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### Abstract

Although the public image of computer games may be a stereotype of a adolescent boy playing alone in his bedroom, a more focused study will result in a realisation of the important part the computer game industry plays in both finance and culture. The computer games industry combines global corporations including Microsoft, Nintendo, and SEGA along with many smaller games developers. What they all have in common is a determination to be at the forefront of development in this branch of the computer industry.

The financial implications of this market are huge. Enormous gains and losses have been made by major corporations because of the timing of new games consoles and games systems.

The music industry has an important and growing part to play in this sector. From the first "pings" produced on a simple chip in the early games, there has been rapid progress to interactive music scores recorded by a symphony orchestra and the appearance both visually and vocally by world famous rock stars on video games. Research was carried out to assess the importance of music in video games by the reading of relevant textbooks, magazines articles, and related websites. The financial reports of major corporations involved in the computer game industry were also studied.

With such a rapidly changing industry it emerged that the potential of economic, creative, and marketable growth is only limited by the technology of the day. As this technology improves, the games become more sophisticated and the music plays a vital role in the total game experience. The music industry is beginning to realise the part it has to play in the computer game industry. Sectors of the music industry that ignore the potential to gain new markets and increase sales may well have cause to regret their short-sightedness.

### Introduction

This Research project will examine how today's Music Industry can work together with video games producers in order to help them reach their full potential. In the past, many artists and record labels have merely tried to synchronise music or artists into video games in order to gain a wider exposure and thereby turn this exposure into increased sales.

Examples of this use in gaming will be given and further ideas suggested for labels and game designers to develop some joint music/game concepts in order to increase the profile of music in video games. Information will also be given on the forthcoming

interactive audio "revolution" which has threatened to surface for years. The historical background of current games machines will also be examined as well as the corporate background behind them and their economic strength. This will help to explain the concepts behind current music practises in the video game industry.

Although there is a large amount of literature about video games and other related topics, the area of music for video games has much less information available. "The Rough Guide To Videogaming" by Kate Berens and Geoff Howard (2002) provides a useful introduction to the world of video games. It includes a review of the various consoles and their history, and the main body of the book is concerned with the games themselves and hints on how to play them. A useful inclusion is the directory section at the end of the book with details of magazines and books, websites, on-line gaming, and software publishers.

"Gargantua, Manufactured Mass Culture" by Julian Stallabrass (1996) is an examination of a number of aspects of contemporary society, and discussion about their sociological and political significance. The idea of mass culture is discussed at length and questions asked about its nature and direction. Among the subjects studied include photography, advertising, graffiti art and video games. The chapter on video games makes interesting points about the contrast between the passive nature of cinema and television compared to the interactive world of the computer game. It also discusses the link between computer games and the arms industry. It may or may not come as a surprise to learn that many computer game scenarios are based on military simulators and war game programmes. "Gargantua" provides a radical and stimulating assessment of video games and how they are used.

"Playing for Profit (How Digital Entertainment Is Making Big Business Out Of Child's Play)" by Alice LaPlante and Rich Seidner (1991), describes itself as "an inside look at how emerging digital technologies are revolutionizing the entertainment business". This book is principally concerned with the business opportunities which new and developing technological change is providing. It examines with knowledge and insight the strategies and methods that are moving forward the digital entertainment and interactive gaming industries. Some of the aspects discussed include product innovation, market domination, and risk taking. It also emphasises the impact of the Internet and the potential it offers for the video game industry.

"The Complete Guide To Game Audio (For Composers, Sound Designers and Game Developers)" by Aaron Marks (2001) is the most detailed and relevant resource book available relating to the subject of music and its place in computer games. This book is essentially a career guide to the world of music production for video games. Instructions are given to describe the process of adding music and sounds to video games, the essential skills required, and suggestions for the recommended technical equipment. Career advice includes business and marketing plans, sample contracts, negotiation techniques, and lists of possible clients. It also gives detailed information on the different specifications and technical requirements needed to compose music for the different gaming platforms and their related hardware. The book also includes a companion CD-Rom that includes audio and cinematic examples, demos of useful sound editing and sequencing programs, and sample business contracts.

The annual Financial Reports of Corporate Industries connected with the video game industry are also a useful source of information relating to the financial importance of the genre. Reports from 'Sega', 'Nintendo', and 'Microsoft' were all studied in order to increase knowledge and understanding of the business aspects of the industry such as marketing, research and development, budgeting, publicity and international branding.

There are a number of magazines that are concerned with computer gaming, most of them aimed at the game player, and not concerning themselves with music for video games. "Sound One Sound" regularly features articles about the technical requirements for the production of music for computer games. These articles have included an account of Nathan McCree and Matt Kemp composing the music for the latest "Tomb Raider" game. In Dec 2002 it featured an article about the creation of the soundtrack for the Harry Potter Game "Harry Potter And The Chamber Of Secrets." This game is described as "one of the most sophisticated ever created" and the music and sound effects built into the game form a very important part of the total game experience.

There are a number of on-line magazines related to computer games and they occasionally feature articles about music for computer games. They include [www.gamespy.com](http://www.gamespy.com), [www.ingaming.com](http://www.ingaming.com), and [www.music4games.net](http://www.music4games.net).

