Please Insert Coin: A qualitative study on the games development industry in Ireland

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Declaration

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Abstract

The games industry in Ireland has seen sustained growth and development in the past decade despite economic turmoil. The growth of development studios has been marked and is the result of both global and local factors. This research paper seeks to identify these factors and how they have facilitated this growth.

It also seeks to identify the problems and challenges facing the industry as identified by those currently working in games development. This was achieved through qualitative analysis of interviews carried out with staff of three different games development studios in Ireland.

The paper concludes with considerations of possible solutions to the challenges and problems identified and suggest possibilities for future research.

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Chapter 1 – Introduction

The worldwide games industry is worth somewhere in the region of $65 billion (Reuters, 2011). Games and, more noticeably, gaming have become ubiquitous. From humble beginnings in arcades, to the consoles in homes, to games on phones they are now part of everyday life. As games development has grown, Ireland has begun to see growth in this fast paced and dynamic sector.

The games industry in Ireland was worth an estimated two hundred million euro in 2011 with the past number of years seeing sustained growth in the numbers employed as well as the number of companies operating in the sector (McCormick, 2012). Several multinational players such as EA, Blizzard and Gala Networks are all operating in Ireland but there are also a number of indigenous Irish companies, such as Time Machine Games, Batcat and Pixel Wolf Studios which have begun to establish Ireland as a centre for the games industry.

The games sector is relatively young in Ireland and has only taken hold in the last decade but one element of the industry that has seen a surge in growth is games development. This sector has traditionally been less developed than the wider sector in the past but it has seen a 292% increase in the number of companies operating since 2009.

This study has two main research goals. Firstly it will seek to identify the reasons behind the recent growth of games development studios in Ireland. This analysis will focus on both global along with local factors and influences that have had an impact upon the industry. Identifying the factors behind growth will help place the sector within worldwide developments and it will also help establish whether any particular local incentives have aided growth and how these may be fostered by the sector and what supports government may enhance or expand.

The second research aim is to identify the main challenges for the industry as it expands in the future and identify possible solutions to issues perceived within the games development industry. This will aid understanding how the industry sees itself in terms of overcoming challenges to ensure continued and sustained growth of games development in Ireland.

As games are a relatively young sector, research on the topic is somewhat limited, specifically in an Irish context and particularly in respect of games development. The corpus of material available consists of industry grey literature, government reports and limited academic material. It is hoped that this study will add to the growing body of literature available and also highlight further avenues of research. It will also help to define an industry that has evolved in a different manner from traditional media and software development.

Games are unique in that they are interactive digital products that have a strong technological element but also possess elements of art, storytelling, music, design, research and animation. All these factors combine to give games a unique place and whether one plays games or not, they are firmly established at the forefront of technological innovation and interactivity in today's digital media landscape.

This study will shed light on how the industry sees its role and relates with other sectors, government and wider society. This is a key factor in defining what games are and how the sector wishes to be perceived.

This piece will take a qualitative approach and examine three Irish development studios at varying stages of development through the use of in depth interviews. It is hoped that by following this approach this study will able to compliment the quantitative work already carried out and produce quality information that allows a fuller picture of the industry to emerge. Although the scope and size of the study was somewhat limited due to length and time considerations the information gathered will allow the industry in Ireland to be compared with its international counterparts.

Chapter 2 – A review of literature on the games industry in Ireland

2.1 International Perspectives

The worldwide games industry is a relatively young sector which has until recently received comparatively little scholarly attention. From its early beginnings in the 1970's it has grown into a worldwide phenomenon worth $65 billion in 2011 (Reuters, 2011).

This growth has seen substantial change with games moving from arcades into homes as consoles and more recently into pockets with the explosion in mobile gaming. This growth in revenue and of the numbers involved, in terms of both development and consumption, in gaming has led to the study of games and gaming to be taken seriously by scholars (Wolf, 2003, Johnson, 2005, Newman, 2004, Kirriemuir, 2006).The role of the players and the games themselves has also received widespread attention (Skykes, 2006).

However the political economy of the industry and the development cycle has been somewhat neglected. This is particularly true as there has been a shift away from the centralised economies of the traditional big players of Japan and the USA to an increasingly globalised industry. (Kerr, 2005, pp. 75-78, 2007, Robinson, 2012).

The structure of the industry has received some scholarly attention most notably in the Far East and USA (Williams, 2002, Aoyama, 2003, Yong, 2008). But a shift in focus has occurred as other countries have begun to develop their own games industry with the growth in globalisation (Chandler, 2005). The development of mobile gaming and decentralisation of the industry provides a new challenge for academic scrutiny.

2.2 Irish Research

The development of the industry in Ireland can be traced to the 1980's and 1990's but it is in the last decade it has begun to seriously develop. The development of middleware by companies such as Demonware and Havok has helped foster the industry within the wider IT sector in Ireland.

Ireland has managed to develop and attract some of the world's biggest IT companies with Google, Intel, Facebook and EBay all maintaining a significant presence in Ireland. These companies compete with the games industry in terms of personnel but they also show how Ireland can attract big players and become a hub of global development. Within the IT and digital media sectors the games industry has grown from humble beginnings but it has somewhat avoided much scholarly attention.

Much of the scholarly analysis carried out in Ireland has been the result studies undertaken by Aphra Kerr who has covered many aspects of the games industry in an Irish context from ludology (Kerr,

2007, pp. 33-35), gender and games (Kerr, 2003) to the political economy of the industry from a social science background (Kerr, 2007) and other more general studies (Delaney *et al.*, 2004, Kerr, 2009, Kerr, 2006, Kerr, 2011).

This work is extremely constructive in terms of relating the industry to other sectors and to wider society as a whole. The political economy approach taken in much of her work is of value as it seeks to understand both games themselves and their production and distribution within complex social structures.

In particular Kerr's "Business and culture of digital games" (2005) takes the political economy of games as the cornerstone of analysis and thus allows many elements not immediately apparent to be linked to the industry and how these may effect a development studio as they seek to build a successful business.

This approach is an extremely effective framework for analysis and is particularly relevant in terms of Ireland as the industry is in the nascent phase of its development and it seeks to attract investment, jobseekers and set itself apart from the wider IT and software sectors.

The establishment of gamedevelopers.ie in 2003 allowed for a greater degree of contact with the fledgling game development industry as it was noted at the time that this was one of the major problems it faced (Kerr, 2002). The establishment of this forum has created a dialogue between those in the industry which has helped create a support structure for established and up and coming developers.

Kerr's study (2009) of the games industry helped to qualitatively identify the size and scope of the games industry in Ireland, the results of which were published on the game developer's website. This study captured a snapshot of the industry in that the survey was carried out at a single point in 2009.

A second up study was carried out by McCormick (2012) with data gathered at two different occasions in 2012 helping to gain a better insight into the dynamic nature of the industry. This approach allowed for the adjustment of data as several new companies had formed while several others had closed their doors. It allowed a more rounded picture of the industry to be captured and showed just how fluid the industry is.

These reports have been critical in establishing the overall development and trends within the industry and show there has been a marked increase in the number of development studios in

Ireland. From 2009 to 2012 there was a 292% increase in the number of developers with an overall growth rate of 91% for jobs in the wider sector (McCormick, 2012, p.6).

Further to this the Government has begun to perceive the value of the industry and some state agencies, such as the Industrial Development Agency (IDA), Forfás and Enterprise (EI) Ireland have begun to engage with the sector (Department of Jobs Enterprise and Innovation, 2012). To this end a number of studies and reports have been issued which are intended as policy documents, to industry and wider public, that outline how the government will respond to the growing industry (Forfás, 2004, Forfás, 2006, Forfás, 2011). Given the fact that the first report was published in 2004 the response from government could be said to be sluggish given the dynamism and growth of the sector since then. This may be related to the image of games as a pastime rather than an extremely lucrative sector.

Third level institutions have begun to study the games industry but they are also active participants by catering for the increasing labour demands by providing courses in games development.[1] The amount of courses available has increased considerably. This has allowed a flow of graduates which have helped build the emerging industry.

This research examines the games development industry in Ireland form the political economy perspective and seeks to add a qualitative element through incorporating perspectives from the games industry itself. This framework is valuable as it examines not only the economic factors involved but the complex social relationships involved in games development. Hesmondhalgh (2007), Mosco (1996) explain that the development of games is a negotiated process in which humans and technology play a role but it cannot be understood without looking at wider social, cultural, economic and political contexts**.** Essentially, to understand the production, buying and selling of games research should take into account how government, laws, social relations, education play a part in the development cycle and consumption of this type of media. Recent years have also seen a shift in how games are both distributed and consumed (Kerr, 2005, p. 45). This has produced a change in the means of production away from larger corporate controlled structures to lower level more independent studios but "power and inequalities" *(Ibid*., p.5) still operate in and around games development. This shift has also seen a growth in indie studios that are able to develop as a result of widening consumption on multiple platforms and not just consoles.

