Understanding the Digital Game Classification System: A Review of the Current Classification System and Its Implications for Use within Games for Health

Hannah Ramsden Marston[1] and Stuart T. Smith[2,3]

[1] Institute of Movement & Sport Gerontology, German Sport University Cologne, Germany
h.marston@dshs-koeln.de, marstonhannah@hotmail.com
[2] Neuroscience Research, Randwick, New South Wales, Australia
[3]Centre for Research and Education in Active Living, University of Tasmania
Stuart.Smith@utas.edu.au

Abstract. This paper discusses and identifies the current video game classification systems employed throughout North and South America, Europe, Eurasia, Far East and Australasia. Ten main systems are employed, and although there are similarities, there are differences across the systems concerning: content descriptors, rating process and age categories. This paper proposes a series of recommendations for the classification of off-the-shelf games used by clinicians within the healthcare sector, for ease of use and clarity while implementing games for rehabilitation use. It is suggested; a worldwide classification system would facilitate a greater understanding and eradicate issues which occur by clinicians, support networks and patients utilizing this innovative approach to aid rehabilitation. For such a system to be established, a number of regional organizations, industry professionals, academics and end-users would be required to outline a format, and establish an appropriate system to be utilized.

Keywords: Classification System, Health, Rehabilitation, Digital Gaming.

1 Introduction

The use of off-the-shelf videogames is fast arising in popularity as a rehabilitation and training aid within many clinical environments. This entertainment medium, which during its short life span has quickly expanded in both hardware and software technology formats, initially perceived as a leisure pass time, [1] suggest this medium has the potential to assist people with rehabilitation. In recent years, several studies have been conducted to identify the suitable use and implementation of both commercial and high-end video game technologies for health issues such as rehabilitation of motor function following a stroke and fall prevention in older adults [2].

Conversely, a recent review focuses upon the utilization of current videogame console systems in the provision of training and rehabilitation programs to older

A. Holzinger et al. (Eds.): SouthCHI 2013, LNCS 7946, pp. 314–331, 2013.

adults within their own homes. The review proposes several scenarios whereby the consoles have been used within a clinical environment. In particular, it concentrates upon the functional independence of older adults; injury and disability resulting from a stroke and fall and the additional opportunities provided by internet-enabled game consoles. Which in turn suggests this technology can serve a wider purpose for example; rehabilitation and training but also facilitate and improve the healthcare services distributed to older adults [2].

In addition to console-based videogames, online gaming environments such as Second Life [3] are providing positive approaches to psychological rehabilitation, for example with soldiers returning from war zones and are suffering from post-traumatic stress disorder (PTSD). The environment can aid soldiers and their families to understand the causes and symptoms [3-4]. Likewise, exergames have shown to be a positive facet in combating subsyndromal depression (SSD), based upon a 12-week intervention utilizing the Nintendo Wii™ Sports, 35 minutes per session, three times a week. The respective authors reported the results displayed a substantial improvement towards 'depressive symptoms, mental health-related quality of life, and cognitive performance'. However, the results did not show an improvement towards the 'physical health-related quality of life' [5]. To ascertain and build upon the initial findings, the researchers stipulate further investigation is required via randomized control trials [5]. The studies which have been reported in the respective review [1] do not outline the specific segments of the games which have been the most beneficial for health rehabilitation in the respective studies.

The method of interaction is varied in current game technologies and has enabled both proficient and novice users the opportunity to experience new forms of gaming into their lives. Due to the nature of the consumer markets, this has motivated development companies to identify innovative approaches to enhance videogame interaction which has led to the integration of leading-edge elements such as; video capture and inertial sensing devices which have the capability to measure physical movement of individuals. Until recently, such technology could only be found in expensive and dedicated laboratory facilities. It is becoming evident that the use of off-the-shelf game technology within the health sector [see 1] is going to increase, in particular with users unfamiliar with such modes of interaction. There is a possibility that health consumers, their personal and clinical support networks may lack a full understanding of video game technology and how it may best be applied to healthcare.

The aim of this review is to provide an outline of videogame technology that has hitherto been neglected in the games for health literature, that being the classification of commercially available videogames. This review outlines the history, development and procedures undertaken by the 10 rating systems currently in use across three regions (North and South America, Europe, Eurasia, Far East and Australasia). Following this, recommendations are proposed offering guidance for the development of a rating system that will be appropriate for the classification of video games for use in health-related contexts across all regions.

1.1 The Devise and Development of Off-the-Shelf Game Classification Organization

At present, off-the-shelf games are classified by one of 10 organizations depending upon their regional distribution; for North America, The Entertainment Software Rating Board (ERSB) [6], Europe, The Pan European Game Information (PEGI) [7], Australia, The Australian Classification Board (ACB) [8-9], New Zealand, The Office of Film and Literature Classification (OFLC) [10], Japan, The Computer Entertainment Rating Organization (CERO) [11] (CERO), and Singapore, The Media Development Authority (MDA) [12], the Unterhaltungssoftware Selstkontrolle (USK) in Germany [13], the Game Rating Board (GRB) in South Korea [14], Russia [15], and finally the Department of Justice, Rating Titles and Qualifications in Brazil (DJCTO/DEJUS) [16]. It is possible, many games are required to be rated by all 10 organizations. Consequently, all off-the-shelf games which are available on the market have to be rated.

