Attention:

Senator Anne Urquhart
Chair, Senate Environment and Communications References Committee
PO Box 6100
Parliament House
Canberra ACT 2600

Submission to:

Senate Environment and Communications References Committee

Subject:

Inquiry into the future of Australia's video game development industry

Date:

13 September 2015

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Dear Senator

I am delighted to forward you a response to the Senate Environment and Communications References Committee Terms of Reference on the Future of the Australian Video Game Development Industry.

The following document has been developed in consultation between a number of individuals who are passionate about the development of serious games including

Stuart Smith, Professor of Disruptive Technologies, University of the Sunshine Coast
Carolyn Mee, Principal at cmee4 Productions
Salih Mujcic, Revelian
Norman Wang, Opaque Multimedia
Adrian Webb, Australasian Serious Games Showcase and Challenge

We look forward to the considered outcomes from this inquiry

Yours truly

Stuart Smith, PhD, MSc
Professor of Disruptive Technologies
University of the Sunshine Coast
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Introduction

“Games, in the twenty-first century, will be a primary platform for enabling the future”

Jane McGonigal. Reality is Broken.

The University of the Sunshine Coast (**USC**) welcomes the opportunity to respond to the Senate Environment and Communications References Committee Terms of Reference on the Future of the Australian Video Game Development Industry as outlined below:

> **The future of Australia's video game development industry, with particular reference to:**
>
> a. **how Australia can best set regulatory and taxation frameworks that will allow the local video game development industry to grow and fully meet its potential as a substantial employer,**
> b. **how Australia can attract video game companies to set up development operations in Australia and employ local staff,**
> c. **how export opportunities from Australia's local video game industry can be maximised, and**
> d. **any other related matters.**

The Committee will receive a number of submissions from existing developers and users of console and PC-based games advocating for continued support for the existing game developer industry base in Australia. Furthermore the peak representative bodies of the game development sector (GDAA, IGEA, IGDA) will also provide the background data in support of arguments for the future of the Australian video game development industry.

However, the contemporary games industry as a whole is highly speculative and highly volatile. In the GDC2015 interview by gamesindustry.biz, (1), Mike Capps, the former president of Epic Games and a highly respected industry figure, voiced his concern of the volatility of the games industry as well as the commercial viability of games production in general using the wildly successful Australian mega-hit, Crossy Road as an example.

“No one can look at Crossy Road and say they seriously knew that that was going to be a hit. And so if you don't have that kind of predictability [in the market] it's a really bad investment of your time.”

- **Mike Capp, formerly Epic Games**

Rather than cover the territory by those from the existing game developer community, our submission will add value to the discussion by outlining the significant opportunities that exist for the development of games for other than purely entertainment purposes, so called **serious games**.

Despite the widespread, possibly skeptical, perspective that games can only ever be an indulgent leisure time activity, games are considered ”serious” when they are developed and used in sectors such as health, education, defense, emergency planning, politics, engineering, urban planning, manufacturing and service delivery. Serious games have been defined as “a mental contest, played with a computer in accordance with specific rules, that uses entertainment to further government or corporate training, education, health, public policy, and strategic learning objectives” [2]. Application areas are as diverse as engaging a person recovering from stroke in repetitive rehabilitation arm movements, to delivering critical incident response training to emergency personnel through to educating a child living with cancer about the impact of chemotherapy on their health or another about the impact of genocide in Dafur.

Rather than provide detailed exposition of the ways in which games are being applied across a range of disciplines, by way of illustration we will provide a brief, and by no means exhaustive, overview of how games are being used in health, drawing upon evidence from the efforts of a growing international community of researchers including our own at USC. We will outline the relative scarcity of Australian game developers who are focused on building health-related games and finally we will address the specific points in the Terms of Reference.

Games for health: an exemplar of serious games

Over the past few decades there has been a wealth of published scientific evidence for the physical, cognitive and social health-related benefits of increased physical activity, especially in older adults and people living with chronic disease. Despite the clear evidence base demonstrating the health-related benefits of physical activity, uptake and adherence is often disappointing [3-6]. Furthermore, while people may be generally aware of the health benefits of physical activity, knowledge alone is often not sufficient to motivate a person to adopt and maintain physical activity behaviour. Therefore, interventions incorporating the principles of behaviour change are needed, both to maximise the reach of physical activity promotion initiatives and programs across the older community and to minimise attrition once people begin to be physically active.

One method by which we can increase understanding of the importance of, and compliance with, exercise programs involves the use of fun and engaging videogames. Consumer driven forces for new ways to interact with videogames have lead to development of sophisticated video capture and inertial sensing devices for measuring movement of the human body. Until recently, such technology could only be found in expensive and dedicated laboratory facilities. Devices such as the Microsoft Xbox Kinect are now at a price point (ca. AUD$400) that it is possible to relatively inexpensively deploy motion capture and feedback technologies directly into the homes of people for use in physical activity programs. Interactive videogames that combine player movement,

engaging recreation, immediate performance feedback and social connectivity via competition, have been shown to promote motivation for, and increase adherence to, physical exercise amongst children and young adults [7-12].