A social studies approach will also be used as this also allows the relationships between the games industry and consumers to be explored as the shifting nature changes due to the advancement in

[1] For a full list of games related third level courses see appendix part A.

technology. (Squire 2002, Kline, 2003) How games as media are consumed and how this affects the developers in their approach to game design, gamers are not merely consumers of this media but are prosumers (Bruns, 2009, Ritzer and Jurgenson, 2010). The games industry has traditionally had a close relationship with its customers, but the rise of metrics and analysis in game has led to a shift as users move from the role of prosumer to prosumers. They are actively able to shape the media they participate in through community, beta testing and the on-going analysis and metric approach used by today's games.

The development of the games industry also faces a challenge in how it is viewed by other sectors, government, investors, third level as well as wider society and faces inequalities that may arise from changing perceptions. As games have moved from a niche pursuit to a more extensive everyday phenomenon the view of the industry must also change. This modification of image from such a 'niche pursuit' to a multi-billion euro industry has meant there has been a shift in the perception of games but there is still a mind-set that games and their development is an area undeserving of attention.

This study also utilise research from non-peer review sources which help to fill some gaps that academic study has not yet reached (Reuters, 2007, 2011, BBC, 2013b, Alexander, 2013, Economist, 2011b). The majority of these articles can be taken at face value as they have been written by those with direct exposure to and experience in the games development industry. However these contributions are critical to identifying how the industry sees itself and its views on the reasons for growth and future issues.

Chapter 3 – Theoretical Framework and methodology

3.1 Framework for analysis

This study uses a political economy approach to analysis as its theoretical framework, following Kerr (2006) as it seeks to understand the structure of and relationships between those in the industry, other sectors, government, education and players. This type of approach is based upon the idea that these various factors all combine to form the way in which the industry is structured and the power and inequalities inherent in this structure. This study differs from previous studies in Ireland as it seeks to go beyond describing the industry statistically by gaining qualitative data from industry players themselves.

Until recently, the industry has largely developed organically and with the increasing role that the Irish government has sought to play, the structure will undergo further change. The nature of this change has somewhat been determined by the traditional approach to software development but it is increasingly becoming apparent that this approach may not fit games development. This may be seen in the multitude of skills required to develop a product; programming, animation, music, sound, art, research, storytelling, writing, art & design are all ingredients that go into the production of today's more complex games. These elements along with the public's and others view of the industry all contribute to the political economy analysis of the sector.

Examining the industry from a political economy standpoint will be complimented with a social studies approach. This will allow a clearer understanding of the various forces at work in games development and how due to technological change the complexity of games as media is shifting. The interplay between the users or gamers and the development industry is also important as the players have genuine power to interact and shape what products they receive. From marketing of the game on social media, beta testing and community development the user is in a unique position as the games development process is geared toward involving the customer at all levels, in contrast to traditional software development.

Metrics and analysis mean games are tailored to suit the player, not a mapped linear experience as before but a constantly evolving model as features are tweaked and change is implemented due to user feedback. This issue is tied to the user as a "prosumer" and may even be evolved a further step with one author coining the phrase 'produser' (Bruns, 2009). Games are developing to meet the needs and wants of the customer base and in a sense the designers are ceding some control of the game world to users through the use of metrics and analysis and as well as the users involvement in beta testing and communities.

The role of technology is also a key factor in the changing nature of the games industry as we are moving from platform specific gaming to a situation where the platform is somewhat irrelevant. By this it is meant that developers are not shackled to a single console or platform as was the case in the past but instead have the ability to deploy their game on several platforms.

3.2 Methodology

This study is structured in two parts. The first consists of literature review as outlined above, while the second focuses upon a qualitative analysis of three game development studios in Ireland. This was carried out in the form of semi structured interviews with a range of questions aimed at targeting specific issues of varying scale. The questions are grouped under various headings i.e. economic, political, educational, and technical. The questions also relate to a number of fields and the interplay between these was closely bound up with the political economy of the industry. These key areas examined with example questions were;[2]

Political

- What support do you feel is required of, Government, and Industry?

Economic

- How have the barriers to entry changed within the industry?

Technical

- How important are metrics and analysis? What system do you use and why?

Educational

- Are third level institutions sufficiently involved with the industry?

The interviews were conducted on the company's premises and consisted of 40 questions, the audio of which was recorded. Due to limitations on length transcripts are not attached in the appendix. All three interviews followed the same line of questioning but certain follow up questions were used to cover specific areas of interest that arose during the interviews.

3.2.1 Interviewee bio's

Interviewee#1

Interviewee 1 is female, game developer as well as a co-founder of a studio, has many years of experience in the software development sector. Also lectures on games programming and development.

[2] For a full list of interview questions see appendix part B.

Interviewee#2

Interviewee 2 is male, game developer and founder of a studio with several years' experience in the industry on projects of varying size. Also Lectures on games design and development.

Interviewee#3

Interviewee 3 is male, game developer and co-founder of a large studio with many years' experience of the games and digital media industries.

Chapter 4 – Evaluating the games industry in Ireland

4.1 The games industry structure

The games industry as a whole has undergone significant change in the last decade. It has moved from a position where console was the dominant player with a number of large hardware manufacturers such as Sony, Nintendo and Microsoft dominated the console market to one where smaller developers can achieve success across a range of platforms. The barriers to entry for developers were substantial as they had to overcome a number of challenges in order to develop and deliver a game to market.

Traditionally the model for developing a game required a substantial investment which was reliant on selling a particular number of copies to become profitable. Developing a AAA title on console meant the particular hardware manufacturer took a certain percentage of every sale, along with determining what type of game was required and setting the rules and guidelines the developer had to follow in order to release on that particular platform. The publisher and distributer would also share in the sales, with retailers again eating into the potential profit for the developer (See Fig. 1).

Activity	Console Manufacturer	Developer	Publisher | Distributor	Retailer	Customer
	↓	↓	↓ ↓	↓	↓
Price Breakdown	€10	€20	€6	€14	€50

Figure 1: Games value chain in 2002. (Deutsche Bank ,2002, p. 18).

These factors were rather constraining and developers took a risk on bringing any game to market in that they had to invest in often expensive software development kits (SDK) for their particular platform or multiple platforms adding to the overall capital required (Kerr, 2007, pp. 41-44).

This also meant that when the next generation of console was developed the developers faced the challenge of upgrading with the financial costs associated but also had to undergo the process of learning the new SDK, a process that could at times require a large investment of staff's time and knowledge creating scheduling delays. Adding in features as they have discovered them (Kerr, 2007, pp. 87-91, Deuze, 2009, p. 87). This type of approach has undergone significant change with the rise of multiple platform gaming, digital distribution and an increase in availability of affordable SDK and game engines.

4.2 Multiplatform gaming

The emergence of multiple platform gaming has had a huge effect on the gaming industry. The explosion of mobile gaming is the result of the propagation of phones, Smartphones and tablets. The sheer multitude of devices on the market has meant that games have made a move from living rooms into the pockets of people on the street and are present in many new areas. As one of the participants of this study concluded, “everybody plays games now…there are more people playing games and it opens up the world of games to people that are 65, 70 years old…it’s not this thing that teenagers do in a cave anymore” (interview#1) and “I just like there to be games that you can play wherever you are. If I’m waiting for my bus, if I go home sitting in front of my TV I’m playing my game, the platform is immaterial” (intwerview#2). Overall this development has led to a situation where games are delivered over several platforms when and where the customer wants it.

4.3 Digital distribution

Tied to the upsurge in platforms is the growth of digital distribution and this has meant that the games value chain has undergone considerable change (See Fig. 2).

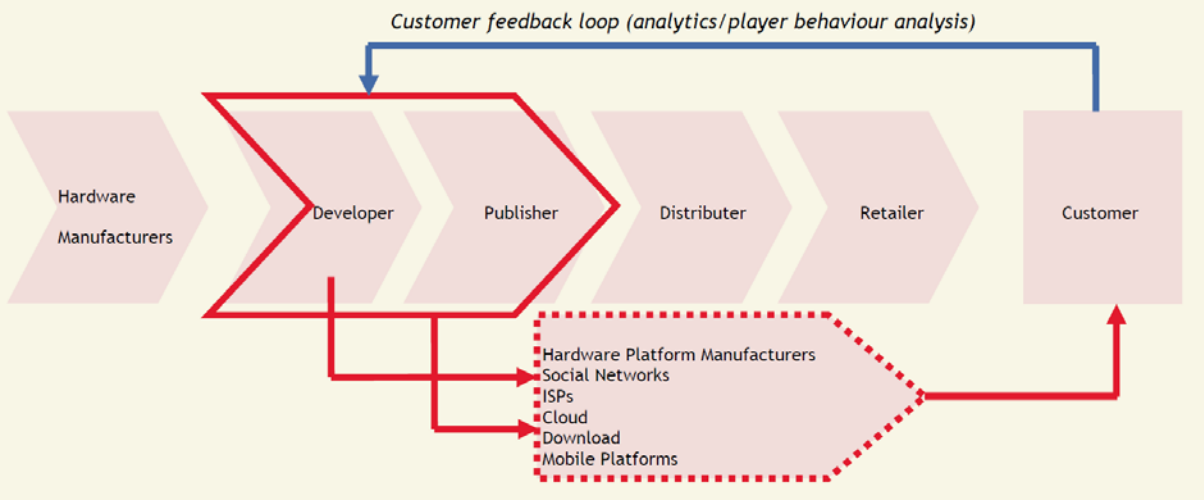

Figure 2: Emerging games value chain (Forfás, 2011, p. 9).