The demise of a classification for videogames was in response to a hearing in the US congress directed by US Senators Lieberman and Kohl, initially resulting in two competing systems in 1994. It was suggested to the industry that a more appropriate rating system would be more suitable. Subsequently, the industry was given one year to devise a self-regulated system or the U.S. federal government would establish a system for implementation [17] and with this in mind, the industry sponsored the developments, resulting in the Software Publishers Association (SPA) and the Interactive Digital Software Association (IDSA, which is now known as the Entertainment Software Association).

The SPA organization created the Recreational Software Advisory Council (RSAC) which was given the role of creating a category system primarily focusing on content. A survey was designed to assess the level (1-4) of content (nudity/sex, violence, and offensive language) quantity and included ‘expert media researchers’ [17] such as Dorothy Singer and Don Roberts. Consequently, the IDSA formed the Entertainment Software Rating Board (ERSB) which created a system focusing on an age-based classification mirroring that used for film ratings. Initially, four categories were created K-A (Kid through Adult), T (Teen; ages 13 and older), M (Mature; ages 17 and older), and AO (Adults Only; ages 18 and older). Initially the K-A category was utilized but then was split into two categories; EC (Early Childhood; ages 3 and older) and E (Everyone; ages 6 and older). An additional category was added in 2005, E10+ (Everyone 10 and older) and this information was placed on to the front of all packaging. Content descriptors which informed the consumer of the content within the game(s) were placed on to the back of products; however, the level of detail was not consistent to that by the RASC classification system. Overtime, the ERSB classification became the leading system due to the RASC system categories being difficult to understand on the products and for the lack of age inclusion [18].

1.2 Why Is There a Need for a Classification System Aimed at the Health Sector?

The evolvement of hardware and software technologies in the mid-1990s has brought this medium to the attention of researchers focusing upon the devise of classification systems (primarily ERSB, PEGI and MAPP) utilized for the purpose of entertainment media (videogames, internet, music and television). However, the literature outlines that the systems in place are not necessarily reliable although, the systems do provide substantial information. It is suggested further work could be conducted to rectify this issue.

Studies have shown parents perspective of the current entertainment mediums are not satisfactory in providing adequate information, adding to the primary focus of age-based ratings, and content descriptors do not represent the context of the medium in full [20-21].

In addition the notion of "forbidden fruit" has being documented showing games which have been categorized under a label such as mature (M) or adult only (AO) is more alluring to younger audiences, especially boys, [19-18,22] who may want to play violent videogames as a means of proving their "manhood" [18] . Bijvank et al. [22] suggested; "Playing videogames with restrictive labels might be a way for boys to vicariously obtain satisfaction through thrills and antisocial behavior" (pg. 874). The principle work of Bijvank et al. has concentrated on the impact of violence and content exposure [20-22] through video games in addition to, television program content portrayed [23] to young audiences.

1.3 Rating Organizations for Off-the-Shelf Games

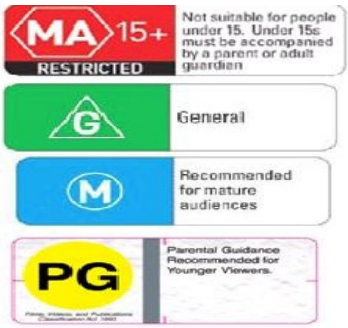
Ten classification systems are presented in Table 1 which provides a brief description of how each classification is executed for that particular region/country. The data presented includes, age categories, content descriptors, rating process, who is employed to rate the games and the icons.

Table 1. Presents the rating organizations for videogames

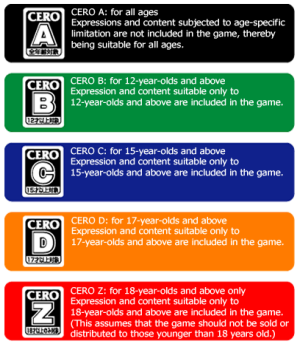
Classification System	Region	Age Categories	Content Descriptors
ERSB http://www.esrb.org/ratings/index.jsp	North America	Early childhood (EC, 3+), Everyone (E, 6+ and 10+), Teen (T, 13+), Mature (M, 17+), Adults only (A), 18+)	Submit online questionnaire detailing pertinent content (all content, context, rewards system & player control). A DVD showing all pertinent content, game play, missions, cut scenes, extreme instances of content and all content that is not playable but exists in the game code must be disclosed. Minimum of 3

	raters, have experience with children,
Rating process/Raters	**Icons**
Submit online questionnaire detailing pertinent content (all content, context, rewards system & player control). A DVD showing all pertinent content, game play, missions, cut scenes, extreme instances of content and all content that is not playable but exists in the game code must be disclosed. Minimum of 3 raters, have experience with children	

