(http://www.ict-alpha.eu/\)](http://www.ict-alpha.eu/)

- **ETICA: Ethical Issues of Emerging ICT Applications**

Description/Objectives:

The ETICA project will identify emerging Information and Communication Technologies (ICTs) and their potential application areas in order to analyse and evaluate ethical issues arising from these. By including a variety of stakeholders and disciplinary perspectives, it will grade and rank foreseeable ethical risks. Based on the study governance arrangements currently used to address ICT ethics in Europe, ETICA will recommend concrete governance structures to address the most salient ethical issues identified. These recommendations will form the basis of more general policy recommendations aimed at addressing ethical issues in emerging ICTs before or as they arise.

Taking an inclusive and interdisciplinary approach will ensure that ethical issues are identified early, recommendations will be viable and acceptable, and relevant policy suggestions will be developed. This will contribute to the larger aims of the Science in Society programme by developing democratic and open governance of ICT. Given the high importance of ICT to further a number of European policy goals, it is important that ethical issues are identified and addressed early. The provision of viable policy suggestions will have an impact well beyond the scientific community. Ethical issues have the potential to jeopardise the success of individual technical solutions. The

acceptance of the scientific-technological basis of modern society requires that ethical questions are addressed openly and transparently. The ETICA project is therefore a contribution to the European Research Area and also to the quality of life of European citizens. Furthermore, ethical awareness can help the European ICT industry gain a competitive advantage over less sensitive competitors, thus contributing to the economic well-being of Europe.

Synergies with PlayMancer:

Representatives from ETICA contacted PlayMancer and asked the completion of an ETICA questionnaire on ethics for computer games. After that, the two projects have had discussions on organising mutual events. PlayMancer has received an invitation to attend the final ETICA public event organised at the European Parliament, on March 31st, 2011, titled "IT for a Better Future: How to integrate ethics, politics and innovation".

[\(http://www.etica-project.eu/\)](http://www.etica-project.eu/)

- **Replay: Ethical Issues of Emerging ICT Applications**

Description/Objectives:

The REPLAY project seeks to leverage the popularity and immersiveness of gaming to create a tool that helps experts understand and address anti-social behaviour. We have created a 3D environment, highly playable, and involving an interactive play 'board' that enables the player to travel at speed through a futuristic world, against the clock. Interspersed with the 'play elements' are a series of embedded activities that have been developed within a sound pedagogical framework and that focus on the values and decision making of the player. Every activity has to be completed before the player can continue.

Synergies with PlayMancer:

The two projects have participated together in the same cluster of serious games projects at the EC Open Day event, organised on Saturday 7th of May, during a bright sunny day that welcomed about 20000 visitors, families and kids to the world of the European Commission, behind the walls of their main Barleymont building, Brussels, Belgium.

[\(http://www.replayproject.eu/\)](http://www.replayproject.eu/)

- **Spe-ler: Ethical Issues of Emerging ICT Applications**

Description/Objectives: This is a project funded by the Dutch state, that is inspired by the Replay project, aiming at building an environment that would mix computer games and educational content, in a new type of serious game. This new media form will interleave computer games with audiovisual educational content at regular breaks. The aim of the study is to investigate the motivation and engagement of children to educational material during and after playing this new serious game form.

Synergies with PlayMancer:

The two projects have participated together in the same cluster of serious games projects (including as well project Replay) at the EC Open Day event, organised on Saturday 7th of May, at the Barleymont building of European Commission, Brussels Belgium.

(<http://www.k-point.be/Spe-Ler> , in Dutch)

1.3.3 Working Groups

PLAYMANCER consortium has reused technologies and knowledge managed by various pertinent research projects and working groups in the areas addressed by the project, as well as shared with them experience and knowledge gained during PLAYMANCER. These events are working meetings for facing specific challenges, however other opportunities might be considered on a per case basis.

There are two prominent working groups that the project participates in, which are organised by the European Commission, specifically by the Networking Media Systems Unit:

- ICT Networked Media Systems Concertation meetings, during which the project funded by the unit present their results, the project representatives acquaint each other and discover opportunities for project collaborations or other mutual activities.
- User-Centered Media cluster activities under the ICT Networked Media, where projects that deal with applications where the users are seen as prosumers (producers and consumers of content) liaise and exchange ideas and assist in defining the future research objectives in that field. Cluster meetings are always taking place adjacently to the main Concertation meetings at the same place, usually the day before or the day after.

The series of meetings and the participants from PlayMancer are presented in the table below (User-Centered Media cluster meetings are not included in this list but the same project members have participated in both):

Table 1: EC concertation group meetings that PlayMancer participated

Meeting				Place	Date	Participant/Organisation
1st	FP7	Networked	Media	Vilamoura, Portugal	16-17 April 2008	E.Kalapanidas/ST
2nd	FP7	Networked	Media	Saint Malo, France	15 October 2008	Alex Conconi/TXT
3rd	FP7	Networked	Media	Antwerp	27-28 April 2009	A.Alexiou/ST
4th	FP7	Networked	Media	Saint Malo, France	28 September 2009	E.Golemi/ST
6th	FP7	Networked	Media	Brussels, Belgium	30 November 2010	E.Kalapanidas/ST
7th	FP7	Networked	Media	Trento, Italy	14 April 2011	E.Kalapanidas/ST

PlayMancer representatives (mostly from the project co-ordinator) have participated in several of these meetings, and they assisted in producing tangible results (ie: position papers, research articles), such as the following:

- Oscar Mayora, Petros Daras, Marianna Panebarco, Nick Achilleopoulos, Peter Stollenmayer, Doug Williams, Nadia Magnenat-Thalmann, Carmen Guerrero, Michiel Pelt, Tim McGrath, Eugenia Fuenmayor, David Salama, Federico Alvarez, **Elias Kalapanidas**, Alex Shani, Jean-Yves Le Moine: *User centric media of the future internet: trends and challenges*. DIMEA 2008: 441-446
- "User Centric Media in the Future Internet", European Commission, Networked Media Unit, Information Society and Media, September 2009, ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/netmedia/200911-user-centric-media_en.pdf (contribution by A.Alexiou from partner ST)

2 Dissemination Plan

2.1 Dissemination Channels

PLAYMANCER consortium plans to exploit various dissemination channels to disseminate the findings and results of PLAYMANCER and to open a dialogue and orchestrate discussions with all the relevant stakeholders. The channels to be used are the following: events and working groups in related disciplines, publications to the Internet and the press

2.1.1 Internet

2.1.1.1 Project Web Site

The project website is the main dissemination channel for the PLAYMANCER project. It serves three major purposes: i) Dissemination of the project results to the public ii) Collaborative working within the Consortium, and iii) Providing access to internal project information (for partners only).

A first version of a dynamic web site dedicated to the PLAYMANCER project has been produced in February 2010 (month 3 from the project start) and two unique domain names for the project have been registered (www.playmancer.eu and www.playmancer.com). This version, after being tested and commented by all PLAYMANCER partners, has been modified and led to the current version of the PLAYMANCER Site (released at the end of March 2010).

The project site is divided into a “Public Area” and a “Members Area”, i.e. an area to which access is restricted to authorized users.

Public Area

The public section features:

- General description of the project and its objectives
- Information about the consortium and links to partners' websites
- Public documents, such as public deliverables (reports) produced during the project, published research articles concerning the project's technological and scientific achievements, project presentations, brochure and press releases.
- Contact information

- Calendar information about past and upcoming events (organized by PLAYMANCER or other)
- Regularly updated news feeds
- Information about research projects related to PLAYMANCER
- Polls

In the following figure, the introductory page of the PLAYMANCER website is presented



Figure 1: PLAYMANCER Website – Public Area

Members Area

The “Members Area” contains the confidential information and material that is intended for communication between the project partners and between the project partners and the European Commission. Therefore the “Members Area” pages do not play any role in the dissemination plan. However, they are a valuable asset in exchanging information among partners and in the fluent communication and coordination within the consortium.

The Members Area provides the consortium members with the following functionality:

- Upload and access to project documents (deliverables, internal documents, management reports, six-months workplan, evaluation reports, meeting documents)
- Community features (forum, Wiki)

The screenshot shows the PLAYMANCER website interface. The header includes the logo and navigation links. The main content area is titled "Project Deliverables" and contains a table of categories and a list of specific deliverables.

Categories	Files
1. In all deliverables	4
2. In progress deliverables	22
3. Peer-reviewed deliverables	9
4. Final approved deliverables	0

No.	Title	Status
D1.1	Series game development Standards and Policies	Update of rejected deliverable
D2.1a	User Requirements	Update of approved under conditions deliverable
D2.1c	Game Scenarios	Update of approved under conditions deliverable
D2.1d	System Specification and Architecture	Update of rejected deliverable
D2.2	Evaluation Methodology	Update of approved under conditions deliverable
D3.1	Report of PlayMancer 3D dialogue-enabled game engine development	New deliverable
D4.1	Report of PlayMancer multi-modal multi-player gaming platform development	New deliverable
D6.1	Report on the development of 3D content sharing and game distribution services	New deliverable
D7.2	Dissemination and communication plan report	Update of rejected deliverable

Figure 2: PLAYMANCER Website – Members Area (Project deliverables section)

The PLAYMANCER site interface and content is being provided in English.

The project consortium is paying particular attention to the impact of our website, as it is a direct window on the PLAYMANCER activities and outcomes. Google Analytics service, a tool for providing information about traffic tracking of web sites, is being used to track / analyse the PLAYMANCER site traffic data, e.g. information about the origins of the connections, the main destination pages, the time spent on each page, the top referring sites and the links that have been most used and so on. In this way the consortium is in position to better adapt the website content to the interests of the visitors.

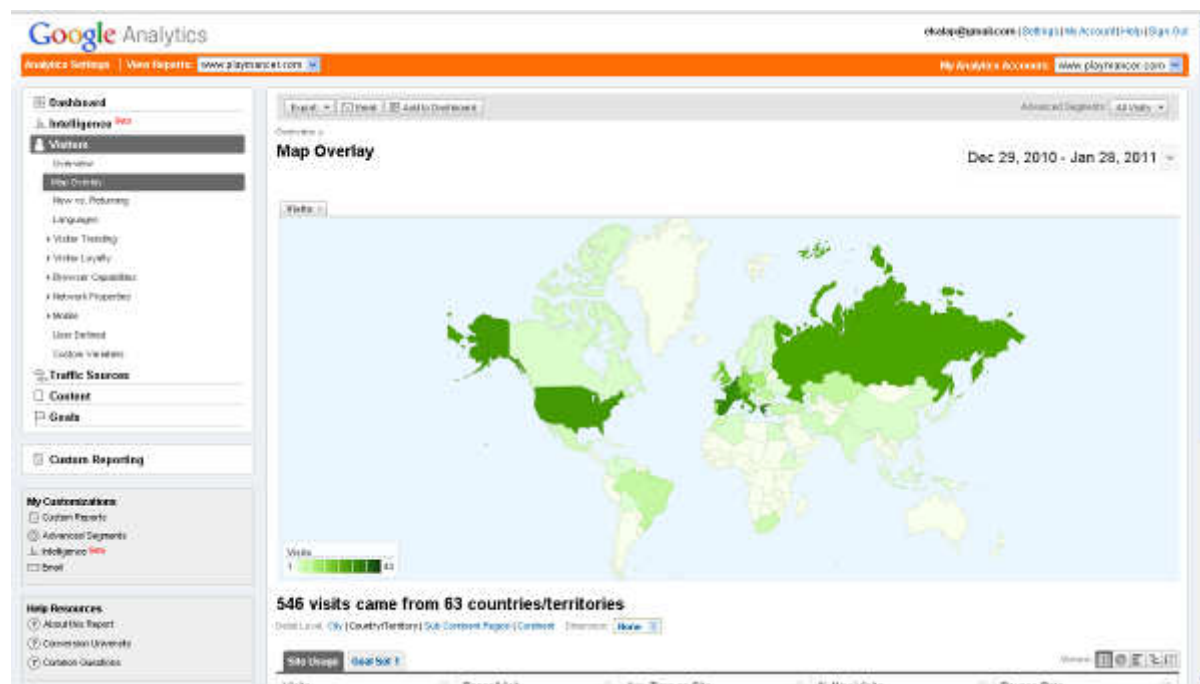


Figure 3: Google analytics for www.playmancer.com

2.1.1.2 E-mailing Lists and Newsletters

Two instruments that will be exploited by the PLAYMANCER consortium for disseminating the project activities and results are the e-mailing lists and Newsletters.

E-mailing Lists

The e-mailing lists are used to disseminate project-related announcements such as intermediate research and development achievements, development of user communities, new collaborations, showcase and dissemination events, project workshop, and in certain cases, press releases.

Newsletters

Newsletters (in electronic form) are used to highlight the most important news announcements, progress and key findings of the project. They, also, communicate the PLAYMANCER project's agenda in the period to follow. Newsletters are released on an annual or bi-annual basis.

2.1.2 Events

2.1.2.1 Organization of public workshops

For raising public participation and awareness, PLAYMANCER organised a 1-day public showcase and dissemination event in Spain, under the HICT conference in Barcelona. The main aim of this event was to showcase the PLAYMANCER project finding and results, including the PLAYMANCER prototype, to a wider audience. This workshop focused on introducing the current state of the art of videogames as a therapy tool in mental disorders and, specifically, to show the participants how Playmancer videogame works, for both regulating impulsivity and emotions in ED and ICD. Furthermore, it was described and discussed how patients' emotional recognition and physiological reactivity interact with the game. Additionally, preliminary results obtained by using the game with end users and healthy individuals were presented. Finally, the videogame was demonstrated. The short version of the event agenda follows:

- Introductory talk about the usefulness of new technologies in mental disorders
- Description of the Playmancer project (participants, purpose, inclusion-exclusion criteria, user requirements, equipment, preliminary results and end goals)
- Demonstration of the videogame
- Questions and discussion with the audience

Intended participants included representatives from the clinical psychologists community, industry (ICT for health representatives, manufacturers, etc), press (health/well-being magazines, gazettes, TV programs) and other interested parties. The event was organised by PlayMancer partner IDIBELL, in collaboration with partner ST. Workshops as this bring together researchers as well as manufacturers of relevant technologies and comprise a very good networking opportunity, that may lead to strategic alliances or other future commercial agreement. Furthermore they contribute considerably to the project visibility in the research community.

Workshop Title	Playmancer European Project: A New-generation Videogame for Treating Eating disorders and Impulse control disorders
Date, Location, Hosting event	9-10 March, 2011, Barcelona, Spain, International Forum on Health Care and Information Communication Technology (HICT2011)
Objectives/Description	This workshop will focus on introducing the current state of the art of videogames as a therapy tool in mental disorders and, specifically, to show the participants how Playmancer videogame works, for both regulating impulsivity and emotions in ED and ICD. Furthermore, it will be described and discussed how patients' emotional recognition and physiological reactivity interact with the game. Additionally, preliminary results obtained by using the game with end users and healthy individuals will be presented. Finally, the videogame will be demonstrated. Besides of reviewing the usefulness of serious videogames for treating mental disorders, the main goal of this workshop is to show the participants the development and current state of Playmancer (EU serious videogame research) for treating Eating Disorders (ED) and other impulse control disorders (ICD).
Presentations	<ul style="list-style-type: none"> • State of the Art on Videogames and mental health (Susana Jiménez-Murcia) • Playmancer: EU-Project and technical components (Elias Kalapanidas) • Playmancer: Psychological components and results (Fernando Fernández-Aranda)

2.1.2.2 Organization of a Networked session at the ICT 2010 event

Further to the one 1-day showcase and dissemination event in Spain, the PLAYMANCER consortium participated in the ICT 2010 event, one of the most prestigious events for collaborative research projects in Europe, where the project was showcased in its own stand. The project attracted the interest of both scientists working in other research projects, journalists, European Commission officials and students who were visiting the event. The stand and the project members that were supporting it were interviewed by three TV channels and two other press media.

PlayMancer project members also participated in the game-related parallel session “Research and development in Serious Games” at ICT 2010, co-organised with ICT project Siren. About 50 people attended this meeting. The agenda of this event comprised of:

Session Title	Research and development in Serious Games
Date,	Wednesday, September 29, Brussels, Belgium, ICT Event 2010
Location,	
Hosting event	
Objectives/Description	Serious games apply games and simulations technology to non-entertainment domains, such as technology-enhanced learning, history and culture, environmental awareness and physical or mental rehabilitation. They define an interdisciplinary research area where concepts such as natural human-computer interaction, user-centred design and evaluation, social networking, signal processing and computer graphics, are interwoven. This session networks researchers, designers, developers and user groups who share interest in serious games as a medium to reach out to wider audiences. It will be based on participants from the Siren (conflict resolution in schools), PlayMancer (physical rehabilitation), and eCircus (social and emotional learning) FP7 projects.
Presentations	<ul style="list-style-type: none"> • Serious games in the context of user centric media and e-inclusion (Loretta Anania, Scientific Officer, Networked Media unit, Giorgio Zoia, Project & Policy Officer, ICT for Inclusion unit) • Emotion and natural interaction in games (Kostas Karpouzis, National Technical University of Athens) • Modelling and measuring user experience (Georgios Yannakakis, IT University of Copenhagen) • PlayMancer: A European Serious Gaming 3D Environment (Costas Davarakis, Elias Kalapanidas, Systema Technologies, Greece) • rePlay: Gaming Technology Platform for Social Reintegration of Marginalised Youth (Francisco Ibanez, Brainstorm, Spain, Jim WhiteLoop, White Loop, UK)

- Global Conflicts: an award-winning educational game series to teach citizenship, geography, and media courses (Simon Egenfeldt-Nielsen, Mikkel Lucas Overby, Jeppe Herlev Nielsen, Serious Games Interactive, Denmark)

2.1.2.3 Participation in events

As PLAYMANCER project pursues very ambitious research issues, the consortium continues on submitting scientific results to and attend prominent international conferences, workshops and symposia. Furthermore, PLAYMANCER participates in exhibitions and Serious Games related events in Europe. An informal protocol has been developed among project partners, so that the project consortium may bring in the maximum of the presented opportunities in the events where the project participates.

Before the event

Once a PLAYMANCER partner receives information on a forthcoming event, the informed person will send an email to the PLAYMANCER mailing list informing the consortium of the upcoming event. He/She also provides details about the event (location, date, topic and any other useful information) e.g. through the project website. This information will be also available to the public website.

When a PLAYMANCER partner receives an invitation to present an aspect of PLAYMANCER at an event, or to represent the project on behalf of the consortium, the informed person sends an email to the Project Manager and the Technology Manager. The managers discuss and agree on the most appropriate person (or group) to present at the event

In all of the above cases, the Quality and Dissemination Committee is informed so that the appropriate dissemination material can be prepared/selected and ready for the event.

Attending the event

When presentations are ready, they should be sent to the Technology manager for comments and approval prior to the event. These presentations along with research articles (if any) will be also made available to the Quality and Dissemination Committee.

After the event

When a PLAYMANCER member participates in a conference, workshop, symposium, exhibition on other event, the person is invited to prepare a brief memo of the event which

should be entered through the project website. In this way, people (registered or unregistered to the PLAYMANCER site) can easily reference the event, the date and read a summary of the event, knowing the person to contact for more information.

In the cases the event is directly related to the PLAYMANCER activities, consortium member(s) participated in the event is/are requested to produce a summary document of the knowledge obtained. This summary should be distributed to the relevant technical work packages along with any other important documents distributed at the event. The experience will be discussed in more detail at the following PLAYMANCER technical meeting.