The removal of logistics, traditional distribution and retail has allowed developers to cut the costs involved and to retain a larger share of sales revenue. This development can also be seen in other industries such as film, music and books as we enter the ‘digital age’. Although this development must be balanced by the fact that the price for games on many of the new platforms is significantly lower than the price expected of a AAA console or pc game(Kerr, 2006).

As one participant of the study put it “you are vying for customer’s attention in a market where prices are 50 cents” (interview#2). The merits of this system have to be weighed against the relative price of the finished product and how games have moved from an upfront revenue generation

system to monetisation of elements within the game, which often includes playing itself. “It’s a very difficult balancing act, so it’s about looking at features, can we monetise this?, should we monetise it? and if we want to monetise it how do we do it in a way that is actually fair and people will actually think that was worth the money to do that” (Interview#3). Games developers were in the vanguard of developing the ‘freemium’ model, where you rely on non-paying customers to build an audience and then extract cash only from a dedicated fan base. This is tied to digital distribution as it is possible to reach a wide audience but not everyone is willing to pay but games now make money by selling in-game perks and virtual goods to more dedicated players.

Digital distribution has also impacted the console market in terms of the growth of console marketplaces. Xbox Live Arcade and the Playstation Network are examples of such marketplaces where mini games and legacy games can be purchased but these are typically significantly cheaper than a main title release for the console. This is one area that the console companies initially overlooked, “Five years ago the PC market was in total decline, and the console manufactures totally missed out on the digital download challenge, because they were worried about retailers”(Alexander, 2013).

This allowed a resurgence in pc as it led the way in digital distribution. With content delivery platforms such as Steam capturing 70% of the $4 billion pc market in 2011 (Forbes, 2011). PC and mobile have led the way in digital distribution and although Steam has successfully established itself as the dominant player there are several others , such as Gamersgate, Desura, Orign and even retailers such as Gamestop all present in the digital market. The development of digital distribution is also linked to the growth in platforms as Smartphone’s developed their own marketplaces such as the ‘App store’ for iPhone and iPad and ‘Google Play’ for Android. As one author put it;

> “media industries are themselves business, selling information and entertainment to consumers, with their own interest in speeding the process by which these commodities reach buyers. This has led them to a series of technological and organisational innovations aimed at saturating each moment of everyday life with opportunities for media consumption” (Kerr, 2005, p. 39).

This evolution can be seen in the games industry with spending on games for Apple's iOS and Google's Android surpassing that for traditional handheld manufacturers such as Sony and Nintendo (BBC, 2013a).

4.4 Barriers to entry

The availability of cheaper software and freeware has allowed a democratisation of the games development process. The participants of the study summed up this situation stating ”several years ago the development engines were incredibly expensive, you could write your own but this was also harder to do with the tools available and time consuming” (interview#2) and "with console games you had big engines like unreal which cost hundreds of thousands of euro investment to get those engines and the kits. Whereas now you can get the unity engine for 5000 per licence which much better it makes it much more accessible that way, so barriers have come down drastically" (Interview#3).

The growth in more accessible software such as Unity, Gamemaker:Studio, Android and iOS development kits have thoroughly opened up the development process. Now “if you have a laptop there are free open source kits, paid for, Unity, Scratch, Gamemaker, trials that all help deploy to certain devices” (interview#1).

This development has led to the growth in easily available SDK as well as engines which has had a huge impact upon games development and could rightly be referred to as a revolution (Alexander, 2013). It means that younger or inexperienced developers can start the process of development on nearly any computer, not be tied to specific platforms and can release with relative ease to huge markets that encompass truly global audiences via digital distribution.

This change from expensive and restrictive development under the control of larger entities to a more open, less expensive, wide audience has led to a democratisation of the games development process and has been a driving factor behind the growth of the games development industry in Ireland and around the world.

The democratisation of the development process has had several positive effects on games development but it also poses challenge in that the market has been flooded with an overwhelming amount of products. Gaining attention for a new product is difficult for start-ups and they are faced with choices about how to achieve this. “Amid increasingly closed gardens and crowded online markets it’s innovation and design expertise that will set indie apart as new hardware offers more options” (Alexander, 2013). Essentially developers are faced with a new set of problems but it could be said that it is better to have the chance to develop and deliver a game to market rather than not having a chance at all.

4.5 Trends in technology

The growth in platforms and digital distribution has led to a situation where developers can no longer think in terms of gaining a license for a single platform. All the participants of the study are developing cross platform, “pc, console handled (Intervirew#1), “pretty much everything, browser, Facebook, iPad, iPhone, Android devices, tablets, phones, kindle, anything, we will try to get onto as many as possible” (interview#3). The reduction in upfront prices has meant that developers must try and compensate by targeting several platforms in an effort to maximise revenue streams. “You have to be everything; the sales are so small so you’ve got to be everywhere” (Interview#2).

This multi platform approach is tied to the availability and sophistication of development tools, game engines that allow developers to utilise a model whereby the front end is tailored to a specific device but several platforms are essentially using the same server side which can be updated and tweaked by developers with minimum impact on the user. In essence “It’s very easy to be multi platform” (Interview#2).

This approach will see users playing the same game across several devices with seamless transfer from PC to Smartphone to tablet depending on the requirements of the user (See Fig. 3). The need to be multiplatform is also manifesting itself in digital distribution with the likes of Steam allowing developers to target PC, Mac and more recently Linux users (BBC, 2013b).

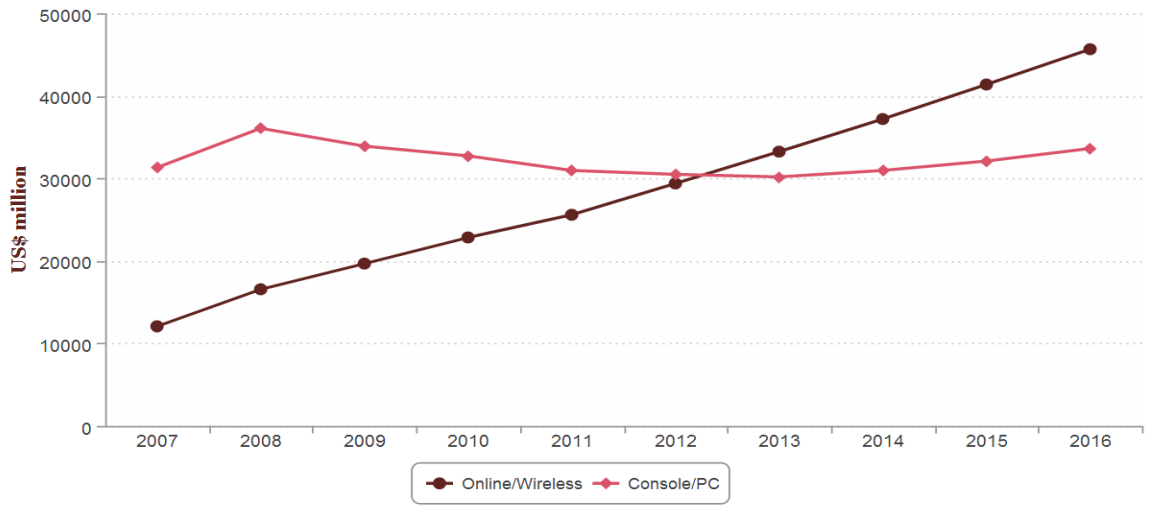

Figure 3: growth online and wireless games (Global entertainment & media outlook: 2012-2016 - Video Games, PWC, 2012).

This interoperability across platforms is a new development and will pose a challenge as the different capabilities of devices must be reconciled to deliver the same gaming experience to the user. This type of approach has been seen with the use of the Playstation Vita and Playstation3 which outlines the possibilities of such a model (Sony Computer Entertainment Europe, 2013).

This will lead to a situation where developers must be aware of the several devices and their technical specifications which will add to the knowledge and experience required of developers but it is also compensated for by the development of game engines as well as development tools that are adept and delivering content across a wide swath of devices. It is interesting to consider this development in light of the continuing technological trend towards 'the cloud' and the possibilities of cloud gaming.