Exercise-based videogame (exergames) have also been shown to improve cognitive abilities [13] to be a feasible alternative to more traditional aerobic exercise modalities for middle-aged and older adults [14]. Furthermore, exergames can be used to train stepping ability in older adults to reduce the risk of falls [15-17]. More recently, videogame technologies are showing promise as a clinically feasible tool to deliver rehabilitation and training programs from issues as varied as stroke (18), through to cerebral palsy (19).

Despite the potential utility of videogames to address the health-related needs of a diverse range of individual and patient groups, a number of challenges remain. Games designed for the general population are frequently too challenging or inappropriate for people living with a complex physical, cognitive, social or emotional capacities. For example, people living with spinal cord injury may experience difficulty manipulating game controllers (20) or responding to activities that are too fast and visually complex (21). Globally there is an increasingly robust academic community (with its own peer-reviewed journal, Games for Health: Research, Development and Clinical Applications) addressing these challenges and an increasing number of game developers are now building games for health.

One of the first successful purpose-built health games, Re-Mission, was created by HopeLab to help young adults with cancer. In the game players control a nanobot named Roxxi who races through the human body fighting cancer with various weapons, such as the radiation gun. Players must also monitor patient health, learning about different forms of treatments and how they work along the way. In a randomized control trial of 375 patients (22), researchers found game players took their antibiotics more consistently and were more likely to adhere to chemotherapy treatments than others. The players also knew more about cancer and had a stronger belief in their own ability to reach goals while undergoing cancer therapy.

There are very few Australian games for health developers

Despite the increasing evidence base on the impact of purpose-built serious games across a range of health issues, with much of the research being conducted in Australia (15-18, 20, 22,23), our Nation is lagging behind the rest of the world with only a few local developers exploring development of games for health. Sound Scouts (auditory health), Opaque Media (dementia awareness training) and Disparity Games (self esteem and anti-bullying) are examples of the few Australian game developers that are building games that can be applied to physical and psychological health. Revelian, a Brisbane-based recruitment consultancy has recently developed its own version of a psychometric assessment game, Theme Park Hero, which could be applied to clinical issues. Digital solutions specialists, The Project Factory (Sydney, London), have also developed game-based apps such as “This Way Up” to help combat depression and anxiety. Finally, Diversionary Therapy Technologies (Brisbane) have developed a hand-held multimedia platform (ditto^{TM}) that uses elements of game design to reduce pain and anxiety, and improve healing times for traumatised children in the clinical environment. This solution is

based on the outcomes of an extensive research program (23) conducted by Director of Paediatric Trauma on the Queensland Statewide Network, Professor Roy Kimble.

"...we have to recognise that the disruption that we see driven by technology, the volatility in change is our friend if we are agile and smart enough to take advantage of it.

Malcolm Turnbull, 14th September 2015

It is time for a disruption of both videogame development and the healthcare sector through serious games

According to Christensen (24), disruptive innovation describes a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors.

Traditionally dominant companies in a sector tend to innovate faster than their customers' needs evolve, most organizations eventually end up producing products or services that are actually too sophisticated, too expensive, and too complicated for many customers in their market.

When we focus on the issue of videogame development, the vast majority of the commercially successful, frequently console-based, games typical of the industry, are vastly sophisticated, extraordinarily expensive (to produce) and absolutely not fit for purpose for the huge and growing health, aged and disability markets.

Furthermore, traditional videogame developers pursue "sustaining innovations" (relatively incremental improvements on the status quo) at the higher tiers of their markets because this is what has historically helped them succeed: by charging the highest prices to their most demanding and sophisticated customers at the top of the market (console game players), companies will achieve the greatest profitability.

However, by doing so, game developer companies unwittingly open the door to "disruptive innovations" at the bottom of the market. An innovation that is disruptive allows a whole new population of consumers access to a product or service that was historically only accessible to consumers with a lot of money or a lot of skill (or indeed particular interests). The population of older adults with complex health conditions **and** people living with a disability or chronic disease **and** even those who are physically healthy but psychologically unwell, is enormous. Traditionally the game developer industry has only considered "their" market as people who like to engage in entertainment-based games. By reframing this perspective towards individuals who like to play games AND may be living with complex physical, cognitive, social and emotional health issues, the potential market for videogames becomes huge and growing.

Games also offer the potential to disrupt healthcare delivery. For example, current rehabilitation practice (e.g. following stroke) involves a period of intense, guided rehabilitation during the early stages of recovery, often in an acute hospital setting. Patients are then gradually discharged back into the community, with limited funded ongoing support through transition care programs, to lead the remainder of their lives functionally impaired to various degrees. Often patients are discharged from rehabilitation with sheets of printed instructions for the kinds of exercises they should engage in to aid their recovery of physical, psychological, emotional and social function. For patients returning to regional, rural or remote Australia, the paucity of access to rehabilitation services is particularly distressing.

Imagine instead a world where the person recovering from a stroke is sent home from hospital with a videogame console, pre-loaded with a suite of engaging, informative games to engage them in their rehabilitation program. As they engage in rehab gameplay, their centrally located rehabilitation specialist can monitor performance and adjust challenge posed by the games, ensuring that progress of rehabilitation is guided, informed and encouraging. Furthermore, for the patient who may have formed close social bonds with others on the rehabilitation ward in hospital, they now have the opportunity to “play” against each other irrespective of the physical and functional distance that may separate them.