List of periodical events relevant to the PLAYMANCER project

The following gives a list of conferences, workshops and other events that are most relevant to the PLAYMANCER project. Some of them will be targeted by PLAYMANCER partners for the dissemination of project results:

Event Acronym and Title
ICIP IEEE International Conference on Image Processing
WCCI IEEE World Congress on Computational Intelligence
Med-e-Tel International Educational and Networking Forum for eHealth, Telemedicine and Health ICT
EFRR Congress of European Federation for Research in Rehabilitation
IAHSA/AAHSA Global Ageing Conference & Exposition
ICIP IEEE International Conference on Image Processing
ICIVC International Conference on Image and Vision Computing
SSCI IEEE Symposium Series on Computational Intelligence
ICIP IEEE International Conference on Image Processing
EMBC Annual International Conference of the IEEE Engineering in Medicine and Biology Society "Merging Medical Humanism and Technology"

ICPR International Conference on Pattern Recognition
WCCI IEEE World Congress on Computational Intelligence
BSG Annual Conference Annual British Society of Gerontology Conference
SETN Hellenic Conference on Artificial Intelligence
VRST ACM symposium on Virtual reality software and technology
AHC Augmented Human Conference
ICT Event

Table 2: List of periodical events of interest to be attended by Partners

2.1.3 Press

2.1.3.1 Scientific Publications (in conference proceedings and scientific journals)

The Consortium continues on submitting a number of individual or joint publications to scientific conferences. An initial list of candidate conferences and workshops has been already presented in section 2.1.2.3.

A list of candidate scientific journals is presented below:

- IEEE Transactions on Image Processing
- IEEE Transactions on Multimedia
- IEEE Transactions on Pattern Analysis and Machine Intelligence
- IEEE Transactions on Audio, Speech and Language processing
- IEEE Transactions on Affective Computing
- IEEE Transactions on Signal Processing
- CyberPsychology & Behavior
- European Eating Disorders Review
- Journal of the International Neuropsychological Society
- Behaviour Research and Therapy
- Psychiatry and Clinical Neurosciences

- European Psychiatry
- British Journal of Clinical Psychology
- Journal of Assistive Technologies
- Journal of Pattern Recognition Pattern Recognition
- Journal of Image and Vision Computing
- Journal of Signal, Image and Video Processing
- Journal of Visual Communication and Image Representation
- Journal on Multimodal Interfaces
- Journal of Telecommunications and Information Technology
- Journal of Machine Learning Research
- Journal of Mental Health
- Journal of Cybertherapy and Rehabilitation

2.1.3.2 Press Release/Press Coverage

Press releases and press conferences are essential means for the dissemination of the project activities and results.

Press releases are prepared, in parallel to the implementation of the PLAYMANCER's activities, as newsworthy events arise. PLAYMANCER uses press releases to announce public showcase and dissemination events, exhibitions, TV reports and other relevant opportunities that might be of interest to people outside the project consortium.

Press releases are circulated among the public through the project web site, mass media, such as health/well-being magazines, gazettes, TV programs devoted to health-related issues. Prior to the distribution of any press release to journalists, it should be commented and approved by the Quality and Dissemination Committee, and any other concerned partner.

2.1.3.3 Advertisements

Besides advertising the PLAYMANCER project in the Internet, the PLAYMANCER consortium plans to place advertisements in national (and/or international) printed newspapers, health/well-being magazines, radio and TV programmes (especially those devoted to health-related issues) to raise public awareness and send a message across target audiences.

2.2 Dissemination Material

2.2.1 Project Logo

Having in mind to create a distinctive visual concept that is closely bound to the PLAYMANCER concept, the PLAYMANCER consortium has designed a project logo to be used in all the dissemination tools (ranging from the web site to presentations). The PLAYMANCER project logo depicts a group of different “smilies” behind the overlay of the project acronym, designed like a stencil. The different smiling faces express the different emotional states of players while feeling the PlayMancer serious game experience, and the gaming nature of the project. In order to maintain a positive and attractive image about the project, no reference is made to the medical nature of the project, which is left to be discovered.



Figure 4: PLAYMANCER Project Logo

2.2.2 Project Brochure

A professional PLAYMANCER brochure has been prepared for the early months of the project for distribution at conferences and similar events, perhaps for mail shots if this is thought to be useful. The brochure consists a two-sided three-fold presentation of the PLAYMANCER project consortium, objectives and scope (horizontal A4).

The first version of the brochure (March 2010) is depicted in the following figures. Updated versions have been produced as the project has evolved and more concrete outcomes have been obtained. PLAYMANCER has designed and printed a brochure update after the first year of the project.

Since the PLAYMANCER brochure targets to disseminate the project for a wide audience, great attention was paid during brochure text formulation to use simple language and

structure, to avoid technical jargon as much as possible and to clearly present the added value and benefits of PLAYMANCER.

PlayMancer Evaluation

PlayMancer evaluation objectives:
To learn self-controlling strategies applicable to different situations, relaxation techniques and planning skills, such as working with aspects of impulsivity.

Therapeutic/Behavioural Goals:
Tolerance to frustration, learning relaxation techniques, acquiring planning skills, dealing with negative emotions tolerance to boredom, persistence.

Measures:

- Semi-structured face-to-face interview on previous experience with video-games and technological devices and on their main problem (ED, PG).
- Diagnostic interview (DSM-IV criteria) for ED/PG.

Psychometrical measures (PRE-POST):

- Impulsiveness: Barrat Impulsivity Scale (BIS-11); Knight Seeking Scale (TCT-R)
- Rigidity: Persistence scale of TCT-R; additional scale to be determined
- Psychopathological symptomatology (depression, hostility, etc.) (SCL90R)
- Anthropometrical measures (PRE-POST), by eating disorders
- Body weight, etc.

Physiological measures (by bio-sensors, weekly):
Heart Rate (beats per minute), Galvanic Skin Response (GSR).

Input/Output devices:
Keyboard, device for measuring pulse/ heart rate, GSR mouse, microphone.

Applications:
Bulimia nervosa, binge eating disorder, pathological gambling.



PlayMancer Partners

Systema Technologies S.A. (Coordinator)
Athens - Greece
www.systematechnologies.eu

Netunion s.a.r.l.
Lausanne - Switzerland
www.netunion.ch

University of Patras, The Wire Communications Laboratory (WCL)
Patras - Greece
www.wcl.ee.upatras.gr

Technische Universität Wien
Vienna - Austria
www.ims.tuwien.ac.at

Fundació privada Institut d'Investigació biomèdica de be Ivitge
Barcelona - Spain
www.idibell.cat

Université de Genève
Geneve - Switzerland
www.unige.ch

Serious Games Interactive
Copenhagen - Denmark
www.seriousgames.dk

Roesingh Research and Development BV
Enschede - The Netherlands
www.rnd.nl

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PLAYMANCER






"PlayMancer: A European Serious Gaming 3D Environment"

AUTUMN 2010



www.playmancer.eu

ICT Contract no.: FP7-ICT-230720-5639






Figure 5: PLAYMANCER 3-fold Brochure (Front and Back Pages)

2.2.3 Project Poster

PLAYMANCER produced a large free-from poster by the end of the first year aiming at supporting project presentations and demos (typically to be printed on 70X100cm board).

The PLAYMANCER poster, as well as the PLAYMANCER brochure, are freely provided to project partners upon request. This greatly enhances the ability to keep all of the above products homogeneous and up to date.

"PlayMancer: A European Serious Gaming 3D Environment"

<http://www.playmancer.com>

FP7-ICT-2007-215839 Objectives

Playmancer integrates a development platform, based on a commercially available games engine, with tools and mechanisms that allow interoperable binding, inclusion and access of existing, emerging and new multi-modal I/O devices.

Playmancer evaluation objectives include recording of interaction data aiming at making them available on a readable and standardized manner, thus enabling Health Care therapists to evaluate and better understand the status and evolution of the patients.

Partners

Systema Technologies S.A. (Coordinator)
Athens - Greece
<http://www.systematechnologies.eu/>

Naturion s.a.c.l.
Luzerne - Switzerland
<http://www.naturion.ch/>

University of Patras, The Wire Communications Laboratory (WCL)
Patras - Greece
<http://www.wcl.upatras.gr/>


Technische Universität Wien
Vienna - Austria
<http://www.tuwien.ac.at/>

Fundació privada Institut d'Investigació Biomèdica de Bellvitge
Barcelona - Spain
<http://www.idibell.cat/>

Université de Genève
Geneve - Switzerland
<http://www.unige.ch/>

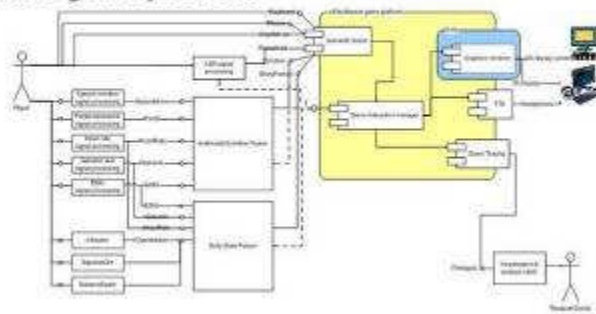
Serious-Games Interactive
Copenhagen - Denmark
<http://www.seriousgames.dk/>

Wobbling Research and Development B.V.
Eindhoven - The Netherlands
<http://www.nr.nl/>



Architecture


PlayMancer game platform



The PlayMancer game platform is the central part of the system comprising of the following components:

- **Semantic fusion component:** This component provides support and adaptation of the multimodal input.
- **Game interaction manager:** This component is the core of the game, defining the rules and actions.
- **Unity:** The Unity Game tool is the commercial basis for the development.
- **TTS:** A text to speech component is available within Unity.
- **Game Tracing:** A component aiming to allow the medical personnel to review the evolution of the game.
- **Visualization and analysis client:** A dedicated user interface for the specialized health-care personnel.

PlayMancer: an emotions recognition game



To evaluate the proposed framework and gaming infrastructure, a series of serious games modules are being developed and tested. Playmancer platform is tailored to realizing serious games scenarios for health. These scenarios are tested and validated for rehabilitation and psychology therapy, integrating innovative "emotions capture" I/O devices.

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Figure 6: PlayMancer poster -2009 version





"PlayMancer: A European Serious Gaming 3D Environment"

FP7-ICT-2007-215839 <http://www.playmancer.eu>

The European PlayMancer project is working hard to improve the technology for serious games engines and tools for 3-D networked gaming.

*We want to build actual games, serious games, around serious health-related problems like bulimia and chronic pain **

PlayMancer is already demonstrating a flair for the sort of press relations it will need to develop this fledgling market for games geared towards more 'serious' goals than entertainment.

* ICT Results 2010

Partners

System's Technologies S.A. (Coordinator)
Athens - Greece
www.systemstechnologies.eu

Neburon s.a.s.l.
Lausanne - Switzerland
www.neburon.ch

University of Patras, The Wire Communications Laboratory (WCL)
Patras - Greece
www.wcl.upatras.gr

Technische Universität Wien
Vienna - Austria
www.tms.tuwien.ac.at

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Barcelona - Spain
www.idibell.cat

Université de Genève
Genève - Switzerland
www.unige.ch

Serious Games Interactive
Copenhagen - Denmark
www.seriousgames.dk

Roessingh Research and Development BV
Enschede - The Netherlands
www.rnd.nl



PlayMancer Concept

People suffering from chronic pain could be playing games designed to ease their symptoms while their therapist monitors progress online. The therapist could interrupt the game any time to adjust the settings, or if there is an imminent health risk to the player. The market PlayMancer is aiming to enter is under-developed. It falls under the umbrella of serious games, which though they are maturing, especially in business and training applications, are still by no means an easy market to break into. "Our games are initially aimed at specific health problems, but all the studies and analyses point to strong potential in diverse health care situations".

The PlayMancer game platform is the central part of the system comprising of the following components:

- **Semantic fusion component:** This component provides support and adaptation of the multimodal input.
- **Game interaction manager:** This component is the core of the game, defining the rules and actions.



- **Unity:** The Unity game engine is the commercial basis for the development.
- **ASR:** Automatic Speech Recognition.
- **Automatic Emotion Recognition component:** Identifies and correlates information coming from different sources, like voice, vital signals, face expressions, with target to deduct with a high accuracy as possible the emotional state of the patient.

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PlayMancer Games




Mental Health and Rehabilitation Mini Games



Figure 7: PlayMancer poster -2010 version

2.2.4 Project Banner

In addition to project posters, which are usually attached to walls or other vertical surfaces, the project has produced a banner, as a portable light-weight assembly, that folds and unfolds easily. This banner, when unfolded, provides a 2 meters by 1 meter vertical printed surface, which is attached on a base.

"PlayMancer: A European Serious Gaming 3D Environment"

FP7-ICT-2007-215839 <http://www.playmancer.com> Objectives

Playmancer integrates a development platform, based on a commercially available games engine, with tools and mechanisms that allow interoperable binding, inclusion and access of existing, emerging and new multi-modal I/O devices.

Playmancer evaluation objectives include recording of Interaction data aiming at making them available on a readable and standardized manner, thus enabling Health Care therapists to evaluate and better understand the status and evolution of the patients.

Partners

Systema Technologies S.A. (Greece)
Athens - Greece
<http://www.systematechnologies.eu>

Infocision S.L. (Spain)
Lisabaine - Switzerland
<http://www.infocision.es/>

University of Patras, The 14th Communication Laboratory (UCL) (Greece)
Patras - Greece
<http://www.ucl.uoi.upatras.gr/>

Technische Universität Wien (Austria)
Wien - Austria
<http://www.tuwien.ac.at/>

INTECO (Instituto Tecnológico de Estudios Superiores de Investigaciones) (Spain)
Barcelona - Spain
<http://www.itecibell.cat/>

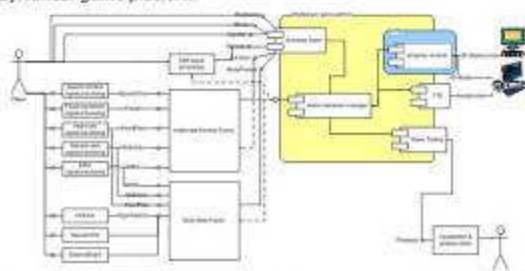
Universitat de Girona (Germany)
Girona - Switzerland
<http://www.unig.ch/>

Serious Games Research Center (Denmark)
Copenhagen - Denmark
<http://www.seriousgames.dk/>

Research and Development BV (The Netherlands)
Eindhoven - The Netherlands
<http://www.rnd.nl/>


Architecture

PlayMancer game platform





The PlayMancer game platform is the central part of the system comprising of the following components:

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- **Game Tracing:** A component aiming to allow the medical personnel to review the evolution of the game.
- **Visualization and analysis client:** A dedicated user interface for the specialized health-care personnel.



PlayMancer: an emotion recognition game

Prototype components

- Motion tracking and interpretation component
- Speech input processing module
- Speech output generation and synthesis module
- Speech-based emotion recognition component
- Facial emotion recognition component
- Multimodal emotion fusion component
- Multi-sensor semantic interpretation component
- Off-line procedural modeling content generation tool

Prototype evaluation

To evaluate the proposed framework and gaming infrastructure, a series of serious games modules are being developed and tested.

Playmancer platform is tailored to realizing serious games scenarios for health.

These scenarios are tested and validated for rehabilitation and psychology therapy, integrating innovative "emotions capture" I/O devices.

Contact

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Networked Media Systems
Directorate General Information Society and Media
loretta.antonio@ec.europa.eu

Figure 8: PlayMancer banner

2.2.5 Project Presentation Template

In order for the PLAYMANCER project to reach the outer world uniformly, the PLAYMANCER consortium has created a dedicated presentation template to be used throughout all project's presentation. The presentation template is kept simple yet quite elegant and will be used for internal as well as for external presentations.

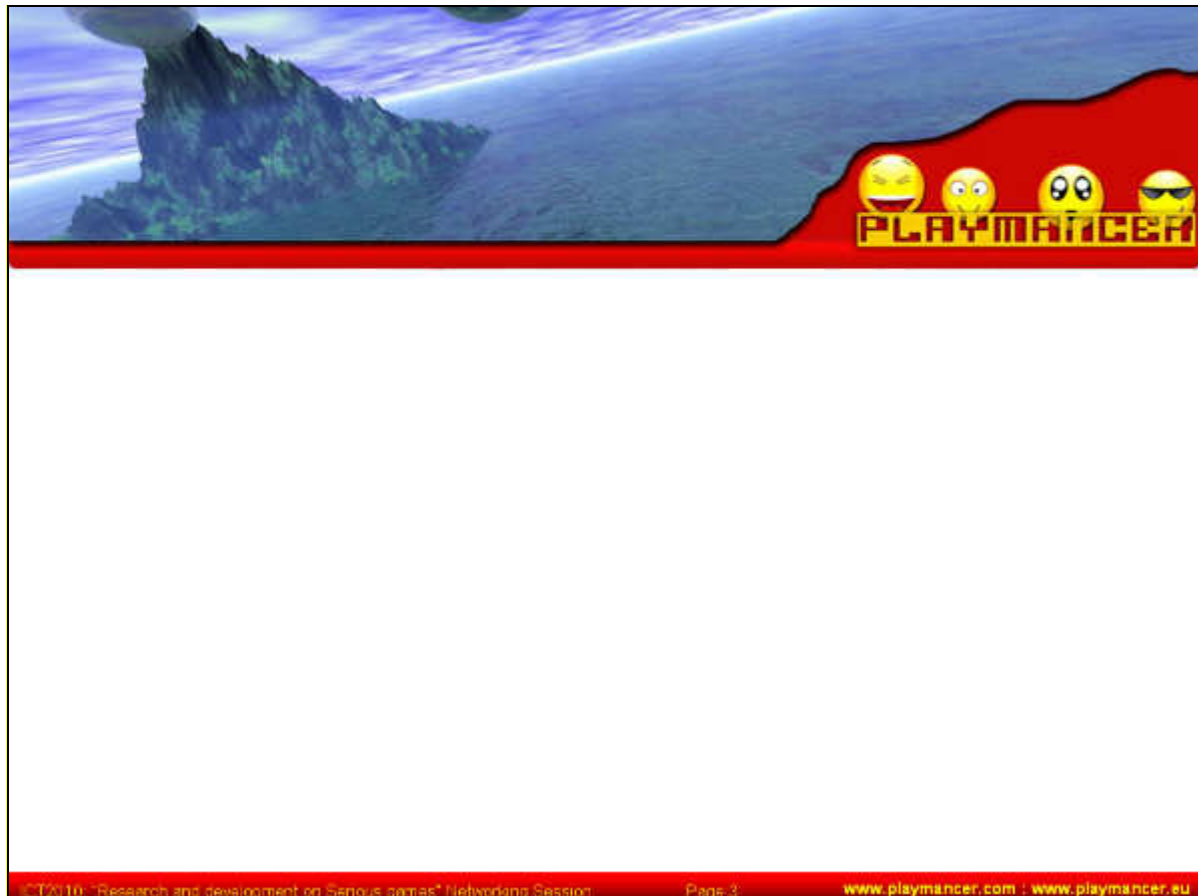


Figure 9: Official PLAYMANCER Presentation Template

Another template has been designed to be used at the last phase of the project. This one provides more space for the slide content, and projects in the background a watermarked screenshot of the final game prototype (view from the island, which is common between the two project games).