Classification System	Region	Age Categories	Content Descriptors
PEGI http://www.pegi.info/en/index/id/26#question_1	Europe, South Africa, UAE	3, 7, 12, 16 and 18 years. * will work within a country law (Portugal). Parental control system; block/ restrict content (2, 3, 5, 7 & 9)	OK label (online content, rated at a 3)
Rating process/Raters			**Icons**
4 stages. A form is submitted and reviewed. Both content and the game review are assessed prior to giving a suitable PEGI rating. A content declaration is required by the developer/ publisher, giving a complete overview of the game. With this information, it allows the reviewer to concentrate on the particular game elements which may affect the decision of the rating. Netherlands Institute for the Classification of Audio (NICAM) – categorizes games between 3 &7, Video Standards Council (VSC) categorizes games between 12-18.			
Classification System	**Region**	**Age Categories**	**Content Descriptors**
Australian Classification Board (ACB) http://www.classification.gov.au/Informationcentre/Pages/NewGuidelinesforthe ClassificationofComputerGames.aspx	Australia	G, PG, M, MA 15+, R 18+ and RC	No information specified

Rating process/Raters	Icons
Using the National Classification Code (NCC) and guidelines prior to release and advertisement. The classification board assigns a rating and reviews can be sought via the Classification Review Board. Three main areas cover the rating system; (1) the context of the game, (2) impact of the assessment and (3) the decision to employ 1 of the 6 classification systems employed for off-the-shelf games. Raters are present on the classification board.	

Classification System	Region	Age Categories	Content Descriptors
Computer Entertainment Rating Organization (CERO) http://www.cero.gr.jp/	Japan	The scheme uses a lettering/color scheme. A & black (all ages), B & green (12+ years), C & blue (15+ years), D & orange (17+ years), and Z & red (18+). Additional icons can be added for educational/database, CERO regulations compatible – used for trial version and rating scheduled – used for promotion items which publishers use for advertisements	26 content descriptors: sex, violence, antisocial (human trafficking, suicide/self-injury, drugs, prostitution, gambling, language). 9 content icons.

Rating process/Raters	Icons
Includes games for household and mobile phones. It covers expressions hidden in commands/tricks. CERO receives an ethics reviewing request. The items subjected to reviewing include 24 items, each expression has an upper limit and if exceeded then they are banned expression, (expressions found within the 26 content descriptors). An age classification is decided based upon evaluating results; CERO notifies the publishers of the result; and The publisher indicates an age classification mark on the product. Raters a recruited from female/male, in various occupations ranged between 20-60 years. Recruited from the public and trained by CERO.	Content icons  

Classification System	Region	Age Categories	Content Descriptors
Departamento de Justiça, Classificação, Títulos e Qualificação (DJCTQ or DEJUS). Department of Justice, Rating, Titles and Qualification	Brazil	6 ratings. L; for all audiences, 10; for people aged 10 plus, 12 and 14 are similar to the ERSB's Teen category, 16; is similar to the ERSB's Mature and suitable for people 16+ and 18 is the equivalent to ERSB's Adult Only.	No information specified

Rating process/Raters	Icons
A completed form outlining the type of platform(s), content, genre, and contact details, including copyright. An overview of the game, and additional material to be classified. A justification for the desired classification based on the content. Evidence of payment to the Development of National Film Industry. Finally the submission of the game will be submitted and within 20 days a response will be given as to the rating decision. No information was sourced relating to the raters.	

Classification System	Region	Age Categories	Content Descriptors
Unterhaltungssoft ware Selbstkontrolle (USK) http://www.usk.de/en/	Germany	These are: 0, 6, 12, 16 and 18. Within each category.	The content descriptors and the age categories are closely linked. For example; the 16 category will include 'acts of violence' and the games will feature armed combat, a framework story.

Rating process/Raters	Icons
The USK checks the functionality of the game and all documentation submitted initially. The game is comprehensively tested. All additional information is collated as supplied by the publisher allowing a full evaluation relevant to child protection issues. A report is written. The USK hands the responsibility for the classification to the Classification Committee whereby the tester presents the game. The USK nor the tester issues an age suggestion. Each member of the committees has the opportunity to play the game in full which 'is a unique approach worldwide'. Classifications are determined by an advisory council comprising g if 16 people from an array of	

backgrounds (churches, youth associations, research institutes, federal government and federal state ministers, ministers of education and cultural affairs of the federal states.

Classification System	Region	Age Categories	Content Descriptors
Media Development Authority (MDA). http://www.mda.gov.sg/Industry/Video/Guidelines/Pages/VGClassificationGuidelines.aspx	Singapore	A game can be assigned an M18 (mature 18) and enforceable by law. In certain circumstances, if titles carry 'contentious elements' an age advisory label is required. If games contain content which exceeds 'acceptable social standards & could be potentially harmful to society'.	Includes violence, nudity, sex, language and drug use.