The Australian game developer and healthcare sectors are primed for disruption through serious games.

We encourage the Senate Standing Committee to begin exploration of opportunities for growth of the Australian serious games development industry. In particular:

1. how Australia can best set regulatory and taxation frameworks that will allow the local video game development industry to grow and fully meet its potential as a substantial employer,

In their submission to the Senate Inquiry, the IGEA have cogently outlined a range of options the Government could consider to support the ongoing vitality of the Australian game developer industry from a taxation and regulatory perspective. We fully support the recommendations of the IGEA regarding financial incentives and opportunities that can facilitate the ongoing vitality of the game development sector, especially applied to serious game developers.

With particular regard to the development, evaluation and implementation of videogames for health, we urge the Committee to begin the discussion around support of the serious games developer industry.

In addition however, in The Innovators Prescription, Christensen and colleagues (25) outline the 4 key elements of disruptive innovation in healthcare, all of which need to be considered for the successful disruption of healthcare by serious games. These are

1. simplifying technology

2. low-cost innovative business models
3. economically coherent value network
4. regulations and standards that facilitate change.

Of the four, the final point on regulations and standards is critical for the eventual uptake and scale potential for games for health and by extension, any game that is developed for a “serious” purpose. It is critical that we start to explore the regulatory framework that will eventually enable clinicians and health professionals to prescribe certified game-based technologies and enable consumers of those technologies to access payment options for these technologies.

Game developers tend not to have very much/any experience with the Therapeutic Goods Administration process and will be in need of guidance. This is already emerging as an issue that developers of games for health are facing in the US with the FDA approval process (26). At the same time the TGA itself must recognize the increasing use of consumer electronic solutions, including videogames, by consumers who are now empowered to monitor their own health to engage in health behavior change.

2. how Australia can attract video game companies to set up development operations in Australia and employ local staff,

and 3 how export opportunities from Australia's local video game industry can be maximised, and

As indicated in the introduction overview, Australian researchers are already competing on a global scale in pushing at the forefront of development, evaluation and application of videogames for health. There is a significant opportunity for Australia to take a global lead by establishing a coherent, purposeful serious games developer industry.

On the Sunshine Coast we have the unique opportunity to respond to the physical, cognitive, social and emotional health related needs of a growing ageing population s well as a significant population of younger adults living with mental illness and increasing rates of chronic disease. The Sunshine Coast can be the unique location in Australia to build a world-class serious games developer industry base. The will attract and retain a new workforce of creative, technical and entrepreneurial people to increase the contribution of regional Australia to the National economy.

To this end the University of the Sunshine Coast has introduced a new Bachelor of Serious Games from Semester 1 2016 to kick start the education and training of the new serious games and games for health workforce. We will engage closely with local age, disability and health service providers and with individuals in the community itself, to develop game solutions for health and wellbeing that can be applied first in the local community but then also exported to the rest of the world. Our goal is to place our flag in the sand and clearly identify the Sunshine Coast as the “go-to” centre for Games for Health both for fundamental research as well as translation into practice.

4 any other matters

In addition to the Bachelor of Serious Games, the University of the Sunshine Coast is already investing significant resources in developing capability around the use of new and emerging technologies for education and training. The development and use of simulation and serious games has enormous potential in delivery of K-12 and tertiary education programs. An overview of the use of serious games in learning envirnments can be found in (27). In addition the University of the Sunshine Coast is exploring development of ongoing Professional Development courses that makes use of immersive, augmented and virtual reality technologies like CAVE2 (28), Oculus Rift (29) and Magic Leap (30). Technologies like Oculus Rift and Magic Leap are expected to become as ubiquitous as the mobile phone within the next 2-3 years and will be the distribution platforms for serious games across a range of sectors.

Support for the emerging serious games developer industry is vital for a "nation that is agile, that is innovative, that is creative" (Malcolm Turnbull, 14th September 2015)

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* research conducted in Australia.

Appendix A. Additional perspectives.

Carolyn Mee
Cmee4 Productions, Creators of Sound Scouts

http://www.soundscouts.com.au

ABOUT SOUND SCOUTS
"A game to check a child's hearing so they're able to live and learn;
their future is worth playing for".

Sound Scouts is a mobile game created to check a child's hearing before, or during, their first year of school. Developed in collaboration with the National Acoustic Laboratories, the research arm of Australian Hearing, the game is fun and easy to play, and is aimed at detecting undiagnosed hearing issues that would otherwise affect a child's social and academic development.

In Australia babies are screened for moderate to severe hearing loss at birth but there is no effective follow up screening in the preschool years. Research has shown that double the number of children diagnosed at birth, are being detected with hearing loss between the ages of 5-8 years, meaning some children are at school for up to 3 years with undiagnosed hearing loss.