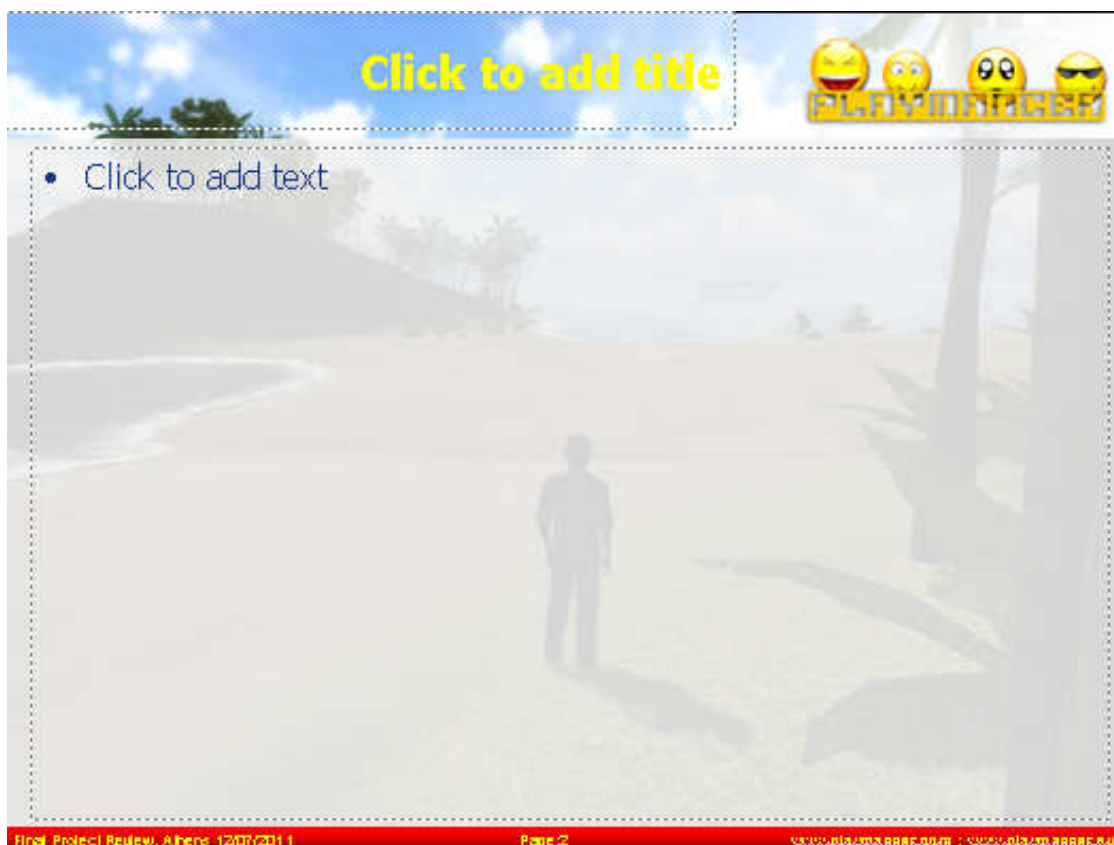


Figure 10: Updated version of the project Presentation Template

2.2.6 Presentations

Making PLAYMANCER related presentations in conferences and similar events is a task that might be carried out by every PLAYMANCER partner for its own exploitation and publicity and not only by WP7 participants. The project presentation template (unless otherwise dictated by the specific event) is endorsed to be used for all project presentations and make clear reference to the PLAYMANCER project. Public presentations are made available prior to presentation for comments and approval by the partners involved in the work being presented. They are available, additionally, to PLAYMANCER partners (i.e. uploaded to the PLAYMANCER Web Site – Members Area) and, when approved, made publicly available in the Public Area of the site.

2.2.7 Publications

PLAYMANCER publications can be either scientific publications or documents that abstractly cover topics addressed by the project. Prior to achieving mature technological and scientific results, only publications of the second category are made.

Scientific publications, i.e. research articles at well referred conferences, workshops and journals in disciplines related to PLAYMANCER, are announced to the PLAYMANCER consortium prior to their submission.

PLAYMANCER publications have been made available to PLAYMANCER partners (i.e. uploaded to the PLAYMANCER Web Site – Members Area).

Where a publication result is not directly available through the permanent identifier provided in the table below (doi number or URL address), then readers are encouraged to search in the public area of the project site, where most of the publications cited in the table are publically available. Digital Object Identifier (doi) number references can be resolved to valid URL addresses through the doi service at: <http://dx.doi.org/>.

Table 3: Template A1 - List Of Scientific (Peer Reviewed) Publications

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS										
NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers ¹ (if available)	Is/Will open access ² provided to this publication?
1	<i>Performance Evaluation for Voice Conversion Systems</i>	<i>Ganchev T.</i>	<i>Text, Speech And Dialogue</i>	<i>Volume 5246/2008</i>	<i>Springer</i>		<i>2008</i>	<i>317-324</i>	doi:10.1007/978-3-540-87391-4_41	Yes
2	<i>Internet-Based Cognitive-Behavioral Therapy for Bulimia Nervosa: A Controlled Study</i>	<i>Fernando Fernández-Aranda</i>	<i>CyberPsychology & Behavior</i>	<i>Volume: 12 Issue 1: February 10, 2009</i>	<i>Mary Ann Liebert, Inc.</i>		<i>2009</i>	<i>37-41</i>	doi:10.1089/cpb.2008.0123	Yes
3	<i>A rigid-body target design methodology for optical pose-tracking systems</i>	<i>Thomas Pintaric</i>	<i>VRST '08 Proceedings of the 2008 ACM symposium on Virtual reality</i>		<i>ACM</i>		<i>2008</i>	<i>73-76</i>	doi:10.1145/1450579.1450594	Yes

¹ A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

² Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

			<i>software and technology</i>							
4	<i>PlayMancer: A Serious Gaming 3D Environment</i>	<i>Conconi, A.</i>	<i>Automated solutions for Cross Media Content and Multi-channel Distribution, 2008. AXMEDIS '0</i>	<i>17-19 Nov. 2008</i>	<i>IEEE Xplore</i>	<i>Florence</i>	<i>2008</i>	<i>111 - 117</i>	<i>doi: 10.1109/AXMEDIS.2008.29</i>	<i>Yes</i>
5	<i>PlayMancer: Games for Health with Accessibility in Mind</i>	<i>Kalapanidas E.</i>	<i>Communications & Strategies</i>	<i>Vol. 73, Special Issue: New challenges for the video game industry, 31-3-2009</i>	<i>IDATE</i>		<i>2009</i>	<i>105-120</i>	<i>http://www.idate.org/en/Digiworld-store/Collection/Communications-Strategies_18/No-73-New-challenges-for-the-Video-Game-Industry_379.html</i>	<i>Yes</i>
6	<i>Serious Games as additional Psychological Support: A review of the literature</i>	<i>Juanjo Santamaria</i>	<i>Journal of Cybertherapy and rehabilitation</i>	<i>Submitted for publication</i>						
7	<i>Full Body Interaction for Serious Games in Motor Rehabilitation</i>	<i>Christian Schönauer</i>	<i>AH '11 Proceedings of the 2nd Augmented</i>	<i>to be published</i>	<i>ACM</i>		<i>2011</i>		<i>doi:10.1145/1959826.1959830</i>	<i>No</i>

			<i>Human International Conference</i>							
8	<i>Playmancer Project: A Serious Videogame as an Additional Therapy Tool for Eating and Impulse Control Disorders</i>	Susana Jiménez-Murcia	<i>Annual Review of Cybertherapy and Telemedicine - Advanced Technologies in the Behavioral, Social and Neurosciences Edited by Brenda K. Wiederhold, Giuseppe Riva</i>	Volume 144, 2009	IOS Press	Netherlands	2009	163-166	doi:10.3233/978-1-60750-017-9-163	Yes
9	<i>Meta-analysis on drugs in people with eating disorders</i>	Ana Calero-Elvira	<i>European Eating Disorders Review</i>	Volume 17, Issue 4, July/August 2009	Wiley		2009	243-259	doi: 10.1002/erv.936	No
10	<i>Comorbilidad del juego patológico: variables clínicas, personalidad y respuesta al tratamiento</i>	S. Jiménez-Murcia	<i>Revista de Psiquiatría y Salud Mental</i>	2 (4), December 2009	psiquiatria.com	Barcelona, Spain	2009	178-189	http://www.psiquiatria.com/articulos/tr_personalidad_y_habitos/impulsos_trastorno_control/ludopatias/45669/	Yes
11	<i>Executive functioning among female pathological gambling</i>	E.M. Álvarez-	<i>Journal of the International</i>	15, 10 Feb 2009	Cambridge Journals		2009	302-306	doi:10.1017/S1355617709090377	Yes

	<i>and bulimia nervosa patients: Preliminary findings</i>	Moya	<i>Neuropsychological Society</i>							
12	<i>Lifetime substance abuse, family history of alcohol abuse/dependence and novelty seeking in eating disorders: Comparison study of eating disorder subgroups</i>	Isabel Krug	<i>Psychiatry and Clinical Neurosciences</i>	<i>Volume 63, Issue 1, pages, February 2009</i>	<i>Wiley</i>		2009	82-87	doi:10.1111/j.1440-1819.2008.01908.x	No
13	<i>Subtyping eating disordered patients along drive for thinness and depression</i>	E. Peñas-Lledó	<i>Behaviour Research and Therapy</i>	<i>Volume 47, Issue 6, June 2009</i>	<i>Elsevier</i>		2009	513-519	doi:10.1016/j.brat.2009.03.003	Yes
14	<i>Meta-analysis on drugs in people with eating disorders</i>	A. Calero	<i>European Psychiatry</i>	<i>Volume 23, Supplement 2, April 2008, 16th AEP Congress - Abstract book, 16th AEP Congress</i>	<i>Elsevier</i>		2008	S184		Yes
15	<i>Predictors of early change in bulimia nervosa after a brief psychoeducational therapy</i>	Fernando Fernández-Aranda	<i>Appetite</i>	<i>Volume 52, Issue 3, June 2009</i>	<i>Elsevier</i>		2009	805-808	doi:10.1016/j.appet.2009.03.013	Yes
16	<i>Male eating disorders and therapy: A controlled pilot study with one year follow-up</i>	Fernando Fernández-Aranda	<i>Journal of Behavior Therapy and Experimental</i>	<i>Volume 40, Issue 3, September 2009</i>	<i>Elsevier</i>		2009	479-486	doi:10.1016/j.jbtep.2009.06.004	Yes

			<i>Psychiatry</i>							
17	<i>Age of Onset in Pathological Gambling: Clinical, Therapeutic and Personality Correlates</i>	<i>Susana Jiménez-Murcia</i>	<i>Journal Of Gambling Studies</i>	<i>Volume 26, Number 2, January 2010</i>	<i>Springer</i>		<i>2010</i>	<i>235-248</i>	<i>doi:10.1007/s10899-009-9175-3</i>	<i>Yes</i>
18	<i>Motivation to change and pathological gambling: Analysis of the relationship with clinical and psychopathological variables</i>	<i>Mónica Gómez-Peña</i>	<i>British Journal of Clinical Psychology</i>	<i>Article first published online: 2 MAR 2011</i>	<i>Wiley</i>		<i>2011</i>		<i>doi:10.1348/014466510X511006</i>	<i>No</i>
19	<i>Social anxiety in the eating disorders: relationship with eating and personality features. Journal of Anxiety Disorders</i>	<i>Peñas-Lledó, E.</i>	<i>Journal of Anxiety Disorders</i>	<i>24 (7), Epub 2010 May 26</i>	<i>Elsevier</i>		<i>2011</i>	<i>767-773</i>		
20	<i>Subtyping Study of a Male Pathological Gambling Sample</i>	<i>Eva M Alvarez-Moya</i>	<i>Canadian Journal of Psychiatry</i>	<i>55(8), August 2010</i>	<i>CPA</i>	<i>Canada</i>		<i>498-506</i>		

Table 4: Template A2- List Of Dissemination Activities

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	Type of activities ³	Main leader	Title	Date	Place	Type of audience ⁴	Size of audience	Countries addressed
1	Conference	T. Kostoulas	<i>A Real-World Emotional Speech Corpus for Modern Greek</i>	May 28-30, 2008	Morocco	Scientific Community		International
2	Conference	Susana Jiménez-Murcia	<i>Playmancer project: a serious videogame as additional therapy tool for eating and impulse control disorders</i>	Jun 21 - 23, 2009	Villa Caramora, Italy	Scientific Community	Annual CyberTherapy and CyberPsychology 2009 conference	International
3	Conference		<i>Serious videogames as</i>	July 15-17, 2009	Barcelona,	Scientific	13th International	International

³ A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

⁴ A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias ('multiple choices' is possible).

			<i>therapeutical tool for mental disorders: enhanced human computer interaction in PlayMancer</i>		<i>Spain</i>	<i>Community</i>	<i>Conference of on Information Visualisation (VIZ09)</i>	
<i>4</i>	<i>Conference</i>	<i>Soto A.</i>	<i>A Review of Serious Games as Psychological Support in Health</i>	<i>July 15-17, 2009</i>	<i>Barcelona, Spain</i>	<i>Scientific Community</i>	<i>13th International Conference of on Information Visualisation (VIZ09)</i>	<i>International</i>
<i>5</i>	<i>Conference</i>	<i>F. Fernández-Aranda</i>	<i>Playmancer project: A serious videogame as additional therapy tool for eating disorders</i>	<i>September 11-13, 2009</i>	<i>London, UK</i>	<i>Scientific Community</i>	<i>In symposium (Chair U. Schmidt) New Technologies in the treatment of eating disorders. European Council on Eating Disorders</i>	<i>International</i>
<i>6</i>	<i>Conference</i>	<i>Kostoulas T.</i>	<i>The PlayMancer Database: A Multimodal Affect Database in Support of Research and Development Activities in Serious Game Environment</i>	<i>May 19-21, 2010</i>	<i>Valletta, Malta</i>	<i>Scientific Community</i>	<i>Seventh conference on International Language Resources and Evaluation</i>	<i>International</i>

							(LREC'10)	
7	Conference	Kalapanidas E.	Ωφέλιμα παιχνίδια ως εργαλείο αντιμετώπισης της επεισοδιακής υπερφαγίας: Το ερευνητικό έργο PlayMancer (in Greek)	October 29-30, 2010	Corfu, Greece	Scientific Community	10th Corfu International Obesity Congress 2010	Greece
8	Conference	F. Fernández-Aranda	A Serious videogame as additional therapy tool for pathological gambling: Playmancer Multicenter European Project	October 2010		Scientific Community	2010 11TH ANNUAL NCRG CONFERENCE ON GAMBLING AND ADDICTION	International
9	Conference	Fernando Fernández-Aranda	A Serious Videogame as additional therapy tool for Eating disorders: PlayMancer EU project	November 12-14, 2009	Universidade do Minho, Braga, Portugal	Scientific Community	INTACT International Symposium- The Dynamics of Eating Disorders: Towards a better understanding of the processes of falling ill, getting well and staying well	International
10	Conference	Fernando	Playmancer project: A serious	11-13	London, UK	Scientific	Symposium	International

		<i>Fernández-Aranda</i>	<i>videogame as additional therapy tool for eating disorders</i>	<i>September, 2009</i>		<i>Community</i>	<i>(Chair U. Schmidt) New Technologies in the treatment of eating disorders. European Council on Eating Disorders</i>	
<i>11</i>	<i>Conference</i>	<i>Juan J. Santamaria</i>	<i>A serious videogame as additional therapy tool for bulimia nervosa and binge eating disorders: PLAYMANCER EU Project</i>	<i>November 25 – 27, 2009</i>	<i>Isla de la Toja, Santiago de Compostela, Spain</i>	<i>Scientific Community</i>	<i>III Simposium Internacional del CIBER Fisisopatología de la Obesidad y Nutrición</i>	<i>International</i>
<i>12</i>	<i>Workshop; Poster</i>	<i>Fernando Fernandez</i>	<i>Utilización de videojuegos como herramienta terapéutica en salud mental: Proyecto Playmancer</i>	<i>December 2009</i>	<i>Sant Boi, Barcelona, Spain</i>	<i>Scientific Community</i>	<i>Roundtable discussion: Las TICs en diagnóstico, terapia y seguimiento en salud mental (II): aplicaciones de realidad virtual y Videojuegos</i>	<i>Spain</i>

13	Workshop	Jiménez-Murcia, S	Tratamiento de la Adicción a la Nuevas Tecnologías	November 25-26, 2010	Sevilla, Spain	Scientific Community	Panel de Experiencias, Consejería de Igualdad y Bienestar Social	Spain
14	Conference	Fernando Fernández-Aranda	PlayMancer project: A Serious Videogame as additional therapy tool for Eating disorders	June 12, 2010	Salzburg, Austria	Scientific Community	Academy for Eating Disorders	International
15	Conference	Susana Jiménez-Murcia	A serious videogame as additional therapy tool for obesity and binge eating disorders: PlayMancer multicenter European project	July 11-15, 2010	Stockholm, Sweden	Scientific Community	International Congress of Obesity	International
16	Workshop	Fernando Fernandez-Aranda	Videojuegos como herramienta terapéutica en Trastornos de la alimentación: Proyecto europeo Playmancer	July 21, 2010	Alicante, Spain	Scientific Community	Cursos de Verano	Spain
17	Conference		Playmancer project: A Serious Videogame as additional therapy tool for Eating and Impulse control disorders	June 21-23, 2010	Verbania-Intra, Italy	Scientific Community	14th. Annual Cybertherapy & Cyberpsychology	International
18	Conference	Kocsis, O.	Serious videogames as therapeutical tool for mental disorders: enhanced human	July 15-17, 2010	Barcelona, Spain	Scientific Community	13th International Conference of on Information	International

			<i>computer interaction in PlayMancer</i>				<i>Visualisation (VIZ09)</i>	
19	<i>Conference</i>	<i>Antonio Soto</i>	<i>A Review of Serious Games as Psychological Support in Health</i>	<i>July 15-17, 2010</i>	<i>Barcelona, Spain</i>	<i>Scientific Community</i>	<i>13th International Conference of on Information Visualisation (VIZ09)</i>	<i>International</i>
20	<i>Conference</i>	<i>Fernando Fernández-Aranda</i>	<i>A serious videogame as additional therapy tool for bulimia nervosa and binge eating disorders: Playmancer multicenter European Project</i>	<i>October 7-9, 2010</i>	<i>Boston, USA</i>	<i>Scientific Community</i>	<i>Eating Disorders Research Society 16th Annual Meeting</i>	<i>International</i>
21	<i>Conference</i>	<i>Fernando Fernández-Aranda</i>	<i>A Serious Videogame as Additional Therapy Tool for Pathological Gambling: Playmancer Multicenter European Project</i>	<i>November 14-15, 2010</i>	<i>Las Vegas, USA</i>	<i>Scientific Community</i>	<i>Annual NCRG Conference on Gambling and Addiction: Redefining Diagnosis, Treatment, Research and Responsible Gaming for the 21st Century.</i>	<i>International</i>
22	<i>Conference</i>	<i>C. Schönauer</i>	<i>Chronic Pain Rehabilitation with</i>	<i>June 29 – July</i>	<i>Zurich,</i>	<i>Scientific</i>	<i>Submitted to</i>	<i>International</i>