4.6 Proactive Industry

A factor behind the recent growth of development studios in Ireland can be attributed to the fact that those within the industry are extremely proactive about encouraging growth. This manifests itself in a number of ways. As mentioned above one of the major problems facing developers in 2002 was a lack of communication (Kerr). The founding of Gamedevelopers.ie started a process whereby there is a dialogue between the various stakeholders within the industry and beyond. A lobby group for the industry, Games Ireland, has also recently begun to promote the industry. These developments were identified in the interviews as having a positive effect, "a lot of game developers, even those not in Dublin meet up informally a lot… started meeting up formally… to see how we can work as a whole, try to co-operate, raise quality of work" (Interview#1).

This willingness to engage in a dialogue, share knowledge and forge links within Ireland and abroad has helped development in Ireland and in the longer term will help create a support structure of huge value. One participant noted the "Lack of experience in Ireland…. First wave of studios and unlike other industries we have no nobody to give us answers to simple questions that have been solved years ago in other countries" (interview#2). Although the industry is still at a stage where start-up's will encounter problems, in the future it would be hoped that by fostering "Collaboration between developers" (Interview#1) and by providing "access to experienced game development people who could help avoid wasting time" (interview#2) and the industry as a whole will benefit.

In summary it is these elements that have allowed the games development industry to expand in Ireland in the last number of years. The global factors of multiplatform gaming, digital distribution and lower barriers to entry due to easier access to SDK and development tools have allowed a greater number of start-ups but this is true of games development not just in Ireland but around the world. The openness and willingness of the industry to engage in dialogue and to drive itself forward must also be identified as a local factor that has greatly aided the upsurge in development studios in Ireland in the last several years.

Chapter 5 - Challenges and opportunities for the games industry

5.1 Labour

An issue that divided opinion among participants in this study is the challenge the industry faces in terms of staff recruitment. This issue can be divided into two parts which are linked. Firstly there is the issue of whether the quality and skills of graduates is sufficient to cater for continued expansion of the sector. The second is how best to attract staff to the industry. Regarding graduates, of the three participants in this study, one believed they are not satisfactory, a second believed they are while the third although giving a negative response qualified this by explaining that it depends on who you ask. Clearly this is an area where further study is required.

As a result of the growth in the sector there is a shortfall in recruiting in that those available are perceived to not have the necessary skills and experience to fill roles as the industry expands to the next level. This manifests itself with the quality of graduates and two of the studies participants identified this as an area of concern. This issue is not confined to games development but is an issue across third level education and is also tied to the nature of games development courses available.

As courses have developed in the last decade they have tended to be rather broad, covering a range of aspects involved in games development from art, programming, game design, sound, website design. This type of approach is geared to meet the requirements of smaller developing industry as it allows gradates to multitask and is suited to a start-up position. In terms of studios expanding this is a problem and was identified by one participant;

> "we get a lot of people applying for jobs here...typically if they are straight out of college they will apply, we could have say a developer role, art role and a game designer role and they will apply for all three because they have a bit of each which isn't exactly ideal"(Interview#3).

As the sector grows in the longer term this may become an issue as established companies require a more specific set of skills from their employees. Specialisation of courses is one way to overcome this problem, especially at master's level and a future development of tailored programmes with input from industry would be of huge benefit in this regard. This possibility was identified and a specific area that has not yet been targeted was games production. By working together third level and industry would benefit as the sector would raise awareness of possible careers and use third level intuitions as a ready pool of talent acquisition, while third level would ensure that course were relevant and in line with industry trends. This process is already well underway and all participants

noted that third level has actively perused people with experience to teach on courses and hopefully this trend will continue.

A method that was identified for overcoming the lack of experience is to establish a games development cluster or "set up incubators is one way to do it" (Interview#3). This was identified as a means for start-ups to share knowledge base as they tackle many similar problems. "One of the biggest challenges is the lack of experience. One way to mitigate that is to put all the studios in the same space. If we put all the studios in the same place, I learn one little nugget I can pass it along" (Interview#2).

This type of approach would see several studios co locating in order to allow the growth of a knowledge economy. This system is used in the IT and financial serves sectors and has resulted in success in the past. A model similar to the IFSC for games development would be ideal as it would be possible to offer financial incentives for larger studios and multinational companies as anchor tenants. This would be of benefit to indigenous start-ups as it would increase the knowledge economy, collaboration, and networking and facilitate mentoring. It would also serve to reduce costs in terms of rents, leases and facilities management, areas which many start-ups can ill afford to expend precious resources on.

This approach has been used with the likes of the Digital Hub, Guinness Enterprise Centre, Ryan Academy at DCU and NOVA UCD all providing space and a model that may be adapted. A dedicated games cluster and not one placed within the wider IT or digital media sectors would be better suited due to the nature of games development. One studio, Digit Games, has already pioneered this approach allowing two start-ups to set up space in its games incubator. The benefits of such a system go far beyond financial with the main benefit being the knowledge and support structure available in this type of approach. It also serves to enhance the standing of smaller companies and may help overcome the inexperience problem and successfully grow the sector.

Government has outlined that "Ireland has the potential to increase employment in core games companies to 4,500 by 2014" (Forfás, 2011, vi). For this level of expansion to occur the industry may have to look further afield to meet the demands for labour. As the sector in Ireland has in the past been unable to cater for the number of graduates and others many have had to look abroad to gain experience in games development. This may provide a pool of experienced labour which has both the skills and experience to fill the roles as the sector attempts to reach the next stage of development. Providing incentives to return to take up a position within Ireland could be achieved through the use of tax credits and tax relief is one way that this may be achieved.

This approach should be used in conjunction with an active policy of recruiting those with the relevant skills and experience from areas that have established industries or emerging tech sectors. A problem relating to this issue was raised by the participants of the study in that attracting labour from outside the EU is difficult due to the visa system currently in use in Ireland. The visa and work permit system that is in place, is there to protect Irish applicants for jobs but as one of the participants stated;

> "it's not that its taking jobs away jobs from Irish people, the people we are looking at that could a job are in jobs already, it's basically trying to let the company grow and its inhibiting that and your just putting a lot of other peoples jobs in danger really I think. it's a bit short sighted" (Interview#3).

Industry need to clearly define its case to government so that some action may be taken. The situation whereby growth will be stunted due to a lack of quality staff will hurt the Government and economy in the longer term and a degree of flexibility to the visa system should be introduced across not just the games sector but the wider IT industries. This case could be lobbied by both the games sector and other IT companies in Ireland and would serve not just to solve the immediate problem but would but would raise awareness of the games sector and help legitimise as well as enhance the image of games development.

This issue should be addressed as a matter of urgency as;

> "the whole industry is moving so quickly and other countries England, Scotland, Canada, Scandinavia all have these robust structures in place and that's where the jobs are going. If we do not move fast this little opportunity that we have got will be gone" (Interview#2).

5.2 Financial challenges

5.2.1 Private Investment Vs. public –investment support structures

A second problem identified by the study is the issue of investment. It appears that securing sufficient seed capital through venture capital is extremely difficult in Ireland. Of the participant of this study only one was able to obtain investment through venture capital firms. This problem is tied to the image of the industry in Ireland and will be discussed further.

The two remaining studios received investment in the form of the competitive start up fund (CSF) from Enterprise Ireland (EI), representing public government support. This is fund established to provide seed capital for start-up and initial stage companies. It consists of two tranches of €50,000

which is provided in return for a 10% ordinary equity stake in the company. The company must also raise €5000 investment prior to the release of the first tranche

The fund is open to a wide field of applicants in the industrial and ICT sectors. The intended target sectors as defined by EI are "Internet, games, apps, mobile, SaaS, cloudcomputing, enterprise software, lifesciences, cleantech and industrial products" (Enterprise Ireland, 2010c).

This type of assistance has come about as a result of a change in EI's eligibility criteria. In the past to be eligible for funding the product developed had to be an internationally tradable service meaning that only middleware and other software could receive funding (McCormick, *pers comm*). This area enjoyed great success in the form of Havok and DemonWare both of which supplied middleware and were both subsequently acquired by Intel and Activision respectively.

Initially Enterprise Ireland had begun to tailor funding for the sector in an effort to boost growth with the 'Internet and Games Competitive Start Fund' (IGCFS) and the 'Internet Growth Acceleration Programme' (iGAP) which were launched in 2010 and allowed games companies and start-ups to receive assistance for the first time (Enterprise Ireland, 2010a).

EI has moved away from this type of specific funding to a broader model CSF which is intended to "accelerate the growth of start-up companies that have the capability to succeed in global markets" (Enterprise Ireland, 2010b). The success of this approach can be seen by the fact that several games start-ups have availed of the funds and it is to be presumed that several more may have applied but were unsuccessful.