A 2010 Senate report into hearing health in Australia, recommended hearing screening of all children on commencement of their first year of compulsory schooling. However the practicalities and associated costs of health professionals screening 300 000 children annually has made universal screening difficult. Only now, with the advent and uptake of digital devices and applications, is a viable alternative to traditional methods (i.e. audiologists) possible. Sound Scouts, a mobile game solution, has been purpose built for the task.

Sound Scouts has been designed and developed to combine the engaging powers of game play with the scientific principles of a hearing test. Sound Scouts has the expertise built in so any responsible adult can set up the game and supervise their child playing. Parents and caregivers can oversee hearing screening of their children in the comfort and familiarity of their own homes.

Packaged as a narrative driven game, the creative concept combined with sophisticated scientific elements, offers a unique test solution that improves patient (4.5- 6.5 year old children) engagement and enables the gathering of multiple data points that when combined and processed in a backend algorithm deliver a comprehensive hearing check.

Traditional hearing tests are notoriously boring and children can lose interest before sufficient data is collected. Testing with Sound Scouts, a fun, age appropriate game, resolves the issue of engagement. The children are actively immersed in the narrative, compelled to complete the tasks to discover how the story ends. The game, in this instance a serious game as play has a targeted purpose, is the perfect vehicle for testing.

In Australia, in 2014, 63% of children aged between 8 and 11 years either have their own mobile device or use their parent's mobile devices (Trend Micro Australia's Children and Mobile Device Survey July 2014). These figures, that are likely to have increased, indicate the use of mobile devices by children is widespread and that future five year olds will be increasingly familiar with the Sound Scouts interface.

Games as a collection mechanism for data have huge potential. Sound Scouts is the perfect example of how games can be harnessed for health and well being, delivering a mobile solution to meet a need that traditional solutions are unable to solve.

Norman Wang
Director of Developments
Opaque Multimedia

Economic Realities of Contemporary Games Development

The contemporary games industry as a whole is highly speculative and highly volatile. In the GDC2015 interview by gamesindustry.biz, Mike Capps, the former president of Epic Games and a highly respected industry figure, voiced his concern of the volatility of the games industry as well as the commercial viability of games production in general using the wildly successful Australian mega-hit, Crossy Road as an example.

"No one can look at Crossy Road and say they seriously knew that that was going to be a hit. And so if you don't have that kind of predictability [in the market] it's a really bad investment of your time."