			<i>a Serious Game using Multimodal Input</i>	<i>1, 2011</i>	<i>Switzerland</i>	<i>Community</i>	<i>International Conference on Virtual Rehabilitation (ICVR)</i>	
<i>23</i>	<i>Conference</i>	<i>C. Schönauer</i>	<i>Full Body Interaction for Serious Games in Motor Rehabilitation</i>	<i>March 12-14, 2011</i>	<i>Tokyo, Japan</i>	<i>Scientific Community</i>	<i>Augmented Human Conference</i>	<i>International</i>
<i>24</i>	<i>Workshop</i>	<i>Fernando Fernández-Aranda</i>	<i>Playmancer European Project: A New-generation Videogame for Treating Eating disorders and Impulse control disorders</i>	<i>8-10 March, 2011</i>	<i>Barcelona, Spain</i>	<i>Scientific Community</i>	<i>HICT 2011: International Forum on Health Care and Information Communication Technology</i>	<i>International</i>
<i>25</i>	<i>TV clip; interview</i>	<i>Project members</i>	<i>Euronews futuris TV report on PlayMancer: Games for Health</i>	<i>January 13-19, 2011</i>	<i>Spain, Netherlands</i>	<i>Public</i>	<i>Millions</i>	<i>Europe</i>
<i>26</i>	<i>TV clip; interview</i>	<i>Fernando Fernández-Aranda</i>	<i>French TF1 TV channel report</i>	<i>February 15, 2011</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>France</i>
<i>27</i>	<i>TV clip; interview; press release</i>	<i>Fernando Fernández-Aranda</i>	<i>Spanish TV3 TV channel report</i>	<i>February 8, 2011</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>
<i>28</i>	<i>TV clip;</i>	<i>Fernando</i>	<i>Spanish TV TVE channel report</i>	<i>February 7,</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>

	<i>interview; press release</i>	<i>Fernández- Aranda</i>		<i>2011</i>				
<i>29</i>	<i>TV clip; interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>Spanish TV Tele 5 channel report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>
<i>30</i>	<i>TV clip; interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>Spanish TV Antena 3 channel report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>
<i>31</i>	<i>interview</i>	<i>Elias Kalapanidas</i>	<i>The World -- BBC/WGBH/PRI; story about PlayMancer</i>	<i>February 8, 2011</i>	<i>Brussels, Belgium</i>	<i>Public</i>		<i>USA, Europe</i>
<i>32</i>	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>RAC 1 Radio Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>
<i>33</i>	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>Catalunya Ràdio Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>
<i>34</i>	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>COM Ràdio Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>
<i>35</i>	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>EFE Televisió Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>
<i>36</i>	<i>Interview; press release</i>	<i>Fernando Fernández-</i>	<i>Ràdio 4 Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>

		<i>Aranda</i>						
37	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>Cadena SER Station project report</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>		<i>Spain</i>
38	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>El Hospital de Bellvitge desarrolla juegos de ordenador con fines terapéuticos, La Vanguardia newspaper</i>	<i>26 January, 2009</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>
39	<i>Interview; press release</i>	<i>Fernando Fernández- Aranda</i>	<i>Videojuegos que sanan la mente, El País newspaper</i>	<i>February 7, 2011</i>	<i>Spain</i>	<i>Public</i>	<i>Millions</i>	<i>Spain</i>
40	<i>Exhibition</i>	<i>Elias Kalapanidas</i>	<i>ICT 2010 exhibition area</i>	<i>27-29 September, 2010</i>	<i>Brussels, Belgium</i>	<i>Registered; Public</i>	<i>Thousands</i>	<i>PanEuropean; Europe</i>
41	<i>Workshop</i>	<i>K. Karpouzis</i>	<i>"R&D in Serious Games", Networked Session in ICT 2010</i>	<i>29 September 2010</i>	<i>Brussels, Belgium</i>	<i>Registered; Public</i>	<i>Thousands</i>	<i>PanEuropean; Europe</i>
42	<i>Press release</i>	<i>Elias Kalapanidas</i>	<i>ICT Results</i>	<i>6 March, 2009</i>		<i>Public</i>	<i>Millions</i>	<i>PanEuropean; Europe</i>
43	<i>Conference</i>	<i>M. Vollenbroek - Hutten</i>	<i>Technology supported training for rehabilitation</i>	<i>23 march 2011</i>	<i>The Hague, The Netherlands</i>	<i>Scientific Community</i>	<i>Symposium Br@ins & G@mes</i>	<i>Dutch</i>
44	<i>Workshop</i>	<i>Fernando Fernández-</i>	<i>Playmancer European Project: A New.generation videogame</i>	<i>8-10 Marzo 2011</i>	<i>Barcelona.Spain</i>	<i>Registered; Public</i>	<i>International Forum on Health</i>	<i>International</i>

		<i>Aranda</i>	<i>for Treating Eating Disorders and Impulse Control Disorders.</i>				<i>Care and Information & Communication Technology.</i>	
45	<i>Workshop</i>	<i>Fernando Fernández-Aranda</i>	<i>Usefulness of new-generation videogames for treating eating disorders: Playmancer European project.</i>	<i>29-31 March 2011</i>	<i>London, UK</i>	<i>Scientific Community</i>	<i>The 10th London International Eating Disorders Conference</i>	<i>International</i>
46	<i>Workshop</i>	<i>Fernando Fernández-Aranda</i>	<i>Usefulness of a videogame for treating Bulimia nervosa and Binge Eating Disorders: PLAYMANCER a Multicenter EU-Project.</i>	<i>28-30 April 2011</i>	<i>Miami, USA</i>	<i>Scientific Community</i>	<i>ICED-International Conference on Eating Disorders</i>	<i>International</i>
47	<i>Workshop</i>	<i>Fernando Fernández-Aranda</i>	<i>Usefulness of new-generation videogames for treating eating disorders: Playmancer European project.</i>	<i>10 June 2011</i>	<i>Sabadell, Spain</i>	<i>Scientific Community</i>	<i>SCRITC</i>	<i>National</i>
48	<i>Interview;</i>	<i>Prproject Consortium</i>	<i>PRI U.S. radio interview and web report</i>	<i>June 13, 2011</i>	<i>Brussels, Belgium</i>	<i>Public</i>	<i>Millions</i>	<i>U.S.A., Europe</i>

2.2.8 Audiovisual Material

The PLAYMANCER consortium promotes the production and distribution of audiovisual material, which is disseminated to a broader audience in the various events. Audiovisual material includes demos demonstrating the PLAYMANCER project prototypes (i.e. demos made while testing/ validating/ evaluating the PLAYMANCER prototypes), as well as the work being carried out on each partner site. Audiovisual material, is made available to all PLAYMANCER partners, and, once approved, made publicly available.

The project has been very active in producing and promoting video clips about the project implementation. It has proved that this material attracted the attention of the public, and maintained their interest in the project. It has also brought the attention of news agencies and news media, the reports of which created a positive and well-received impact, not to mention the viral side effects of the reproduction of these reports in the electronic press, news casts, blogs and other social media.

The first video comes from an open event by partner TUW, available to citizens of Vienna (Vienna Science Fair, October 11-12, 2008). There, hundreds of children played with an early prototype game based on the motion capture technology used in the PlayMancer rehabilitation game. There is no narration in the video footage, only introductory and closing screens in English.

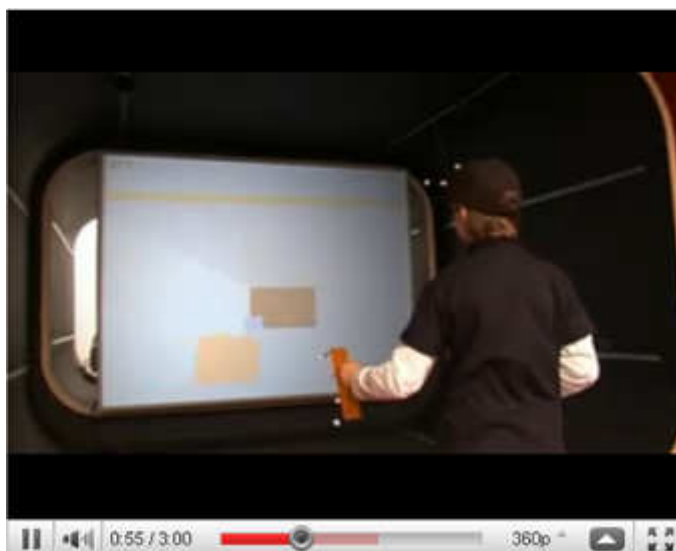


Figure 11: Capture from the first project video

The second video was released through the project site on 3rd of November, 2009. It focused on the new low-cost motion capture technology built for PlayMancer from partner TUW. Also no narration or spoken language exists, all the explanations provided in this material are in English.



Figure 12: Capture from the second project video

The third video was released the same day (3rd of November, 2009), and consisted of a sneak peak in the bridge building game prototype that has been demonstrated at the NEM summit of that year, by partner ST. No narration or spoken language exists, titles and explanations are in English.



Figure 13: Capture from the third project video, a game prototype

The fourth video was a report by Austrian TV channel ORF, interviewing our Austrian partner members (TUW), released through the site at 17 of September, 2010. The language of the report is German, but the project members have successfully produced subtitles in English.



Figure 14: Capture from the fourth project video, a TV channel report

The fifth video was a report by Euronews TV channel, interviewing several of the project members, with video footage at both of the field trial premises, in Barcelona, Spain (IDIBELL) and Enschede, Netherlands (RRD). The producers provided a license to the project to use the final cut video for all the project dissemination needs and through any channel. A YouTube version exists already with English narration, while the project members own the original DVD material, holding versions narrated and close-captioned in 10 EU languages, which will be edited in order to be used in other project dissemination activities.

The report is available on Euronews website, www.euronews.net/sci-tech/futuris and it is also accessible on YouTube and other smaller regional streaming online websites. The report is also broadcast in athenaweb.org, website specialised in Worldwide Research TV reports. All European public televisions and main private ones have received the report via an Eurovision exchange.



Figure 15: Capture from Euronews TV report

Then, a number of TV reports in Spanish were generated after a press conference organised by project partner IDIBELL (see below, section 2.2.9). Spanish TV channels own the rights to the produced content, which is narrated in Spanish.



Figure 16: Capture from a Spanish TV channel report on the project

At last, in June 2011 a report has been published in the world wide web and aired by the public radio PRI about the project. The journalist covering this story has travelled to partner RRD premises and played with the pain rehabilitation prototype (he had to wear the body suit in order to be motion-tracked). His story can be found here: <http://www.theworld.org/2011/06/playmancer-rehab-netherlands/>



2.2.9 Press Releases

Summaries of newsworthy events or results achieved by the PLAYMANCER consortium form the content of press releases. The press releases are sent to journalists in various European Countries and are written and distributed in a timely manner.

The first release, introducing the project and its objectives, was sent to ICT Results site of the EC, published there and then reproduced by dozens of other electronic news sites, blogs and social media.

The second release was sent to interested parties before the ICT 2010 event, September 2010, where the project had an exhibition stand, and where also the project co-organised a networking session about serious games.

The third release has been issued by partner IDIBELL on 6th of February, 2011, and resulted in a massive Spanish TV and radio coverage day, while the field trial evaluation of the game for mental health has been running. The release was covered by Spanish TV stations TVE, TV3, Tele5, Antenna3, and by the radio stations RAC1, Catalunya Ràdio, COM Ràdio, EFE Televisió, Ràdio 4, Cadena SER.

After the end of the project, another press release is being expected, summarising the project results and achievements, and stimulating the market potential of these results by interested third parties.

2.2.10 Public Project Documents

The public project documents are stored in 5 folders, each holding a different type of available document:

- Public deliverables: Here one can find the project deliverables that are tagged as Public in the project contract (Description of the Work Annex I), and that have been accepted by the project reviews
- Public research articles: most of the articles produced by project members that acknowledge the funding by EC can be found in this folder
- Public brochures: The project leaflets, brochures and banners can be found here as Adobe pdf documents
- Public press releases: The project press releases, as well as the printed press articles about the project can be found in this area
- Public presentations: All project presentations made at different public events or project video material can be found here

- [+ Add Deliverables](#)
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What is going on when:

February 2011

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

March 2011

	M	T	W	T	F	S
27	28	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

April 2011

	M	T	W	T	F	S

Deliverables

In this area (or document category) you may find the project deliverables that have been approved and released so far to the public. If no files are found here, then please come back again later.

Date added

Documents

Order by: [Links](#) | [Date](#) | [in Ascending](#)

[D2-1b- StateOfTheArt-Revision2-v4-3](#) [View](#)

Deliverable D2-1b "State of the Art on Serious games, Games for Health, and Multimodal Game Technologies" Hits: 310 11/11/2009

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[PlayMancer_D5_1_Report_on_game_distr_services_v03_PU_version](#) [View](#)

Final version of the deliverable D5.1.1 "Report on the development of 3D content sharing and game distribution services" Hits: 477 11/11/2009

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[PlayMancer_D4_1_Multimodal_Platform_final_v1_1](#) [View](#)

Final version of the deliverable D4.1 "Report of PlayMancer gaming platform development" Hits: 297 11/11/2009

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[D7-1-PlayMancerWebSiteDeployment-v1_2Updated](#) [View](#)

PlayMancer Website deployment Hits: 333 11/03/2009

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[D2-2-Evaluation_Methodology_V4.3](#) [View](#)

Evaluation Methodology Hits: 331 11/03/2009

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Page 1 of 2

Figure 17: Partial list of the public project deliverables

Figure 18: Partial list of the public project research publications

Figure 19: Partial list of the public project press releases

Public Deliverables
 Research Articles
 Press Releases
 Presentations
 Events
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What is going on when:
 February 2011
 March 2011

Presentations
 You can find here some presentations that might help you understand the objectives and research behind PlayMancer. [\(date added\)](#)

Documents
 Order by: Name | Date | Hits | Ascending

PlayMancer prototype video [Download](#) [Details](#)
 First PlayMancer mini game demonstrated in NEM summit 2009 Hits: 734 11/09/2009

Low-cost Motion Capture technology built for PlayMancer [Download](#) [Details](#)
 Low-cost Motion Capture technology built for PlayMancer presented in NEM summit 2009 Hits: 1153 11/09/2009

VR Rehabilitation Game, Demonstration @ Wiener Forschungsfest 2008 [Download](#) [Details](#)
 VR Rehabilitation Game demonstration @ Wiener Forschungsfest 2008 Hits: 608 02/20/2009

A video of a PlayMancer's game [Download](#) [Details](#)
 A brand new walkthrough video from the current development thread. You can see an arrangement of islands during the sunset. Hits: 317 05/01/2009

PlayMancer Project presentation [Download](#) [Details](#)
 This is an overview of the PlayMancer project, the origin of the project idea, the objectives and some technical aspects of the implementation. Hits: 648 02/11/2008

Figure 20: List of the public project presentations

2.3 Dissemination activities: Distribution of material by dissemination channel

As described before, the PLAYMANCER consortium has identified, planned and carried out a number of dissemination activities ranging from developing and maintaining the project's web site, to organising and participating in events, interest groups and collaborating with research projects working on similar research disciplines. The PLAYMANCER project's dissemination material (such as project brochure, poster, press releases, etc) has been or will be created in order to inform the wide audience and also to act as supportive means to the more specific dissemination activities.

Aiming at the maximization of benefit from the PLAYMANCER's dissemination activities, the PLAYMANCER consortium took into account the issues mentioned below:

- Identified the expected results of each dissemination activity
- Defined the different players in each dissemination activity (participants, organisers, and so on).
- Identified the players/audiences on which to focus

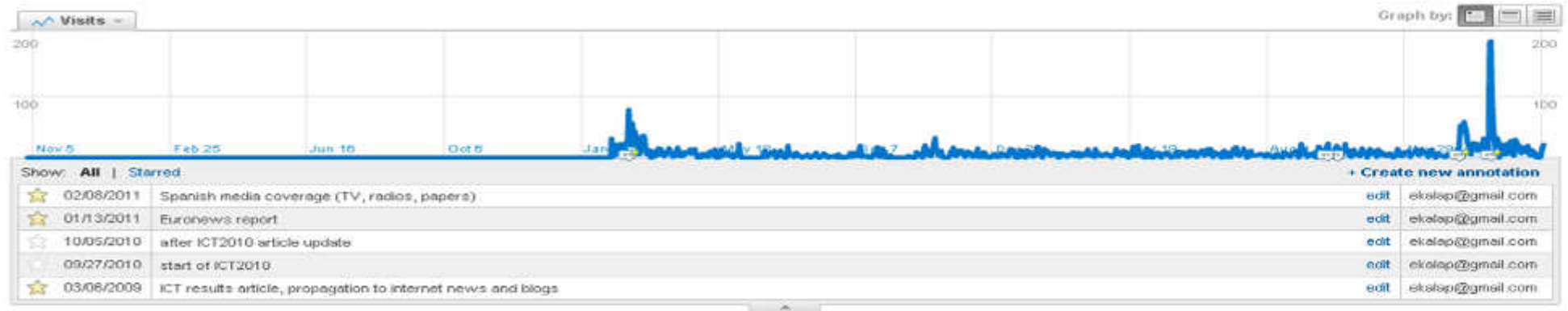
- Identified the most appropriate material to be used in each dissemination activity
- Applied cost-effectiveness criteria when selecting and/or producing the dissemination material

The followed strategy is to maximise the release of dissemination materials after the completion of the project milestones. This is proved by how the main publications, internet publications and campaigns and video/press releases coincide with or follow the important project dates (the milestone dates have been adapted to the latest version of the project DoW, including the project extension).

Table 5: Dissemination plan per project quarter as number of events per disseminations channel

Project months	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	31-33	34-36	37-39	40-43
Periods	1/11/07- 31/01/08	1/02/08- 30/04/08	1/05/08- 31/07/08	1/08/08- 31/10/08	1/11/08- 31/01/09	1/02/09- 30/04/09	1/05/09- 31/07/09	1/08/09- 31/10/09	1/11/09- 31/01/10	1/02/10- 30/04/10	1/05/10- 31/07/10	1/08/10- 31/10/10	1/11/10- 31/01/11	1/02/11- 30/05/11
Project milestone	M1			M2			M3, M4				M5			
Internet*		1				4	3		7			2	1	
Events			1				3	2	3		7	5	2	2
Press		1	1	2	2	5	4	1	2		1	1	1	17

*: As internet activities we count the news announced on the public area of the project site(s), not other activities (e.g. document and deliverable uploads and downloads, calendar update, poll participation, web site traffic). The following chart depicts the web site traffic from the start of the tracking date to date.



3 Use Plan

In order to structure the formation of the PLAYMANCER use plan we adopted a methodology that is based on the model of *Exploitation Vectors*. This is presented below.

3.1 Exploitation Vectors

The PLAYMANCER exploitation strategy will be supported by the definition of the *Exploitation Vectors*. These vectors act as a main guide through the processes of the formation of the PLAYMANCER Exploitation Plan.