## **Methodology**

Considering that computer games are an important aspect of the cultural life of young people worldwide, there has been comparatively little research done on this topic. The popular music industry has dominated most of the research carried out even though computer games have had a more sustained and financially secure growth since their appearance on the market place. Initial reading and discussion about computer games established that a research project into the relationship between the computer games industry and the music industry would improve understanding between both sectors. It could also establish the potential for future growth in the development of new games with a musical element reflecting the strength and excitement of the game rather than simply accompanying it.

This research project examines not only the development of music for video games up to the present time, but also suggest ways in which it may develop in the future. As with all aspects of new technology, the pace of change is very rapid. The implications of this rapid change on the related music industry, is also discussed. Initial research was primarily conducted via the study of secondary sources including textbooks that included relevant topics and literature reviews. Having established the need for research into the relationship between the computer games industry and the music industry, a more structured review was carried out using primary sources of research. This included articles from journals and magazines, information from web sites and industry financial reports.

Initial use of an informal questionnaire amongst fellow students to establish the level of awareness about computer games music was generally unsatisfactory. It was decided not to conduct a formal research programme using a dedicated questionnaire and a representative sample. The initial informal research with students and study of the available documents gave evidence that the awareness of the importance of computer

games as a vital element in the music and related leisure business is generally low. Time spent on merely gaining more negative feedback could be more usefully spent studying how the topic has developed almost unnoticed by its consumers.

### **A Short History of Console Gaming, With Reference To the Mass Marketing Of Games Consoles and Their Global Economic Impact.**

The first computer game to give players the opportunity of playing on their own television set was the table tennis game called "Pong" in 1972. It used a basic black and white image of a ball being hit across the screen, the only sound used was an electronic bleep when the ball hit the bat. This game was featured on the 'Magnavox Odyssey', the first home game console to appear on the market. This device gave households the first opportunity to use their television sets in a totally new way, instead of merely watching whatever entertainment the various channels were offering them. The Head of Magnavox, Ralph Baer, said in 1972:

*"You should be able to do more with TV than just watch it".*

Although people did not realise this at the time, this rather crude device was to develop into a multi-million dollar corporate industry.

In 1978 the game "Space Invaders" appeared. This game utilised what can be considered to be the first use of sound as an element of the game. As the aliens appeared on the screen and advanced towards earth, there was a steady metronome - like sound that became faster as they progressed. As the player needed to shoot the aliens before they reached earth, this accelerating sound helped to build tension and increase the excitement of the game.

Many more games were introduced during the 1970's and 1980's, as well as improved games consoles produced by Atari and Nintendo. At the same time the sale of home computers was being aggressively marketed in both USA and Europe.

Games were being developed for games consoles and computers, and successful games were often transferred from one format to another.

The early home computers had little or no capacity to make sounds. The only sound they made was bleeps or clicks, which served as warnings that the computer was about to crash. Gradually computer makers devolved the computer chips that controlled these bleeps until eventually the computers could play a limited kind of music.

In 1981 Atari produced their 5200 home console. This contained the "pokey chip", an audio processor with four separate channels enabling four different sounds to be heard at the same time. Previously games music was limited to repeated snippets of synthesized mono sounds because of the small memory and sound output facilities of the console. Similarly the AY-Music Chip was built in to the 128k Sinclair Spectrum computers, and this gave this early computer the potential to play music of some kind. The AY-Chip was originally included in the Amstrad CPC, but the Spectrum retained an earlier music chip for compatibility reasons. With the two chips in the Spectrum, this then made the computer capable of playing more interesting music. On the AY-Chip the player could

produce a melody and the older Spectrum chip could be used as a fairly primitive drum machine. The AY-Chip was later to be used in the Atari ST, which was the first home computer to offer music creation for home computer users. Anyone who wished to experiment with music composition on the computer at this time would generally use the Atari STO, (which was principally developed for games use), with early versions of 'Cubase' software.

The end of the 1980's was producing game music of real quality produced on the Commodore, Amigo and Atari ST computers. As the music quality became more appreciated by the players, games manufacturers began to recruit composers to provide music for the games. Many of these composers had previously produced demos. These demos were basically free-ware audiovisual programmes that were produced to demonstrate the composer's skill.

In 1989 the 'BitMap' Brothers used "MegaBlast" by "Bomb The Bass" for the game "Xenon 2". Many computer players decided to link their computers to their stereo systems in order to appreciate the sound quality of the game. The game won many awards including the "1989 In-Din Award for Best Music and Effects", "1989 ZZAP Readers Award for Best Music and Effects" and "1990 ELSPA Award for Best Shoot 'Um Up". The 'BitMap' Brothers became well-known for the quality of the music they programmed into games.

A big breakthrough for the quality of music on personal computers was the release of the first sound card in 1987. This was the "Adlib Music Card" made by Yamaha, and many games were produced in 1988 that featured its use. The "SoundBlaster Card" produced by Creative Labs quickly followed it in 1990. This had an eleven voice FM Synthesizer with "text-to-speech", digitised voice input/output, MIDI/joystick port and bundle software. The SoundBlaster card became the number one selling add-on board for the PC market within a month of its release.