- *Mike Capp, formerly Epic Games*
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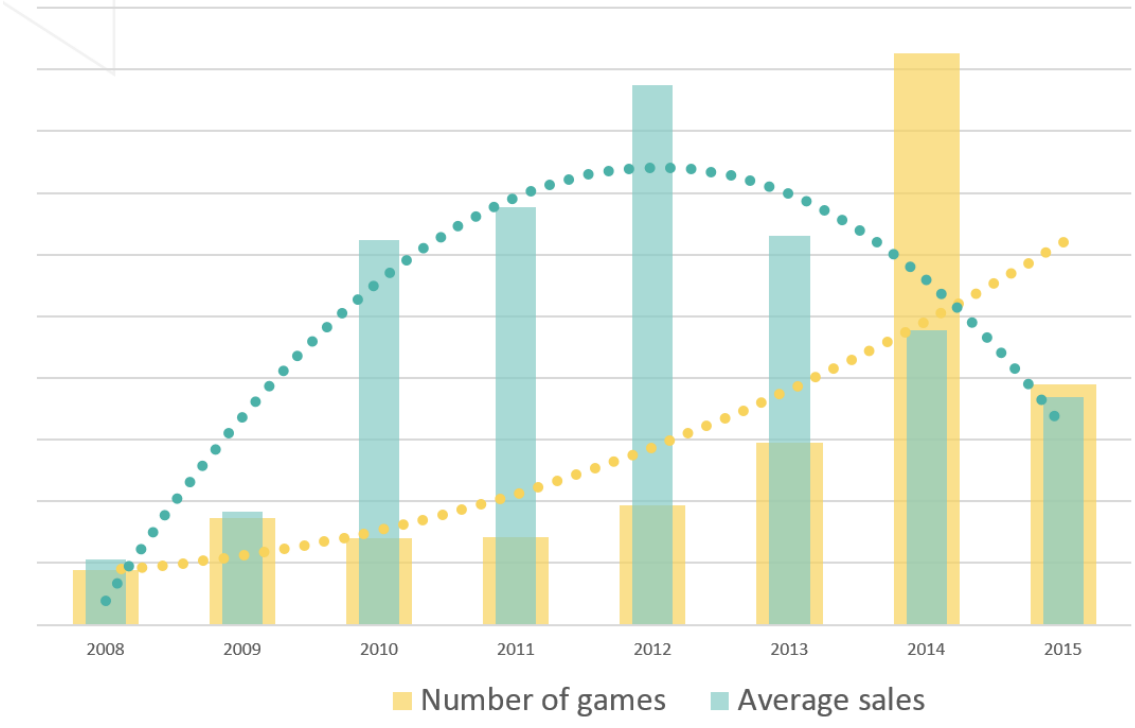
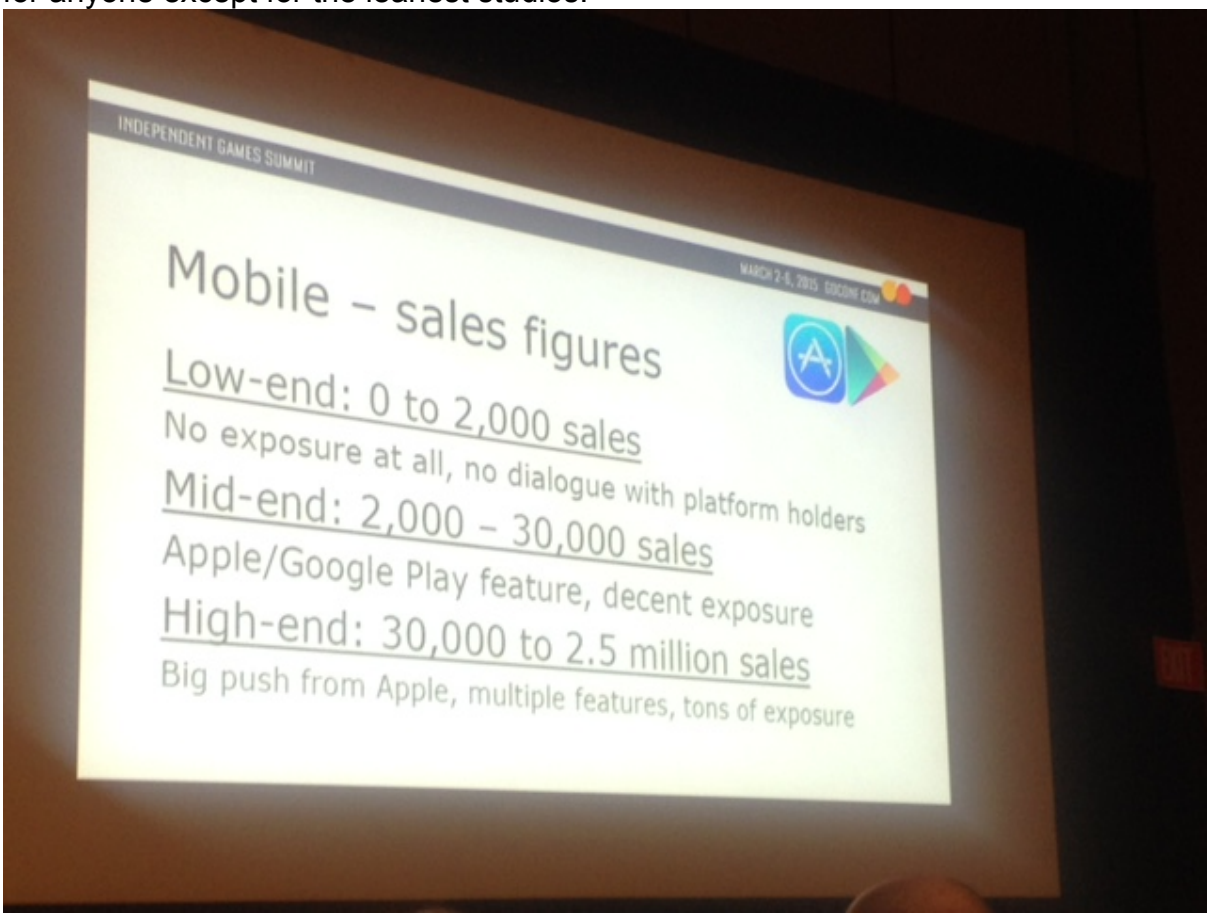
In the recent Medium article by Sergey Galyonkin that quantitatively examines in detail the economic realities of on Steam, the key platform for self-publishing and digital distribution on PC, the author observed that there is an exponential increase in the number of games competing for attention with an average of 7 new releases per day. Anto Savcheko, from Medium, calls this competition in the hugely the rat race to the Steam store.



Number of games versus the average sales per title (Galyonkin, 2015)

This apparent saturation is mirrored in other distribution channels, particularly mobile platforms, with statistics indicating as many as 500 new games launched per day on iOS and 250 new games per day on Android.
The analysis also clearly shows the key barrier of breaking into the lucrative high-end sales being traction with premium marketing channels and the alarming statistic that sales revenues for most mid-end games are not enough to make these titles economically viable for anyone except for the leanest studios.



Sales figures and key characteristics of titles in various sales band (Rose, 2015)

The fierce competition for exposure created by the oversaturation in market gave birth to a worrying industry trend of studios either under-investing in projects to minimise exposure to risk, or investing very significantly in a small number of key projects. This observation is echoed in a recent Kotaku article, Morgan Jaffit, one of the most seminal figures in Australian games industry, shared his thoughts on the economic reality of the games industry and commented on the vanishing middle ground between lean indies and enormous AAA studios.

“There are two ways to make a profitable game for mobile these days—spend an absurd amount of money, or spend almost no money at all. The middle is rapidly getting pushed out.”