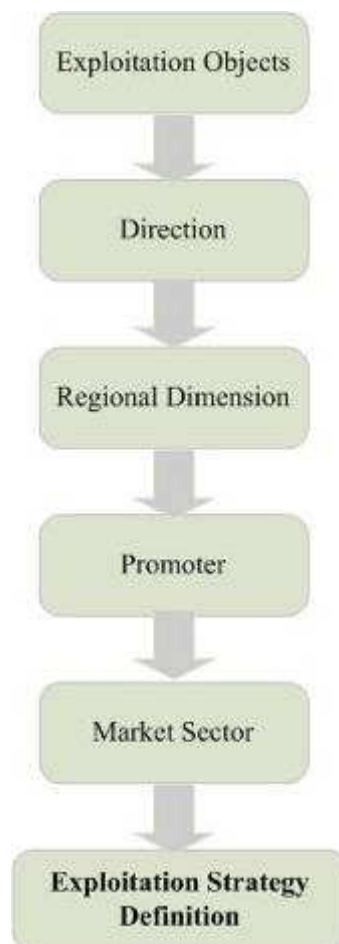


Figure 21: Exploitation Vectors

Exploitation Objects: The project is based on a modular concept that is composed of components (modules and/or applications) around the project architecture. These components effectively represent possible partial, tangible, solutions / products, being exploitable as such, that is, partial outcomes of the project.

Furthermore, another result of the project can be an integrated and advanced prototype along with the services provided to the end users (medical institutions/patients).

This prototype - that will already satisfy subsets of requirements for a real product - represents the main Exploitation Object and thus an important input for the Exploitation Plan to be established.

The Exploitation Objects in PLAYMANCER are described in detail in Section 3.4 ("Exploitation Objects").

Direction of Exploitation: The exploitation interest and opportunities can be separated into Internal and External Exploitation.

- **Internal:** Exploitation activities developed inside the network/organisation of one of the partners of the consortium, e.g. in further R&D and activities, teaching & training services, etc.
- **External:** Exploitation activities that take place from within the project consortium but are targeted to the outside. This direction can still be sub-classified into exploitation on a national, European and world-wide level.

Regional Dimension: This vector provides a classification for the regional scope of any exploitation strategy.

- The **national** level comprises all the exploitation actions that are mainly oriented to the countries of each of the consortium members.
- The **international** level includes the European market as a whole, the principal market for any exploitation strategy to be adopted.
- The **world wide** level, that is, in countries that do not belong to Europe, but offer good (effective) exploitation opportunities (North and South America, Asian, etc.).

Promoter: Contractors are owners of the results and any exploitation strategy or activity concerning the exploitation should respect what is established on the **Consortium Agreement (CA)**, signed by all consortium members by the kick-off meeting. Among others,

the CA defines the rules for the access and transmission of the project's IPR's and must be respected by all the partners.

Possible options of promoters for the development of exploitation strategies:

4. **Partner:** one of the partners of the consortium exploits for and by himself. This option would be selected in case of developing exploitation strategies for individual project results. In that case, a partner would, also, promote other PLAYMANCER partners as the best solutions for a full integration.

Even if this "policy" would lack some of the benefits coming from a higher level of cooperation, it offers obvious advantages in market penetration, as smaller (and cheaper) packets can stimulate a first step customer order and become the better advertisement for the other PLAYMANCER components.

5. **Consortium via Partner:** the consortium exploits with one (or more) of the partners who are becoming the "exploitation front-end" for the project results, especially for the composite results of the project. Several exploitation models are viable (open-source licensing, licensing by units, ...)

6. **Consortium via External Entity:** the consortium can agree to establish an agreement with an external entity that will be responsible for the exploitation of the project results.

For example, in the case of internal exploitation it is reasonable to assume that the respective partner will be the main responsible for the exploitation strategy to be adopted.

A combination of the abovementioned options is also possible.

The best practice will be selected only at the end of the project or in the following one to two years after its conclusion, depending on market demand. What can be done at this early stage of the project is to start establishing first attempts to exploitation strategy.

Market Sector: The Market Sector refers to the identification and categorization of companies based on the industry which has to be considered as our target market. To be used on other markets and other knowledge domains, the system must be customized according to the market specific needs and languages. Moreover the system must be configured for a customer's application field or developer's process.

However, it is not intended by the Consortium at the time to present hard and up-to-date market figures since this would require a specific Business Plan and therefore clearly out of this deliverable and the project.

3.2 Exploitation Model

The generic Exploitation Model to be adopted in this project is described in the following figure, with the required technological capacity decreasing from the inner to the outer circles. The conception of the *Specific Model* will additionally be guided by the Consortium Agreement, the identified exploitation vectors, the preliminary market analysis, the structure and potential of the consortium, the status of the current prototype(s) and the objective to provide a feasible and sustainable model for exploitation.

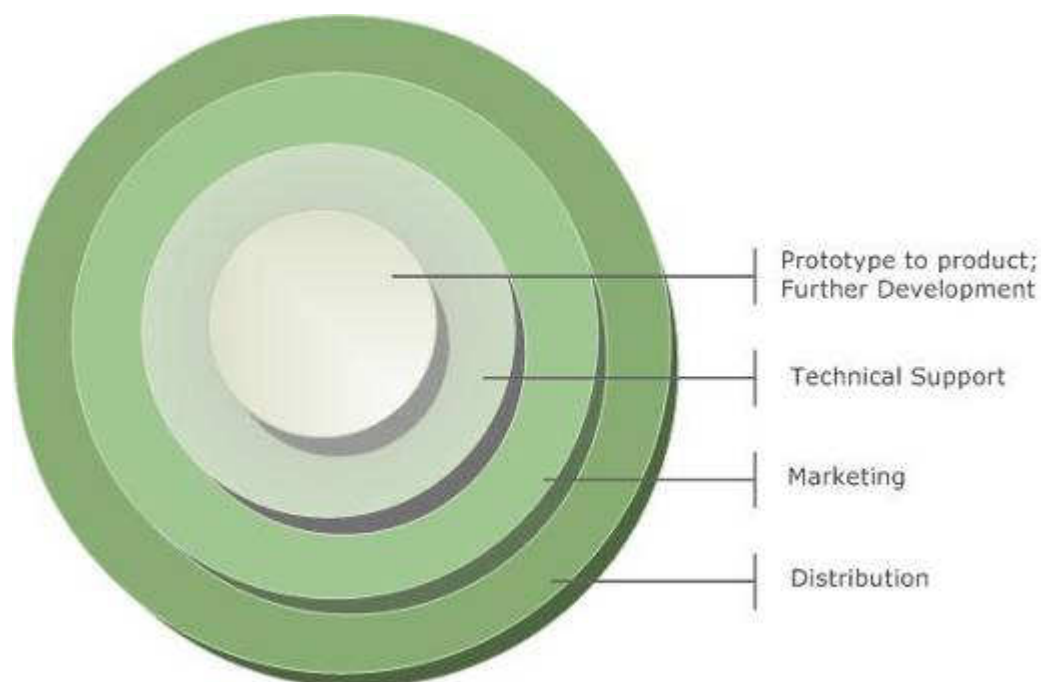


Figure 22: Exploitation Model

3.3 Competitors

This document attempts to provide an adequate market analysis of all the associated with the project market sectors (both ICT and health care). It will also survey a list of the main competitors, R&D projects, etc. which are relevant for this project. Competing systems or systems targeting the same segment of the market will be identified and will be compared to the system targeted by the project.

Since PLAYMANCER deals with emerging technologies (ICT) in emerging markets (Serious games; Games for health; Physical body rehabilitation; Mental health; Eating disorders; Gambling addiction; Motion capture; affective computing; ...), "competition" is still somewhat

relative. Synergetic effects and cooperation models where "competing" solutions are complementary to each other are also relevant factors for any exploitation strategy.

Another fact which should be taken into account is the geographic localization of the competitors. Because the project involves different participants from different countries, the market situation and commercialization conditions differ from region to region.

Additionally, not only the regional context but also the global one; e.g. local, personalized services against off-the-shelf products designed for exploitation in a global scope, should also be taken into account.

List of competing solutions

A list of competing solutions to the PlayMancer results and to the individual project results is provided in Section 4.1.

3.4 Exploitation Objects

Analysing the work within PLAYMANCER, we are sorting out two major categories for the exploitable results:

- **individual exploitable results:** this class groups individual PLAYMANCER components sorted out by research and development activity;
- **composite exploitable results:** in this second category, we are identifying a list of exploitable results built using one or more of the individual exploitable results.

3.4.1 Individual Objects

Based on the current status of the PLAYMANCER research stage, the individual exploitable objects - per PLAYMANCER subsystem - are the following:

1. Serious game for mental health
2. Serious game for pain rehabilitation
3. Game design for mental health patients
4. Game design for pain rehabilitation patients
5. PlayMancer Serious Games assets
6. Bio-feedback-based emotion recognition
7. Speech-based emotion recognition

8. Visual facial expressions-based emotion recognition
9. Emotion recognition fusion
10. PlayMancer emotion recognition database
11. Low-cost Motion capture system
12. Multi-sensor signal fusion
13. Unity 3D emotion recognition input
14. Unity 3D human player motion input
15. Game Automatic Speech Recognition
16. Field trial results on the use of the PlayMancer serious game for mental health patients
17. Field trial results on the use of the PlayMancer serious game for chronic pain rehabilitation

An analytical list of the project results is presented in the Appendix, Part B2, at the end of the document.

3.4.2 Composite Objects

This category represents the PLAYMANCER exploitable results consisting of more than one of the individual exploitable results. We can divide them into in the following main classes:

- ***PLAYMANCER integrated prototypes:*** Two of the PLAYMANCER composite exploitable results are the integrated PLAYMANCER prototype games, consisting of all the individual exploitable results:

PlayMancer serious game for mental health. This integrated environment consists of:

- Serious game for mental health
- Unity 3D emotion recognition input
- PlayMancer Serious Games assets
- Bio-feedback-based emotion recognition

- Speech-based emotion recognition
- Visual facial expressions-based emotion recognition
- Emotion recognition fusion
- Field trial results on the use of the PlayMancer serious game for mental health patients

PlayMancer serious game for pain rehabilitation. This integrated environment consists of:

- Serious game for pain rehabilitation
 - Unity 3D human player motion input
 - Low-cost Motion capture system
 - Multi-sensor signal fusion
 - Game Automatic Speech Recognition
 - Field trial results on the use of the PlayMancer serious game for chronic pain rehabilitation
- **Re-packaged results:** The PLAYMANCER project results can be re-packaged and offered as composite system components that could be promoted as individual results for third-party systems or applications. These could be:
 1. User emotion recognition component. This is made up of the following individual components:
 - a. Bio-feedback-based emotion recognition
 - b. Speech-based emotion recognition
 - c. Visual facial expressions-based emotion recognition
 - d. Emotion recognition fusion
 2. Multi-sensor Motion capture component. This is made up of the following components:
 - a. Low-cost Motion capture system
 - b. Multi-sensor signal fusion

3. Principles, theory and practice on using serious games for mental health patients. This comprise knowledge for building new games for the intended user group:
 - a. Game design for mental health patients (part of deliverables 5.4, 5.6)
 - b. Field trial results on the use of the PlayMancer serious game for mental health patients (part of deliverable D8.2)
 - c. Publications on PlayMancer serious game for mental health patients
4. Principles, theory and practice on using serious games for pain rehabilitation patients. This comprise knowledge for building new games for the intended user group
 - a. Game design for pain rehabilitation patients (part of deliverables 5.4, 5.6)
 - b. Field trial results on the use of the PlayMancer serious game for chronic pain rehabilitation (part of deliverable D8.2)
 - c. Publications on PlayMancer serious game for pain rehabilitation

Last but not least, the individual and collective know-how acquired by the project partners will serve as an additional Exploitation Object.

3.5 Exploitation Direction

In PLAYMANCER, we will follow both directions: internal and external exploitation.

3.5.1 Internal

All PLAYMANCER partners develop objectives and strategies for the promotion and internal exploitation of the project results in the scope of:

- Own R&D activities, i.e.:
 - in future R&D initiatives/projects/contracts;
 - in developing best practice guides of the knowledge gained throughout the project that might be exploited in future activities;
 - in improving tools for internal R&D activities; knowledge gained can be used for improving existing products, services, processes, etc.
- Training of new personnel, students, etc.
- Investment in project-related research and development, including:
 - equipment
 - foreground knowledge expressed as improved personnel expertise
- Intellectual Property initiatives, such as:
 - patent submission/grant
 - result licensing (protection)

So far, the project members have not filed any submission for patents, trademarks, etc. There is a plan for pursuing this Intellectual Protection activity for selected project results after the end of the project. An analytical list of the project patents, registered trademarks, etc., is appended at the Appendix, Part B1, according to the template of this deliverable (which is empty at the date of the delivery of this document).

3.5.2 External

External exploitation, i.e. activities from within the consortium targeted to the outside, will be based on the PLAYMANCER exploitation objects and the general exploitation strategy that will be adopted. The main exploitation activities planned and partially executed so far are presented below:

- Consolidating relationships with standardisation bodies, such as the W3C, and contribution to standardisation activities. The project has identified a specific aspect of serious games technology where standardisation can benefit researchers working with serious games. A member of W3C has been contacted for consultancy on this matter through the concertation meetings that the EC organises for the projects funded under the Networked Media Systems unit.
- Building relations with interested external stakeholders by:
 - exploiting the end-user partners visibility and reputation (ie: IDIBELL and RRD) to establish links to research community/industry/funding schemes/collaborators/opinion leaders/opinion builders. IDIBELL has gathered useful feedback on various project prototypes from international experts on clinical psychology and eating disorders, while RRD is investigating the opportunity of synergies with own spin-off companies.
 - exploiting the list of contacts made during participation to several events (representatives from the academic, industrial and end-user community). We have had already proposals for new initiatives or collaborations with several interested parties by using this network of people.
- Dissemination of scientific results to the research and scientific community;
- Consortium-wise Intellectual protection of results, e.g. through:
 - patent filling;
 - licensing the project exploitable results.
- Securing additional (external) funds for exploiting the PLAYMANCER results from:
 - Business angels;
 - Investment funds;
 - National/international research funds.

- Commercialisation of the project exploitable results (individual or composite).
- Creating new synergies between academic R&D and industrial research. These may lead to better market adaptation and new market opportunities and thus improve sales, incomes and employment.
- Sharing know-how and project experience in the e-Health, Networked Media and User-centered media community.

3.6 Regional Dimension

Our main focus will be on a European wide exploitation due to the nature of the project, the scope and dimension of the underlying problem and the constitution of the project consortium. Nonetheless, as mentioned earlier in this document, the project partners will try and exploit the project results also on a national level, mainly in the scope of internal exploitation (see also Section 5.2).

3.7 Promoter

The role of "Promoter" of the PLAYMANCER exploitable results has not yet been assigned to any partner or entity by the consortium. As stated earlier in this document, the best practice will be selected only at the end of the project or in the following one to two years after its conclusion, depending also on the market demand.

However, SGI and ST as profit-oriented SMEs in the consortium and technical partners involved in the design & development of the PLAYMANCER components are interested in taking up this role. NetUnion, as a SME active in the area of ICT for mental health, will assist the promoter in that direction.

4 Market Analysis

This chapter gives a short overview of the most relevant market sectors and niches that are of interest for the project as well as of the respective market trends. It provides also a preliminary survey on relevant R&D projects as well as a preliminary SWOT analysis.

4.1 Market Segments

The market products that compete with the PlayMancer individual results may fall in a range of different market sectors:

- Games for Health, Well-being games, Exergames
- ICT solutions for mental health CBT
 - Eating disorders
 - Gambling addiction
- ICT solutions for pain rehabilitation CBT
- Human-Computer Interaction
 - Motion Capture
 - Affective Interfaces
 - Speech Recognition

We list below some examples of serious games for health solutions. As the market is developing quickly, this is by no means an exhaustive list.

4.1.1 Games for Health, and for Psycho-education

Re-Mission by HopeLab is a PC game where the player takes the role of Roxxi, a nano-robot battling a variety of cancer cells inside the body of various human patients. The game is filled with important information and lessons about cancer and as such helps cancer patients to understand what their condition is all about, changes their attitudes towards the illness and promotes adherence to prescribed treatment regimens, specially self-administered treatments such as oral chemotherapy. This game was first described in the literature by Kato and colleagues in 2006 [2] and has been found to be an acceptable psychotherapeutic tool to a high percentage of adolescents and young adults suffering from cancer [3]. Re-mission is available for free after a quick registration.

3 Flash-based games for self-esteem are available by McGill University [7], Canada:

- “Wham!”: 2-D matrix game where the player is trained to associate personal information (name, birthday, etc.) with content or happy faces
- “EyeSpy: The Matrix”: based on the face-in-the-crowd paradigm used for social phobia, where the player should pick out of a face matrix the happy one
- “Grow your Chi!”: combines the concepts of EyeSpy and Wham! in a shoot’em up game, where the player should click on happy faces or on his own name, while face images and names are scrolling in the screen.

The latter two games are marketed by MindHabits company [8], with two other games. Their business model is free play for up to one hour, or unlimited play by buying the games for 19.99 US dollars.

SomaticVision is a company that focuses on creating games for stress relief and well-being. Their games are working with specific bio-feedback devices; currently with Wild Divine IOM hardware (see section 4.1.5), in a future release with HeartMath emwave sensor. Their prices per game range from 80-90 US dollars (without the sensor device) to 290 US dollars (including the sensor device).

Relax-to-Win [27] is a competitive two-player racing game using biofeedback to control the game. It was initially developed for research on treating children with anxiety problems. In the game, players compete against each other by controlling a dragon in a 3D virtual race using their stress level measured by their Galvanic Skin Response (GSR): if the player relaxes, their skin resistance increases and the dragon they control will go faster; on the contrary, if the player starts to be stressed, the dragon will slow down. The winner of the game will therefore be the player who managed to relax the most. The game, as distributed by Orange in the UK, uses a small biofeedback device made by Philips Design held between the fingers to measure the GSR.

Most of the abovementioned games have been used for research purposes. In a related comparison of empirical studies assessing the effectiveness of serious videogames for mental health (see project deliverable D8.2 Part B, section 2), several internal methodological and development related shortcomings have been identified, which limit their individual conclusions. PlayMancer in the same document presents a methodology and implementation of a controlled study which does not constraint its conclusions. The first results are promising, though the final results with the defined number of patients and sessions is expected later this year.

In general, there is no major well-established study yet to conclude about the therapeutic impact of a video game. Such results have been shown only for the educational impact of video games. Here lies the opportunity of the final PlayMancer controlled trials to statistically conclude about the clinical effect of the PlayMancer game for mental health.

4.1.2 ICT solutions for Eating disorders, Gambling and other addictions

Very few commercial solutions have been rolled out in this niche market. The ones that did, are products or by-products of related research efforts or programmes.

NetUnion, a partner of PlayMancer consortium, has released a series of applications that aim to support bulimia sufferers, binge eating disorder and gambling addicts: Salut BN, Salut BED, Salut Chat, Risiko and Orbast [14].



Figure 23: The Khemia game for smoking addicts

Individuals who are trying to quit smoking can get assistance to fight craving with a computer game called Khemia, part of My Quit Kit online quit smoking tool [15]. This PC game was developed by Hoozinga Game Media for the Vermont Department of Health and is meant to provide a distraction for smokers. Khemia is designed to be simple and short, taking between three and five minutes to play, but requires players to be focused on the task at hand, shooting at small moving target. The game also offers traditional smoking cessation reinforcement techniques and is provided free of charge.

PlayMancer goes beyond the abovementioned solution, by evaluating its therapeutic effect as a complement to traditional therapy. The conclusions of applying valid field trial methodologies such as the one that has been followed in PlayMancer with real patients can be the only scientific proof for the medical value of such solutions.

Regarding NetUnion web-based programs, there is not yet adequate data in order to compare their effect. Playmancer is an innovative approach in the sense that it links physiological, emotional and behavioral reactions of mental disorder patients.