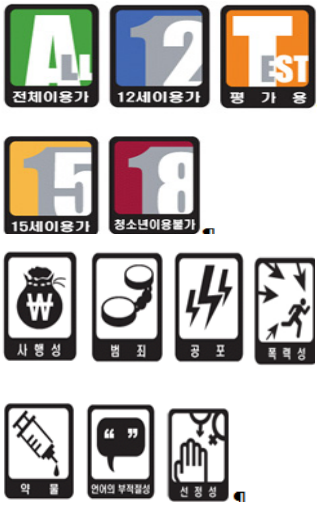
Rating process/Raters	Icons
The board will take into account: generally accepted social mores, need to protect the young, racial/religious harmony, national interest, treatment of theme and content, evaluation of impact, creative educational merit. Third-party modifications are not rated by the board. No information is specified regarding the raters	

Classification System	Region	Age Categories	Content Descriptors
New Zealand http://www.censorship.govt.nz/industry/industry-games.html	New Zealand	G, PG, M, MA 15+, R 18+ and RC. There are 5 classifiable themes within each rating category	No information specified.

Rating process/Raters	Icons
Conducted under the act this contains the NCC. The act covers 4 points: (a) the standards of morality, decency and propriety generally accepted by reasonable adults;(b) the literary, artistic or educational merit (if any) of the publication, film or computer game; (c) the general character of the publication, film or computer game, including whether it is of a medical, legal or scientific character; (d) the persons or class of persons to or amongst whom it is published or is intended or likely to be published. Decisions made under the code should address the following: (a) adults should be able to read, hear, see and play what they want; (b) minors should be protected from material likely to harm or disturb them; (c) everyone should be protected from exposure to unsolicited material that they find offensive; (d) the need to take	 

account of community concerns about: (i) depictions that condone or incite violence, particularly sexual violence; and (ii) the portrayal of persons in a demeaning manner. Office of Film & Literature Classification (OFLC). An expert gamer will play the game while an officer from the office examines the game against the criteria located in the Classification Act.

Classification System	Region	Age Categories	Content Descriptors
Game Rating Board. http://www.grb.or.kr/english/default.html	South Korea	A – for all, 12+, 15+, 18+ and T for testing	There are 7 content descriptors: sexuality, violence, fear/horror/threatening, language, alcohol/tobacco/drug, crime/anti-societal/anti-governmental messages, gambling

Rating process/Raters	Icons
3 processors to the rating process. Within the first process there are 6 stages. Stage 1: application submitted online, stage 2: all documents checked, stage 3: in-depth review/technical test and game is examined by tester/reviewer. Stage 4: decision of rating/content descriptors. Stage 5: there are 3 options at this level; rating pending, rating decision or provisional rating declined. Stage 6: the rating is issued with a certificate. The additional 2 processors provide an informative overview of how to appeal against a rating. The rating board comprises of 15 individuals from the areas of education, law NGO member who meet every Wednesday and Friday to discuss the forthcoming ratings.	

Classification System	Region	Age Categories	Content Descriptors
Federal Law of 28.07.2012 N 139-FZ. Article 12.	Russia	0+, 6+, 12+, 16+, 18+	Content which is banned includes: the encouragement of children to commit a threat to their life, drug, alcohol consumption, gambling, prostitution, and vagrancy, the incitement of violence towards animals or humans. Foul language, denying family values and

	being disrespectful towards parents and pornographic material.
Rating process/Raters	**Icons**
Category '0+' is aimed at children 6 and under. Reviewing a translated document via a web link, it seems the document outlines that products are assigned a classification by an expert. However the definition of 'expert' is not specified. The assessment of suitability will include: the subject, genre, contents and artistic design, perception of information for each age category, the probability of certain content being harmful to the health/development of children.	No icons available. On products there may also be a text warning in adidtion to the figures. The text warning is "for childre older than six years". There is a minimum of 5% sizing for the icons which will be employed on the product.

2 Discussion

Overall there have been five continents comprising of ten regional/countries which have been reviewed in respect to the approval of off-the-shelf games. The main features identified from the classification systems are: (1) the process of application, (2) content descriptors, (3) age categories, (4) execution of rating a game, and (5) code of conduct. It is important to note, not all of the information was available via the documentation for example reviewing the information for Brazil and Russia did not report an in-depth analysis in comparison to the ERSB or PEGI. Although these features are utilized across the regions, there are also, discrepancies across the classification systems forming a variance of how videogames are rated and categorized for the market? This leads to the question, where does 'games for health' stand within the market place for the future use within clinical/home settings and users?

2.1 Games for Health

Since the release of the PlayStation® Eye toy (1999) and more recently the Nintendo™ Wii (2005) and Microsoft™ Kinect (2010) consoles; researchers have focused their efforts, to applying these technologies for the benefit of health rehabilitation in conjunction with commercial software (Wii Sports/Resort). The commercial software will have to have undergone an inspection by the regional classification board prior to being released in the respective region(s). However, with this notion becoming popular and results albeit utilizing small populations suggest this approach could be fruitful; additional work is needed in this area. Several recommendations were proposed by [1] relating to future work conducted in the realm of commercial technologies and health rehabilitation.