This popularity quickly made games producers aware that people really cared about the quality of the music in games, and that good music could help generate increased sales. When Roland introduced even higher specification Soundcards like the LAPC-1, this gave games players the chance to hear the kind of music on their computer game which was previously impossible to achieve. The 'Wing Commander' series of games produced by 'Origin' featured music played by a symphony orchestra, and the "Star Wars" games produced by "Lucas Arts" included some of the music by John Williams written for the films.

In 1985 the Nintendo entertainment system (NES) was marketed to immediate and enduring success. The NES incorporated many new innovations, including the technology to give games a musical soundtrack, due to its sound processor with eight sound channels. Nintendo eventually ceased production of the NES in 1995, but during its existence, more than 50 million consoles and 350 million games were sold. Many of these NES games were 'Tetris' and 'Super Mario Brothers'. Both of these games contained music that became popular in its own right. It poses an interesting question relating to the use of music in computer games. Many people have considered whether the music became popular because of the immense popularity of the games, or conversely whether the music itself played an active part in the massive sales of the games. The answer to the question is probably that both were important - an effective

and original musical score will enhance a good game, but will not necessarily transform an unsatisfactory one.

By the early 1990's there were two companies who were seen to be the main contenders in the market struggle for supremacy in the video game business. They were SEGA and Nintendo. Both of them produced hugely successful games during the 1990's and improved levels of sophistication and technology in their consoles. The competition between the various console manufacturers became increasingly aggressive during the 1990's. Sega finally failed in its quest for market leadership with their new 'Saturn' console. In retrospect, it seems clear that they neglected their own market and overestimated the brand loyalty of previous customers. When Sony entered the market with the 'PlayStation', it enjoyed enormous and immediate success. This was due in no small measure to important work between Sony and independent games makers prior to the release of the PlayStation. Not only did it offer a new name in the Console market, but also it was able to play a large number of new and exciting games.

Nintendo released their N64 console a year later, but were unable to repeat the success of Sony. With the increasing complexities of the consoles and their associated games, game players could not justify the expense involved in buying every new innovation as they appeared.

Sega's final console was the 'Dreamcast'. This was the first console to incorporate an Internet connection for online gaming between players. However it did not achieve the success that Sega anticipated, as Sony were widely advertising the arrival of their next console (the 'PlayStation 2') and customers preferred to wait to see if it was good as they promised. Eventually, Sega decided to discontinue their involvement in the production of games consoles in order to develop games for other consoles and their own larger machines in Amusement Arcades and the Leisure Market:

However, on January 31, 2001, we discontinued the production of Dreamcast, which had been fighting an uphill battle, and we will now concentrate our corporate resources on the content and amusement business. Henceforth in the content business, we will focus our efforts on ensuring a high profitability organisation and becoming the world's top content provider. Concurrently, in the amusement business, we will exhibit a greater than ever role in market leadership. (Yoshiji Fukushima - Chairman of Sega)

The PlayStation2 proved to be as successful as Sony had predicted. It was so successful that it had sold fifty million units within two years and ten months after its initial launch in Japan. Part of the reason for the success of Playstation2 was the fact that it could also play games designed for the original PlayStation; this is known as "backward compatibility."

Another reason for the success of the PlayStation2 is its capacity to play DVD's. There had been a growing relationship between video games and cinema films and indeed a number of films were made based on popular video games, including 'Super Mario Brothers', 'Tomb Raider', and 'Resident Evil'.

The most recent game consoles include the entry of Microsoft into this important aspect of the computer industry. The Microsoft 'Xbox' has a very impressive specification and

indeed includes similar specification processors to home computers. It also has Broadband Internet connection for online gaming and also has a DVD player facility. However, it has not achieved the success envisaged by its developers - presumably because they did not possess the expertise to develop attractive games to appeal to their target market. The rather disappointing debut of the Xbox has not prevented Microsoft from continuing to promote their games system as they describe their plans for the future:

We help people realise their potential for pure fun too. With Xbox, the most powerful console games system ever built. In the near future we plan to launch Xbox Live, a ground breaking on-line gaming service that will let broadband users play multi player Xbox games on the Internet. (Microsoft Annual Report, 2002)

The Xbox is the closest of the three main consoles, in terms of architecture, to a PC. The console contains a hard drive the main function of which is to temporarily store data of a game. Accessing the hard drive is quicker than reading a disc, thus reducing in-game data read delays. The hard drive is also used for players to save game "positions". This hard drive also has the capability to store music CD's as audio files which can be recalled at a later date and played back during the game.

The rather muted customer reaction in Europe to the Xbox has not prevented Microsoft's profits from rising. Their consumer software, services and devices revenue, (which includes The Xbox video games system) rose from \$1.63 billion in 2000 to \$1.95 billion in 2001 and \$3.59 billion dollars in 2002. It is clear to see that Microsoft is determined to stay a dominant force in all computer related industries.