4.1.3 ICT solutions for pain rehabilitation

Other than research prototypes, few commercialised solutions exist for the need of pain rehabilitation as of now, that involve VR or sensor technologies. One such is Curictus VRS[16], a solution that combines the SensAble Phantom Omni [17] with some VR glasses to create a small rehabilitation system. The other less-related products are mechanical devices (chairs, trainers, etc.) or electronically-supported massage or thermo therapeutic devices.

4.1.4 Motion Capture (for Games)

Tracking is a critical component of any virtual reality system and typically the most expensive one. Costs of tracking systems, especially of optical tracking systems which provide the highest measurement accuracy have always been high. They are sold by a small number of companies worldwide and due to a small end user market for such systems, prices were kept high for over a decade. This especially applies to motion capture (mocap) systems which are mainly used in movie/animation production and (human) motion analysis.

Four different, basic technologies are commercially used for capturing motion. We distinguish between motion capture systems using optical sensors, magnetic sensors, inertial sensors and mechanical linkages (exoskeleton). Due to the technological principle these systems differ in many aspects such as measurement accuracy, cost, range of motion, scalability and ease of use, to mention only the most relevant parameters.

Before the start of this project, the partners have decided to use a motion capture system with the highest possible quality to enable medical partners to record, analyze, compare and publish high quality data and results. In the medical community optical motion capture systems are the de-facto standard in rehabilitation. Due to their high costs at the start of the project such systems have mainly been used in rehabilitation research or applied gait rehabilitation for human motion analysis. They provide the highest measurement accuracy and highest capture quality (e.g. smoothness of motion) compared to other mocap technologies, and they provide good usability. In order to publish results comparable to prior work in the medical domain (e.g. bioengineering, human motion analysis etc.) high quality data are of primary importance. Today, many years after this decision has been made, this is still the case. Although lower cost (and lower quality) systems that capture movement have been introduced to the market recently.

In November 2010 – three years past the project’s start and after the final submission of this deliverable – Microsoft released the Kinect (for Xbox 360) based on Primesense’s system on a chip which outputs a depth map in addition to an RGB image of the scene. An infrared light pattern is projected onto the scene, a depth map is then calculated from the pattern’s deformation. The system uses a standard CMOS sensor to keep hardware costs low. In April 2011 ASUS released the Xtion Pro, a PC version of the Kinect, which also uses the Primesense chip.

A comparison of the Kinect to our iotracker system can be found in our [28]. In summary, Kinect may be usable for some serious games where tracking accuracy and smoothness of motion are not of primary concern. For Kinect, jitter in positional data is clearly visible in the extreme positions. Jitter also strongly disturbs the velocity, which we calculated on a frame by frame basis. Since velocity is being used to determine smoothness of motion this is considered problematic for our purpose.

Due to the low quality of motion data captured by a device based on the current Primesense sensor, such data cannot be used for a medical evaluation of human motion. Therefore, low cost motion capture devices such as the Kinect or ASUS Xtion Pro cannot be considered competitors to our iotracker high quality mocap system.

However there is a range of professional optical motion capture systems and companies which can be considered competitors to the iotracker system. They are all established companies and provide high quality systems.

Manufacturer	Product/Solution Link
Vicon	http://www.vicon.com/products/bonita.html http://www.vicon.com/products/viconmx.html
Natural Point	http://www.naturalpoint.com/optitrack/
Motion Analysis	http://www.motionanalysis.com
Phoenix Technologies Incorporated -PTI	http://www.ptiphoenix.com/
PhaseSpace	http://www.phasespace.com/
NDI	http://www.ndigital.com/medical/polarisfamily.php http://www.ndigital.com/medical/certus.php
Atracsys	http://www.atracsys.com/_products/tracking_systems.php
WorldViz	http://www.worldviz.com/products/ppt/index.html
Codamotion	http://www.codamotion.com/products.html
Qualisys	http://www.qualisys.com/

BTS Bioengineering	http://www.btsbioengineering.com/BTSBioengineering/Kinematics/BTSSMARTD/BTS_SMARTD.html
Advanced Realtime Tracking	http://www.ar-tracking.de/

In a configuration tailored to a room-sized multi-user environment, all of the existing optical systems have price tags in the range of tens of thousands of Euros. The urging matter of costs originally led to the development of the iotracker low-cost infrared optical tracking system which was further developed within this project into a full motion capture system. The original goal was to reduce costs of high quality optical tracking systems without sacrificing quality i.e. speed or accuracy. Iotracker is commercially available for target tracking (<http://www.iotracker.com>) and has already been a success in this respect. Since the introduction of iotracker which is available at a fraction of the price of other systems, some vendors have already reduced their prices or introduced new products at lower prices.

While corporate entities, movie production companies and well-funded research laboratories will not be deterred by such costs, many smaller corporations, medical or educational institutions operate on tightly constrained budgets that leave little, if any, room for an expense of this magnitude. High quality lower cost tracking technology in return opens up new end user markets and new application areas.

All of the above mentioned optical systems have a price higher than 35.000 USD except the Naturalpoint OptiTrack system. Their lowest cost 8-camera USB version is being sold for 8.000 USD, a 6-camera Ethernet bundle starting at 14.500 USD. It is the only real competitor to iotracker. No statements about OptiTrack's quality and range of motion can be made due to missing data and lack of opportunity to compare both systems. Therefore it is not clear if its quality is comparable to iotracker. Iotracker is licensed by the company Imagination (www.imagination.at) which manufactures and sells an 8-camera bundle starting at around 17.500 EUR.

In addition to optical motion capture systems there are systems based on inertial sensors such as one from the Dutch company Xsense⁵. Its entry price is about 15.000 EUR.

Mechanical motion capture systems such as the Gypsy 7⁶ start at 8.000 USD. Magnetic systems such as the MotionStar from Ascension Technologies⁷ start at about 10.000 USD.

⁵ <http://www.xsens.com/>

⁶ <http://www.metamotion.com/gypsy/gypsy-motion-capture-system.htm>

We define “software based” optical motion capture systems as systems which use conventional 2D cameras and perform all image processing and motion tracking on PC(s) via software. They either operate offline, are very expensive (e.g. OrganicMotion using at least 12 HD cameras; costs ~80.000 USD) or use low cost cameras which typically result in low capturing quality and high latency (due to high software processing times). If only few cameras are used – or even a single camera – occlusions are the biggest problem since occluded body parts cannot be tracked. Positions can only be estimated in such a case. The quality of such systems for medical purposes is usually not acceptable.

The decision not to display the high quality of iotracker’s motion capture data to the user was a game design and therapeutic decision and not a technical one. Abstract visualizations of users’ movement are supposed to avoid frustration and discouragement in case of wrongly executed movements. Patients are not supposed to see every tiny fault; they are not supposed to feel unsecure by variations in velocity and smoothness. Therapists, in contrasts, need high quality mocap data to be able to record, analyze and interpret patient’s behaviour. Finally only reliable and robust data can be published in the medical community. Whereas for patients at home a very low cost system based on the Primesense chip may be advantageous, clinics need high quality motion capture systems for medical analysis and rehabilitation research. This is a commercial opportunity for the iotracker system.

4.1.5 Affective Interfaces and bio-feedback (for Games)

In the high extreme of the affective interface market, there are two solutions tailored to precise and professional medical applications:

g.MobilLab is a portable biosignal acquisition and analysis system. It consists of both hardware (acquisition device, sensors, connection cables, electrodes) and accompanying software, and can be used to:

- acquire EEG, ECG, EOG, EMG and other signals
- on-line visualize and store of up to 16 channels on a Pocket PC or a notebook / PC
- exploit various software solutions available (driver/API, recording software, MATLAB/SIMULINK/LabVIEW, ...)
- transmit online biosignal data wirelessly via bluetooth 2.0 to a Pocket PC or notebook / PC
- log data directly on an internal flash card memory (Mini-SD card)

⁷ <http://www.ascension-tech.com/realtime/RTMotionSTARTethered.php>

- integrate the device into a real-time system under SIMULINK (BCI, neuro-, biofeedback)



Figure 24: The g.Mobilab+ system for medical signal acquisition

MobiHealth and Mobi8 sensorsystem is a suite of hardware and interoperating software services that provide a wide range of functionalities:

- MobiHealth Portal™ is an on-line service center that allows care professionals secure access to remotely acquired data of their own patients exactly *how* and *when* they need it.
- MobiHealth Mobile™ is a mobile remote monitoring and feedback system that is worn on a patient's body, monitors a wide range of physiological parameters and transmits data wirelessly in a safe manner to a care professional (in a hospital). Supported physiological monitoring functions include:
 - multi-lead ECG
 - multi-channel EMG
 - plethysmogram
 - pulse rate
 - oxygen saturation (SpO₂)
 - respiration
 - core/skin temperature

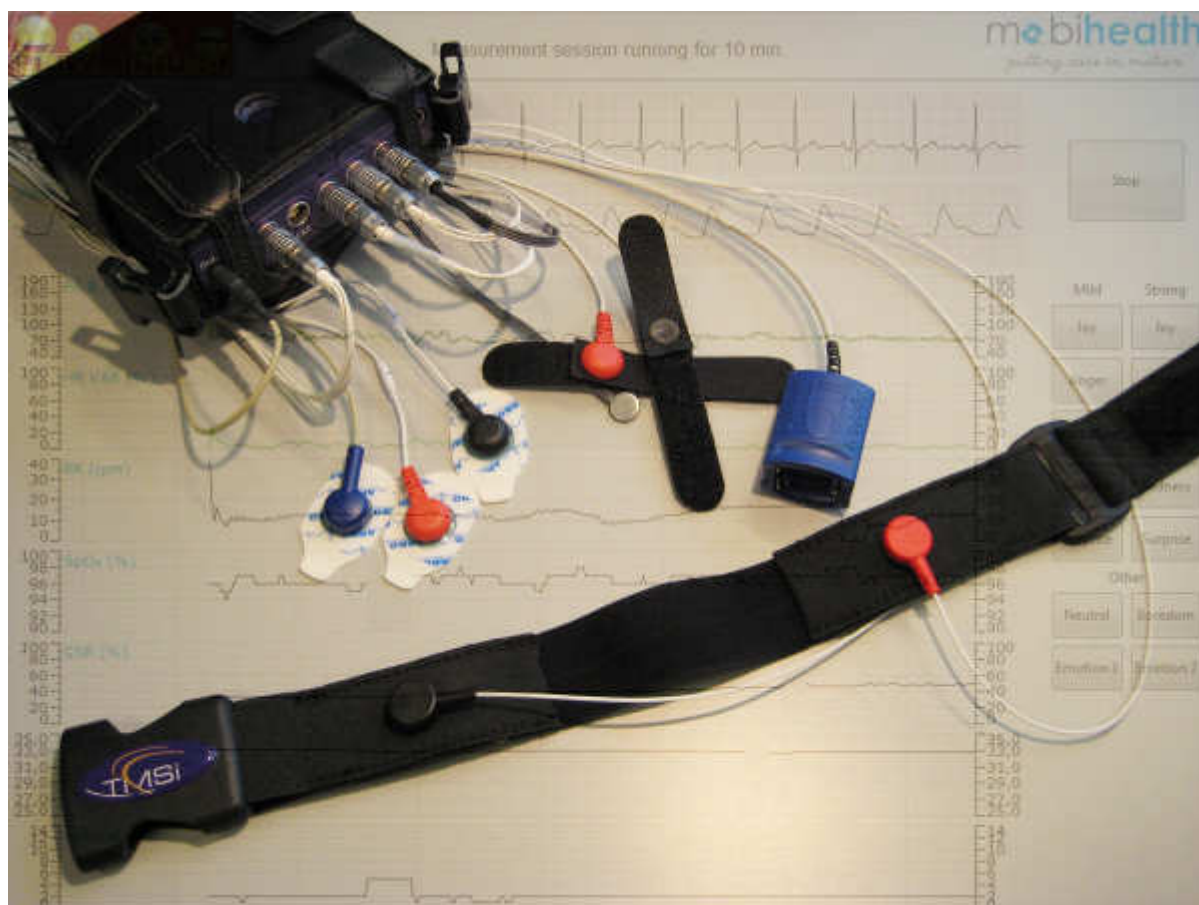


Figure 25: The MobiHealth system for medical signal acquisition

There are products that allow monitoring of similar parameters for long periods, like ADInstruments ones (their software, LabChart 7 [18], can be used together with Zephyr BioHarness [19] or Polar Belt [20], the cost of the former is about € 2.000), but both belts are not comfortable.

Another potential solution is Telcomed Watch Me, a simplified system composed by only a Watch[21], but both complexity and reliability of this system are to be evaluated, as it promises an ECG lead, but it is not clear if it is composed by a watch only – its cost is € 120, probably without any software for data visualisation.

Other more medical oriented systems are available, but they seems more to be used for spot measurements, not for long term monitoring: all systems allow ECG monitoring and transmission for telemedicine like those commercialised by Telemedicine Service Providers like Chubb Community Care (UK market) [22], Vitaphone (worldwide, with HeadQuarter in Germany), Telbios [23](HQ in Italy, but with a wider market), also other more flexible products like Telcomed WristClinic, etc.

In the low-cost niche of this market, there are several solutions that usually bundle hardware and software that plug into compatible desktop personal computers.



Figure 26: The wild divine bio-feedback game

Part of “the Journey to Wild Divine” game, the Light Stone is a USB biofeedback device that measures the player’s Skin Conductance Level (SCL) and Heart Rate Variability (HRV) through three finger sensors called the Magic Rings: the two rings worn on the index and ring fingers measure the SCL and the middle finger ring measures the HRV. SCL measures sweat gland activity and can be correlated to excitement and nervousness; HRV is calculated from the differences in heart rate from one heart beat to another [9]. A derivative of this product from the same company is the IOM Hardware, a patented bio-feedback device that features heart rate, heart rate variability (HRV) and sweat gland activity measurement, a USB interface, priced approximately at 250 US dollars[10].



Figure 27: The emwave desktop bundle of bio-feedback hardware and software

HeartMath is offering the emwave sensor device. This is a patented USB module and has two alternative sensor units:

- finger sensor with strap,
- ear sensor with lapel clip

This device is featuring measurement of the cardiac coherence, HRV and stress (emotional arousal), and is priced at 250 US dollars including the hardware devices and desktop software kit (utilities for measuring, displaying, storing monitored data and exporting to other formats).

In PlayMancer both g.mobilab and MobiHealth (and Mobi-8) were tested for the purposes of the bio-feedback emotion recognition module and the EMG signal acquisition. Finally, the consortium adopted the latter -MobiHealth- solution for the development of the required software components that the project required. Lower-end systems do not offer the variety of the signals and the capabilities for signal pre-processing and processing that are required for PlayMancer.

4.1.6 Speech Recognition (for Games)

For some of the pain rehabilitation exercises (e.g. Temple of Magupta and Face of Cronos), the player might not be able to see the game while they are moving their body. In these cases voice commands or other audio input or output gives some flexibility. In the pain rehabilitation games the player controls the avatar using his/her body-motions and voice. The body-motions are related to the physical exercises that the patient needs to do during the mini-games. The speech control of the avatar was needed, since the patient, wearing a

motion-capture suit and standing on a treadmill, would not be able to sufficiently operate a keyboard or mouse (to control the avatar) while exercising. Other control devices would, to a much larger extent than speech, interfere with the training. This is why we have implemented Speech ASR as a user input interface in the pain rehabilitation PlayMancer game.

The Microsoft Kinect is one of the dominant low-cost solutions for 3D image recognition and speech recognition for games. It employs a multiarray microphone that is allegedly able to locate voices by sound and extract ambient noise, and software performing ASR and speaker identification[12]. Kinect is released by Microsoft for use as an X-Box game console accessory, but independent drivers for PCs and other platforms have been emerged, not officially supported by Microsoft. The ASR functionality has yet to be supported, while an officially released Software Development Kit (SDK) by Microsoft for research purposes has been announced[13]. A similar announcement for a license for commercial use is expected to follow. Its cost for third parties is yet unknown.

There is a number of voice command programs available already for games. In most cases, these programs are voice recognition software that maps voice commands to keystrokes, and assists in controlling any keyboard-based game with voice.

Shoot⁸ is free for non-commercial use. It provides configuration scripts that can be tailored to any legacy computer games. Say2Play⁹ is a similar template-based application. New templates are released tailored to new games, supporting their game play interaction abilities and features with speech. VR Commander¹⁰ is designed to augment the use of keyboard and mouse to control legacy games and applications, supporting triggering hotkeys, launching files, etc, also based on application templates. T

These programs are offered free to use, but without source code availability. Hence we could not adapt the programs to support languages other than English.

There are other solutions for speech recognition, both commercial (proprietary) and open-source. For example, Microsoft Speech engine and tools (Speech Application Programming Interface), and especially the Text-To-Speech synthesis features of which have been used in a number of computer games.

⁸ <http://clans.gameclubcentral.com/shoot/>

⁹ <http://www.say2play.com/>

¹⁰ <http://www.vrcommander.com/Product.html>

Because in PlayMancer we had to support Dutch (and Spanish) languages other than the commonly offered English in the aforementioned solutions, and in order to have some control over the ASR process, PlayMancer has developed its speech resources based on a deprecated and adapted version of the open-source spoken dialog systems platform “Olympus /RavenClaw” originally developed and maintained by CMU. An appropriate interface to the Unity3D game engine and development platform has been implemented, and instructions on how to setup this component for use with Unity are included in deliverable D3.3. There has been no comparison or benchmark tests of the recognition accuracy among the aforementioned solutions, but PlayMancer implementation is available to third parties after request for not-commercial use such as this.

4.2 Relevant R&D projects

The output of this project is really innovative and cannot be easily compared to already existing products/services in the sector chosen as the target of PLAYMANCER. In this section we present an initial and non-exhaustive list of relative to PLAYMANCER research and development projects, most of which have started in 2010 and relate to the e-Health or Networked systems sectors.