Alternatively, researchers, clinicians and entertainment manufactures may need to consider obtaining approval for the use of specific hardware and content for the purpose of health rehabilitation. For example; the development of drugs by pharmaceutical companies are required to complete a process comprising of several

stages which are necessary for the release of a new drug on to the market. The process can be lengthy and may take several years before the approval is granted via government bodies such as the Food and Drug administration (FDA) [24] in America which also approves medical devices into three categories (1-3). Category three is the most regulated, and is defined as a device which can support or sustain life or has the ability to prevent impairment or has the potential to cause harm relating to illness or injury [25]. Additionally, Class II devices require both special and general control requirements which refer to labeling or mandatory performance standards. Class I devices require little regulation but do require general control requirements. This includes manufacturing of site registration, listing the device, premarket notification and quality system regulations [26, 27].

For the approval of medical devices, a Premarket Approval Application (PMA) is completed similar to that submitted for a New Drug Application (NDA). A private license is granted for marketing a medical device. However, a class 3 device which fails the PMA requirements is deemed 'adulterated' and cannot be marketed [25].

Approval of medical devices in Europe is granted by the European Council Medical Device Directive [26-28]. Altogether there are four classifications and the higher the category, the more invasive and risky it is to prospective individuals. To classify a device, several factors are considered; (1) length of use, (2) invasive or surgically invasive, (3) is the device implantable or active, and (4) contains a therapeutic substance.

It is proposed with future studies and the identification of results via the integration of commercial hardware for health rehabilitation, video game consoles may have to be processed through this application, to be certified and be legally covered which in turn will enable appropriate information to be sought by the public and the health sector to identify such devices which have been suitably passed to be categorized as a medical device.

2.2 Content Descriptors

As previous studies have shown the parent's perspective of content descriptors is not sufficient and the studies conducted by [20-21] identified 45 observations of content which could have had a justified content descriptor in 29 games, which were absent. The respective authors concluded games rated at category M (ERSB) include a variety of unlabeled content which may be exposed to audiences who are impressionable and influence behavior, perceptions and attitudes.

Thompson & Haninger [21] contend the level of violence in E-rated games is extensive, although the content descriptors do reiterate this level of intensity, further caution is required. The results showed genres which required the gamer to kill/injure a character were rewarded and overall, there was intentional violence implemented into genres such as sports, racing, and action which may not have been published on the packaging. This leads onto the suggestion that content descriptors provided by the ERSB, are misleading and may not cover the full spectrum of the game content.

It is suggested, the assignation of content descriptors can be inconclusive and the ERSB do not provide sufficient detail relating to content descriptors. Furthermore,

[20] note, the ERSB assigns descriptors to some games but not all which contain the same content thus, leading to confusion for parents who are seeking a comprehensible indicator. With this in mind, [20] propose the ERSB should provide greater transparency about the descriptors and their rating standards.

Conversely, the MDA specifically outlines game content which is not allowed within games and if it is implemented then it is possible the game will not be classified and will be banned. For a game to be rated M18 (Mature 18), six areas will be reviewed: (1) theme, (2) violence, (3) sex, (4) nudity, (5) language, and (6) drug use. Indicators are placed on to the products which may contain this type of content within the game. Similar content areas are focused upon under Federal Law in Russia. However, there are no specific labels assigned to the products and the level of content varies depending upon the specific age category. Moreover, the Russian Federal Law focuses upon content which does not encourage children to inflict violence and self-harm to themselves, animals and other humans. Vagrancy/begging and the denial of family values including being disrespectful towards elders is assessed. The DJCTO/DEJUS in Brazil also has no content descriptors for the classification of games and reviewing the translated documentation (Russia and Brazil) there were no specific content descriptors examined.

Based upon existing studies not all content is presented and appropriately categorized, especially in games such as Grand theft Auto (GTA) whereby; the gamer has the potential to unlock hidden content via codes or completing tasks. Consequently, this facet changed the initial rating by the ERSB from M to AO [20]. With this in mind, the concept of establishing a suitable health rating system to be comprehensible by the public is crucial, especially the design/implementation of content descriptors to ensure the content which has been implemented into the game is projected correctly on to the packaging. It is suggested, this notion would provide all interested parties will feel safe in utilizing commercial games for use in the health sector.

2.3 Age-Based Labeling

The implementation of a rating system by age is clearer to understand by parents than content descriptors. On the contrary, [19] reported age-based ratings are simpler to understand than detailed descriptors to base a decision. However; the authors state “the system fails if there is no true consensus on what is age appropriate” [19] (pg 42), resulting in the limited use of the rating system by parents. An age appropriate system will vary depending on the region although the alignment with the current rating systems, the content has to be deemed appropriate by parents not by the organization(s). In Table 1 nine of the ten classifications have icons which are placed onto the products with the exception of Russia. Although they have an age classification system, the respective document provided no visual icons. Taking into account the information presented in the translated document, there was no detailed outline as to how parents or guardians are advised to the classification of games across Russia. The classification system implemented in Brazil is closely associated to that of the ERSB.