This type of funding is clearly helping to foster the industry and is a step in the right direction and support like this is applied in other countries, such as Canada, where a thriving games industry has developed with the likes Ubisoft, Strategyfirst, EA, Edios, Rockstar and many smaller studios all present. The last decade has seen a constant development in the numbers employed in the sector in Canada increasing from 9000 in 2007 (Entertainment Software Association of Canada, 2007, p. 13) to 16000 in 2012(Entertainment Software Association of Canada, 2012, p. 14).

This is an increase of 56% and shows the potential for growth given Canada has had a longer history of games development that stretches back to the late 1970's and early 1980's. The UK also has a large sector that comprises 6000 directly involved with development but wider employment across the games sector of 20,000 (Kerr, 2007, p. 41). Again this sector has its origins in the late 1970's and early 1980's.

Irelands industry has seen growth in the last number of years with the earliest figures for employment available show 300 employed across the whole games sector in 2000 (Kerr, 2002). This figure grew to 1469 in 2009 (Kerr, 2009) and 2802 in 2012 (McCormick, 2012).

This represents a 933% increase across the whole games sector in little over a decade and although the figures may seem small when compared to the likes of the UK and Canada but those countries have a longer history of games development and also have larger population and industrial bases than Ireland. The number of developers present in Ireland has seen a sharp rise in the past several years with an increase of 292% from 2009 to 2012 (McCormick, 2012, p. 6).

These figures clearly illustrate the growth potential of the wider games sector with a growth rate of 91% in that time (*Ibid.*). Indeed the author of the 2012 report states;

> "Today a new generation of companies are evolving in the specific area of games content creation; a section of the industry in which Ireland has historically been weak. Despite a limited local market, the developments in on-line functionality have given this wave of developers much greater access to worldwide distribution. A successful development in this key area could lead to a healthy portal for digital exports and future growth in the sector" (McCormick, 2012, p. 8).

Access to such funding sources, such as the CSF, has had and will continue to have a positive impact upon the industry as several games development start-ups have availed of it in the past number of years. The opening up of alternative funding sources for seed capital has helped in the development of the industry and may be seen to be one of the factors that has helped games development to see such growth in Ireland in the past number of years. This helps in the direct assistance that it lends to companies as well as legitimising the industry as a valid investment area for investors and venture capital.

The expansion of these grants to acknowledge digital gaming products as a recognised business and is a major victory for this growing industry which has allowed an increasing number of indigenous companies to gain access to seed capital, incubation space, mentoring, and in turn, begin to release products in this expanding market sector.

The application process for EI funding adds to skills required as the process of submitting and pitching to achieve funding may add to the workload of those in a company. This is not necessarily a negative impact as it shows how the creation of a successful game is not purely concerned with design and implementation but there are other key areas such as investment, marketing and research that all play a part in the successful evolution as a game as a product.

In terms of political economy a clearly identifiable inequality is the issue of investment and funding. Start-ups and smaller studios face a huge challenge securing investment that would allow them to develop and deliver a game to market. Larger studios do not suffer to the same extent from this issue as due to their size, track record or the background of their staff**.** This type of situation is to be expected but it means that smaller studios face a 'catch 22' dilemma in that they cannot get the same level of funding without state investment but conversely they cannot get investment without having a product that shows capabilities. Enterprise Ireland therefore is a key player in this regard as it serves to diminish this perceived inequality as it takes on the role of investor. This also serves to demonstrate that the Government is taking the industry seriously and helps legitimise it as an area that investors should be examining and actively involved with. As Kerr states "for start ups, finding a way to reduce the 'perceived risk' associated with investing in their project is crucial" (Kerr, 2005, p. 82). The type of support lent by Government will pave the way for wider investment from venture capital companies as it will demonstrate the potential of the industry by allowing a number of start-ups to deliver a product to market and it will also help the industry reach somewhat of a critical mass.

5.2.2 Image of the industry - Does nobody like games?

The problem of securing finance is closely tied to the image of both games and the games industry. This issue arose during the interviews with all participants noting that in their efforts to seek funding, dealings with other sectors and even the wider public the view that predominated was "making games isn't a real business or industry, which just comes from years of people thinking just kids play games" (Interview#3). This notion flies in the face of the facts with the industry worth $65 billion globally in 2010 and expected to rise to $82 billion by 2015 (Reuters, 2011). Pricewaterhouse Coopers have also made similar predictions for growth (See Fig. 4). With economic players such as Time Warner and Disney buying games firms the value of the industry should not be underrated (Economist, 2011b).

The advent of educational and serious games along with the term 'gamification', a management technique that applies the psychological principles of game design to motivate workers and engage with customers show that the industry and today's games are far from Childs play.

The growth in the demographic of those 'playing' games has moved from a niche pursuit to a situation where;

> "today the average age of players in America, the biggest market, is 37, and 42% of them are female, according to the Entertainment Software Association (ESA), an American trade group. Some 72% of households in America play games of some

sort, says the ESA. Even among the over-50s the share is one in three." (Economist, 2011a)

This growth has signalled that games should be viewed as a "cultural industry similar to film and tv (Kerr, 2007, p. 44) and considered as ubiquitous digital media that has well and truly 'grown up'.

	2011 US$m	2015 US$m	2011-2015 CAGR %
Console Games	28,605	34,815	+4.4
Online Games	16,327	28,396	+14.9
Mobile/Wireless Games	8,492	12,684	+11.0
PC (Packaged) Games	3,794	3,574	-1.7
TOTAL	59,293	82,436	+8.2

Figure 4: Global forecast of growth in gaming markets by platform (Global Entertainment and Media Outlook 2011-2015, PWC, 2011 in Forfás, 2011, p. 7).

Despite this the view of games as a trivial pursuit still persists and this is one of the key factors behind the difficulty in securing investment in Ireland. To overcome this hurdle the industry must actively seek to change this notion and also to move away from the negative image that often appears in other media of games as a cause of violence. This could be identified as a secondary problem relating to the image issue in that when games are portrayed in media it is most often in a negative light. We must only examine controversy surrounding the likes of the Grand Theft Auto franchise or the knee jerk reaction to blame games for violent episodes while ignoring the range of social, behavioural, economic, biological and mental health factors that actually contribute.(Schie and Wiegman, 1997, Kutner and Olson, 2008, Time, 2012).

This type of negative image has led to a situation where companies and start-ups are unable to raise capital and face an uphill struggle to get themselves off the ground or to move onto the next stage of development. As one games entrepreneur noted;

> "We started our first games company (DemonWare) in Ireland in 2003 to hoots of laughter and utter incomprehension from the local investment community. In 2008, we were laughed at (again) by local investors when we started Jolt Online (again in

> Ireland), who told us that people wanted more sophisticated games, not simpler ones they could play from Facebook" (Collins, 2011).

The games industry must move away from the old stereotype that games development "Can't be proper business" (Interview#3) and needs to focus upon building a "positive perception"(intwerview#1) where games are helping push the boundaries of technological, economic and educational development. The fact that the industry is now "more than twice the size of the recorded-music industry, nearly a quarter more than the magazine business and about three-fifths the size of the film industry, counting DVD sales as well as box-office receipts" (Economist, 2011a) shows the growth potential for the industry in an Irish context.

5.2.3 Taxation

Tax breaks and tax reforms were mentioned on several different occasions by the participants in this study and identified as a key area in which the government could lend further support. "Tax breaks would be very welcome…lower tax rates for online revenue, lower tax rates for in game items" (Interview#3). "I think if you were looking for ties for what the government or bodies can do, it would be great to get tax breaks" (Interview#1).

This type of support is used in other countries, such as the UK, France and Canada to support their games industries (Forfás, 2011, fn. 26, Stuart, 2012). The issue of tax breaks was examined in the Government's Forfás report which identified the need to "determine the scope, rationale and benefit of introducing a new horizontal financial instrument to incentivise creative concept and content development to enhance Ireland's attractiveness for investment and indigenous growth in games development" (2011, xxii).

There has been some debate over how this would be implemented and the example of the film industry in Ireland is often touted as a possible solution. Under section 481 of the Taxes Consolidation Act 1997 film and television production are granted tax relief towards the cost of production (Office of the Revenue Commissioners, 2013).It has been suggested that this system be extended to include games with the Irish Film Board and Screen Directors Guild Ireland amongst others recommending that games development be taken into this scheme (Department of Finance, 2013).

Interestingly Games Ireland, the lobby group responsible for representing the industry, in their review of this possibility believe that "it is not appropriate to Irelands video game industry" (Games Ireland, 2013, p. 2). This stance is based upon a number of issues. The first being that the games development process is no longer a one time or static investment of capital for production. They

state that “development and investment activities do not, as with film production, cease when the product is made available to the public” (Games Ireland, 2013, p. 2).