Table 6: Relevant to PlayMancer R&D projects

Project Name	Project description	Project site
ICT4Depression	The ICT4Depression consortium will develop an ICT-based system for use in primary care that will further improve patient outcomes and increase access to treatment. All technologies to be developed will be beyond state of the art and include 1) devices for monitoring activities and biosignals in a non-intrusive and continuous way, 2) treatments for depression and automatic assessment of the patient using mobile phone and web based communication, 3) computational methods for reasoning about the state of patients, progress of therapies, and the risk of relapse and 4) a flexible system architecture for monitoring and supporting people using continuous observations and feedback via mobile phone and the web.	http://www.ict4depression.eu/
INTERSTRESS	The objectives of the project are: <ul style="list-style-type: none"> • Quantitative and objective assessment of symptoms using biosensors and behavioural analysis • Decision support for treatment planning through data fusion and detection algorithms • Provision of warnings and motivating 	http://interstress.eu/

	<p>feedback to improve compliance and long-term outcome</p> <p>These goals will be achieved through the novel use of technology:</p> <ul style="list-style-type: none"> • 3D shared virtual world role-playing exercises in which players interact with each other, using immersive technology in the healthcare centre augmented by non-immersive technology in the home setting • Biosensors and activity sensors to transmit data from the real world to the virtual world, tracking emotional, health, and activity status of the individual, thereby influencing the individual's experience in the virtual world • Mobile phone applications to transmit data from the virtual world to the real world
OPTIMI	<p>OPTIMI will develop technology-based tools to monitor the physiological state and the cognitive, motor and verbal behavior of high risk individuals over an extended period of time and to detect changes associated with stress, poor coping and depression. A series of "calibration trials" will allow the project will test a broad range of technologies. These will include wearable EEG and ECG sensors to detect subjects' physiological and cognitive state, accelerometers to characterize their physical activity, and voice analysis to detect signs of depression. These automated measurements will be complemented with electronic diaries, in which subjects report their own behaviors and the stressful situations to which they are exposed. All participants will be regularly assessed by a psychologist, who will use standardized instruments to detect stress, poor coping and depression. A few will also be asked to wear implanted devices levels of cortisol in the blood, an objective physiological correlate of stress. The project will use machine learning to identify patterns in the behavioral and physiological data that predict the findings from the psychologist and the cortisol measurements. The final OPTIMI monitoring system will consist of the subset of tools that proves useful for this purpose and acceptable to users.</p> <p>To achieve its second goal, OPTIMI will adapt two existing systems, already used to provide online CBT treatment for mental disorders. The project test the treatment systems in "treatment trials" targeting individuals at high risk of exposure to chronic or acute stress. Examples include</p> <p>http://optimiproject.eu/</p>

	persons with personal responsibility for the long term care of elderly or disabled people, individuals (especially unemployed people) in situations of acute financial stress, workers in emergency services and students preparing for important examinations. Ongoing monitoring with the OPTIMI tools will make it possible to assess the effectiveness of the treatment and to optimize the treatment cycle.	
MIMICS	Multimodal Immersive Motion rehabilitation with Interactive Cognitive Systems: The main hypothesis of this project is that movement training for neurorehabilitation can be substantially improved through immersive and multimodal sensory feedback. The approach is real-time acquisition of behavioural and physiological data from patients and the use of this to adaptively and dynamically change the displays of an immersive virtual reality system, with the goal of maximising patient motivation.	http://www.projectmic.com/
CNG	CNG intends to enhance collaborative activities between online gamers by developing new tools for the generation, distribution and insertion of user-generated content (UGC) into existing MMOGs. CNG will research and develop in-game community activities using in-game graphical insertion technology (IGIT) and a Combined CDN (Content Delivery Network)-P2P (peer-to-peer) architecture for the distribution of UGC.	http://www.cng-project.eu/
ELDERGAMES	The key “generic” objective of ElderGames project is to develop IST-based games using advanced visualisation and interaction interfaces with high preventive, therapeutic value that will allow elderly people to enjoy new ways of leisure and entertainment while improving cognitive, functional and social skills. The project has developed a back-projection multi-touch table on top of which a mixed reality game is setup, which is using both virtual and physical assets, and on which up to 4 players can participate to table-top (card-based mostly) games. This project has been successfully completed.	http://www.eldergames.org/index.php
PSYCHE	PSYCHE (Personalised monitoring SYstems for Care in mental HEalth) project develops a personal, cost-effective, multi-parametric monitoring system based on textile platforms and portable sensing devices for the long term and short term acquisition of data from selected class of patients affected by mood disorders.	http://www.psyche-project.org/
GAMES@LARGE	Games@Large objectives are outlined in five main areas: <ul style="list-style-type: none"> • To enable ubiquitous game access, without the 	Official site not available;

	<p>need to install/transfer games to each device. The project aims to enable devices that typically do not possess a full set of technical requirements to run video games, such as hand-held devices or set-top boxes, to serve as an interface</p> <ul style="list-style-type: none"> • To create the infrastructure for running multiple games simultaneously on a Local Processing Server (LPS). Each game will run in its own virtual environment while the application is streamed and partially stored on the Home Game Storage unit. The goal is to utilize a single LPS to serve multiple end-devices. Games@Large will try and overcome difficulties associated with the mutual exclusivity nature of video games • To decouple input devices (Wireless Game Pad) and output device (TV Screen or Handheld device) from the Execution on Local Processing Server. The project will investigate two approaches for such an extension either using pre-rendering protocol or via video streaming • To create interconnectivity between the devices. Wireless is considered as the preferred alternative (latency issues and QoS are factors to be further researched and developed) • To provide the best user experience while enforcing copyright restrictions. <p>This project has been successfully completed.</p>	<p>ftp://ftp.cordis.europa.eu/pub/ist/docs/ka4/au_fp6_gamesatlarge_en.pdf</p>
<p>Player Modeling And Procedural Content Generation For WiiHabilitation</p>	<p>The overall objective of the project is to investigate how game-based digital technology can be designed to install a stronger sense of continuity in the rehabilitation process as experienced by both the therapists and patients. The project relates to the emerging Wiihabilitation trend referring to the use of new more bodily-oriented off-the-shelf gaming technologies for rehabilitation purposes. Such technologies include Nintendo's Wii and Microsoft's upcoming Project Natal , both allowing control of games through body movements in physical space. The project however, goes beyond the immediate features of existing gaming technologies and investigates player modeling and procedural content generation for rehabilitation purposes.</p>	<p>http://game.itu.dk/index.php/Player_Modeling_and_Procedural_Content_Generation_for_WiiHabilitation</p>
<p>Rehabilitation Gaming System</p>	<p>The Rehabilitation Gaming System (RGS) is a novel and highly innovative ICT Virtual Reality (VR) tool for the rehabilitation of motor deficits of the upper extremities after a brain lesion due to stroke. The system deploys an individualized and specific deficit oriented game training that combines movement execution with the observation of a correlated action by virtual limbs that are displayed in a first-person perspective. The RGS is based on the neurobiological</p>	<p>http://rgs-project.eu/</p>

	<p>considerations that plasticity of the brain remains motor areas affected by stroke remains throughout life and can thus be utilized to achieve functional reorganization of areas affected by stroke by means of the activation of secondary motor areas such as the so called mirror neurons system. As a multi-level adaptive tool, the RGS provides a task oriented game training with individualized graded complexity. Additionally, the system retains qualitative and quantitative information of the performance of the subject/player during the tasks, hence allowing for a detailed assessment of the deficits of the patient player and their recovery dynamics. The RGS approach is currently being evaluated in a randomized clinical study and the initial results with 14 patients have demonstrated positive impact.</p>
Replay	<p>The REPLAY project seeks to leverage the popularity and immersiveness of gaming to create a tool that helps experts understand and address anti-social behaviour. We have created a 3D environment, highly playable, and involving an interactive play 'board' that enables the player to travel at speed through a futuristic world, against the clock. Interspersed with the 'play elements' are a series of embedded activities that have been developed within a sound pedagogical framework and that focus on the values and decision making of the player. Every activity has to completed before the player can continue.</p> <p>http://www.replayproject.eu/</p>

4.3 SWOT Analysis

In the following preliminary SWOT analysis, we are estimating or identifying the Strengths, Weaknesses, Opportunities and Threats relating to the integrated PlayMancer result and to the 4 PLAYMANCER composite exploitation results.

4.3.1 Integrated PlayMancer result

Strengths

- Strong level of innovation (technological solutions and services provided).
- Modular solution with high technological flexibility, which can be integrated and deployed in different locations ranging from private homes to large-care facilities.
- Important ratio of R&D and industrial partners in the field.

- Multidisciplinary analysis of the stakeholders is being carried out.
- It includes the monitoring of several parameters (GSR, Oxygen saturation, respiration, posture) that allow further post-session analysis by experts or researchers.
- Allows the enhancement of conventional CBT therapy of patients with a motivating and engaging medium, which is a computer game.
- Expected to reduce drop-out rates of patients participating in therapeutic programs.
- Experience in promoting ICT solutions in the health sector

Weaknesses

- There is a gap between the possibilities offered by ICT solutions for health and the willingness of users (both medical practitioners and patients alike) to accept such technological changes.
- No industrial partners have a market experience in promoting Games for Health solutions in the health sector

Opportunities

- Change of social environment into an ageing society, information-oriented society. Numbers of patients suffering from mental health issues or from chronic pain constantly increase.
- People progressively improve their relations with technology as long as it enables them to live a safe and comfortable life.
- Capitalise on the recent trend of computer games and more specifically on serious games.
- Growing market in home-based health care, games for health and peripherals (see computer games and accessories for computer game consoles Nintendo Wii, Nintendo Wii fit, Microsoft Xbox, Microsoft Kinect, Sony PlayStation3, Sony Move controls).
- Researchers and institutions in the area of psychologically-related mental health issues and pain rehabilitation are very interested in the project results (we have received many inquiries and expressed interest about the availability and scope of the PlayMancer prototype)

- Interest of the Health and Safety Service Providers for new ICT solutions for Health applications.
- Wide net of rehabilitation institutions, health care centres, hospitals and similar resources for people with rehabilitation needs or for people dealing with eating disorders of psychological nature and other mental health issues.
- At present, no other bio-feedback system exists that can be attached to a computer game for health purposes (this point refers to the project background system used, Mobi8 and MobiHealth health monitoring solution).

Threats

- End-users are often technology resistant.
- Problem of acceptance due to the estimated costs and the complexity of use of devices (an important dragging factor is the cost of background solutions used).
- Mostly a B2B solution, in a market not completely developed.
- Research in the sector is rapidly evolving, so potential new competitors may arise quickly. This fact is complemented by emerging super-powers in technology (e.g. Japan, USA, etc).
- Some potential users of the services may reject them as they feel their lives are being controlled.
- There are potential concerns for breach of privacy (especially with emotional state recognition devices).

4.3.2 PlayMancer serious game for mental health

Strengths:

Similar to the rehabilitation games, the behavioural and addictive disorders games enjoy a first mover's advantage. As IDIBELL-University Hospital of Bellvitge previously have demonstrated in earlier pilot studies, patients clearly benefit from this type of combined therapy, to approach specific previously uncovered therapy goals. Targeting personality traits common to several behavioural disorders, and emotion regulation through novel interactions have showed to be positively evaluated from patients and their families and to present additional advantages. Clinical benefits could be possible especially if the games are used as an additional tool to standard treatment. The commitment of IDIBELL, one of the

largest European scientific research centers in eating disorders and behavioural addictions (e.g. pathological gambling) will facilitate potential exploitation, as well as in helping to spread out application to other mental disorders. After the presentations of the initial results in several international conferences in mental health disorders, the scientific community has expressed a significant interest in the exploitation and adaptation of Playmancer in other related pathologies (substance abuse disorders, adolescent and youth psychotherapy, anxiety disorders, etc). In sum, several European and North American centers have expressed their interest for this game and its application in a near future.

Weaknesses:

Clinical evidence for behavioural games is in early stages. The current biosensor and emotion capture packages make direct exploitation of the full package, ie: games, biosensors and emotion recognition, a challenge.

Threats:

New entrant with well designed games, and effective niche strategy.

Opportunities:

The Playmancer behavioural games are a good first step for follow-up research. The integration of more user-friendly biosensor packages, more sophisticated niche analysis could enable limited exploitation to support further research settings.

4.3.3 PlayMancer serious game for pain rehabilitation**Strengths:**

RRD confirms that the Playmancer rehabilitation games enjoy a first mover's advantage, in the application of serious games to the specific clinical objective. This advantage is rendered more defensible by having initial clinical results. A first mover's advantage generally allows some flexibility in pricing strategy: premium pricing, or pricing for market penetration. The commitment of RRD, the largest Dutch scientific research centre in rehabilitation technology will also facilitate potential exploitation. Finally, the rehabilitation games offer a clear solution package, because both the games objective, and the technical tools are clearly linked to clinical objectives. Successful exploitation would depend a clear strategy, speed of execution, and sufficient financing.

Weaknesses:

The accumulated benefits of the rehabilitation games: a first mover advantage, an industry champion, early clinical results supporting efficacy, could easily be nullified.

First, the clear link between clinical and games objective means that the approach can be replicated. The clinical evaluation cycle is relatively short (especially if one has the funds to do them) thus allowing new entrants to catch up. The cost of the motion capture solution used, even if it is one of the lowest for the degree of precision and robustness needed for Playmancer, dwarfs any potential for home market expansion (as a ICT rehabilitation accessory).

Threats:

New entrants with low cost motion capture systems, clear strategy and established market presences in the rehabilitation domain. Other manufacturers might decrease their introductory product price range (a trend that has been demonstrated already) and/or invest considerably more in promotion and marketing of their products (hence they will negate IOTracker price advantage).

Opportunities:

Integration of a low cost motion capture system could clear the way for exploitation. A less expensive system means potentially faster market penetration and less opportunity cost for the product promoter. Otherwise, any potential exploitation strategy would have to balance the following: threat of new entry, versus the development time for integrating lower cost motion capture into the current system and the additional opportunity cost for marketing the current system at the current price point.

4.3.4 User emotion recognition component**Strengths:**

One of the few emotional recognition systems based on medically approved physiological signal acquisition platform. Goes over prototypes based on single GSR or GSR-HR measurement for emotion recognition in terms of accuracy of signal measurement and processing abilities.

Integration is easy with third party game engines or applications, through detailed interface specifications, based on XML. Internal complexity of emotion recognition is not exposed by this interface.

Fuses 3 individual emotion recognition components (included), based on different physiological modalities, which means far more detailed and precise data acquisition, and more processing abilities compared to other lower-cost solutions that are based on less inputs.

This component has a proven and tested implemented interface to a popular game engine (Unity 3D).

Weaknesses:

Emotion classes that are recognised have been selected and tailored to the specific domain of mental health, ED and PG. These classes might not be adequate or proper for other domains. Changing the set of emotion classes would require re-acquisition and annotation of an adequate corpus and then re-training the models of each individual emotion recognition component. This whole process would decrease the re-use potential of this component.

Furthermore, the accuracy of recognition for the overall emotion recognition fusion stage, which is the final stage before passing the recognition results to the game engine, is tested and found acceptable for use in the specific serious game for mental health. Developers of other applications that would like to re-use this component, will have to re-assess the accuracy results presented in deliverable D8.1 (Part B).

Another important weakness relates to using the MobiHealth platform, which is a medically approved platform for medical applications, and its cost (about 7000€) deters any home market use.

Opportunities:

Expand in niche markets where competition is still in its infancy, and apprehend a competitive advantage: affective interfaces, affective computing, psychological assessment, emotional assessment of human efficacy in critical situations (or during games or applications that simulate critical situations), as bio-feedback component in affective games (such as tending and caring for artificial creatures), emotion tracking for audience response systems (during measuring the audience response to audio-visual content).

Implement interfaces to other game engines and 3D development suites (including major ones that are used to develop AAA computer game titles).

Threats:

There are considerably lower cost devices (accompanied by software) in the market as of now, that are providing physiological measurement acquisition, signal processing and

physiological state recognition, as shown in the related market research section 4.1.5 of this document. This state recognition can range from

4.3.5 Multi-sensor Motion capture component (IOTracker system)

Strengths:

Its technology (optical motion capture system) is considered the de-facto standard in the medical rehabilitation community. Its estimated cost is one of the lowest (if not the lowest) among equivalent systems (please see the market research section of this document, section 4.1.4). Able to track not only position in space and motion of specific points of interest, but also velocity and smoothness of motion. As discussed in [28], IOTracker outperforms low cost popular systems for optical markerless tracking, which (the latter) are not yet ready in terms of precision and motion velocity accuracy to be used in medical applications such as PlayMancer.

Integration is easy with third party game engines or applications, through detailed interface specifications, based on XML. Internal complexity of motion capture and signal fusion is not exposed by this interface.

Weaknesses:

Overall cost is high, of many magnitudes higher than cheap commercial technologies available for game consoles and computer games of today (e.g. Microsoft Kinect), prohibiting expansion in the home market.

For marker-based tracking such as IOTracker, a suit bearing markers is necessary to be worn by the tracking targets. There is a degree of obtrusiveness enabled in this, since all suits are usually less comfortable than the regular outfit that the target wears, which may be a restraint for certain uses.

Opportunities:

Whereas for patients at home a very low cost system based on the Primesense chip may be advantageous, clinics need high quality motion capture systems for medical analysis and rehabilitation research. This is a commercial opportunity for the iotracker system.

With the rise of the computer game market, more game developers are seeking to use motion capture for their animations, in order to create more natural and more fluent animated 3Dmodels in their products. It is expected that more low-budget or independent game development studios will search for affordable mocap solutions such as IOTracker, which can interface well-known applications such as Autodesk MotionBuilder and C-Motion Visual3D.

Threats:

New entrants with low cost motion capture systems, clear strategy and established market presences. Probable improvements over the accuracy and precision of products based on Primesense chips (e.g. Kinect), or emergence of competing technologies for markerless tracking.

5 Exploitation Strategy

5.1 Common Exploitation Strategy

Short-Term Strategy (during the project)

Still in the course of the PLAYMANCER project, we will evaluate opportunities and potentials to continue and extend the work carried out in PLAYMANCER, by way of follow-up R&D projects, especially in the areas of the ICT for Networked Media and ICT for Health. For this purpose we are currently looking into upcoming ICT Calls.

Additionally, we have participated in project showcase (exhibition) and dissemination events and one workshop to raise public, scientific and industrial awareness.

The consortium has lately intensified its dissemination efforts due to the very positive feedback to the project's results, obtained from press releases and press coverage.

The consortium is also striving to consider and possibly to contribute to standards specifications produced / published by various standardisation committees. Unfortunately the need to focus to the core project objectives did not allow us to pursue this objective further.

Long term market strategy

As stated earlier in the document, several long-term market strategies will be selected to let this system penetrate the market: a global PLAYMANCER packet or several individual exploitable results. The best practise will be selected only at the end of the project after its conclusion, and should respect what is established on the Consortium Agreement.

According to the CA that the project parties have signed prior to the project kick-off, the exploitation strategy will be followed after:

- Identifying the joint innovations;
- Defining the project foreground knowledge;
- Attempting to distinguish the contribution of each party to that knowledge;
- Notifying each partner that has contributed to one or more individual contributions to the project foreground knowledge about waiving or not the right to protect that knowledge;
- Assigning the rights from the partners that would like to waive such rights, to other party(ies), by mutually agreeing on terms and conditions;

Then, in a policy/plenary meeting at the end of the project, the consortium will discuss on the role of promoter of the project results. Promoter would subsequently specify the individual results that will be exploited in a business plan document. All project partners that will not waive their rights to owned individual results will participate after signing an exploitation agreement. Individual licensing agreements will be signed with those partners that do not wish to be (part of the) promoter, whose project foreground IPRs are going to be exploitation goals.

All final owners of foreground knowledge rights will be able to promote and exploit opportunities for achieving the return of the investment in the PLAYMANCER research project through a multitude of ways.

5.2 Individual participant's exploitation plans

As part of such European research projects, the exploitation of PLAYMANCER results is one the main objectives of all project partners. Each individual partner has elaborated their plan for exploitation as introduced in the Description of Work. These exploitation activities are further refined. Here below are the final exploitation plans per project partner.

5.2.1 Systema Technologies (ST)

5.2.1.1 Profile

Systema Technologies S.A. [www.systematechnologies.eu] was originally established in 1992. As of 2002 the company has specialized on integrated solutions in the areas of human computer interaction, visualization, mixed reality, multimodal interaction, serious games, and robotic applications for health care aiming at new ICT technology market niches. During the years, SYSTEMA has been recognized as a European ICT Small to Medium scale Enterprise (SME) bearing an ISO 9001:2000 certificate registration no. 12 100 21779 TMS, articulating its business processes to focus on the “Design and Development of innovative Information and Communication Technology products and services”.

The company channels its activities into the following research and development strands:

- Digital Content
- Networked Media
- Serious Games
- Multimodal Interfaces

- Accessibility and Inclusion

A technological advantage that Systema Technologies has acquired so far is the ease of developing multi-modal interaction and 3D visualization applications in various fields e.g. education, culture, transport. Since 1994, the company has been experimented with new interface technologies and innovative modalities. From the first days of the company when 3D display technologies have been in its focus until today, the company has designed and developed many bespoke applications that exploit innovative aspects of Human Computer Interaction.