- *Morgan Jaffit, Defiant Development*

This trend is due to the low revenue potential of a typical mid-end titles limiting even the leanest of indies from investing resources in their products. However, even the biggest AAA titles with millions of sales and significant resources can still fail – and they often do, even for some of the most critically acclaimed titles in this space. With many AAA title costing in excess of 50 million dollars to produce, the magnitude of the potential financial loss involved in these large scale productions has pushed AAA industry to become increasingly risk-adverse and largely deficient in innovation.
“Innovation in the AAA space doesn't always mean "different." Sometimes, it just means "more."

- *Jessica Conditt, Engadget*

Industry experts also have observed the apparent technology arms race that is causing an escalation in the production scale of AAA titles, sparking fears that AAA studios might be crumbling under their own weight.
To exacerbate the draconian economic reality facing game developers, it would seem that there are no reliable “best-practices” that can be followed to reasonably guarantee successful game production.

This fact is apparent in Galyonkin’s examination of sales of Steam games, where he found that with each example of a best practice, there are a number an opposite counter-point that invalidates these supposed best practices. Furthermore, there are also many instances where critically acclaimed games with strict adherence to best-practice still meeting commercial failure.

“In 2015, this is exactly what you should expect. […] If you only do everything right, it’s quite unlikely you’ll find success.”

- *Daniel West, Cross-Product*
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This lack of confidence in having development practices that can be reasonably followed is also echoed in Mike Capp’s comment on the inability of even the most experienced developers to have even a reasonable chance of success even when provided with abundance of resources.

“if I were to pick the 20 best developers I've ever worked with in my life - and those are some really good developers - and someone gave me $30 million or whatever it would take or $5 million to build an amazing mobile game and said go, I couldn't guarantee you a hit. I couldn't even guarantee you a 10 percent chance of a hit anymore. It's so hard and it's so luck based at this point”

- *Mike Capp, formerly Epic Games*
-

These comments from industry veterans lead to the alarming observation that the games industry is rapidly becoming not a skill-based or knowledge-based, but rather, a luck-based economy with an industry force that drives studio to becoming lean, creative and resource-limited, or bloated, risk-adverse and crumbling under its own weight.

This is the frightening reality of contemporary game development.

However, there is scope for game developers to extricate themselves from this adverse environment by applying their skills and knowledge to opportunities in the highly related, but often overlooked field of Serious Games.

Salih Mujcic
Product Manager
REVELIAN

Gamification in recruitment

Cutting edge technologies have been found to impact positively on applicant perceptions of the organisational image (Bartram & Hambleton, 2006; Reynolds and Sinar, 2001; cited in Lievens & Harris, 2003). A number of organisations have used gamified recruitment processes to re-engineer the way they source and recruit applicants. Interestingly, many of these developments have been restricted to entry level role recruitment or graduate programs. Many of the top tier companies attract between 4000 - 7000 applicants for a handful of vacancies (AAGE, 2014). Graduate programs are seen as an especially important component of successfully identifying and managing the organisation's talent pipeline and competitiveness into the future. Attracting the best talent in an intensely competitive environment requires organisations to be timely, present an attractive brand, and stand out from other organisations which are vying for applicants from the same pool. Consumer experience and brand reputation now play an important role in attracting the best talent. For these reasons graduate employers are often first to experiment with novel and innovative approaches. Notable examples where organisations have used gamifications to improve their prospects of attracting top talent include:

- America's Army – a first person shooter game that allowed young Americans to virtually experience army life and training. The game has been highly successful in attracting new recruits with over 41 versions being released since 2002.
- Siemens Plantville – a simulation strategy game that requires players to maintain the operation of a plant while trying to improve productivity, efficiency, sustainability and overall health of their facility.
- My Marriot Hotel – a game where players create their own restaurant, buy equipment and ingredients on a budget, hire and train employees, and serve guests. Players are rewarded for excellent service, customer satisfaction and profit.
- Accenture Path to Success – a simple quiz based game that tests the players' general knowledge. There are 4 levels to complete, representing the corporate ladder within Accenture (i.e. associate executive, sr. associate executive, mid-level executive, and senior executive).
- Royal New Zealand Air Force Virtual Missions (RNZAF) – RNZAF released a simulation game where players can switch roles of the various crew members involved in completing military missions to help shape applicant understanding of the importance of each discipline. The game was used to help combat perceptions that the Air Force is just about pilots.
- Telstra Job Jam - a playful view into careers at Telstra. The goal of the game is to play through a series of short and fun mini games to create happy customers and unlock more challenges to reach the highest score.

Gamification in assessments

Just like an effective recruitment campaign can impress positively upon applicants, the use of innovative or novel assessment communicates the organization's technological standing (Richman-Hirsch, Olson-Buchanan, & Drasgow, 2000). With employers demanding a competitive edge, test publishers have recently started adding gamification to psychometric assessments. The amount of gamification in the assessment marketplace

varies from provider to provider, but the various offerings can be grouped into three broad classifications: a) traditional web assessments - simple web assessments that offer a paper and pencil like assessments experience online with no gamification layer (e.g., SHL cognitive ability test); b) modded assessments - that include traditional web assessments with simple feedback mechanisms and progress mechanics (e.g., Revelian, cut-e etc.) , situational judgement tests that use avatars and work scenarios (e.g., Talegent), simulations (e.g., Logiserve) or simple game like puzzles (e.g, ConnectCubed); and c) game based assessments - full blown game experiences that use story arcs and narrative along with simpler game mechanics like feedback, progress markers, tutorials.