This point essentially sums up the change in gaming from an upfront model to monetisation of games elements. This monetisation is in flux and changes depending on user feedback, metrics and analysis which continues long after the game is launched. This is in contrast to film and television production where production and post-production have definite end points. On this basis Games Ireland has identified a problem of extending section 481 reliefs to the games development industry.

Games Ireland also raise the point that under section 481 production are required to satisfy certain criteria that ensure the “contribution which the film will make to the development of the film industry in Ireland, and the promotion and expression of Irish culture” (Office of the Revenue Commissioners, 2013)

It may be argued that it is difficult to identify the cultural value of games as they are often set in fictional settings and therefore not representational of Irish culture whereas it could be said that in film it is generally easier to measure and define their cultural value. Games Ireland makes this point stating “games do not contain a ‘cultural‘ element…not all games are inherently cultural and so not all games would pass any ‘cultural test‘ necessary to qualify for such state aid” (Games Ireland, 2013, pp. 2-3).

This is an interesting stance as two of the respondents equated the games development process with that of a film and that “there aren’t enough ties to TV and film and it’s there that the success stories are happening. Technology is obviously part of making games but it is no more a part than it is in making modern animation (Interview#2) and “The process for a game is more like a film…it would be great if the film board would start seeing the cross over is going to happen so they might as well get ahead of it” (Interview#1).

This apparent divergence of opinions goes further with Games Ireland proposing that an alternative to section 481 would be the extension of the R&D tax credit system to cover games development and content creation. The Forfás report also identified this as a possibility but notes that it would be “necessary changes to qualifying criteria associated with the R&D Tax Credit to include relevant social sciences as eligible fields of science in R&D activity”(Forfás, 2011, p. 55).

This appears to be the same issue as raised by Games Ireland in relation to the nature of games. The eligibility criteria for the research & development tax credits state;

> "for software development to be classified as R&D, its completion must be dependent on the development of a scientific and/or technical advance, and the aim of the project must be resolution of a scientific and/or technical uncertainty on a systematic basis. Software developments using known methodologies, in standard development environments using the standard features and functions of existing tools would not typically advance technology and would not exhibit technological uncertainty. Undertaking routine analysis, copying or adaptation of an existing product, process, service or material would not be considered to be R&D activities. Advances are typically made through innovation in software architectures, designs, algorithms, techniques or constructs" (Office of the Revenue Commissioners, 2012).

This would seem to eliminate games from the R&D credit as there nature is different from that of traditional software. Not all games would develop a 'resolution of a scientific and/or technical uncertainty', fundamentally games, unlike software, do not solve a problem. Yet it is this very difference in nature that Games Ireland uses to reject the film funding approach. This is a very unusual stance as academic opinion views games as cultural (Squire 2002, Kline, 2003, Kerr, 2007, p. 44). Again this view is also reflected by participants. A "misunderstanding that happens a lot is seeing the games industry as a tech industry rather than a creative entertainment industry. I feel strongly that I should be dealing with the film board" (Interview#2).

In the UK the tax breaks accorded to the film industry were extended to games with the British Film Board oversee the cultural tests to determine what games qualify (Pearson, 2013). The issue raised by Games Ireland regarding film funding do not appear to be warranted as the legislation in Ireland states "contribution which the film will make to the development of the film industry in Ireland (Office of the Revenue Commissioners, 2013). By focusing upon developing the industry the extension to games could be easily achieved.

Similar worries were expressed in the UK with the chair of the Creative Industries Council's Access to Finance Group stating "there may be a cultural test – that doesn't mean you'll need to have red telephone boxes throughout your game, it's about having a certain amount of British production talent working on the game" (Stuart, 2012). Clearly a situation where studios received funding as they are helping the industry develop is easier to determine than their cultural importance.

Another benefit of extending this type of funding is the message it sends out about gaming. It is as important as film and television in terms of its media positioning. This would be a clear statement and go a long way to dispelling the image problem the industry faces.

The temptation to extend an already working system from another industry and apply it to games development is obvious. Although this would be a positive step in the short and medium terms facilitating further growth, this may eventually develop into a problem. It would be better in the long run to tailor a tax package that suits the unique position that the games industry. It is a creative entertainment industry but the support and adaption of the finished product continues long after it is launched on the market and includes feedback from consumers. A system whereby the in game elements that have been monetised would benefit from some form of tax relief should be introduced. This would be advantages to developers and aid development as well as support continuing growth. It would also be forward looking and take into account that the revenue system by which games now operate.

A situation whereby initially the Section 481 scheme was extended to include games development would provide immediate relief and would seem more appropriate and expedient than the R&D tax credit. The R&D scheme could be adapted in the future and may be a better suited for medium and larger studios. Indeed this may be a method of determining which tax relief would apply in that the number of employees and studio size would be the key parameter. A tiered system of tax relief could be instituted with section 481 at entry level, moving to the R&D tax credit at the next step up with a specific games tax scheme being the ultimate goal.

It is clear that some sort of tax reform would greatly benefit the industry and help it grow but it may be the case that extending models from other sectors is simply not relevant as games are neither software nor films but rather combine elements of both and the industry must decide on what exactly they believe constitutes a game. This problem appears to have already arisen in academic circles with the on-going debate over ludology (Aarseth, 2001, Eskelinen, 2001) Vs. Narratology (Murray, 1997, Atkins, 2003). This is an interesting topic and one which future research on the industry should address.

The government in consultation with the industry and by examining international practices formulate a beneficial tax regime that helps grow the industry but also takes into account the different nature of games development. This would need to be implemented in a timely fashion but also there must be balance between tailoring programme that meets the needs of the sector but also is formulated and implemented so that it keeps pace with international developments in terms of games support.

Chapter 6 – Conclusion

This study set out to identify the reasons behind the growth of games development in Ireland in the last decade. It has identified a combination of factors effecting games development globally, such as digital distribution, multiplatform gaming and lower barriers to entry. These developments have combined to democratise the games development process and have opened up what was a restrictive industry. This democratisation must be viewed as a positive step, as it has allowed new entrants to deliver games to market which would have been impossible in the past and has greatly contributed to the growth in the demographic of those now playing games. However this process has also presented a new set of problems in that the marketplace is flooded with games and achieving a level of success is a much harder process.

Trends in the global industry have allowed games development to establish itself in Ireland but this has also come about as a result of local level initiative. The growth of games development in Ireland has been facilitated by the passion and dedication of those already working in the nascent sector. The establishment of Games Ireland and gamdevelopers.ie have increased the communication and networking channels which will allow the industry to voice its concerns and ultimately help grow the games development sector. This factor has allowed a support structure to organically develop which suits the needs of start-ups and will be an element that will greatly aid in nurturing growth as more companies are established. It also allows the industry to lobby government and engage with other sectors in a meaningful way.

These developments have presented an opportunity for games development to expand further but the results of this study show that the industry faces a number of structural and cultural challenges that must be addressed in order for this growth and development to take place.

Firstly the image of games and gaming in Ireland is outdated and the sector must seek to educate the investment community and show the potential of the sector. It must also seek greater interaction with other sectors and government in order to legitimise games development and dispel outdated views of the industry.

A second issue facing the games development industry in Ireland is that of labour. As an emerging industry the level of experience of those entering the workforces is seen to not be up to the level required. A method of overcoming this skills gap is to recruit experienced employees from aboard through a streamlined visa process. This approach should be used in conjunction with reaching out to any experienced Irish personnel working on other games industries and incentivising any return to Ireland. These measures would greatly aid overcoming the skills shortage that the sector faces.

A secondary aspect of this problem is the perceived lack of skills graduates possess. This is related to the general skills shortage and a way of overcoming it is by establishing a games cluster. By locating several studios and start-ups in a single location, a strong knowledge economy would develop. This approach has already been used to great success in the financial services and IT sectors and should be extended to games development.

Third level and industry should continue to liaise ensuring courses on offer remain relevant and that their structure suits the needs of industry. The participation of those within the games industry in teaching on courses was noted and this approach is beneficial in keeping education in touch with industry trends and developments.

An area where Government can directly aid the industry is tax breaks. One possible way to meet this requirement is too extend successful tax systems from other sectors. The example of section 481 for film and the R&D tax credits were identified as candidates. These measures can be reworked to suit the nature of games development in the short and medium term but ultimately they will only be stop gap measures. A full tax system that caters to the uniqueness of games development, in terms of user participation by today's prosumers, as well as the differing revenue model, in terms of production costs compared to film and traditional software, should be developed.

The introduction of a competitive tax system would also allow games development to compete with other industries and the wider IT sector in terms of recruitment by making it more attractive for skilled specialised staff to enter games development. Finally it would also assist in negating the image problem by illustrating the Government's commitment to the sector and identifying it as an area worthy of investment from venture capital companies.