"In 1999, Microsoft became the largest company in the world, as evaluated on its share price, although its tangible assets are little more than a few office buildings. The very high valuations put on Internet shares are also not backed by tangible assets, but reflect a belief in their future earning power. These ratings rely on the hidden assets - the intellectual capital in the organisations. While such examples are extreme it is now becoming recognized that the intellectual capital in almost any organization is the seed corn for future prosperity. (Finley, 2000)

### **The Changing Demographic Profile of the Games Player.**

An interesting development in the history of computer games is the changing demographic profile of the games players. During the 1990's record shops began to sell consoles and games and video stores began to rent out consoles and their associated games. This had the effect of attracting an older audience who were perhaps unaware of the increased sophistication and excitement of the new developments that had been introduced in video games. The other aspect of older players becoming involved in computer gaming was the introduction of certification or 'age ratings' for the new wave of computer games which may contain elements of violence or sexual content which could be considered unsuitable for a younger player.

The large numbers of young adults returning to video games has resulted in the following interesting statistics obtained from the Interactive Digital Software Association in the USA in 2002.

"Sixty percent of all Americans age six and older play computer and video games. The average age of a game player is 28 years old. Forty three percent of gamers are women. Computer and video game software sales grew eight percent in 2001 to \$6.35 billion and are expected to show strong growth over the next few years. In 2001, over 225 million computer and video games were sold, or almost two games for every household in America. All games are rated by the Entertainment Software rating Board (ESRB), and sixty eight percent of games are rated "E "for Everyone. Over ninety percent of all games are purchased by adults over the age of eighteen. "

One aspect of the marketing of video games, which has hitherto been largely ignored, is that of the untapped potential in games for teenage girls. Research in the USA carried out by M. Chaika in 2001 found that the vast majority of video games were aimed at the male game player and this was reflected in both the type of game and the way it was marketed. As girls actually spend more than boys, games makers have been generally very slow to realise that by careful marketing, they could appeal more to the female market. Some companies have produced 'gender neutral' games, but girls are often expected to play the more 'educational' type of game, often involving role-play and strategy. Some companies have created video games aimed at the female adolescent market, and these include 'American Laser', 'Girl Games', and 'Mattel'. It will be interesting to see how far this trend develops, and whether the Music used in these games is substantially different to that aimed at the male. It has long been in the case in the Music Industry generally that particular singers and bands have been aimed at a male audience and others at a female one.

### **Music in Computer Games, the Story So Far.**

Just as computer games have progressed out of all recognition from a Ping-Pong ball bouncing backwards and forwards on a television screen, to the high quality video experience of computer games in the 21<sup>st</sup> century, the music accompanying these games continues to reach new heights of sophistication and musical relevance. The player often listens to this music through a home entertainment system or stereo system. The sound quality is therefore of a very high level.

In order to understand the developing part that music has played in video games, it will be useful to examine the various types of games available. Because these games have specific differences, they tend to use music in a variety ways, and composers will have a variety of different requirements. Probably the first type of game to emerge from the game console was the "Platform" game. In these games the player is required to progress through a series of levels to the final prize or reward. The characters in the game were viewed in side view and this gave the visual impression of moving up or down in the game. Thus the genre was labelled platform. More recent platform games do not have the side-on view as due to an increased processing power of today's consoles the platform world can be seen in a three-dimensional world.



The music in platform games is generally lively and vigorous enough to help the player progress through the game. It is generally not interactive which, means the player has little or no input into the music played. The only occasion when the music changes in response to the player's progress is that it often speeds up if the player's time limit is about to expire. Examples of platform games include two of the most popular and financially successful games ever produced - "Sonic the Hedgehog" and "Super Mario Bros" "First person shooter" games or "F.P.S." is another popular genre of computer game. In these games the player progresses through a variety of environments armed with some kind of weapon. The player experiences the game through the perspective of the weapon and is required to survive a number of frightening encounters with a wide range of armed adversaries or monsters.

The music in a FPS game can often fulfil a similar function to that composed for a feature film. It can create an atmosphere relating to the environment in which the player finds himself. This atmosphere will often change and the mood of the music can help warn the player if an enemy is near. It is therefore a much more interactive use of music than in a platform game. Examples of FPS can be "DOOM" and "UnReal".

Another type of game, which tended to be featured on home computers rather than consoles, was the Graphic Adventure game. The earliest examples of these required the player to type in the commands on the keyboard, in order to solve puzzles and progress through the game. As the processors became more powerful the game became less text based and the player generally used the mouse rather than the keyboard. The music is usually pleasant enough, but not an essential ingredient of the game. However, some graphic adventure games featured music that was regarded as effective and well-chosen by many game players. "Monkey Island II" is an example of such a game and its music.

A progression from the Graphic Adventure game is the Role-Playing Game (RPG). Again the player is required to explore new worlds, but progress is now made in a more active and often violent way than by simple problem solving. The character played by the player will have specific strengths and these will be used during the playing of the game.

Role-playing games can often have soundtracks that accompany the player as they progress through the complex plot of the game. Because the structure of role playing games is programmed, this means there is little opportunity or necessity for interactive music - it merely reflects what is happening to the player and what environment they find themselves in. A well-known and successful example of the Role Playing Game is "Final Fantasy 7".