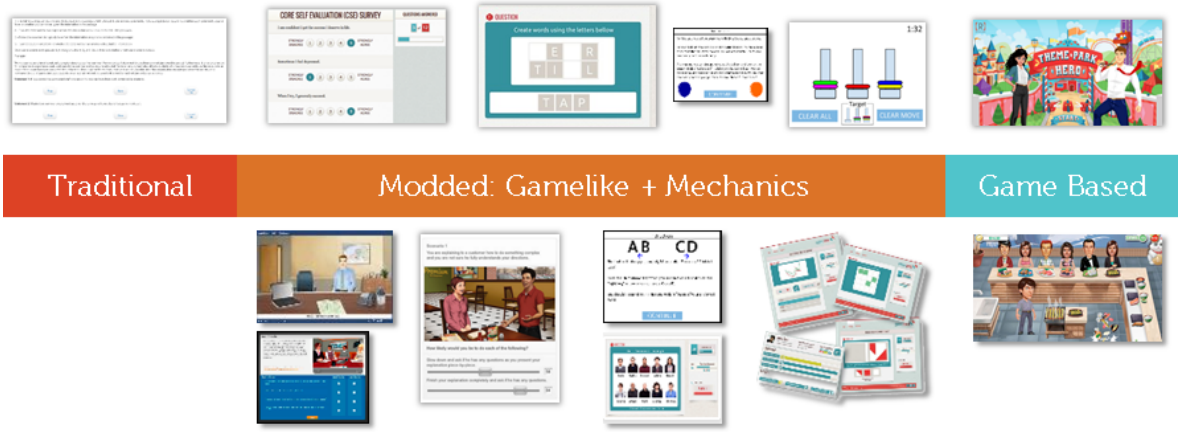

Figure 1. The spectrum of gamified assessments vendors provide in the marketplace Revelian is Australia's first psychometric test publisher to create a game based assessment, Theme Park Hero, domestically and one of the few companies to do so globally. Gee (2007) argues that many games are already forms of assessments that gather player data (e.g. experience, success, activity) implicitly to tailor a unique and engaging experience. Real time streaming data capturing every click, keystroke, and other interaction afford seemingly limitless inferences that could be mined to inform and predict candidate characteristics (Shute, 2011). Unlike traditional assessments, and to an extent modded assessments, where an individual is presented with a distinct task to complete, GBAs integrate challenges, problems or tasks more seamlessly into a continued experience as part of a narrative or progress towards an overall end goal (Kamenetz, 2014).

Creating a game based assessment requires real collaboration between psychometricians, data scientists, software engineers and the gaming community broadly. Striking a balance between game design, level of interactivity, whilst providing a serious measurement tool is difficult. Game based approaches to assessment offer many advantages:

- We are able to stream and ingest thousands of data points tracking every decision and interaction made by a candidate every millisecond
- Games allow us to measure many candidate qualities at the same time, whereas traditional assessments typically tend to focus on a specific aspect
- Games not only record the candidate response but also the context in which an action was performed
- Games provide more immersive and positive testing experiences compared to traditional tests

- Games create strong brand impressions

Employers are very welcoming of innovation and products where they can see genuine value. Game based assessments are legitimately revolutionizing how we assess applicants. Not only do they provide a great experience but also provide a lot of insightful data. In a consumer driven world this is critical. Theme Park Hero is one of the first steps in what we expect to be the norm in terms of how we pinpoint quality talent. We surveyed over 700 applicants that completed the assessments as part of their recruitment process and found that:

- Close to 70% of candidates feel that game based tests are better than traditional assessments
- Over 3Ž4 of candidates feel that it's an appropriate way for employers to test candidates for their abilities
- Close to 7 out of 10 candidates wished other employers would use game based assessments as well
- Qualitative feedback suggests that candidates most valued the experience as it was fun, engaging and not as stressful as traditional testing. Candidates also found it challenging and full of variety. Candidates were suitably impressed by the technology that was used to test in this new way. It's a very different experience to traditional tests due to the design, multimedia and interactive nature of game based testing. Candidates feel like they have more control over their testing experience and feel completely immersed in the activities they are completing.

Adrian Webb
Australasian round of the Serious Games Showcase and Challenge organiser

Senate enquiry submission – Serious Games, VR and AR technologies.

The games industry in Australia is growing, and this can be seen within the DA16 report compiled by the interactive Games and Entertainment Association (iGEA). One part of this industry is the serious games, which also contributes to the simulation industry as well. These fields are heavily tied to the Australian Game development community as much of the technology, advancements and skillsets utilised within the gaming industry have direct relevance to these fields.

The simulation industry contributes to every industry within Australia, with significant investment within the Defence, Health, Education, Mining and Transport industries. These simulations can range in their objectives, from training in equipment and procedures, to familiarisation with new areas and evaluation of skills. Large companies within Australia are continually looking for talent to assist in these areas and the gaming industry talent pool is a major contributor to this.