It has been noted the application of age-based ratings allures younger users to play or watch content, known as forbidden fruit [18-19, 22]. Although the purpose of the rating systems is to provide guidance to parents, earlier studies have shown some parents do not follow the age-based categories, nor, pay close attention to the information. Therefore, it is questionable, whether there should be an overhaul of the rating systems? Gentile et al., [19] concluded the perceptions by parents in the respective study, requires change, and consideration should taken into account to establish a universal rating system across all entertainment mediums, which was recommended by The American Academy of Pediatrics. This notion could be suitable for these mediums. However; it is questionable whether a universal system would be appropriate for games with the primarily purpose of health rehabilitation. Equally, it is questionable whether this would eradicate the confusion and contradictions of content descriptors and age-based ratings which is currently being witnessed?

2.4 Rating Process

Rating the actual game content is utilized by similar processors across all regions. There are however, regional differences during this process. Likewise, the region of Australasia uses a color coding system which identifies games that are restricted in one country but not in another (New Zealand). The PEGI system uses a similar classification unless the law of a particular country varies for example; Portugal which has a different age rating to that of other European Union (EU) countries. The age classification implemented by the ERSB is similar to that of PEGI, but again varies. The age rating is more detailed, than PEGI and Australasia, including additional systems, starting approximately at the Teen level and Adult Only (18+). In Japan, a color scheme, with a letter from the alphabet, follows a similar ethos to PEGI and Australasia. However, the rating system employed in Singapore has two categories; Mature 18 (M18) and if caution is required a separate label is assigned stating 'suitable for 16 & above'. If games do not fall into either of these categories but are approved for distribution, the games are not required to carry any rating label. Although there are no age-based labels used, the MDA do suggest that parents are required to seek out more information about the game content prior to purchasing.

Likewise, seven of the ten organizations do not report actual game playing when reviewing a game for a classification rating. However, the three classification boards that do execute game play are South Korea, New Zealand and the USK in Germany. Additionally the USK report that the whole game is played and allows all of the advisory committee to play the game prior to making a final decision. The USK website states this facility is unique worldwide. All ten organizations use different approaches; the ERSB employs adults who have experience with children. Two administrations are used by PEGI one for rating games aimed at children and one aimed at teenagers/adults. PEGI do not stipulate the experience of the raters employed, but in comparison to Australasia who use the expertise of a gamer(s) to play the game, in conjunction with an officer from the OFLC, who examines the content against a set criterion.

Furthermore, the CERO recruits various people between the ages of 20-60 years who are employed in a variety of occupations. The MDA board assigns ratings to games, and consists of individuals from both the education and business sectors. The raters recruited by the USK are individuals who are associated in professions concerned with the welfare of children. For example; the church, youth organizations, research institutes, Federal government and Federal State Ministers of education and cultural affairs. Furthermore 50 individuals, State wide have been appointed from areas such as teachers and journalists. Similar raters are utilized by the GRB in South Korea but also comprises of individuals from the legal profession and non-governmental organizations (NGO). The rating process in South Korea comprises of six stages, the first stage comprises of the application being submitted, at stage 2 all of the documents are checked and then at stage 3 the game undergoes an in-depth examination by a tester/reviewer. Stage 4 comprises of a rating decision based on the content descriptors, followed by stage 5 which has three parts (rating pending, rating decision/provisional or rating declined). Stage 6 is the issuing of a certificate. The rating system in Russia is executed by an expert. However, in the translated document, there was no specific detail relating to the assignation of the expert. Similarly, in Brazil the translated document outlined no detail of how the product is rated or by whom.

Taking into account the approaches of content and age based ratings from 10 organizations there are several differences; (1) labeling of content descriptors and age-based categories, (2) similar age-based coding with the exception of Singapore, (3) rating process of games varies across all organizations; and (4) Japan provides informative labels displaying additional game/rating standard.

Consequently, off-the-shelf games for entertainment are regulated; but a regulation of games for rehabilitation does not exist. Therefore the authors suggest, with collaboration amongst academics, industry professionals, health practitioners, patients and their support network(s) a universal classification system should be devised to display critical information which would inform prospective users the suitability of a game for rehabilitation. Similarly, the Australian government have designed and implemented a tick symbol which is placed onto food packaging to display the nutritional value to consumers. It is suggested, what has been employed here, could be taken and built upon within a suggested health rating system. Additionally, researchers and clinicians should contemplate particular areas of a game which could be more beneficial to the patient whereby a positive effect is being noted during the rehabilitation.

Taking into account the information presented in this paper, the authors are proposing several recommendations building upon previous literature to initiate a discussion of a classification system for games aimed at the health sector. Several recommendations are proposed which have been highlighted from earlier studies, but also taking into account the information from the different regions in a bid to start a discussion and process for stream lining a game classification which is presented in Table 1.