### **How Rock Bands became involved in Computer Games.**

Rock bands have become increasingly aware of the marketing potential of video game and many have chosen to use this medium to either launch a career or revitalise one. Artists ranging from David Bowie, Ozzy Osbourne, 'Rage Against The Machine', and Britney Spears have all appeared on games in some graphic form. Many established rock acts including Marilyn Manson, The Beastie Boys, Snoop Dogg and Yes, have already made deals with video game companies. These deals can be mutually advantageous to both parties. Even unknown bands can be signed to video games as the game makers do not have to pay enormous fees and the bands gain valuable

exposure from the game. Annual sales of video games exceed cinema ticket sales in America and appearance on the game gives exposure to a wide range of marketing segments. The video game companies pay about half what the film studios pay for a license to play the music, but the increased publicity the bands receive by featuring their music on a video game can often lead to increased album sales. The Video game can also include concert schedules and music videos as extra bonus items on the game.

Even bands that have long since left the charts behind have found that use of their music on a game can help their careers. The lead track from the latest album by YES is played in "Homeworld" a space fighter game produced by Sierra On-Line Inc. Considering that YES released its first album in 1968 the game players who purchase "Homeworld" may well create a new audience for the band.

Many of the recording artists are themselves fans of video games. Mix Master Mike of 'The Beastie Boys' recorded a track for a racing game produced by Electronic Arts and personally contacted SEGA to collaborate with them. He was shown the plans for a new roller blading game called "Jet Grind Radio" (Named "Jet Set Radio" in the UK); he was later asked to prepare a 60 second track for the game for a fee of about \$5000. Mix Master Mike was also contracted to write a song for the TV commercial and his name appears as graffiti in the game itself.

The American band 'Adema' featuring their lead vocalist Mark Chavez produced their own rock theme for the video game "Mortal Kombat: Deadly Alliance" the most recent title in the immensely popular series produced by 'Midway Games'. In the words of Chavez:

I like the idea of integrating music of the time with video games. Some video games have cool music as background music. But I like this whole idea of using bands. I think kids dig it more too, because they don't have to put on the stereo and the game at the same time.

'Midway Games' have been very active in promoting rock music as an ingredient in their video games. They started the collaboration when they hired the American band 'Saliva' to play a rap-metal version of 'The Peter Gunn Theme' by the famous American composer of film music Henry Mancini for its 'Spy Hunter' game, and included a video of 'Saliva' performing the song as an 'extra' on the game. They then progressed to featuring hard-core metal version of 'Take me out to the Ball Game' by 'Dry Kill Logic' on the 'MLB Slugfest 20-03' game. Another example is the hip-hop act 'Jurassic 5' writing the title song for the basketball game: '2003's NBA Ballers'.

In the words of Helene Sheeler, the vice president of marketing for 'Midway Games':

"We're in this industry where there's just boatloads of games coming out, so it's nice to have a corner on the market with the music thing. When kids buy these products, this is the only place they can get this song. It's a total added value for them. "

Other Games makers have not been slow in realising the economic potential of using video games as a vehicle to promote Rock Music, and gain by the association. The popular 'Tony Hawks' skateboarding games produced by 'Activision' have used a mixture

of punk and ska music to appeal to the skateboarding fraternity, and have also included an original song by 'The Mighty Mighty Bosstones'. Another skateboarding game called 'Thrasher: Skate and Destroy' featured hip-hop recordings by 'Public Enemy', Grandmaster Flash', and 'Run- DMC'. The Science Fiction racing game 'Wipeout XL' used an instrumental version of 'Firestarter' by the UK group 'Prodigy'.

The mutually beneficial economic gain to the Bands and Games Manufacturers has already been touched upon. Bands gain by being associated with their fans' favourite video games, and the Games Manufacturers gain by developing a new branch of the market. Some games manufacturers are now actively involved in the promotion and sponsorship of major Rock Concerts and tours. For example, Xbox sponsored the tour of 'Blink- 182' and 'Green Day' in the USA, and Sony Corporation is sponsor of the 'Warped' Concert Tour and the 'Ozzfest' tour by Ozzy Osbourne.

Games producers like Electronic Arts have also signed deals with record labels including, Electra, Capital, Atlantic, MCA, and Def Jam and will feature new releases as part of the attractive features of a new game. As Steve Schnur, (the World Music Executive for 'Electronic Arts'), explained in 2002:

Music labels now see games as an important channel for promotion and distribution. We've introduced an enhanced audio experience into our EA titles, allowing our games to become a major promotion and distribution channel for introducing new artists and debuting new music from established acts

One development in video games that has significant musical content is dance games such as "Britney's Dance Beat" for the PlayStation2. The game uses a dance mat as a digital controller and the player is required to dance on the mat while following instructions from the game. It begins easily by simply tapping to a simple rhythm represented by a symbol on the screen, and progresses to more complex movements and rhythms. Other dance games have been introduced for the PlayStation including "Dance, Dance, Revolution", but the association with Britney Spears has obviously had an enormous appeal to the teenage market. It also can be considered to be a game that is aimed at the female market and as such shows that the games industry is becoming more aware of the female demographic.

Another new type of game with more direct relevance to the music industry is 'music making' games. 'EJay', who began designing music creation tools for PC's, have now produced 'EJay Clubworld' for the PlayStation2. This game gives the opportunity to create music in a range of styles using a simple wav samples, virtual synths, drum machine and turntables. A similar game is the range of 'MTV Music Generator' games developed by 'Codemasters', which is also for the PlayStation2. This relationship between 'Codemasters' and 'MTV' give the game massive co promotional and marketing opportunities via MTV's extensive reach throughout the world and over the MTV music network. This shows again the potential for growth in the Music Industry by its association with the video games industry.