Games are not just for entertainment however. Games like where in the world is Carmen Sandiago, and Zombinies are prime examples of successful games that reach beyond pure entertainment. These two games are lorded within the industry as great education tools as well as fun and enjoyable games. It's not just in the education space however that games can assist. Re-Mission (http://www.re-mission.net) is a game that teaches children about cancer, and have completed clinical studies that show that children with cancer after playing the game have a greater uptake in regular medicine intake. These are just some examples of how games can assist with more then just entertainment.

Here in Australia, the serious games idea is growing within the industry. At the Australiasia regional finals for the International Serious games showcase and Challenge we had a threefold increase in entrants on previous years, with two local game designers in Hacknet by and Project Desal winning their respective sections, and now representing Australia on the world stage at I/ITSEC in Orlando Florida.

HACKNET is an Indie game created by Team Fractal Alligator, headed up by Matt Trobbiani which see's you enter the world of Bit and follow his story, learning about the fundamentals of Linux based terminal commands and hacking techniques. Hacknet is currently available on Steam and an engaging way to remind users of how much work modern OS are doing for us.

PROJECT DESAL was developed by Justin and Troy of Monkeystack, in collaboration with South Australia Water. The game came out of a need to demonstrate the Desalination process to children visiting the Kauwi Interpretive centre at the plant. It encourages users to build and understand the components and processes that carries salt water from ocean to tap in a competitive and charming way. Project Desal is currently free on the App Store.

But games don't always just have to focus on teaching people skills. Last years Australian Serious games competition winner was a game called Sound Scouts. Sound Scouts doubles as a hearing test for preschool children, assessing their hearing before they start school. Created in partnership with the National Acoustic Laboratories, Sound Scouts incorporates several advanced scientific principles that enable it to detect a range of hearing problems. While Sound Scouts is based on science it's the game play that engages the child helping to secure a valid hearing test result. Sound Scouts was called by Ross Symons (CEO of Big Ant) as the "best use of tech for a serious game that I have seen in quite a while."

The serious games movement is beginning to gain lots of attention internationally, especially from large international organisations. Phaedra Boinodiris is the Global lead for game development ecosystem at IBM; while recently in Australia, she was informed of the current regulatory standards and issues currently facing the local development scene and was amased that Australia still had an industry as strong as it is on the world stage. She also assisted in helping judge the Australasian Serious games Showcase and Challenge and was impressed by the professional manner of all the entries and stated how awesome it was to see the games deliver their chosen fields issues in an engaging and unique way.

The serious games field is also just one field that games contribute towards. The rise of virtual and augmented reality is another field games heavily influence. The VR and AR industry is expected to be generating $150 billion by 2020 (http://fortune.com/2015/04/25/augmented-reality-virtual-reality/) and this field has really come to ahead due to the push for gamers to create more immersive experiences. This field has really started to take off thanks to companies like the oculus rift.

The oculus rift was originally developed by Palmer Luckey back in 2010, and became a company in 2012. His desire to create the Oculus was always driven by his love of immersion and video games. When asked in a recent interview what application he was most excited about for the rift he instantly said *"in terms of personal excitement it's video games. They are the evolution of books and movies. It's not just you watching something fantastic; it's you acting in it and you performing your own destiny"* *http://www.telegraph.co.uk/technology/11309013/Oculus-Rifts-Palmer-Luckey-I-brought-virtual-reality-back-from-the-dead.html*

Augmented reality also is a rising field, with technology such as the mircosoft hololens making a large statement within society. These technologies which were originally created for the gaming market have taken off in all walks of life. The Hololens has been used by NASA to help explore mars, by arcitects for envisioning buildings and universities to interactively teach using 3D models. https://www.microsoft.com/microsoft-hololens/en-us/commercial in their unveiling in 2014, example of it's usages included interactive instructions, sharing views and experiences and of course gaming. https://www.youtube.com/watch?v=fh_7iQr5j-s (CNET)

The AR and VR technology have been created with gaming in their sights, and who knows what other technologies will come out of the gaming industry. By not having a thriving industry here in Australia, we are limiting our opportunities to b part of these international

movements. With these technologies all being commercially released in 2016, Australia can still get on board to create leading edge research and consumer products that utilise these products.

One such company doing this is called zero latency in Melbourne. Zero latency is a new company that allows you to walk around within a warehouse sized room, fighting off hordes of zombies in virtual reality. This technology is one of the first internationally to be created and gives “infinitie potential” http://www.kotaku.com.au/2015/08/this-is-zero-latency-the-future-of-immersive-gaming/ as to what can be created within the space. Through grants supplied by state governments and crowd sourced funding, they have been able to open a permanent site within Melbourne and are currently looking to export their product globally, with plenty of interest already expressed. http://www.cnet.com/au/news/zero-latency-vr-entertainment-revolution-begins-melbourne-australia/

Between serious games and the new VR and AR industry coming in a few years time, we can see that the games industry will only be growing in skillsets and demand. To capitalise on this, we must continue to encourage people to stay here in Australia and this can only be completed through having a thriving industry creating more jobs and oppurtunities.