- Adopt/devise a national classification system for all entertainment mediums [18-19], with the additional section relating to games for health.
- In future studies, clinicians and researchers should attempt to identify which areas of the game(s) are most beneficial to the patient during the rehabilitation.
- Suitable content descriptors to represent different health conditions.
- Adopt the notion of the PEGI, Australasia or Japan color schemes used for the age-based rating categories which would provide consumers an easier way to understand the category. However, based upon parents differing viewpoints, it is suggested adopting the labeling system employed in Singapore maybe more cohesive.
- Consideration should be taken into account if age-based rating were to be maintained. The organization/regulation should abide by each country's law. This has been demonstrated with the roll out of PEGI in Portugal.
- Conduct interviews with parents to gain further insight to understand and establish how parents perceive age and content categories [18-19]. It is anticipated this would facilitate building upon knowledge for re-categorization and can be broadened to include patients, clinicians to aid in the design of health categories.
- Conduct initial consultation and guidance by the prospective board in relation to health and the potential for law suits by the public based upon the game(s) being suitable for health rehabilitation. In conjunction; the need for future longitudinal studies of health and games should be considered, following a similar process to that by the FDA approval of medication.
- A consistent approach to the rating of games for use within a clinical/health environment. This could take on experience and guidance from clinicians, support networks, patients, academics and industry professionals who have substantial experience in a variety of environments in particular randomized control trials (RCTs). It is suggested undertaking a similar approach to that of the USK (Germany) whereby, the whole game is played by the raters/reviewers would be suitable to understand and assign a suitable health classification.
- Implementing a tick symbol similar to that utilized in Australia for healthy food, is a possibility to indicate the suitability of software for utilization in the health sector. This could be implemented as an initial stage of the process while the design and devise of a fully entertainment medium classification is being produced.
- Current and future commercial game hardware systems will apply for approval from respective government agencies to be classified as an appropriate medical device. This would mean games companies applying to the FDA and the European Council Medical Device Directive.

The proposed recommendations have taken into account the information which has previously being published by the respective authors, in conjunction with the work by [1].

It is suggested, if there was an overhaul of the classification system as proposed by [18-19] enabling the new system to follow the existing system implemented by the MDA organization in Singapore, whereby games which contain themes, require a M18 or an advisory notice. Additionally, removing the age-based rating could be

justified based upon the studies which have outlined, parents do not actually take on board the age-based ratings. Furthermore, it has been established that parents find the content descriptors confusing, and in some instances, some games do not carry the necessary descriptors as they should, [18-19] it is questionable whether this should really be continued.

On the contrary, adopting a similar system to that used in Singapore would enable parents to decide for themselves which games are suitable for their children based upon their own information seeking and parental values. However, the primary objective of a new system is to target games which have been identified suitable for use in the health sector. Therefore, suitable content descriptors are needed which may aid prospective users to initially identify the suitability of the product for a particular health complaint/condition. This detail would need to be thoroughly discussed and an appropriate design label(s) created if it was decided to be included.

Similarly, raising the awareness to the research and industry communities regarding the subject of approval is at present not a necessity but the authors feel this is an area which may encounter future concerns from a legal stand point. In particular, if there are specific claims about a piece of hardware/software. For example, software/hardware which is said to facilitate the prediction and prevention of falls, the authors question whether approval from the appropriate authorities is required for 'medical devices' and whether there should be some level of certification to actually display to users the proposed equipment is appropriate for this particular rehabilitation.

It is suggested, further investigation would include the legal profession, government bodies, researchers, clinicians and manufactures to identify and understand the potential if any, of future actions brought forward from individuals who have used the hardware/software for a specific health complaint. With this in mind, one approach for all groups concerned is to initially conduct a series of discussions based upon the investigations being conducted to gain clarity for the published studies, and to identify if at any point there could be legal action or approval required.

3 Conclusions

Employing a universal rating system in addition to a health sub-category has the potential to be cohesive throughout all health settings. Integrating similarities between the classification organizations could provide ease of use and adoption. However, it is suggested a similar format to that of Singapore which presents itself in a simple and cohesive format maybe the most suitable or a combination of the ratings systems to ensure all necessary information is presented.

Nevertheless, agreeing upon a universal rating structure would entail representatives from each of the rating organizations, in conjunction with academics, clinicians, patients and their support networks, having to agree upon a new set of criteria with the assistance of industry professionals and the rating organization boards. This would take time and lengthy discussions amongst many interested

parties. During the process of a new classification system additional consultation with the FDA and the European Council Medical Device Directive bodies should be considered to determine the legal/approval standpoint of commercial game products for health. Consequently, the impact of an aging society and the issues and recommendations which have been identified in this paper are important facets for the future use, sustainability and the integration of technology into the lives of older adults.