A more unusual aspect of the association of rock music with video games is the commissioning of original music for new games by contemporary musicians. David Bowie wrote eight songs for the game: 'Omikron: the Nomad Soul' produced by 'Eidos Interactive', and was even featured as a character in the game.

Trent Reznor - the lead singer and motive force behind the group: 'Nine Inch Nails', created the music for 'id Software's first 'Quake' game. This was the first of many such collaborations between the rock musician and the games producer. He later was involved in the update of the famous first person shooter game - 'Doom' which was to be released as 'Doom III'. Reznor's role in the project has changed from being a music composer to being more concerned with 'sound design'. The soundtrack he created for the game added to the sense of dread and general horror that permeates the game. Sound effects are oppressive and unsettling and blend industrial noises with a general unease and sense of threat.

Reznor explained that he was "aiming to allow the environment to be the soundtrack and try to invoke feelings of fear".

"It seemed like an interesting experiment and appealed to the sound designer in me. Also, it's not that dissimilar to how I approach writing songs: I usually dress the set and then put a song in there. This was kind of the same thing".

### **Two Important and Influential Composers Working In Video Games.**

Bill Brown is an American composer who has produced music for both the Hollywood film industry and the video game industry. He has achieved success in both genres and is recognised as an innovative and creative musician who has recognized the increasing potential of video game music and embraced the related technology enthusiastically. His film scores include "Ali", "Scorer", and "Any Given Sunday". His wide range of video game credits include the "Tom Clancy" series of games, "Rogue Spear - Black Thorn", "Jurassic Park: The Lost World" and Michael Crichton's "Timeline".

Because he has worked in both styles of soundtrack creation, Bill Brown is totally aware of both the differences and similarities in the two forms. The main difference is that film is a linear medium, while a game is essentially non-linear. Because the progress of the game is literally in the hands of the player, the composer has to write music that can cope with sudden changes of setting, action, and mood which can blend smoothly. The other important factor to be taken into consideration is the limitations and problems concerning the available hardware for sound production in the video game.

Recently Bill Brown has been working on the music for "The Sum of All Fears". He has had to prepare material for different versions of the game produced for the Xbox, Gamecube, and PlayStation2. He considers that the most important aspect of composing a game soundtrack is to try and create music that really evokes a sense of the atmosphere of the game.

Jon Holland is another American composer who has found great success writing music for video games. He has actually one of the highest paid composers in the industry. His first work was in 1994 when he was contracted to compose the music soundtrack and design the sound effects for the "Vectorman" Genesis game for SEGA. The console was very limited in terms of sound production, as a chip in the console itself generated the sounds itself. Despite the fact that only about 5 notes could be played at the same time,

Jon Holland was very successful and has gone on to write much more sophisticated and effective music, which has reflected the growing complexities and importance of computer games.

Jon Holland has also been at the forefront in the negotiations for favourable terms for the payment by games makers to composers. He has established his fee as \$1700 per minute for the first 20 minutes of music, then \$1500 per minute for the next ten minutes. After 30 minutes the price is negotiable. This agreement is for only one game platform. Any additional platform added will carry a flat fee of \$10,000 per port. Any additional use, such as film, television, or CD soundtrack release is split 50/50 on net profits. He also negotiates a \$10,000 bonus on sales over 100,000 units.

Jon Holland is passionate about his belief in the importance of video games music:

"It seems to me that the games that get high accolades always have great music scores.... Music is not the most important factor in a game, but it can be as important as high-gloss graphics and sound effects. The synergy of those elements really creates the recipe that equals success. "

### **Awards for Outstanding Music for Video Games**

The growing recognition of the importance of music in video games has slowly begun to show itself in the promotion of awards, particularly in the USA.

In 2000 the National Academy of Recording Arts and Sciences (N.A.R.A.S.) approved 3 categories for the winning of a Grammy to include music written for video games. These 3 categories are:

Best Soundtrack Album for Motion Picture, Television or other visual media, Best Song for Motion Picture, Television or other visual media and Best Instrumental Composition for Motion Picture, Television or other visual media. (Other Visual media is the term designed to include video and computer games, multi-media, and future developments on the Internet into one category.)

Although no game music was nominated in the first year, this has established the importance of the genre. This new recognition is a positive incentive to the video games industry and to music makers within the industry.

Other organizations also acknowledge excellence in the production of music for video games. The Academy of Interactive Arts and Sciences (AIAS) gives the Interactive Achievement Award in the Best Sound Design and Best Original Score categories at their yearly presentation.

There are also several awards sponsored by the industry and games magazines. These include The Electronic Entertainment Expo (E3), The Game Developers Conference (GDC), Independent Games Festival (IGF), and PC Gamer Magazines.

In the UK, the importance of computer games music has been recognised by its own award at the BAFTA Interactives.

## **The Future of Gaming.**

The Internet first appeared on a games console on the SEGA Dreamcast and has since become a feature of Sony's PlayStation2 and Microsoft's Xbox.

Microsoft and Sony are both spending vast amounts of money on research and development of ideas for use in next generation consoles and how they will be powered. Some very recent developments in gaming consoles indicate a new objective by the corporate giants.

Sony's research and development section have been investigating running a PlayStation2 on a Linux based system. Linux is basically a computer operating system much like "Windows", and Sony has begun to encourage game designers to use the system. Sony believe that games players experimenting with a robust TCP/IP (internet communication) protocol can only bring new and varied innovations to the console, which is devolving from a games console into a multi-task entertainment machine.

Encouraging users to develop for the PlayStation2 is a very interesting concept, and shows that Sony is actively encouraging game developers to use the proprietary system software. It could be that Sony is linking the console battle between themselves and Microsoft to the first contest between Apple and Microsoft. In this Microsoft actively encouraged developers to develop software for the then brand new "Windows 95", Apple preferred to keep software development "in-house". This caused a vastly increased demand for the flexibility and usability of Microsoft's Windows platform.

The PlayStation3 currently under-development by Sony has a potential release date of two to three years from now. The PlayStation will feature a chip designed by IBM, which has been dubbed "The Cell". The Cell will provide a "much more interactive way of delivering content, including advertising, sports and entertainment such as video," to a wide range of Internet-ready devices, said Jim Kahle, director of broadband processor technology and a research Fellow at IBM.

It has been estimated that the power this chip may offer the PlayStation3 is one trillion calculations per second (technical term teraflop) and that it will be roughly 100 times more powerful than Pentium 4 chip running at 2.5GHz. This is possible because a single chip will contain multiple processing cores and it is this concept that gave it the name 'Cell'.

PlayStation3 will be able to use its broadband Internet connection to draw additional computing power from idle processors across the Internet. If even more power is required, the PlayStation3 can even tap into a home network to enlist support from other available machines. Put simply, Cell allows pieces of a computing task to be distributed among all available processors to harness their combined power.

Of course, while Cell will be a boon for gaming, it offers benefits beyond this arena extending to all areas of entertainment. This can include downloading games from the Internet, tapping into vast networks of movies and music, recording TV shows, and engaging in e-commerce. It also provides Sony, in particular, with some unique

opportunities with its next generation PlayStation and their other entertainment products such as high-definition televisions and digital camcorders.

The development of broadband Internet services is set to change many preconceived notions about console games. At the moment the online video game market is relatively small. Although there are an estimated 90 million people playing video games throughout the world. There are only a few hundred thousand at the moment paying subscriptions to play games like "Uhima-Online" (EA Arts) and "EverQuest" (Sony) on the Internet. Estimates of the growth of the revenue from online video games vary, but it has been forecast that it could be worth \$5 billion in the USA by 2004.

As for far distant gaming devices for video games, Ken Kutaragi has made some interesting predictions on how games consoles could develop. He stated that a brand new CPU is needed - possibly made with protein! Communication between the human body and servers will be a key element in the future of new video games. The development of different media for the games consoles has gone from games cartridges to CD's to DVD's. But the new medium is the Internet. Once you get connected to the Internet, there are no boundaries based on physical constraint. Unlike CDs or DVD's, there's no sense of capacity on the Internet. Network bandwidth (Internet speed) is developing at such a furious pace that that soon the connections between computers on the internet will be quicker than the pathways inside the computers themselves.

It is clear that developments on the Internet and broadband will continue to have a great influence on the development games in the future, and indeed Xbox have already begun to market 'Xbox Live' as a system to enable games players to talk and play online with other games players throughout the world. The "Xbox Live" starter kit includes a one-year subscription to the broadband only service and a head-set that allows players to talk to each other while playing an on-line game. The general manager of Xbox J. Allard explains "with a hard-drive, either net-port and slots for the Xbox communicator built into all controllers, Xbox was designed by Microsoft to facilitate on-line play right out of the box. Moreover, with more than 20 on-line service sites and 270 million monthly users worldwide on the MSN network of internet services, Microsoft has the resources and the experience to lead the way in on-line console gaming."

It is clear that these new developments in linking console games over the Internet will eventually not just be concerned with on-line game playing. It also has the potential as a medium to exchange music for the games and other music related activities like collaborations between different musicians.

"Gestural Interfaces" are another new idea for improving the human-computer interface. In the 1970's the University of Illinois were first to "attempt to capture gestures using a glove, wired up with sensors to detect the orientations of the hand and fingers". The "Dataglove" as it became known was commercially available in 1980 as a product from VPL, one of the pioneer Californian Virtual Reality companies. Mattel later marketed a redesigned version of the- Dataglove, known as the 'PowerGlove' for use with Nintendo video games, using conductive ink and ultrasonic position sensing. Although no longer manufactured, the PowerGlove made quite an impact and is still in widespread use by DIY Virtual Reality enthusiasts.

Shin'ichi Okamoto, Senior Vice President and CTO of Sony Computer Entertainment has talked about the possibility of basing the designs of future PlayStations on biotechnology "with protein".