The nature of tax breaks must be examined in a timely fashion as the sector is growing in a dynamic and faced passed fashion. Other countries are seeking to build and expand their own development industries and the Irish government must act quickly to seize the opportunity that local growth has provided.

The extension of tax breaks and the introduction of a streamlined visa system would build upon the successful measures already implemented by Government and Enterprise Ireland in particular. The support provided thus far has had a positive effect and has greatly aided games development in Ireland.

With the games development industry and Government working together to find solutions to the problems of talent, tax breaks and investment Ireland can become a centre of games development in the 21st century.

Bibliography

AARSETH, E. 2001. Computer Game Studies, Year One. *Journal of Computer Game Research* 1.

ALEXANDER, L. 2013. *Paradox CEO: New devices, open platforms offer key chances for indies* [Online]. Available: http://www.gamasutra.com/view/news/184898/Paradox_CEO_New_devices_open_platforms_offer_key_chances_for_indies.php%23.UR6TDR3vjbN#.UR_oax3vhRw [Accessed 04/02/ 2013].

AOYAMA, Y. A. I., H 2003. Hardware gimmick or cultural innovation? Technological, cultural and social foundations of Japanese video game industry. *Research policy,* 32**,** 423-444.

ATKINS, B. 2003. *More than a game: the computer game as fictional form,* Manchester, Manchester University Press.

BBC. 2013a. *Smart device games outsell portable console titles* [Online]. Available: http://www.bbc.co.uk/news/technology-21529178 [Accessed 22/02/ 2013].

BBC. 2013b. *Valve opens Linux video game store* [Online]. Available: http://www.bbc.co.uk/news/technology-21471974 [Accessed 20/02/ 2013].

BRUNS, A. 2009. From Prosumer to Produser: Understanding User-Led Content Creation. *Transforming Audiences 2009.* London.

CHANDLER, H. M. 2005. *The game localization handbook,* Massachusetts, Charles River Media.

COLLINS, D. 2011. *Gaelic Games* [Online]. Available: http://www.gamesindustry.biz/articles/2011-10-12-gaelic-games-editorial [Accessed 10/02/ 2013].

DELANEY *ET AL.* 2004. Game for it? . *The Engineers Journal,* 58 244 - 249.

DEPARTMENT OF FINANCE, T. P. U. 2013. *Submissions for the the Review of Section 481 Film Relief* [Online]. [Accessed 02/02/ 2013].

DEPARTMENT OF JOBS ENTERPRISE AND INNOVATION 2012. Action Plan for Jobs 2012. *In:* DEPARTMENT OF JOBS, E. A. I. (ed.). Dublin.

DEUZE, M. A. M., CHASE BOWEN 2009. The Independent Production of Culture: A Digital Games Case Study. *Games and Culture,* 4**,** 276-295.

ECONOMIST. 2011a. *All the world's a game* [Online]. Available: http://www.economist.com/node/21541164 [Accessed 22/02/ 2013].

ECONOMIST 2011b. Leaders: The serious business of fun ; Video games. *The Economist.* London: The Economist Intelligence Unit.

ENTERPRISE IRELAND. 2010a. *Enterprise Ireland launches Internet and Games Competitive Start Fund* [Online]. Available: http://www.enterprise-

ireland.com/en/News/PressReleases/2010/Enterprise-Ireland-launches-Internet-and-Games-Competitive-Start-Fund.html [Accessed 26/01/ 2013].

ENTERPRISE IRELAND. 2010b. *Funding Supports & Programmes Competitive Start Fund (CSF)* [Online]. Available: http://www.enterprise-ireland.com/en/funding-supports/Company/HPSU-Funding/Competitive-Start-Fund-CSF-.html [Accessed 10/01/2013].

ENTERPRISE IRELAND. 2010c. *Sectors eligible for Enterprise Ireland support* [Online]. Available: https://www.enterprise-ireland.com/en/About-Us/Our-Clients/Eligibility-criteria.html [Accessed 12/01/ 2013].

ENTERTAINMENT SOFTWARE ASSOCIATION OF CANADA 2007. Essential Facts About the Canadian Computer and Video Game Industry (2007)

ENTERTAINMENT SOFTWARE ASSOCIATION OF CANADA 2012. Essential Facts About the Canadian Computer and Video Game Industry (2012)

ESKELINEN, M. 2001. The Gaming Situation. *Journal of Computer Game Research,* 1.

FORBES. 2011. *The Master of Online Mayhem* [Online]. Available: http://www.forbes.com/forbes/2011/0228/technology-gabe-newell-videogames-valve-online-mayhem.html [Accessed 15/01/2013].

FORFÁS 2004. A Strategy for the Digital Content Industry in Ireland. *In:* DEPARTMENT OF ENTERPRISE, T. A. E. (ed.). Dublin.

FORFÁS 2006. Future Skills Requirements of the International Digital Media Industry: Implications for Ireland. *In:* DEPARTMENT OF ENTERPRISE, T. A. E. (ed.). Dublin.

FORFÁS 2011. The Games Sector in Ireland: An Action Plan for Growth. *In:* DEPARTMENT OF ENTERPRISE, T. A. E. (ed.).

GAMES IRELAND. 2013. *Review of Section 481 Film Relief - Department of Finance Consultation Games Ireland Statement* [Online]. Available: http://taxpolicy.gov.ie/wp-content/uploads/2012/09/Games-Ireland.pdf [Accessed 02/02 /2013].

HESMONDHALGH, D. 2007. *The cultural industries* London, SAGE.

JOHNSON, S. 2005. *Everything Bad is Good for You: How Today's Pop Culture Is Actually Making Us Smarter,* New York, Riverhead Books.

KERR, A. 2002. Loading ... please wait : Ireland and the global games industry. *STem Working Paper.* Dublin: Dublin City University.

KERR, A. 2003. Girls/Women Just Want to Have Fun - A Study of Adult Female Players of Digital Games. *Level Up Conference Proceedings. University of Utrecht,.* University of Utrecht, Utrecht

KERR, A. 2005. *The business and culture of digital games: gamework/gameplay,* London, SAGE.

KERR, A. 2006. The business of making digital games. *In:* RUTTER, J. A. B., J. (ed.) *Understanding Digital Games.* London: SAGE.

KERR, A. 2007. From Boston to Berlin: Creativity and Digital Media Industries in the Celtic Tiger. *In: My Creativity Reader: A Critique of Creative Industries.* Amsterdam Institute of Network Cultures.

KERR, A., AND CAWLEY, A. 2009. The Games Industry in Ireland 2009.

KERR, A. C., ANTHONY 2011. The spatialisation of the digital games industry: lessons from Ireland. *International Journal of Cultural Policy,* 18**,** 398-418.

KIRRIEMUIR, J. 2006. A history of digital games. *In:* RUTTER, J. A. B., J. (ed.) *Understanding Digital Games* London: Sage.

KLINE 2003. *Digital Play. The Interaction of Technology, Culture and Marketing,* Montréal, McGill-Queen's University Press.

KUTNER, L. & OLSON, C. 2008. *Grand Theft Childhood: The Surprising Truth About Violent Video Games and What Parents Can Do,* Ney York, Simon & Schuster

MCCORMICK, J. 2012. The Games Industry in Ireland 2012.

MOSCO, V. 1996. *The political economy of communication : rethinking and renewal* London, SAGE.

MURRAY, J. 1997. *Hamlet on the Holodeck: the future of narrative in cyberspace,* Cambridge, MA, The MIT Press.

NEWMAN, J. 2004. *Video games,* London, Routledge.

OFFICE OF THE REVENUE COMMISSIONERS 2012. Revenue Guidelines for Research and Development Tax Credit. *In:* FINANCE, D. O. (ed.). Dublin.

OFFICE OF THE REVENUE COMMISSIONERS. 2013. *Film Relief - IT57* [Online]. Available: http://www.revenue.ie/en/tax/it/leaflets/it57.html [Accessed 06/02/2013].

PEARSON, D. 2013. *BFI to administer cultural test for UK games tax breaks* [Online]. Available: http://www.gamesindustry.biz/articles/2013-02-25-bfi-to-administer-cultural-test-for-uk-games-tax-breaks [Accessed 26/02/2012].

REUTERS 2007. Video game industry growth still strong: study.

REUTERS. 2011. *Factbox: A look at the $65 billion video games industry* [Online]. Available: http://uk.reuters.com/article/2011/06/06/us-videogames-factbox-idUKTRE75552I20110606 [Accessed 22/01/2013].

RITZER, G. & JURGENSON, N. 2010. Production, Consumption, Prosumption: The nature of capitalism in the age of the digital 'prosumer'. *Journal of Consumer Culture,* 10**,** 113-36.

ROBINSON, M. 2012. *The truth about Japan: a postcard from the Japanese games industry* [Online]. Available: http://www.eurogamer.net/articles/2012-10-10-tokyo-story-a-postcard-from-the-japanese-games-industry [Accessed 22/01/2013].

SCHIE, E. V. & WIEGMAN, O. 1997. Children and Videogames: Leisure Activities, Aggression, Social Integration, and School Performance *Journal of Applied Social Psychology* 27**,** 1175–1194.

SKYKES, J. 2006. A player centred approach to digital game design *In:* RUTTER, J. A. B., J, (ed.) *Understanding Digital Games* London: SAGE.

SONY COMPUTER ENTERTAINMENT EUROPE. 2013. *Cross-platform features on PS Vita explained* [Online]. Available: http://ie.playstation.com/psvita/news/articles/detail/item497300/Cross-platform-features-on-PS-Vita-explained [Accessed 10/02/2013].

SQUIRE , K. 2002. Cultural Framing of Computer/Video Games. *Iinternational Journal of Computer Game Research* 2.

STUART, K. 2012. *Video game tax breaks: what does it mean and what happens now?* [Online]. Available: http://www.guardian.co.uk/technology/gamesblog/2012/mar/23/video-game-tax-credits [Accessed 25/02/2013].

TIME. 2012. *Sandy Hook Shooting: Video Games Blamed, Again* [Online]. Available: http://ideas.time.com/2012/12/20/sandy-hook-shooting-video-games-blamed-again/ [Accessed 20/02/2013].

WILLIAMS, D. 2002. Structure and competition in the US home video game industry. *The International Journal on Media Management,* 4**,** 41-45.

WOLF, M. J. P. A. P., BERNARD 2003. *The Video Game Theory Reader,* London, Routledge.

YONG, C. A. D., J. 2008. The realities of virtual play: video games and their industry in China. *Media, culture & society,* 30**,** 515-529.

Appendix

Part A - Table of Games Development courses[3]

Institution	Course Title
Athlone Institue of Technology	AL802 Software Design (Games Development) - Level 8
Ballyfermot College of further education	NFQ level 5 - Computer Games and Interactive Entertainment, BCFE (Dub)
Carlow Institue of Technology	CW208 Computer Games Development - Level 8
Clane College	NFQ Level 6 - Game Development & Design, Clane College (Kildare)
Clane College	NFQ Level 5 - Introduction to Games Analysis & Design, Clane College (Kildare)
Cork Institute of Technology	BA (Hons) in Multimedia, CIT
Dorset College Dublin	NFQ Level 5 - Game Design & Animation - Dorset College, Dublin
Dublin City University	BSc. in Computer Applications at DCU
Dublin City University	BSc. in Multimedia at DCU
Dublin City University	MSc. in Multimedia at DCU
Dublin Institue of Technology	DT205 Mathematical Sciences - Level 8
Dublin Institue of Technology	DT211 Computing - Level 8
Dublin Institue of Technology	DT228 Computer Science - Level 8
Dublin Institute of Technology	MSc in Digital Games (DIT)
Dundalk Institue of Technology	DK820 Computing in Games Development - Level 8
Dun Laoghaire Institute of Art and Design	BSc in Computing in Multimedia Programming at DLIADT
Dun Laoghaire Institute of Art and Design	BA in Animation at DLIADT
Dun Laoghaire Institute of Art and Design	BSc in Computing (Multimedia) at DLIADT
Griffeth College	**GC445** Computer Games Technology (Dublin) - *Level 6*
Griffeth College	GC460 Music Production for Games (Dublin) - Interview - Level 6
Institute of Technology Carlow	BSc. in Computer Games Development Carlow IT
Institute of Technology Tralee	TL711 Computing with Games Development - Level 7
Institute of Technology Tralee	TL811 Computing with Games Development - Level 8

[3] This list was compiled using the CAO, institution websites and gamedevelopers.ie.

Letterkenny Institue of Technology	LY707 Computer Games Development - Level 7
Letterkenny Institue of Technology	LY747 Computing with Web amd Mobile Applications Development - Level 7
Letterkenny Institue of Technology	MSc in computer games development
Limerick Institue of Technology	LC518 Digital Animation Production (Clonmel) - Level 8
Limerick Institue of Technology (Tipperary Campus)	LC418 Computing - Games Design and Development (Thurles) - Level 8
Limerick Institue of Technology (Tipperary Campus)	LC517 Creative Multimedia (Clonmel) - Level 8
Limerick Institue of Technology (Tipperary Campus)	LC518 Digital Animation Production (Clonmel) - Level 8
NUI Maynooth	MH211 Multimedia, Mobile and Web - Level 8
NUI Maynooth	BSc. in Computer Science & Software Engineering, NUIM
Pulse College	NFQ level 6 - Games Analysis & Design (Pulse College)
St Johns College, Cork	NFQ Level 5 - Computer Game Design & Development, St. John's College, Cork
Sligo Institue of Technology	SG131 Computing - Games Development - Level 7
Trinity College Dublin	MSc in Computer Interactive Entertainment, TCD
Trinity College Dublin	BA & BSc (evenings) in Computer Science, TCD
Trinity College Dublin	MSc. In Interactive Digital Media
University College Dublin	DN201 Computer Science - Level 8
University College Cork	BSc in Computer Science at UCC
University of Limerick	LM060 Mathematical Science - Level 8
University of Limerick	LM110 Computer Games Development - Level 8
University of Limerick	LM118 Electronic and Computer Engineering - Level 8
Waterford Instite of Technology	WD168 Entertainments Systems - Level 8

Part B – Interview Questions

- What if any support/guidance did you receive from state agency/Third level institution/games industry?

- Barriers to entry. SDK's, H/W, knowledge, skills. How have these changed?

- If you received support what was the level it came to? How could this support be improved?

- Mentor system, investor angel etc. Would these/where these helpful, were they industry insiders already?

- Did you encounter any problems in securing funding, office space, equipment, skilled employees etc?

- Would you consider a kickstarter/fundit like approach?

- What support do you feel is required of
    A. Government
    B. Industry
    C. Infrastructure

- Do you think there is sufficient talent in Ireland for the industry to develop?

- Is Ireland in the post Celtic tiger era still capable of attracting and retaining employees and graduates?
    A. Are there any particular skills gaps that currently exist?

- Does the Dublin central grouping of companies pose a challenge?
    A. If a regional company takes a hit how would this effect the area?
    B. Do you see this as a problem for Dublin?

- Are there sufficient ties to film, TV, animation sectors?

- Are third level institutions sufficiently involved with the industry?
    A. Has the introduction and growth in games development courses had an impact on the industry?
    B. Are the courses relevant and forward looking?
    C. Do graduates possess the skills to cut it in the industry?

- Does Ireland possess the infrastructure to support the industry i.e. broadband, 3G, h/w, s/w support & on-site support, specialised, office space.

- How long was/will the development cycle on your last game?

- How did you find the transition from your first game to subsequent games?
    A. Dev cycle
    B. Costs

- What platform did you choose to develop your game on?

- Why did you choose it? Was this choice related/influenced by
    A. Skills available
    B. Target market
    C. Revenue sys

- Did you have a plan for support the game once launched?
    A. How did you research this?
    B. Patches & updates, DLC (down loadable content)

- What was your plan for revenue generation?
    A. Ads, fermium, free to play, micro transactions etc?
    B. Do you have an in game currency or PayPal, why that particular system?
    C. Would you join a wider currency i.e. industry or platform specific currency?

- How has the change from up front revenue to game generated revenue effected you approach to development?

- Would the openness and piracy of android be a negative of positive influence on choosing to develop for that marketplace?

- Some big players such as EA (Sims, Simpsons) are moving into mobile, do you see this as a threat, marketing & budget and foresee a return to older console model/system in mobile market?

- What was your intended target market? Irl, uk, eu, far east usa etc
    A. Why did you choose this market?
    B. Did you carry out any market research?

- There is a larger market for pc in the EU would this influence your development choice?

- Social games and browser games, Is there a prestige factor involved, do you ‘look down’ on those platforms?

- Change in console to mobile, serious/hardcore to casual or leisure gaming. What effects on dev?

- Capturing 1% of emerging markets such as china and India represent significant revenues in comparison to Irl/UK/EU would you consider developing for those markets?

- Market research on target demographic, age, gender, location? Did you tailor content in light of this?

- What was your marketing plan and did it involve social media, web site, forms, existing online community, word of mouth, market place trend etc?

- Websites such that provide marketing data, would similar info on Ireland help or would you use UK, EU information to base research on?
    A. Do you think Irl is too small to develop such information?

- How important are metrics and analysis?
    A. What system do you use? Why?

- Did you have a community development plan? Or staff dedicated to this?

- Did you carry out any beta testing? What size?

- How useful is this approach in the development process? Predict changes in what is required?

- Did you encounter any legal issues in development process? Had you planned for this r taken any precautions?

- What do you think of the games industry in Canada and how the government there are developing it?