References

1. Marston, H.R., Smith, S.T.: Interactive Videogame Technologies to Support Independence in the Elderly: A Narrative Review. Games for Health Journal 1(2), 139–152 (2012)
2. Smith, S.T., Schoene, D.: The use of exercise-based videogames for training and rehabilitation of physical function in older adults: current practice and guideline for future research. Aging Health 8(3), 243–252 (2012)
3. Linden Labs, Second Life, PTSD education, http://secondlife.com/destination/t2-ptsd-education (accessed January 2012)
4. Games: Improving Health, ESA, http://www.theesa.com/games-improving-what-matters/ESA_FS_Health_2011.pdf (accessed January 2012)
5. Rosenberg, D., Depp, C.A., Vahia, I.V., Reichstadt, J., Palmer, B.W., Kerr, J., Norman, G., Jeste, D.V.: Exergames for Subsyndromal Depression in Older Adults: A Pilot Study of a Novel Intervention. Am. J. Geriatr. Psychiatry. 18(3), 221–226 (2011)
6. Entertainment Software Rating Board (ERSB), http://www.esrb.org/index-js.jsp (accessed January 2012)
7. Pan European Game Information (PEGI), http://www.pegi.info/en/index/id/28/ (accessed January 2012)
8. Australian Classification Board (ACB), http://www.classification.gov.au/ (accessed January 2012)
9. Australian Classification (Publications, Films and Computer Games) Act 1995 (2008). Guidelines for the Classification of Computer Games. Attorney-General's Department, Canberra (2011), http://resources.news.com.au/files/2011/05/25/1226062/865826-guidelines-for-computer-games-classification.pdf
10. Office of Film & Literature Classification, New Zealand (OFLC), http://www.censorship.govt.nz/industry/industry-games.html (accessed January 2012)
11. Computer Entertainment Rating Organization (CERO), http://www.cero.gr.jp/
12. Media Development Authority (MDA), http://www.mda.gov.sg/Industry/Video/Guidelines/Pages/VGClassificationGuidelines.aspx
13. Unterhaltungssoftware Selskontrolle (USK), Germany, http://www.usk.de/en/classification/
14. Game Rating Board (GRB), South Korea, http://www.grb.or.kr/english/default.html
15. Russia Federal Law, Article 12 (July 28, 2012), http://base.consultant.ru/cons/cgi/online.cgi?req=doc;base=LAW;n=133372;from=108808-0;div=LAW;rnd=0.05636497470550239

16. Departamento de Justiça, Classificação, Títulos e Qualificação(Department of Justice, Rating, Titles and Qualification) (DEJUS), Brazil, http://portal.mj.gov.br/classificacao/data/Pages/MJ6BC270E8PTBRNN.htm
17. Chalk, A.: Inappropriate Content: A Brief History of Videogame Ratings and the ERSB, The Escapist Magazine (July 20, 2007), http://www.escapistmagazine.com/articles/view/columns/the-needles/1300-Inappropriate-Content-A-Brief-History-of-Videogame-Ratings-and-the-ESRB
18. Gentile, D.A.: The rating systems for media products. In: Calvert, S., Wilson, B. (eds.) Handbook of Children, Media, and Development, pp. 527–551. Blackwell Publishing, Oxford (2008)
19. Gentile, D.A., Maier, J.A., Hasson, M.R., Lopez de Bonetti, B.: Parents' Evaulation of Media Ratings a Decade After the Television Rating Were Introduced. Pediatrics (2011), doi:10.1542/peds.2010-3026
20. Thompson, K.M., Tepichin, K., Haninger, K.: Content and Ratings of Mature-Rated Video Games. Arch. Pediatr. Adolesc. Med. 160(4), 402–410 (2006)
21. Thompson, K.M., Haninger, K.: Violence in E-Rated Video Games. JAMA 286(5), 591–598 (2001), doi:10.1001/jama.286.5.591
22. Bijvank, M.N., Konijn, E.A., Bushman, B.J., Roelofsma, P.H.M.P.: Age and Violent-Content Labels Make Video Games Forbidden Fruits for Youth. Pediatrics 123, 870 (2009), doi:10.1542/peds.2008-0601.
23. Cantor, J.: Ratings for Program Content: The Role of Research Findings. The ANNALS of the American Academy of Political and Social Science 557(1), 54–69 (1998)
24. Food and drug administration (FDA), http://www.fda.gov/Drugs/default.htm (accessed April 2012)
25. Food and Drug Administration (FDA). Medical devices, http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/DeviceApprovalsandClearances/PMAApprovals/default.htm
26. Mackenzie, J.H.: Regulation in the Medical Devices Industry in the US and Europe. Business Briefing: Medical device Manufacturing and Technology (2004), http://www.touchbriefings.com/pdf/954/qualimedd_techEDITED.pdf (accessed April 2013)
27. Hills, B.J.: The EU Medical Devices Approval Process: Device Classification and the Technical File (2011), http://www.gatewayfda.com/medical-devices/the-eu-medical-devices-approval-process-device-classification-and-the-technical-file/ (accessed April 2013)
28. European Medicines Agency (EMA), http://www.ema.europa.eu/ema/index.jsp?curl=pages/home/Home_Page.jsp&mid (accessed April 2012)