To prove his point, he talked about conversations with an in-house Sony game developer soon after the launch of the original PlayStation (PSOne). Okamoto asked the developer about future power needs for the PlayStation. The developer replied that the realistic real-time rendering they wanted to do would require 18,000 times more processing power than what was available with the PSOne. Faced with this enormous request, they succeeded in achieving 300 times the power of the PSOne. Further consultations with the developer confirmed that the power needs were escalating constantly. Real-time rendering was almost completed, but genuine world simulation would require something even more powerful that is 1,000 times more powerful than even the PS2 had to offer. The continuing relentless pace of technological change is probably more relevant to the development of video games than perhaps any other branch of the computer industry.

More than twenty five years ago, Gordon Moore, the co-founder of Intel Processors predicted that the number of transistors on a microprocessor would double approximately every eighteen months. This prediction became known as 'Moore's Law' and has generally been surprisingly accurate. However, in the opinion of the many of the researchers and games developers working on the games of the future, they pace of change will actually speed up more than Moore predicted and that 'Moore's Law' is too slow for them.

### **The future of Music in Video Games.**

With such a rapidly changing media as computer games, there is always a concentration on future developments. It is generally thought that the next major improvement in video games will be truly interactive music.

"Rez", a game jointly produced for PlayStation2 and Dreamcast demonstrates the possibility of this approach. In the game the player moves forward along a route shooting enemies and dodging their attacks. The difference in this game is that the slightest movement by the player alters the soundtrack of the game. Each shot fired and enemy destroyed, results in a new musical idea and a visual effect, and by carrying out these actions players create both musical and visual ideas. The high level of interactivity in this game makes it a game which can make music as well as shooting the enemies. Among those involved in the musical soundtrack of this innovative and ground-breaking game include 'Coldcut', Ken Ishii, and 'Oval' who are all well-known in other fields of music production outside the video game industry.

As games become more complex, the music score can also be more interactive and adaptive. The game can involve the player much more if the music reacts to the changing environment and plot of the game.

Improvements in sound production will also have a dramatic effect on the development of video game music. Innovations such as surround sound and 3-D audio positioning will change the game experience in a very positive way. Players using consoles like the Xbox and PlayStation2 are already using their Home Theatre Surround System on most



games. Game players using their PC's are also taking the opportunity to upgrade their systems to include multiple channels and speaker arrangements. The current set-up of a 5.1 speaker system will eventually grow to 6.1 and 7.1. This improvement in sound reproduction can only have a positive impact on the composition of computer game music.

## **Conclusion**

It is clear that computer games both on consoles and personal computers have emerged as a significant part of the leisure related industry sector. From simple beginnings with primitive games, the industry has grown in a very short time to a multi million-dollar business with involvement by the giants of the computer industry like Microsoft and global entertainment corporations like Sony and Nintendo.

As the industry has developed, so the games and the equipment on which to play them have become more powerful, sophisticated, and imaginative. The games no longer just appeal to teenage or younger demographic, but are so designed to appeal to a much wider market base with a higher disposable income. Older game players have been attracted by the high levels of game play after growing up with the early examples of video games.

Further research projects could be carried out in to the widening demographic of computer games. This research could include games aimed at teenage girls and other 'minority' consumer groups.

Another useful area for further research is the development of internal music departments in major computer game companies and their relationship with the mainstream music industry.

Along with the technological improvements to these games, the musical elements within these games has grown in importance and creativity. Many composers have chosen to work in this medium and have become very successful both by gaining a reputation for high quality and by creating a new, highly lucrative branch of the music industry. Although the games sector of the music industry has not yet gained the reputation and prestige of the film music industry, new awards for excellence in games music are beginning to be presented.

The popular music industry has also recognised potential growth in collaborations with games makers. Pop Stars and rock bands have featured in highly popular games and this has given beneficial financial rewards for both partners. Most games now have licensing deals with musicians and their name may be featured on the games outer packaging. It is clear that there are enormous investments being made in research and development in order to satisfy an expanding market of customers who are demanding new levels of creativity and excitement. A vitally important ingredient in these games is a truly interactive music score that combines excitement and relevance to the game with a high level of aural quality. Many games players are now linking their games equipment to stereo systems or home cinema systems to take advantage of this higher level of musical content.

As to the future of sound in tomorrow's game machine, there are at least two developments, which could radically affect the computer games industry. The first is the possibility that a bedroom PlayStation2 Linux programmer could develop a file sharing program. This program could allow users to not only share music but also cracked (illegally copied) games and patches, much in the same way Napster and AudioGalaxy have worked in computer users sharing copyrighted music on the Internet. The music industry is currently failing to control the current rise of these sites on the Internet, and their flouting of intellectual property laws is a major problem for the music industry. The gaming industry will need to prepare for similar problems for their legal departments and could well learn from the experiences of the Music industry.

The other development in computer gaming with considerable potential for growth is the opportunity for game players to actually choose their own soundtrack for any individual game. Future games on the PS3 will not be released as a tangible product, but will only be downloadable. This could lead to the idea of consumers picking and choosing their own soundtrack for the game they are paying for. This can be seen as either a possible area for growth or as a threat to established composers of computer games music and the industry will need to think carefully about their response to this.

It seems clear that the video games industry represents a valuable opportunity to the music industry in order to develop and increase its share in such a successful sector of the home entertainment industry. At a time when record sales are declining globally because of CD piracy and on-line file-sharing, some sections of the music industry are beginning to realise that this is a market with the enormous potential for growth and development.

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