5.2.1.2 Expected use/ exploitation of the project results

ST, as a solutions integrator and software development company active in the area of culture and education, will exploit the project results in the development cycle of products (e-learning objects and content, games, educational productions) thus offering a unique competitive edge over other Greek and European companies in the same market sectors.

Short-term goals: In the course of the project implementation, we have met prominent key persons in the area of games for health (e.g. Ben Sawyer –Digital Mill, Pamela Kato-HopeLab), who play an active role in the evolution and promotion of this computer games niche. We will keep on investing on such persons through events and other initiatives in the future, for bolstering the company's standing within the games for health community. Foreground knowledge such as enforcing more prompt and active project management actions and methods, Unity scripting techniques, assets created, and game development knowledge acquired especially involving the integration of external modules (such as the ones for emotion recognition) will also be put in use for future products of the company in the area of serious games, and for "gamefying" some of the other company's products in the content documentation, education and networked media sectors. The resources for the abovementioned actions will be originated from owned funds.

Mid-long term goal: After the project completion, it is of importance to our company to translate all PlayMancer resources to the Greek language and make it available in the Greek market. Also, the technical support department of ST will be trained so that they will be able to offer their technical expertise for client support of PlayMancer platform and games. A further technical goal is to investigate the degree of integrating an even lower cost peripheral for motion tracking such as the Microsoft Kinect, the SDK of which is about to be released for not-for-profit projects and a commercially available SDK is planned for a future release. Resources necessary for mid to long term business development of PLAYMANCER based company activities are being sought in European and Other (e. Chinese) Markets.

Systema is following several venture capital and fund raising initiatives. For example Systema will follow the European Venture Summit (EVS) on November 23rd 2011 in Düsseldorf, where companies from competitions held throughout Europe will showcase their businesses to international investors and other industry experts. The summit will take place on 28th & 29 November in Düsseldorf, Germany and it is sponsored by the Ministry of Innovation, Science and Research of the State of North Rhine-Westphalia and the City of Düsseldorf. More than 100 international investors are expected to be on hand reviewing company presentations and looking for potential partnerships. Systema aims at introducing a business case for the PLAYMANCER results.

Similar initiatives will be followed closely to tap investor funds and/or direct customers, such as the National Institution of Psychology Health in Greece (www.epsype.gr).

5.2.2 Netunion (NETUNION)

5.2.2.1 Profile

NetUnion was founded in 1996, in Lausanne, Switzerland. We specialise in the research and development of individually tailored, guided self-help programs for chronic disease prevention and management, focusing on food, and diet related disorders, i.e. obesity, diabetes, eating disorders, as well as associated addictive and behavioural disorders.

The company has a successful track record for transforming the latest research into clinical applications. Our leading program, Salut BN, a guided self-help program for Bulimia sufferers, is a good example. Clinicians in 6 European countries (Austria, Germany, Holland, Spain, Sweden, Switzerland) are now using this program as part of their clinical service on a daily basis. The program was developed and validated within the European research project "Salut".

Building on this success, we are currently developing a program for obese patients with Binge Eating Disorders, as well as a motivational and behavioural program for pathological gamblers, and addictive behaviour with severe social and psychological consequences.

5.2.2.2 Expected use/ exploitation of the project results

We see the project results a first step towards to wider introduction of serious games as adjuncts to therapeutic support for behavioural disorders. Unlike the rehabilitation games, the games for behavioural disorders require additional research and clinical validation. Given these considerations, we will intend to exploit project results as follows:

1. Localisation of games and dissemination

Developing French, and German language version of the behavioural games. These version will be presented to partners in our clinical and research network in France, Switzerland, Belgium, and Germany (see partner network below). This fills a gap in the current dissemination actions, since no French, or German-speaking partners were involved in the project. Future localisation efforts could include the development of Swedish and Dutch versions of the games. Meanwhile, the English version will be used as a dissemination tool for partners in these and other European countries.



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Spital Wallis



Parkland-Klinik
Fachklinik für Psychosomatik und Psychotherapie



Novarum
Gespecialiseerd Centrum
voor Eetstoornissen



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FRIBURGENSIS



Stockholm Center for
Eating Disorders



Queen Silvia Children
Hospital, Gothenburg



Vårdalinstitutet



VÄSTRA
GÖTALANDSREGIONEN
Södra Älvsborgs Sjukhus



PSYQ
PSYCHO-MEDISCHE PROGRAMMA'S



HUG
Hôpitaux Universitaires de Genève



AES
Arbeitsgemeinschaft Ess-Störungen



Cinderella



Universitätsklinik
Ruhr-Universität
Bochum/LWL-Klinik
Dortmund.



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2. Exploitation and expected outcomes

We anticipate that the games will generate sufficient interest to warrant additional pilot studies in other countries, and that these pilots could be structured in a way to reuse the project outcome with reasonable adaptation in collaboration with relevant Playmancer partners.

3. Expected barriers and solutions

However, Playmancer games are still in the beginning stages of the innovation curve and additional investments are necessary for tailoring and customisation of the games, and their intervention protocols for various needs and target populations. The performance of the various emotion recognition components, and their ease of integration could be improved.

Two parallel strategies could be pursued for overcoming these obstacles: 1. Additional developmental funding from government agencies or private foundations for further trials and refinements, 2. Searching for alternative games and emotion recognition components as necessary that would accelerate adaptation towards clinical applications.

5.2.3 University of Patras (UOP)

5.2.3.1 Profile

The Wire Communications Laboratory (WCL) was established in 1970 in the Department of Electrical and Computer Engineering of the University of Patras. It currently has a staff of more than 50 researchers, support personnel, and PhD students. The WCL is active in three main areas with organised R&D teams: Speech & Natural Language Technology, Telecommunications, and Audio & Acoustics Technology. In the Speech & Natural Language Technology area, R&D includes Speech Recognition/Understanding, Spoken Dialogue processing, User Modelling, Speech Enhancement, Speaker and Language Recognition, Speech Synthesis and coding, Natural Language Processing, Natural Language Generation, Lexicography, Texts Engineering, Information Extraction, etc.

5.2.3.2 Expected use/ exploitation of the project results

As concerns the exploitation activities, the overall description of the PlayMancer design will be offered to our undergraduate and postgraduate students as part of the courses: (i) Artificial Intelligence, (ii) Natural Language Processing, (iii) Spoken Language Technology. The voice-based emotional recognition component as well as the speech recognition module that UoP has developed will be utilized in the training and research activities of our post-graduate and PhD students.

5.2.4 Technical University of Vienna (TUW)

5.2.4.1 Profile

Besides its teaching activities for students in computer science and information systems the Institute of Software Technology and Interactive Systems is one of the leading institutes in research and development in the areas of information systems, electronic commerce, information retrieval and interactive media systems. The institute's research is based on tight co-operation with Austrian and international academic partner institutions on the one hand side and industrial partners on the other hand. The mission of the institute is to perform both basic research and applied industrial research leading to solutions based on innovative technologies. The research group on Interactive Media Systems (IMS) within the institute works on augmented reality and media processing systems, as well as web-based information systems in the field of e-learning. A further stronghold of the institute is constituted by its works in the fields of information retrieval, content-based image retrieval and digital libraries.

5.2.4.2 Expected use/ exploitation of the project results

First, a low cost motion capture system was developed by TUW within Playmancer. Its high tracking accuracy is ideal for medical applications. However it can be used in a wide range of applications.

The earlier product upon which we based the development of the motion capture system is our target tracking system. It is already sold by the company Imagination who has an exclusive license to produce and distribute iotracker. We plan to negotiate a licensing contract with Imagination to also produce and commercially distribute iotracker as a standalone optical motion capture solution. In addition we will use it for research and teaching.

Second, we integrated the motion capture system into the Unity game engine. This combination of technologies constitutes an excellent platform for developing serious motion-based games in all domains that require high quality and reliable motion capture. Playmancer evaluation results are crucial in reasoning medical value and commercial value of the developed system and games. We plan to contribute to the commercialisation of the game development platform and of the Playmancer games with partners. Therefore we will discuss exploitation strategies of joint work with partners and we consider follow up projects towards commercialisation.

5.2.5 University Hospital of Bellvitge (IDIBELL)

5.2.5.1 Profile

The University Hospital of Bellvitge (IDIBELL) is based in Hospitalet del Llobregat, one of the major public university medical centres in Barcelona. The University Hospital has been recently recognised as one of the five most funded research centres of Spain and is one of the leading research centres for Psychiatry, and Neurosciences in Spain. The research foundation involved is IDIBELL.

IDIBELL as Beneficiary is charging personnel costs by Hospital Universitari de Bellvitge (HUB) as Third Party linked to this beneficiary in carrying out the project, in accordance with the provisions of the FP7 Model Grant Agreement. These contributions will not be considered as receipts of the project. Hospital Universitari de Bellvitge is a foundational partner of IDIBELL and is linked to it permanently and long before the proposal submission date.

The department of Psychiatry provides local mental healthcare for a broad area of Catalanian and the NE of Spain, and is officially recognised as a national referral centre for difficult cases and has been selected by the Spanish government as part of a Multi-centre network for neurosciences research in Spain.

5.2.5.2 Expected use/ exploitation of the project results

Currently, our main objective is to continue to apply the PlayMancer videogame in patients with Eating Disorders (ED) and Pathological Gambling (PG) and moreover to increase the sample sizes of both clinical groups. The aim is also to show the usefulness of the game for other pathologies to expand the future research field. Furthermore, we want to demonstrate the usefulness of Playmancer for emotion regulation and establish this through neuroimaging and randomized trials. We intend to use the PlayMancer videogame for research, therapy and teaching purposes.

All of the above stated may contribute to scientific dissemination and commercialization for potential new users and other hospitals, an extended platform which we will encourage. Common exploitation strategies will therefore be discussed with partners in order to carry out future joint work successfully.

5.2.6 University of Geneva (UNIGE)

5.2.6.1 Profile

The Centre Universitaire Informatique (CUI) of the University of Geneva is an interfaculty centre for research, graduate and postgraduate teaching in computer science at the

University of Geneva. It is one of the major university research centres in Switzerland, with a long history of participation in national, European and international research projects. Research at CUI is performed in different areas, including electronic commerce, artificial intelligence, computer vision, object systems, broadband communication and computer animation.

The Advanced Systems Group is chaired by Prof. Dimitri Konstantas since October 2002. The group is composed of contains 4 senior researchers and 4 PhD students. During the last 15 years the group has carried out research activities on both theoretical and applied aspects of object-oriented technology, including object based multimedia communication systems, security issues and platforms, mobile and peer-to-peer applications and system etc. Since 1987 the group has published 4 books, 9 yearly collections of technical reports, 13 Ph.D. Thesis and more than 100 papers in different international conferences.

The MIRALab was founded in 1989 by Professor Nadia Magnenat-Thalmann, and is composed by more than 20 researchers coming from as many different fields as Computer Science, Mathematics, Medicine, Telecommunications, Architecture, Fashion Design, Cognitive Science, Haptics, Augmented Reality, etc. MIRALab is an interdisciplinary research lab working in domains as mixed reality, personality and emotion simulation in robotics, 3D medical simulation, cultural heritage, virtual humans, 3D multimedia application and simulation of hair and clothes.

5.2.6.2 Expected use/ exploitation of the project results

UNIGE retains the rights to the emotion recognition module that is based on bio-feedback from the patient's physiological readings and to the emotion recognition module that is based on the patient's facial expressions. UNIGE will also use the foreground knowledge resulted from PlayMancer for other future related research projects, and internally in the organisation as teaching material.

5.2.7 Serious Games Interactive (SGI)

5.2.7.1 Profile

Serious Games Interactive (SGI) is a research-based SME based in Copenhagen, Denmark that has won several awards. We currently have 15 employees that provide all the necessary skills to make a high-quality serious game. We offer a unique blend of competences within games, learning, marketing and storytelling that grow out of proud traditions in the region.

The staff includes programmers, animators, 3D artists, educational experts and game designers. We work in close collaboration with subject experts on all our projects and carry

out thorough assessment and research to ensure that our games work both in theory and practice.

SGL develops and sells its own serious games products as well as engages in projects for clients. We have released three game series "Global Conflicts", "Playing History" and "Trunky's Colorful Adventures" totalling more than 15 games on various platforms including CD-Rom, Web, iPhone/Android and iPad. The series have been very well received by the press featured on CNN, Spiegel and BBC, and receiving much interest from teachers and students. In terms of our client projects we work with corporations, state agencies, NGOs and other organizations to meet their specific needs and deliver results through the use of digital technologies. Our client service areas include Corporate Education, Social Education, Cultural Education, Academic Education and Health Education.

We have a close partnership with our technology provider Unity Technologies that owns a significant share in the company, which enables us to offer state-of-the-art 3D games (offline & online) by using the UNITY game engine. We also work closely with trusted partners to ensure that we can offer our services at a competitive price.

5.2.7.2 Expected use/ exploitation of the project results

SGL retains the rights to several of the 2 game assets and to a great part of the 2 PlayMancer games. SGL plans on exploiting the experience gained by working on a serious Game for Health in order to enter this very promising market. During the past three years SGL has put a strong strategic focus on the health market. Northern Europe is well-known for its significant health care system and with an aging population, the opportunity of using serious games for treating different (potential) diseases and disability is very promising. We have been involved in a number of projects focusing on both improving physical and mental health for players. Examples of these include a "Stress Master" game for the Working Environment Information Centre to lower the stress levels in public working environments, a "Brain Lounge" for Nordic Brain to motivate elderly people to exercise their brains, a "Food Registration" game for Danish Technical University to make youngsters aware of their eating habits and their consequences. The PlayMancer games will allow us to position us even stronger in this market, which is a key element of our corporate strategy. Specifically, the games will be used for both positioning and deployment purposes in our future sales and marketing initiatives focused on existing and new clients. Secondly, SGL aims to join an exploitation initiative that will start from the project consortium, aiming to market the project results as an integrated solution (hardware and software), because this has the potential to increase the profit margins compared to serious games as software products.

5.2.8 Roessingh Research and Development (RRD)

5.2.8.1 Profile

Roessingh Research and Development (RRD, Netherlands) is a private research institute in the area of rehabilitation and technology, positioned between the academic and health care world. This is reflected in its strong formalized links to both a large rehabilitation Center in the Netherlands (Roessingh Rehabilitation Center) and the University of Twente. The mission of RRD is to carry out scientific research and contribute to its implementation both in clinical practice, health care services and products, by close cooperation with clinical centres and industry. The multidisciplinary staff includes over 60 people, including biomedical engineers, physicians for rehabilitation, psychologists, physical therapists, movement scientists and technicians. RRD has three areas of research, being (1) non-invasive assessment of the neuromuscular function(ing), (2) restoration/enhancement of function and (3) Technology Assisted Pain rehabilitation. Research focuses on development of methods and instruments, modelling, assessment and treatment, not only for chronic conditions but also for its development process. Concerning new treatments, telemedicine gets a lot of intention. There is about 10 years experience with the development, evaluation and support of implementation of ICT applications for the health care. The ICT applications under development focus on consultation between patient and professionals and professionals mutually as well as on remote monitoring and treatment. As such there is extensive experience with webbased training programs, monitoring and feedback on biosignals which this project focuses on also RRD has over 20 years of experience with all aspects (hardware, signal processing, interpretation) of assessment of motor function (EMG, ECG, accelerometry, stress) both in laboratory and ambulant conditions, applied in various neuromuscular disorders (stroke, copd, C.P., spinal cord lesions) and chronic pain. RRD has also very extensive experience with the definition of functional requirements for and design and execution of evaluation studies for new by technology supported interventions. RRD has participated in many European (over 20) and national projects.

5.2.8.2 Expected use/ exploitation of the project results

RRD investigates the possibility to join an exploitation initiative that will be promoted by the project consortium, under the umbrella of a spin-off company that has emerged from RRD and is addressing rehabilitation needs with innovative ICT products.

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Appendices

Part B1

No applications for patents and generally for IP protection have been submitted yet, due to lack of project resources. However, the project partners are seriously considering doing so with own funds, in order to protect and establish the core concept idea, after the project termination.

Table 7: Template B1 - List Of Applications For Patents, Trademarks, Registered Designs, Etc.

TEMPLATE B1: LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS, ETC.					
Type of IP Rights ¹¹ :	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant (s) (as on the application)

¹¹ A drop down list allows choosing the type of IP rights: Patents, Trademarks, Registered designs, Utility models, Others.

Part B2

Table 8: Template B2 - List Of Exploitable Foreground

Type of Exploitable Foreground ¹²	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
<i>Commercial exploitation</i>	Serious game for mental health	YES		Binary files of computer game executables				Project consortium
<i>Commercial exploitation</i>	Serious game for pain rehabilitation	YES		Binary files of computer game executables				Project consortium
<i>General advancement</i>	Game design for	NO		Written report				SGL, IDIBELL, ST

¹⁹ A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

¹³ A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

Type of Exploitable Foreground <small>12</small>	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
<i>of Knowledge</i>	mental health patients							
<i>General advancement of Knowledge</i>	Game design for pain rehabilitation patients	NO		Written report				SGI, RRD, ST
<i>Commercial exploitation</i>	PlayMancer Serious Games assets	YES		Binary files of computer game artistic elements				SGI, ST
<i>General advancement of Knowledge</i>	Bio-feedback-based emotion recognition	NO		Hardware and collaborating software component (binary executables) and source code				UNIGE
<i>General advancement</i>	Speech-based emotion	NO		Software component			RESULTS PUBLISHED	UoP

Type of Exploitable Foreground <small>12</small>	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
<i>of Knowledge</i>	recognition			(binary executables and source code)				
<i>General advancement of Knowledge</i>	Visual facial expressions-based emotion recognition	NO		Software component (binary executables and source code)			RESULTS PUBLISHED	UNIGE
<i>General advancement of Knowledge</i>	Emotion recognition fusion	NO		Software component (binary executables and source code)				UNIGE
<i>General advancement of Knowledge</i>	PlayMancer emotion recognition database	NO		Written report, text and binary files			RESULTS PUBLISHED	UoP, IDIBELL, LREC

Type of Exploitable Foreground ¹²	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
<i>Commercial exploitation</i>	Low-cost Motion capture system	YES		Assembly of hardware and software (binary executables and source code)				TUW
<i>Commercial exploitation</i>	Multi-sensor signal fusion	YES		Software middleware software (binary executables and source code)				TUW
<i>Commercial exploitation</i>	Unity 3D emotion recognition input	YES		Software source code for the Unity3D game engine				SGI
<i>Commercial exploitation</i>	Unity 3D human player	YES		Software source code				SGI

Type of Exploitable Foreground ¹²	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
	motion input			for the Unity3D game engine				
<i>General advancement of Knowledge</i>	Game Automatic Speech Recognition	NO		Software middleware software (binary executables and source code)				UoP
<i>General advancement of Knowledge</i>	Field trial results on the use of the PlayMancer serious game for mental health patients	NO		Written report			PUBLICLY AVAILABLE	IDIBELL
<i>General advancement of Knowledge</i>	Field trial results on the use of the PlayMancer serious game for chronic pain rehabilitation	NO		Written report			PUBLICLY AVAILABLE	RRD

Type of Exploitable Foreground <small>12</small>	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ¹³	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved