The Impact of Digital Technology upon the Filmmaking Production Process

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Abstract:

The aim of this thesis is to demystify some of the issues surrounding digital filmmaking, and to try to ascertain what impact the technology has had (and is having) upon the filmmaking production process. Ultimately, the aim is to evaluate what impact digital filmmaking has had, and will have, upon cinema as a whole. The study explores the history of changing technologies within cinema, and explores what is meant by the term 'digital revolution'. It subsequently examines the ways that digital impacts upon the practice of filmmaking, as an industry and an art form. Furthermore, it develops what impact digital technology has upon an audiences consumption of cinema, and asks whether it changes our relationship to the cinematic experience. The study concludes upon ways in which cinema can re-establish itself in the digital age, and asks whether the current situation is really any different from the uncertainty of when cinema first began.

Research has been conducted from a number of interviews, journals, websites and textbooks in an attempt to offer a contemporary objective balanced overview of the subject. It must be noted that as the author of this work I have come from a primarily video based background, having completed an undergraduate degree in Television & Video Production at Bournemouth University in 2002. This has motivated my interest in the subject and may have some unconscious level of bias towards the video format, despite all efforts to be objective.

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Introduction

The aim of this thesis is to demystify some of the issues surrounding digital filmmaking, and to try to ascertain what impact the technology has had (and is having) upon the filmmaking production process. Ultimately, the aim is to evaluate what impact digital filmmaking has had, and will have, upon cinema as a whole. It is important to note immediately that there is little or no point in simply cataloguing what digital technology can and cannot do in the summer of 2006. Indeed, by the following year the study will be out of date and irrelevant. The aim of this thesis is to examine the broader implications that digital technology has over previous technologies, and what these implications mean (if anything) for filmmakers, the film industry and audiences.

Most importantly, this thesis seeks to avoid the 'emotional and at times overwrought language brought to bear on the topic within the world of film production' (Kipnis, 1998, 595). It is therefore necessary to clarify and define the terminology that will appear within this study.

Defining the terms

As Kipnis argues that the 'language of crisis, loss and uncertainty is endemic to anything connecting to film these days' (1998, 596), the temptation is to explore and quantify the limits and liberties of digital technologies, creating a definitive summary of what is lost and what remains. However, as Baudry points out:

> If we are to take into account of the imperfections of these instruments, their limitations, by what criteria may these be defined? If, for example, one can speak of a restricted depth of field as a limitation, doesn't this term itself depend on a particular conception of reality for which such a limitation would not exist?

(Baudry, 1970, 287)

Indeed, it is immediately obvious that a limitation to one person is a liberation to someone else, and that the terminology is emotive and hampered by subjectivity itself. The 'crisis, loss and uncertainty' that Kipnis mentions connotes as negative, whereas some may argue that losing some elements of traditional filmmaking is a good thing, and that uncertainty can bring endless possibilities. Also, it is apparent that there is no quantifiable way in which to measure the limits or limitations, no empirical values that can be divided into units. It is therefore very difficult to ascertain the *extent* to which an element is liberating or limiting, and perhaps only possible (and worthwhile) to establish if there is some kind of 'impact' at all.

We can presume that an impact occurs when one element meets another; in this case digital technology enters the filmmaking production process. The scale of this impact or change is difficult to quantify, as mentioned before, but it allows us to proceed without having to define whether an impact is positive or negative, and therefore avoiding emotive connotations.

Perhaps the 'production process' is the easiest to define. It will be considered here to be the collective term for the pre-production, production, post-production, distribution and exhibition of a film. In this instance, the effects of digital technologies will be measured with regard to each of the above elements in turn. Ultimately, we shall explore the natural consequence of the production process – the product – and examine how its consumption is affected by the new digital technologies.

The term 'digital filmmaking' is a lot more problematic; indeed, it could be read as an oxymoron. Arguably we must split the term into two in order to define each separately and adequately.

'Digital' technology stores information electronically in discreet binary digits. The quality of the information is determined by many factors, including the resolution and bit rate as well as the compression ratio that the specific technology uses.

For this reason, digital video (DV) is different from analogue video, as analogue technologies represent changing values as continuously variable quantities. Human vision is arguably an analogue experience because we perceive infinitely smooth gradations of shapes and colours. However, analogue video suffers 'generation loss' when these continuous electronic signals are re-recorded over, and 'ghosting' appears upon pictures. DV reshuffles the binary information upon the tape, so it can be re-used and played back supposedly without a loss in quality. Similarly, the ability to reproduce 'digital clones' is a large advantage that digital video has over analogue video. Most importantly for this study, DV is different from film, which is analogue and celluloid based; the information is not stored magnetically but chemically infused permanently upon the negative.

Therefore, as mentioned earlier, 'digital filmmaking' is a slightly problematic term, as digital film doesn't actually exist. Arguably in this instance the term 'filmmaking' is being used loosely to describe the process of narrative storytelling on screen. In order to be technically correct it should be read as 'video-making', but this is semantic and churlish. As Rabiger points out, we shall call work in either medium 'a

film' to distinguish from the 'music and experimental video products' (1992, 3). Similarly, the term 'filmmaking' should be taken read in the broadest sense, not specifying between documentary and drama.

It is also important to note that digital filmmaking has ramifications that are far more significant than the camera alone. Digital editing for example has changed the process of linear editing into a non-linear process, and editing obviously remains an important part of the filmmaking process. For this reason, all the aspects of digitalisation will be explored throughout the production process, as opposed to just the camera.

Similarly, it could be argued that the much of the terminology connected with new technology already carries connotations – the terms 'progressive' and 'innovative' often imply that superiority over existing technologies. For this reason, the preferred term shall be 'changing technologies', and other terms will be used in specific cases. This is to avoid the 'emotive' language that was mentioned earlier.

Who cares?

The 'digital debate' is currently under much scrutiny within academic film studies and the mainstream media, with neither sector really understanding what the ultimate outcome or impact of digital technologies will be. However, Kipnis argues that 'film studies has been somewhat slow to come to terms with a changing apparatus, or to theorise the shifts in film language and grammar that technological change seems to have so rapidly brought about' (1998, 597). It could be argued that despite technological changes, the filmmaking process has remained constantly akin to the production of narrative storytelling. Therefore, the exploration of such a topic is not

deemed worthwhile (Gomery, 1998, 250). Certainly, many of the storytelling techniques that were relevant to early cinema can still be found today. For example, many of the angles, cuts and montages used within contemporary filmmaking remain the same as when cinema began. Indeed it would be difficult to argue that digital technology actually enables the filmmaker to escape the restrictions of narrative or 'movement of return' (Lyotard, 1973, 352).

> We are speaking not only of the requirement of profitability imposed upon the artist by the producer but also of the formal requirements that artist weighs upon his material. All so-called good form implies the return of sameness, the folding back of diversity upon an identical unity.
>
> (Lyotard, 1973, 352)

Lyotard believes that we must ultimately resort back to our cinematic language of semiotic signals to construct whatever message we may have to our audience, and that it cannot be escaped by the filmmaker. But does that render a discussion about digital technology obsolete? Stam argues that:

> Changing audiovisual technologies dramatically impact virtually all of the perennial issues engaged by film theory: specificity, auteurism, apparatus theory, spectatorship, realism, aesthetics. Just as Umberto Eco suggested in *Focault's Pendulum* that literature would be changed by the existence of word processors, so film, and film theory, will be irrevocably changed by the new media.
>
> (Stam, 2000, 319)

In such a short study it is impossible to encounter the impact of digital technologies upon each of the theoretical elements raised by Stam, but it nevertheless points out the need to explore such a topic. Indeed, as Pramaggiore and Wallis illustrate:

> Aesthetic and cultural concerns in film studies are inextricably tied to industry's structure and technology. Analysis of a film as an art form should not discount its status as an industrial product.
>
> (2005, 397)

It is this intersection between industry and art form that perhaps results in much of the contention within the digital debate, and forms the fundamental cornerstone upon which this thesis is built. It is important to explore these impacts in an attempt to

understand what implications they may have for both the art form and the industry, regardless of whether cinema's connection to narrative remains unchanged. Whilst digital technology may not change cinema's close relation to narrative, it arguably affects *what* stories are being told, *who* is telling them, and *how* they are being told (which perhaps includes *where* they are being told).

Approaching the argument

In order to explore this topic successfully it is necessary to briefly examine the previous approaches that have been used to research technology within cinema. Petrie argues that two distinct approaches emerged regarding technology within academic film studies (1998, 238). The first is the 'great man' theory, based on the premise that a handful of inventors and pioneers developed technology and that technological advances have been creatively led. The second theory involves 'technological determinism', whereby the technology dictates the conditions for creativity (Petrie, 1998, 239). However, as Petrie points out:

> The shortcomings of such approaches lie in their inability to account adequately for why the cinema developed at the times, in the places, and the forms it did; and why certain technologies and techniques were adopted and others rejected in the emergence of the new medium.
>
> (1998, 239)

It is with this criticism in mind that this thesis proposes to explore digital technologies impact upon filmmaking production. Arguably there is a real need to explore how digital has developed in the past, discovering what has been adopted and what has been rejected, and search for reasons why. Some theorists, including Bazin believe in the 'myth of total cinema', whereby the inventors of the medium sought to develop it in ways that created an ever increasing verisimilitude to the 'real' world (Petrie, 1998, 239). Bordwell and Staiger believe that 'technological development can be explained by the operation of one or more of three basic factors

– production efficiency (economy), product differentiation (novelty), and adherence to standards of quality (aesthetic norms)' (Bordwell & Staiger quoted by Petrie, 1998, 241). It is these three parameters that perhaps form a simple model for this thesis to follow, as opposed to determining whether changing technologies bring us closer to a recreation of a 'real world'. Arguably, there are so many caveats and provisos attached to an understanding of a 'real world' that the topic would require a larger study.

Whereas it is unsuitable to become tangled in the subjectivity of limits or liberties, it is useful to assign one or more of the above reasons (economy, novelty, aesthetics) to technological change. After all, things change for a reason and it is the purpose of this study to find why, as opposed to whether the change is good or not.

Having ascertained that there is a need to explore such an area and established parameters as to how the topic can be approached; it is now essential to develop a logical order in which to explore the study.

Chapter One examines the term 'digital revolution', and attempts to find what it actually means. Initially, this chapter will explore the previous technological changes within cinema to examine whether they can teach us anything about the advent of digital technology. Secondly it will broadly develop a brief history of the position that digital has had within film so far; attempting to determine what can be made of the 'digital revolution', if anything at all.

Chapter Two shall focus upon the impact that digital technology has specifically had upon the way that films are *made*, looking into the ways that digital has affected each of the various stages of production. The purpose of this chapter is to ascertain what implications digital has for the people who make films, what impact it has upon the creativity, the budget, the crew and many other elements.

Chapter Three shall focus upon the implications (if any) that the digital technologies will have upon the consumption of cinema; how the audience reacts. As Rosen points out:

> As often as not, when the apparatus is theorized, the writer will have in mind not simply "the cinema machine" in a literal sense (e.g., the basic camera-projector mechanism), but this literal machine in the context of a larger social and/or cultural and/or institutional "machine", for which the former is only a point of convergence of several lines of force of the latter.
>
> (1986, 282)

This chapter will briefly explore the position that cinema takes within modern society as a whole, and ask whether digital technologies have played (or will play) any part in altering that position.

The conclusion will seek to resolve what possible future impacts digital technologies will have in the cinema industry, and attempt to answer the most contentious question of all – is this the end of celluloid film?

Possible pitfalls

Whilst it is not difficult to find research upon this contentious topic, it is worth acknowledging that much of what has been written is often in favour or in defence of digital technology, therefore from a bias perspective and not particularly balanced. One example would be Paul Wheeler, who writes very favourably of digital cinematography yet acknowledges his own bias as a director of photography who has

made the switch from conventional filmmaking and now solely works upon digital. Another pitfall is the contemporary nature of a text. Technology has changed so rapidly that much of what has previously written is no longer relevant, for example Tashiro's exploration of spectator interaction when changing the sides of video-discs is no longer an issue with dual layer DVDs (1991, 360). Wherever possible this study seeks to produced a contemporary balanced argument, primarily by quoting from varied sources, but also by extensively interviewing a variety of practitioners first hand.

Chapter One:

The King is Dead… Long Live The King

Digital – the latest in a line of 'new' cinema technology?

Corliss argues that basically speaking, film practices upon a Hollywood set in 2006 are pretty much the same as they were 100 years ago in D.W. Griffith's day. He argues that very little has changed – there are still dozens of technicians, the film still runs through a mechanical camera and is chemically processed and reproduced before being sent to cinemas (2006, 37). But this is unfair and too simplistic. In the last 100 years cinema has seen the introduction of sound, colour and widescreen to name a few developments. So what changed in the 'digital revolution'? Much has been written and debated over the 'digital revolution', but it is arguably very difficult to determine when it began and ended (if indeed it has) – and more importantly, what has it done? This chapter explores the reasoning behind previous technological changes, and seeks to establish what reason there may be behind a shift to digital.

Technological change and cinema history

Think of the clichés 'things change for a reason' and 'necessity is the mother of invention'. Cinema has had various developments within history and most have come about for a *reason*. It is not the focus of this study to deliver a detailed history of the development of cinema technology but it is necessary to briefly examine what has gone before in the hope that it can tell us something about the position that digital occupies with filmmaking production.

When cinema began, it was perhaps the novelty of the technology that attracted audiences (Petrie, 1998, 238). However, the artistic potential for the new medium certainly developed and stories and narratives began to appear, budding creative

techniques such as montage. The development of sound could be attributed towards the drive for greater verisimilitude as explored in the introduction, but it arguably reinvigorated the sense of novelty amongst an audience, and therefore became an economic bonus as people went to experience the new spectacle. Gomery argues that the introduction of sound was a result of a model of invention, innovation and diffusion. The invention of sound recording had been developed, Warner Bros. and Fox studios saw an opportunity to innovate and combine it with film for spectacle, and other studios picked it up and the technology diffused (Gomery quoted by Petrie, 1998, 240). As Petrie points out, 'at each stage, the overriding concern of the companies concerned was the maximisation of long-term profitability' (1998, 240). It is interesting that development of sound was contentious, as many felt that it did not take the visual art form forward. Indeed, it can be argued that the introduction of sound saw filmmaking regress, returning to the studio from location, and problems were created in the fields of lighting and also film stock (Wollen quoted by Petrie, 1998, 241).

The introduction of colour was equally contentious. Once again, it could be deemed a novelty factor for audiences and therefore a motivation for development. Indeed, it was deemed such a novelty by filmmakers that some believed that the technology impacted upon audience reaction to their films – 'the ideological appeal of colour, it seems, was both as a signifier of spectacle and as a self-conscious celebration of the technology itself' (Petrie, 1998, 240). Indeed, far from being used to heighten the verisimilitude of the 'real' world, colour was almost exclusively used in its infancy for fantasies, animations and musicals, which perhaps dispels the theory that every technological development was made in an attempt to recreate the 'reality'. It is

interesting that at this stage of development, Europe wanted to create other colour stocks and equipment that would disintegrate the hegemony of Technicolor and Hollywood's cultural imperialism (Petrie, 1998, 242). This American – European relationship, as we shall see with digital distribution, is perhaps still a fractious one.

If technological advances had been made at this stage to refresh and renew the novelty for visiting audiences, the creation of widescreen was arguably cinema's attempt to reassert the cinematic experience against the novelty of television. Petrie points out that the Hypergonar lens had been available in the 1920s but it was not until the 1950s that the similar CinemaScope was adopted, once the medium was under threat (1998, 240). This perhaps illustrates that technology is often developed for experimental or aesthetic reasons, but then it is not necessarily adopted or 'rolled-out' until it is economically advantageous or necessary. Once again, this shall be explored later in digital distribution, whereby the technology seems ready but the business model does not.

Whilst television perhaps fought cinema for the attention of viewers, it was arguably a fundamentally different medium and therefore the two co-existed quite successfully. More importantly, the film industry realised that selling their back catalogue of movies to television broadcasters brought an extra revenue stream, and perhaps in turn acted as an advert for the cinema itself. After all, if audiences enjoy watching their favourite stars on the television, they would perhaps be inclined to see their new releases in the cinema so they don't have to wait for it on the small screen.

Perhaps the largest concern for cinema came with the arrival of video recorders. This technology offered one novel difference that had eluded television - *control*. Television was essentially a live broadcast medium, you essentially had to sit in front of it at the time the programme was broadcast in order to see it, much the same as cinema. However, video enabled the audience to record television, watch it at their leisure, collect their favourite shows, and most importantly, skip to their favourite bits by fast-forward and rewind. This interactive element shall be explored in greater depth in Chapter Three, but it interestingly sparked an economic advantage for studios. Once again, they were able to market their back catalogues upon another platform, which saw people buying their favourite films on VHS to watch at their leisure. As Hill illustrates:

> Whereas returns from theatrical release… accounted for nearly 76 percent of studio revenues in 1980, these were only responsible for 32 percent of revenues in 1990. In contrast, revenues from pay-TV rose from 4.8 to 9 percent, while most dramatically, revenues from video increased from 1 to over 45 percent.
>
> (1998, 605)

It can be understood then that the consumption of film was not diminishing, if anything it was improving, but the *way* it was being consumed was changing (this shall be explored in greater detail in Chapter Three). However, VHS was never a competitor to film in terms of aesthetic quality. The US standard of NTSC has only 525 lines of resolution and the European PAL 625. Film roughly converts to 3500 – 4000 lines of resolution. The colour response and contrast upon analogue video has never been as good as film. It is for this reason that video never really offered an alternative to celluloid as an acquisition format for cinema, and therefore it was seen as a domestic (as opposed to professional) format. It is perhaps this questionable aesthetic heraldry that has led to a suspicion towards the validity of digital video within filmmaking circles.

The 'Shared Language'

It is arguably the fundamental differences in the technological make-up of these formats that has led to film and video not having a 'shared language' (especially surrounding aspect ratios), and it has led to video being seen as 'not simply a *different* technology, but a social inferior' (Kipnis, 1998, 599). Kipnis argues that the film industry's aversion to video, and it's relegation to mere technology, is an example of Freud's 'narcissism of small differences', and that much of the audience cannot tell the difference when watching the film on their television screen anyway. (1998, 600).

However, it could be argued that it is not the film industry's aversion, but the *filmmakers'* aversion. After all, studios maximise profits by selling a film many times over for different viewing platforms, cinema, cable and DVD (Pramaggiore & Wallis, 2005, 393). Indeed, with industrial and technological convergence the studios seem to be the greatest beneficiaries of video technology, as they would no longer be operating upon different acquisition formats. Therefore, it is the filmmaker's vision upon video that is being cropped, pan-and-scanned and sped up for commercial breaks (Scorcese, 1995), and perhaps this has resulted in their reluctance to adopt it as a medium to shoot on.

Indeed, in the past they have had good reason not to adopt video. Analogue video had the drawbacks of generation loss, inferior colour response and lack of contrast to name a few (Tashiro, 1991, 355). But digital video, with its constantly improving technology, is gradually eradicating these complaints and leaving filmmakers with no other option other than to resort to illogical emotive language –

> Digital is just too smooth… you have to degrade the image to make it more real. If you take a digital photo and I take one on film, there's just no way you are going to compete with the humanity that I can create from my little Hasselblad. Yours will be smoother, crisper, perfect in every way, and mine will be grainy, but you will definitely grab my picture over the digital one.
>
> (M.Night Shyamalan quoted by Corliss, 2006, 38)

It seems ironic that Shyamalan speaks of degrading an image to make it more 'real'. The theory that technological advancement was based upon achieving greater reality would be bipolar to Shyamalan's argument, and it would arguably be a catalyst for the take-up of digital technology.

Indeed, there have previously been worthier complaints. There are certainly format issues within digital filmmaking; different video standards and frame rates can confuse practitioners as to what is best. Whereas the film industry has worked universally since the 1930's with 35mm and the same sprocket perforations, video has branched into various avenues with different specifications (Wheeler, 2003, 3). Indeed, there is still much confusion over the term High Definition (HD), with different formats all emerging at the same time – HDV, DVCPro HD and HDCAM to name a few. These each have different specifications with regard to CCD chip size, compression ratios and much more. Ultimately, Wheeler believes that video shot progressively (as opposed to interlaced) at 24 frames per second (fps) will result as the industry standard as it emulates existing film technology so closely (2003, 3).

As mentioned in the introduction, Bordwell and Staiger stated that technological advancement was created either for economy, novelty or aesthetic value (quoted by Petrie, 1998, 241). Seemingly the motivation behind digital is to recreate the existing aesthetic value with such fidelity that an audience could not tell the difference.

Therefore, the novelty factor is negated if they are fundamentally being offered the same experience. Using Bordwell and Staiger's theory, the only motivation for digital would be economic. Indeed, this is in keeping with the premise that video now favours the film industry, whom now produce so much material for television that converging video technologies are economically more suitable (Epstein, 2005, 10).

But does an economic motivation benefit all aspects of filmmaking production? Especially if some argue it is at the expense of aesthetics (such as Shyamalan) or delivering no benefits in terms of novelty (as the exhibitors point out.). As we shall see, establishing a global take-up of digital will not be easy or instantaneous. As Neil Connelly, a director of Light House Cinema, recently pointed out at an Access Cinema seminar – it is less of a digital revolution, more of a digital evolution.

Chapter Two:

Thrilled to Bits?

The impact of digital upon the filmmaking production process.

Chapter One concluded that the most obvious reason to shift to digital was economic. It simply saves money, and any business or industry obviously wants to save money. But what about the *art*? The *creativity*? The *craft*? As illustrated in the introduction, we cannot simply read cinema as an industry alone, it must also be regarded as an art form. This chapter explores what impact digital technology has had upon the filmmaker's process of making a film, and examines what reasons there may be for digital to supersede film.

Indeed, even a fervent supporter of digital technology, Paul Wheeler, is predominantly focused upon the economic advantages of digital technology. He argues that all the other advantages with digital are just reinventing the wheel, and doing what film has been doing for decades (2003, xxi). This is perhaps a little exaggerated, as there is other elements with could be deemed beneficial with digital filmmaking, even if they are coincidental by-products of the digital shift, as opposed to the primary reason of development. As mentioned in the introduction, the aim here is not to determine whether the changes are advantageous or not, but to discover what changes there have been and to subsequently establish their consequences.

Pre-production

It is perhaps obvious to point it out, but before a film is even made, digital is being exploited in the form of script software and computer based production packages like Final Draft and Movie Magic. Admittedly, these packages were being used long before digital filmmaking came about, but it is interesting to note that there are some

areas of the filmmaking production process where computers are just accepted as the norm. Presumably this technology was adopted as a result of its convenience; it is easy to edit text (which has perhaps impacted upon creativity) and later versions provide synergy between scheduling and budgeting packages, which arguably saves time. The crucial point is that the word processor enabled new creative ways of working that had not been available before. As we shall see later, that is perhaps the kind of impact that is necessary to spearhead the take-up of a new technology.

One of the manufacturers' primary selling points of digital technology is the affordability of the stock. It cannot be ignored that one of the major factors in the shift to digital is obviously economic – 4 perf 35mm film can cost 32 times as much as HD stock and Super 16mm stock can cost 8.5 times as much (Wheeler, 2003, 11). Obviously Wheeler acknowledges that such a generalist statistic is useless when other variables such as shooting ratios and film stock are not taken into consideration. However, in this study there is no room for a finite breakdown into the various different cost savings of HD, but it can be determined that HD stock is cheaper than film. This may be in part to its physical make-up, after all, film is a silver based medium and its value can fluctuate with silver commodity stocks, whereas video is recorded on silicon, the equivalent of dirt (Kipnis, 1998, 601). However, it is only an economic saving if the shooting ratio remains similar to that of film. Of course, if a filmmaker shoots 8.5 more footage because they are shooting on HD instead of Super 16mm, then the saving is lost. For this reason, preparation in the pre-production is equally as essential as ever before.

Interestingly, Wheeler notes how one producer negotiated a better negative insurance deal with a completion bond company by delivering digital clones of the rushes each day (2003, 12). Wheeler is obviously focusing upon the economic aspect, but from a security perspective, an immediate clone of footage is obviously a change from the occasionally risky process of film processing.

Production

Digital stills cameras offer the ability to capture images and view them instantly, much the same as Polaroid cameras. However, digital is particularly helpful to wardrobe and make-up departments, who can quickly capture many images for reference without relying on an instant (yet expensive and unpredictable) Polaroid still. Whilst the difference in speed is not too different, there are certainly economic and environmental advantages. The reduction in waste may seem minimal on any one shoot but obviously throughout the many productions taking place at any one time the overall effect is important. Take into consideration the environmental implications of all the shooting stock and theatre print stock also, and the reduction in waste is large. Undoubtedly the individual production companies probably had the budget in mind over the environment, but the effect remains the same.

But digital technology has a factor that is not good for the environment. Technical obsolescence arguably renders ten year old cameras practically redundant, similar to computers. Kipnis argues that this has contributed to the reluctance towards digital camera technology, suggesting that studios are wary of investing in technologies that do not have a sustainable 'shelf life' (Kipnis, 1998, 595). However, it is not always the studios bearing the brunt of the rapid technological change, rather the hire companies who must buy wisely to future-proof their business. Ironically, one

current economic disadvantage with HD is the cost of kit hire. Currently, it can cost up to 150% more than a similar 35mm film kit. This may largely as a result of the video assist equipment (Wheeler, 2003, 13), but could also be speculatively attributed to the fact that the hire companies have less time to recoup their investment than they had with a mechanical film camera.

There seems little or no reason to going into the differences between digital camera technology versus traditional camera technology, suffice to say that both are still developing and much of what can be done on one can be done on the other (and in a short space of time the technological landscape will shift and the situation will change again). Some may argue that they feel limited by the technological changes, as they could operate faster with mechanical interfaces as opposed to electronic menus. Indeed, certainly within the realm of digital audio, there have been many developments to re-create a digital controller with an analogue-style interface just to familiarise engineers with the traditional principles and technologies of analogue equipment. Many cinematographers often use traditional film lenses and camera peripherals and simply use digital as an acquisition format. Indeed, many lenses and other traditional camera peripherals are attachable to the new digital technology, and with cameras like the Genesis adopting a 35mm CCD; many of the methods of using them are identical. Whereas before cinematographers could argue that video provided them with less latitude for their art (Kipnis, 1998, 600), much of the differences have been eradicated and many filmmakers are (currently) left with a broad palette of tools from which to choose their preferred method of shooting, dependent on budget, style and circumstances. However, it is worth exploring some

of the fundamental differences between the digital technology and the traditional camera.

Primarily, the digital camera is *electronic* as opposed to *mechanical*. Many of the functions upon digital cameras are performed upon motherboards as opposed to tangible mechanisms. For example, 24P HDCAM systems scan images progressively instead of interlacing them in an attempt to emulate film physically passing the lens. In addition to this, the imaging chips also switch off in between the image being received and subsequently read out for recording, which creates a motion blur similar to film, and one that the human eye has arguably become accustomed to perceiving as close to the original action (Wheeler, 2003, 3). This technology, combined with the other Video Tape Recorder (VTR) elements, such as helical scan tape heads and scanning drums, are, as Wheeler describes, 'not quite as robust as we might wish it be' (2003, 138). But, as Wheeler also points out, when treated with respect 'the VTR will give years of unfaltering service' (2003, 138). But, even when treated with respect, the video camera is susceptible to a few faults that cannot readily be fixed in the field. For example, dead pixels can occur through no fault of the operator and can be costly to repair and not immediately serviceable. Similarly, even though many digital cameras can handle the weather elements as effectively as a film camera, many of the peripherals can be susceptible to extreme conditions. For example, batteries in cold weather can run down quickly and BNC cables can become brittle (Wheeler, 2003, 97). These factors may seem churlish to point out, but if a shoot has to stop due to a mechanical error that cannot be immediately remedied, costs start spiralling and producers get worried.

There are other obvious technical differences between the digital technology and traditional film equipment such as video playback and the ability to clone rushes to name a few. But arguably there are more fundamental differences that impact upon creativity that warrants greater attention in such a short study.

Some filmmakers argue that have more flexibility and control over their projects with digital technology. Robert Rodriguez for example:

> Writes, directs, shoots, cuts and scores his own movies as well as supervises the special effects, doing it all at his home ranch on the Pedernales River and at a small Austin, Texas, studio. Using high-definition cameras, he shot his Sin City actors against a green screen, filling in the backgrounds digitally, and rarely went beyond a second or third take.
>
> (Corliss, 2006, 38)

And, although another digital pioneer, George Lucas, employs the same size crew on his digital 'Star Wars' films as he did on his celluloid ones, Rodriguez operates on a tiny tight crew. Wheeler does not believe digital video should diminish the size of the crew, but simply alter their roles - apparently Focus Puller and Clapper Loader are now First Assistant Cameraperson and Second Assistant Cameraperson respectively (2003, 38). Wheeler argues that choosing crew size upon format decisions is foolish, as it is picture quality that determines crew size (2003, 37). But it would be difficult to argue that the picture quality upon 'Sin City' (Rodriguez & Miller, 2005) was not up to a suitable standard. Perhaps most practitioners believe that in the same way the technology is emulating the existing technologies, the crew structure must be similar also. Perhaps it is a case of 'status anxiety', a consequence of feeling that their jobs are under threat by the computerisation of technology (De Botton, 2004, 101). Kipnis uses the example of Kodak, who at the time of her study had made 17,000 employees in the US and 30,000 abroad unemployed since the mid-eighties. She argues furthermore, that it has impacted upon the town of Rochcester,

NY, where Kodak's presence was a large boost to the local economy. After the redundancies, it affected all cultural elements of the area and created a social vacuum (1996, 596). Such statistics will obviously concern practitioners in other areas of filmmaking production, who perhaps see Rodriguez's 'small crew' approach as the beginning of the end for their separate crafts.

However, as argued in the introduction, the unemployment of people cannot just be seen as negative. Can it not be determined as a positive element if it enables different filmmakers the opportunity to go out and 'fly solo'? Indeed, the focus of this thesis has so far been upon how Hollywood studios have been impacted by digital technology, but this perhaps bypasses the most interesting development that digital technology has brought upon the filmmaking production process – the independent 'guerrilla filmmaker'.

So far it seems that Bordwell and Staiger's model for demonstrating why technological change occurs may only offer digital an economic advantage over film as opposed to a novelty or aesthetic advantage. But 'guerrilla filmmakers' are exploiting this economic advantage to produce their own films independently, which is arguably offering a novel and aesthetic difference to audiences. The cheaper stock and availability of digital video cameras has afforded opportunities to new or marginal filmmakers, with unconventional narratives or storylines, who would not be able to convince major studios to fund their projects. These 'guerrilla filmmakers' use digital to their advantage; to shoot, and edit their films in a fashion that truly alters the process of traditional filmmaking.

One example would be Perry Ogden, who recently directed 'Pavee Lackeen: The Traveller Girl' (2005), an unconventional story the contentious topic of travellers within Ireland. He shot the film upon the 'prosumer' Sony PD150 camera and used digital technology to his advantage in the following various ways:

- He shot mostly improvised footage upon 130 hours of MiniDV, a shooting ratio of just under 90:1 - this would be extremely expensive to achieve on film and probably would not be afforded to a project of limited commercial appeal.

- He shot in long takes, which could not be achieved with conventional magazines of film.

- He shot the film over a period of nine months intermittently. Arguably most studios would want to employ staff for a fixed period and then release them contractually to avoid scheduling problems.

A by-product of Ogden's decision to shoot on DV was that it offered an aesthetic decomposition to the image, caused by MiniDV's lack of resolution. However, Ogden insists that this is in no means accidental and had been inspired by Anthony Dod Mantle's work upon many of the Dogme films. Indeed, Mantle's decision to shoot 'Festen' (Vinterberg, 1998) upon single CCD handicams was not influenced by budget but by aesthetics. Mantle felt that the deteriorated picture quality was symbolic of the deterioration within the family in 'Festen' (Kelly, 2000, 99). Obviously it is not as if film stock could not be deteriorated visually, so it is not a particular advantage that video has over film. Nevertheless, it illustrates that video can have an aesthetic quality of it's own, and be advantageous to cinematographers who wish to use it for creative intentions.

Arguably, much of the success attached to the Dogme was probably novelty, and it eventually diminished. But arguably a new novelty has emerged in the form of a resurgent documentary genre. Arguably many documentaries have recently taken greater advantage of the benefits of DV than drama. Obvious box offices successes have included 'Super Size Me' (Spurlock, 2004) and 'Spellbound' (Blitz, 2002), but perhaps it is the recent plethora of Iraq war documentaries such as 'Gunner Palace' (Epperlien & Tucker, 2004), 'Occupation: Dreamland' (Olds & Scott, 2005), 'Iraq In Fragments' (Longley, 2006) and 'The Blood of my Brother' (Berends, 2005) that illustrate the true versatility of a format that is compact and capable of shooting quickly and in difficult locations. Indeed, these are just some -

> of several remarkable feature-length documentaries to have sprung forth from the efforts of intrepid film-makers who shot digital video, with great patience and bravery, in those fleeting months during which it was possible to follow ordinary Iraqis through their own country.
>
> (Economist Magazine, July 13th 2006)

Whilst these examples do not satisfactorily dismiss Gomery's assertion that 'the process of moviemaking has remained constant because of the underlying ideology of narrative production has remained unchanged' (1998, 250), many undoubtedly would not have been made without the benefits of digital technology. So arguably, even if digital doesn't change the fact that cinema is still linked to narrative, the digital technology does impact upon *what* stories are being told, *who* is telling the story and most importantly, *how* they are being made. As Stam's quote in the introduction illustrated, there is certainly a debate to be explored over what impact this approach has upon the notion of the 'auteur theory' within film studies, and also the democratization of filmmaking, but within such a small study, it can sadly not be explored here.

Post – production

Whereas digital cameras are perhaps emulating their celluloid counterparts, digital non-linear editing offered a completely new concept to the way images could be cut together, in much the same way that text can be cut and pasted in electronic word processors. It was perhaps for this reason that post-production was one of the first areas of the film industry to really embrace digital technology in the form of computerised non-linear editing. Admittedly, the decision to develop this technology was perhaps partially motivated by the economic, in that it was not exactly cost effective to edit traditionally, but there were other advantages that could be exploited with non-linear technology.

Most obviously, it has impacted on the creative control it gives filmmakers in that various sequences can be cut and re-cut effortlessly with non-destructive editing packages, and no film stock is being damaged whilst the edit is taking place. Indeed, as the name suggests, non-linear editing brought about a way of constructing edits in a non-sequential fashion. Interestingly, whilst we may think of a narrative as linear (start, middle, end), the introduction of a 'timeline' meant that sections could be skipped and returned to later.

But digital technology within post has not stopped with non-linear editing. Perhaps one of the largest continuous impacts that digital technology has had within cinema within the last fifteen years has been Computer Generated Image (CGI) effects and animation. In Corliss' recent article about digital technology, Steven Spielberg is quoted as saying that the advantage of CGI is that directors can now follow what their imagination tells them. As Corliss shrewdly points out, these CGI effects sell

tickets at the box office (2006, 41). Perhaps this technological development would belong under all three of Bordwell and Staiger's reasons for change – CGI's novelty is successful at the box office (which in turn is economic) and it is aesthetically empowering to the director. However, novelty is short lived, and the demand to constantly improve the effects means that CGI prices drop approximately 90% every five years (Schoenfeld, 2004, 31), which illustrates the rapidly moving growth in the technology of post-production.

Once again, the focus of this post-production analysis has so far has been upon major Hollywood productions, but the one result of these constantly improving, affordable editing packages is that low-budget filmmakers can now edit themselves without the cost of an expensive post-house. For example, Ogden took the rushes of 'Pavee Lackeen' home at the end of each day and provisionally cut scenes upon a home computer to see what he needed for the next shoot. With film, the dailies would need to be sent off and processed before the production team could view them. Even then, the celluloid would need to be transferred to tape before the director could begin non-linear editing.

It is this speed and convenience that gives digital a distinct advantage over analogue technologies, especially in a world where *time* can be viewed as a commodity. Even a personal digital stills camera is seen as more of an advantage over a traditional camera as it enables users to see their photographs instantly, and shoot many more without the limitation of the cost of negatives, and then not having to wait for their expensive prints to be returned. DVDs allow users to skip around a movie without

having to fast forward or rewind through tape. This shall be explored further in Chapter Three.

However, there is one current fundamental problem with producing video that affects just *whom* gets to *see* your movie – the expensive process of telecine transfer. Although it is relatively easy to stay within the 'digital domain' throughout pre-production, production and editing, when it comes to getting your film seen by a wide audience, you currently need a 35mm print.

The telecine process is where video is transferred onto film or vice versa. It is not the remit of this thesis to explore the intricacies of the process here, but it is fair to say that the process is not cheap, largely as a result of the two mediums not 'sharing the same language' as Kipnis mentioned earlier, and much technological wizardry takes place to calibrate the contrasts, frame speeds and other differences. This process takes place because currently films are distributed to cinemas upon celluloid prints for projection. Although, as we shall see, that may well look set to change as well.

Digital Distribution

It is difficult to divide up the roles of digital distribution and digital exhibition, as the two elements are perhaps so closely intertwined on some issues – such as security. But for the sake of this study, it shall be considered that the distribution shall focus upon the elements of bringing the picture to the screen, whereas the digital exhibition will focus upon the aesthetic implications of digital projection. There may, however, be some overlap between the two sections, which is sadly an unavoidable consequence of one element in a chain affecting the next. It is fair to say that it is these two areas that are the most contentious within the current digital debate.

Whereas digital cinematography has emerged with the 'Star Wars' trilogy, 'Sin City', 'Superman Returns' et al, digital distribution is arguably still in its infancy.

Pramaggiore & Wallis believe that 'digital technologies and the convergence of communication and information technologies promise to play an important role in marketing and exhibition' (2005, 392), but as yet it remains a broken promise. The main areas that are stalling the roll out of digital distribution (and subsequently digital exhibition) are, in no particular order:

- finding a universal format,

- security against piracy,

- who pays for it.

If we take a look at each of these issues in turn, we can explore what impact digital technology looks set to have upon the cinema industry, whenever (and if ever) it comes about.

Finding a universal format: Currently, the technology to manage digital distribution is available, but not in one unified format. As the threat of technical obsolescence perhaps worries cinemas, very few have committed to digital distribution and exhibition. Currently, QuVis, MPEG, XTC and Doremi formats are all fighting to be the industry norm. There is a push for one unified platform led by Digital Cinema Initiatives (DCI), a consortium of the major Hollywood studios. Their belief is that one format (titled MXF and JPEG2000) will enable global compatibility and will be the digital lingua franca, and perform much the same as 35mm film does today. Perhaps this will lead to the US continuing their dominance of world cinema, as they arguably get to develop and dictate what the 'global format' will be. Kevin

Cummins, Director of Operations at Digital Cinema Limited, pointed out in a recent Access Cinema seminar that in Europe we are 'typically European – we don't want to accept the DCI standard, we want to come up with one of our own'.

Security against piracy: Piracy is a major concern for studios as it arguably undermines their asset of copyright upon a movie. Digital technology is perhaps considered to have lead to the prolific rise in piracy as one of the major benefits of digital is creating clones fairly easily at very little loss in quality. Obviously, if a digital copy could be intercepted between the distributor and the exhibitor then it would be practically ready-made for rapid duplication and instant piracy. Kevin Cummins (director of a company developing the new technology) argues 'we use the same encryption policy as Wall Street and all the banks. It's a 1024-bit encryption procedure, and if criminals break that they'll be going after the banks, they won't be going after your cinema content'. Perhaps studios will be seeking a more positive approach before they commit to such a venture, after all, criminals are enterprising enough to probably rob the bank *and* the cinema. Corporations do not want them to rob anything from anywhere. So, similarly to banks and their cash, digitally distributed films are going to be delivered with a 'watermark' so that pirated copies can be traced back to a unique source.

Who pays for it: Perhaps the most contentious issue comes back to Bordwell and Staiger's assertion that technological change occurs for economic, aesthetic or novelty value. The aesthetic and novelty value shall be explored later under digital exhibition, but the economic argument perhaps belongs somewhere in between distribution and exhibition. Who pays? The distributor or the exhibitor?

Exhibitors argue that it should be the distributors, after all, they benefit from the economic advantage of not having to produce physical print copies. Distributors argue that the largest cost (the projector) should be the cinemas' responsibility, as projection does not traditionally fall in the distributors' remit. As yet, a business model is yet to be devised that will see digital successfully rolled out, and for a few transitional years it is expected to operate in tandem with 35mm.

Throughout this chapter we have explored the implications for both major studios and the smaller independent filmmaker. So what impact does digital technology have upon the distribution of the small independent film? As mentioned earlier, without a 35mm print, it is currently very difficult to get their film seen by an audience. But will this change with digital distribution?

It is unlikely, as there will obviously be an economic pressure to recoup the investment of expensive projectors, and blockbusters will be needed more than ever. The DCI compliance will no doubt place expensive technical requirements upon filmmakers and with the eventual advent of 4k projectors, a DVD quality copy will not hold up to the image resolution. Even if the independent production were up to a suitable technical specification, there would perhaps need to be a decent press and advertising budget before a cinema would be interested in taking it on.

> You may see a whole band of new young filmmakers working in their locality, going to their local cinema, trying to do more DIY distribution by just having a digital copy and taking it round… But there is a reason why people…. like me as a film distributor exist and that's to try and persuade the audience to go and see it in the first place.
>
> (Edward Fletcher – Access Cinema Seminar 2006)

Indeed, perhaps marginal filmmakers would find greater success in electronic cinema (e-cinema), as opposed to digital cinema (d-cinema). These two terms are often used interchangeably and the difference is somewhat semantic. However, e-cinema is the broader term can also include 'alternative content', such as the projection of live sports events and independent productions as opposed to d-cinema, which is fixed upon showing solely films. There is little technological difference other than e-cinema is arguably lower quality (thus not DCI compliant) and the focus has been upon audience accessibility rather than security. The lower cost and lower quality seems to have appealed to some cinemas around Europe, who see it as a good way of getting exposure for specialist documentaries and independent filmmakers. There is little point in speculating here, but it will be interesting to see whether this leads to a diffraction of cinema, with alternative theatres emerging to cater for marginal audiences.

Digital Projection

The arguments for and against digital projection are similar to those that have been waged over the digital video camera – this one works fine so why change? There are certainly emotive and aesthetic arguments but the primary reasons that it has not been rolled out sooner, as we saw earlier, has been the lack of an economically sound business model and the concern over format and piracy.

The belief is that 2k projection (2000 pixels per square inch) is as good as film, and better when you consider the degradation in print quality when celluloid is scratched or dirty. The arrival of 4k projection (4000 pixels per square inch) will arguably end any aesthetic element about resolution, but some objections will still be made about its lack of 'look' and 'aura'.

> Importantly, the interruptive character of film projection, in which a shutter obscures advancing film frames to create the illusion of movement, has been shown in scientific studies to be an important agent in relaxing viewers and facilitating suspension of disbelief… [Digital projection] doesn't have these characteristics. The image is made up of picture elements arranged in a grid-like structure, and there is no interruptive shutter'.
>
> (Guckian, 2006, 14)

Wheeler does not disagree, recognising that that even an improved image quality would not match the current audience expectation and therefore would be unacceptable. But, Wheeler believes the same film effect can be achieved by shooting progressively at 24fps and at a shutter setting of $1/48^{th}$ of a second, which is indiscernible from film. Therefore, it could be argued that for us as an audience, the impact of digital projection should be unnoticeable. Cinematographers will no doubt be concerned that they need a calibrated shutter setting of $1/48^{th}$ of a second, but Wheeler is pointing out what can be done 'in-camera' upon location, and an editor would possibly argue that it can 'be done in post'.

The concern for exhibitors is that audience figures have slumped by 13% in the last three years, and research does not suggest that digital projection would spark an audience revival (Corliss, 2006, 40). It is reason that cinema chains do not believe digital projection is an economically sound investment. If economics is indeed a driver for the digital revolution, the cinemas themselves have no incentive and therefore no reason to change.

Summary

As we have seen, there are certainly creative, social and environmental impacts from the changing technology, albeit if they are by-products of an economic drive. But if motivations are economic, the suggestion that audiences and revenue are down does not bode well. Having explored what impact these digital technologies have had

upon the filmmaker, we must now explore what impact they are having upon the audience, and in turn, cinema as a social and cultural event.

Chapter Three:

Reality Bytes.

Digital technology and its impact upon cinema as we know it.

So far, the focus of this thesis has been fixed largely upon the filmmaking production process from the film industry's perspective; how digital has impacted upon the practitioners as a collective whole. However, there is one fundamental element that must not be overlooked – consumption. If we subscribe to the notion that there is a production process, we must logically conclude that this process results in a *product*; and furthermore, that these *products* are *produced* for consumption. We, the audience, are the consumers. Therefore, the focus of this chapter is to explore what impact these digital technologies have upon our lives as consumers of cinema.

It could be argued, ironically, that it is digital technology itself that has lead to the greater economic push for digital within film production. Whilst the number of cinema screens in the UK in 2002 and 2003 grew by 2.4%, admissions fell by 5.1% (Allison, 2006, 81), and DVD sales and rentals have grown, with the primary UK DVD rental website Lovefilm seeing 530% increase in business last year. Is it therefore, that the greatest impact that digital technology has had upon the filmmaking production process, are the Digital Versatile Disc and the Internet?

The DVD

The technological development of the DVD fulfils all of Bordwell and Staiger's three factors of being advantageously economic, novel and aesthetic. As explored in Chapter One, the arrival of video initially concerned cinema, but the film industry soon saw it as a format that could be exploited to bring in a new revenue stream. The same could be said of DVDs, which have greater consumer appeal as they do not

deteriorate in aesthetic quality (unlike VHS) and they offer many other novel features, such as extras and chapters. Importantly, there has been an increase in the availability and affordability of domestic 5.1 sound systems and larger, high definition screens. Is it 'home cinema' that is creating a decline in conventional 'cinema' audiences, and forcing the film industry to turn to the economic benefits of digital?

Laura Mulvey argues that:

> Even on an intermediate level, as carriers, video and DVD keep the old cinema alive. More and more people, beyond the world of buffs and cinephiles, are taken into it's history – perhaps most especially in the case of the DVD, as commentaries, interviews and documentation expand the consumption of film from its traditional format into a new context of knowledge and critical self-awareness.
>
> (2006, 147)

It is true that audiences obviously have not become bored of watching films, as DVD sales illustrate, but they have perhaps become bored of the novelty of watching them in a cinema. Perhaps consumers prefer the tangible benefit of *owning* the DVD as opposed to *watching* the film, especially when the price of a DVD can compete with a couple of cinema tickets. But is that not a completely different experience?

Tashiro uses Walter Benjamin's argument that an original work of art has an 'aura' and a uniqueness that is created by its status as an object. He argues that in the case of cinema, it is not the film itself that creates the 'aura', but the space in which it is received – the cinema. Perhaps the 'aura' is derived from our inability to control the film in this environment (1996, 115).

> If we are to speak of the "aura" of a cinematic text, it cannot be dissociated from the *context* in which it is received. This context includes the theatre, sound system, particular audiences and, finally, individual viewers.
>
> (Tashiro, 1996, 115)

But surely contemporary audiences do not feel so compelled by the 'aura' of cinema otherwise the revenues would not be falling? Perhaps the mystic 'aura', or emotional impact, of a cinema is being destroyed by the queue for the expensive ticket and popcorn, watching twenty minutes of adverts and then tolerating the coughs and giggles in the auditorium. Maybe we, the audience, have changed. Time is now a commodity. We don't want to queue for tickets so we order them over the phone. We want to watch the film when it is convenient for us, so we head for a multiplex that starts the same movie every half hour on four different screens. We leave the house late because we don't want to sit through twenty minutes of adverts. And then, the experience of watching a film over which we have no control, no way of skipping through the boring bits? Perhaps with the advent of digital technology offering us control within our daily lives the expectations of the cinema audience have changed.

> Who, after becoming used to the flexibility of home video, has not wanted to fast-forward past bits of a boring or offensive theatrical film? Doesn't this desire suggest a transformation of the cinematic experience by home video? What we once might have endured, we now resent. Hollywood continues to offer plodding, linear narratives wilted with halfhearted humanism as the staple of its production. But doesn't our itchy, reflexive reaching for the remote control suggest a complete *saturation* by classical narrative?
>
> (Tashiro, 1991, 367)

Tashiro makes two fundamental points in this assertion:

- it is audience's boredom with narrative that is damaging cinema revenues.

- changing technologies have altered our response to the cinematic experience.

The first point shall be dealt with in greater detail later in this chapter, but whilst we are exploring the issue of DVDs, let us examine the ways in which changing technologies have altered our response to the cinematic experience.

Firstly, think of the time (*now a commodity*) that we spend in front of screens. We sit all day at our computer at work. Then some people play upon a PlayStation Portable (PSP) on the bus back home. Once home we watch a little bit of television before checking the Internet for personal emails. Then a friend may call on the videophone and asks if you want to go to the cinema to watch something. Haven't we seen enough already?

Secondly, think of the *time* that the DVD saves us. No queuing, no twenty minutes of adverts. We can even skip through the boring bits, without having to spend time fast forwarding or rewinding. 'The significance of chapters is that viewers are beginning to think in these terms, to feel *in control* of a film's tedium.' (Tashiro, 1991, 360). Perhaps we are now thinking of films in a similar fashion to that of albums, whereby we skip to our favourite parts and enjoy them again and again, but leave other boring bits out. 'Digital manipulation thus restores the possibility of the consumer and viewer as a *creator*, someone who not only receives and constructs the text in his or her head, but who breaks it down and re-builds it to personal needs and desires' (Tashiro, 1996, 116). Indeed, this has even greater implications -

> A movie's linearity, its apparent dependence on a horizontal narrative structure, can mutate. As sequences are skipped or repeated, different heirachies of priveledge are brought into being. In digression from the storyline, detail can become as, or more, significant than the chain of meaning invested in cause and effect.
>
> (Mulvey, 2004, 146)

This is arguably the opposite of Lyotard and Gomery's argument in the introduction. Their assertions were than despite digital technology, film was still remained constantly linked to narrative. Yet Mulvey and Tashiro suggest that digital has afforded us the control of the images, and that we can use them to fulfil our own wants. Play separate sequences in the order that we choose. 'It is because they offer

each viewer the possibility of becoming a producer that digital technologies can be spoken of as creative tools' (Tashiro, 1996, 117). This is indeed a big impact of digital technology, and one that surely requires a restructuring into how we understand our consumption of cinema. 'Digital technology isn't … simply shifting the viewing practices of audiences. It's also changing a culture's ideas about movies and stories and their place in everyday life' (Pramaggiore & Wallis, 2005, 396).

So is the experience of the cinematic 'aura' becoming lost? Tashiro argues that DVDs attempt to provide a different 'aura' through their expensive packaging and 'special edition' versions (1996, 115). As he goes on to point out,

> By offering the possibility of control, and by shifting the emphasis from time to space, from experience to object, it opened the door to the further manipulations of digital technology. The special, public, "sacred" character of watching a film has been transformed from an all-encompassing, engulfing process, to an occasionally interesting one subjected to the stop and go realities of daily life.
>
> (Tashiro, 1996, 116)

Indeed, the element of control can be taken further. Whereas DVDs afford us the pleasure of controlling the *way* in which we watch things, they, combined with the Internet, now offer us control over *what* we watch. As Tashiro pointed out earlier, if audiences are bored with the narratives that are presented to them in cinemas, the Internet and DVDs can offer an exciting alternative.

The Internet and the Long Tail

The arrival of the Internet, unlike video, does not seem to have opened up many new economic opportunities to the larger studios. They certainly have another platform for marketing, and the telecommunications advancement will be the catalyst for digital distribution, but it does not offer a real advantage to them, especially in balance of its disadvantages.

Primarily, the Internet is another contender for people's leisure time. Another screen to sit at instead of cinema. Secondly, it has enhanced the volume of piracy with their material. After all, the liberty of digital cloning brings about the limitation of digital piracy. Thirdly, it offers opportunities for other smaller independents to compete with them for audience attention.

> The emerging digital entertainment industry is going to be radically different to today's mass market. If the 20th century entertainment industry was about hits, the 21st will equally be about misses. For too long we've been suffering the tyranny of lowest-common-denominator fare, subjected to brain-dead summer blockbusters and manufactured pop. Why? Economics. Many of our assumptions about popular taste are actually artefacts of poor supply-and-demand matching – a market response to inefficient distribution.
>
> (Anderson, 2004)

Essentially, the film industry has perhaps not managed to harness the potential of the Internet in the same way they harnessed the potential of television, VHS and DVD. Admittedly, many film companies are benefiting from investing or merging with Internet companies, but they are not seeing good figures on their film revenues. Time Warner for example, are the parent company of Internet provider AOL. In their first quarter financial report of 2006 they reported that their film divisions of Warner Bros. Entertainment and New Line Cinema had seen an 8% decrease in revenue (although it still brought in $2.8billion, whilst Time Warner Cable only brought in $2.6billion despite the a 15% rise in revenue - proving that the film industry is still a lucrative market, despite all the talk of crisis).

However, whereas before there was arguably a marginal sector within the film industry market that was made up of independent releases, there is now a large element of independent companies shooting their own material and distributing it via

the Internet, and generating revenue from it. This has become known as the 'long tail'.

Anderson argues that the physical world puts two limitations upon our media entertainment – the need to find local audiences and the constraints of broadcast technology (screen time, bandwidth etc) (Anderson, 2004). The way the 'long tail' works is simple. Online Internet companies like Amazon, iTunes & Netflix have built a huge market upon stocking material that doesn't make it into the mainstream shopping mall. Not limited by the locality and size of a shop space, these companies can afford to keep marginal products that may not sell in quite the same bulk as a 'hit' movie. But as they sell many of the so-called 'misses', they find the money adds up to be more profitable than the 'hits'. As Anderson points out, 'popularity no longer has a monopoly over profitability' (2004). He gives the example that an average Blockbuster store has fewer than 3000 titles, yet a fifth of Netflix online rentals are outside its top 3000 titles (Anderson, 2004).

Anderson argues that there are three rules to the new entertainment economy:

- make everything available,
- cut the price in half and then lower it,
- help audiences find the product.

Make everything available: Anderson finds a parallel between these online rental companies and the boost in the documentary filmmaking market, as it is providing a way for the film to find their audience. On the whole the documentaries are not large enough 'unit shifters' to wanted inches on the shelves of local video rental stores. As the Internet is not limited by locality, the online sites can aggregate customers from

wherever in the world, and make these documentaries available to a collectively large market. He illustrates how half of the US rental revenue for Capturing the Freidmans (Jarecki, 2003) was made by Netflix alone (Anderson, 2004). Another example that Anderson gives of distribution's failure in the US is that of Bollywood movies. India produces over 800 movies a year and yet one of the most successful Hindi language films, Lagann: Once Upon A Time In India (Gowaricker, 2001) opened on just two screens, despite a population of approximately 1.7million Indians in the US. That is quite a large target audience for a market to exploit.

Cut the price in half and then lower it: In the case of audiences eventually downloading movies as opposed to renting physical DVDs, Anderson believes the prices should drop much the same as music should do. Currently music online sells roughly for the same prices as physical CDs, arguably to prevent channel conflict – i.e. putting their shops out of business. But eventually the economics suggest that by making a product cheaper people buy more. It also perhaps closes the gap upon the need to pirate material if you can buy a legitimate copy cheaply (Anderson, 2004). On-line music store Rhapsody recently held an experiment to sell songs for 49c as opposed to 99c. They sold three times as much.

Help audiences find the product: Having a large collection of 'misses' doesn't work by itself. The term the 'long tail' comes from the fact that it is behind the body of the mainstream. The way the process works is that a consumer visits Amazon to buy a film, and the site offers them a recommendation of other products that they may like, based upon the similar purchases of other shoppers. Now, the consumer may be interested in other titles, but it is usually a mainstream product that brought them to

the site in the first place, so therefore, there is still an obvious need for a mainstream (Anderson, 2004).

> The advantages are spread widely. For the entertainment industry itself, recommendations are a remarkably efficient form of marketing, allowing smaller firms and less mainstream music to find an audience. For consumers, the improved signal to noise ratio that comes from following a good recommendation encourages exploration and can reawaken a passion for music and film, potentially creating a far larger entertainment market overall. (The average Netflix customer rents seven DVDs a month, three times the rate at brick and mortar stores.) And the cultural benefit of this is much more diversity, reversing the blanding effects of a century of distribution scarcity and ending the tyranny of the hit.
>
> (Anderson, 2004)

It certainly seems that as consumers we are becoming empowered with choices and trade-offs. What do you want? Cinematic experience? Then go to a cinema, but the choice of films may not be very good. You want choice? Go online, and you can order a DVD, but you won't have the cinematic experience and you'll have to wait for it to arrive. You want speed and choice? Download something, but the quality will be questionable and you won't have the 'aura' of either the cinematic experience or the collector's edition box set.

Indeed, downloading seems to offer an extension of Tashiro's observations upon audience control. When downloading an .mov or .avi file, the user is given a scroll bar along the bottom of the image which is the equivalent to the timeline in non-linear editing. Now, unlike DVD's, where you must either skip via chapters or fast-forward, you can now drag your mouse to where you want to watch – and it goes there instantly. Furthermore, with the growth of sites such as blip.tv, youtube and myspace, videos are being shared and swapped between users more and more. People are (illegally) taking their favourite moments from films and embedding them upon their personal websites, which is a completely different way of consuming the

film text than originally intended, which in turn suggests that the changing technologies *do* take the film away from its connection with narrative.

However, one impact of these changing technologies is that it largely benefits the 'technology rich' over the 'technology poor'. This terminology is perhaps an unfair divide. After all, the terms 'rich' and 'poor' suggest that there is a *value* at stake. As mentioned in the introduction, we can place no empirical value upon these impacts. One could argue that we could try to determine what impact these technologies have upon our quality of life, but once again, it is a subjective perspective. Indeed, those of us who are 'technology rich' perhaps feel empowered to have more choice, but we are only empowered as *consumers*. We have a choice over what media we consume, as long as we keep consuming. To maintain the feeling of empowerment we must have the latest computer hardware and software, the latest playback format, the extra-special commemorative collector's edition with more discs of extras and a small book of postcards. With the changing technologies you can have whatever you want, when you want it, but do you *need* it?

Indeed, the exciting factor that comes into consideration with the Internet is that, without being limited by physicality, you can search for whatever you want in the whole world. Except, in the same way that Hollywood dominates world cinema, it could be said that the 'democratic' medium of the Internet largely benefits an English speaking audience, and fast connection speeds and superior communication infrastructures are only really available to the developed world. The *choices* that you have are perhaps largely made up of our cultural imperialist products. Arguably, Third World countries working upon dial up modems do not share the same

opportunities to explore the creative communication possibilities. Does this mean that the shift in the way audiences consume media is only available to the developed world, and that the 'technology rich' and 'technology poor' becomes the 'information rich/information poor' – cementing our perception that the third world is in some way less educated and somehow inferior to our more sophisticated way of life? Does this global village really offer us all the opportunity to communicate, and more importantly, *trade*? It seems not. The earlier assertion that digital technologies impact upon *what* stories are being told, *who* is telling the story and *how* they are being made, should now include the caveat: as long as you can afford and have access to digital technology. Interestingly, of the earlier films mentioned that are being made in Iraq, not many Iraqi's are making them.

Even within our own society it is believed that we are creating a 'technology literate' and 'technology illiterate' divide between those who can operate changing technologies more effectively than others. 'Illiteracy' suggests that some people are in some way disadvantaged or inadequate, and the term perhaps acts as a catalyst for anxiety amongst people who prefer a life without the dominance of technology.

Summary

So, when exploring the ways that these changing technologies have impacted upon 'cinema' as we know it, we must conclude that they are ultimately perpetuating an interest and consumption in film, but not in the ritual of conventional cinema attendance.

Perhaps this means that we should seek to re-define 'cinema'. Indeed, as Gripsrud points out, 'when the hundredth anniversary of cinema was celebrated in 1995,

"cinema" was defined as a screening of moving images for a paying audience' (1998, 202). This then surely, would include pay-per-view audiences, renters and purchasers of DVDs and (legitimate paying) downloaders?

Perhaps 'home cinema' is the new cinema. After all, it is these different modes of cinematic consumption that have diluted the audience figures for conventional cinema attendance. Do these new technologies ring the death knell for conventional 'cinema' as we know it? There are only so many novel approaches and spectacles that you can create and the novelty of epic special FX do not seem to be promising a secure long-term future for cinema. What ways are they going to find, if any, to bring audiences back to the big screen?

Conclusion:

The Empire Strikes Back?

The Resolution

So is cinema doomed? As a society are we retreating into the comfort of our own homes and shunning the communal experience of watching a cinematic spectacle? Are we bored of over-priced tickets, tired narratives and variable viewing conditions and do we prefer our 5.1 home cinemas instead?

Conventional cinemas seem to have a paradoxical situation being brought about by the impact of digital. Digital perhaps offers consumers speed in a world where time is a commodity and the word 'instant' is synonymous with the word 'better'. We do not want to wait anymore. Allison argues that multiplexes are expected to offer cinema 'on demand'; i.e. the customer turns up and expects to see the blockbuster being screened at multiple times (2006, 88). This leads to many screens showing the same thing, and lack of choice. Indeed, when 'Die Another Day' (Tamahori, 2002) opened in the UK five days after 'Harry Potter and the Chamber of Secrets' (Columbus, 2002), the two films accounted for 66% of the national screens (Allison, 2006, 88). This lack of choice does not please the consumer who has multiple channels at home upon the television. This means that the customer stays at home and revenues drop in theatrical release attendance. This in turn leads studios to find ways to increase production efficiency, and the solution appears to be a production process that resides entirely within the digital domain.

But, as illustrated in Chapter Two, in some areas digital does not provide an economic, aesthetic or novel incentive to the industry, especially in the areas of distribution and exhibition. So what can be done to save cinema?

The Spectacle that needs spectacles: 3D

> In the brave new digital world, form is defining content. Because the toys are so cool, directors make movies to exploit their technical possibilities. That's why James Cameron, after doing *Titanic*, the all-time top grosser, stopped making features to shoot underwater documentaries with his favourite new toy, the 3-D camera.
>
> (Corliss, 2006, 41)

Valentine argues that 3D is more than just a toy, it is Hollywood's answer to getting audiences back to the cinema, recreating the 'event experience' (2006, 8). Indeed, Valentine notes that if digital projection doesn't lure audiences in, perhaps 3D will, and it will inadvertently bring digital projectors with it (Valentine, 2006, 8).

But theatres have had 3D before, and it has not been economically successful as it is expensive to shoot on film (for Stereoscopic 3D, each movie needed two prints and often two projectionists). But perhaps digital can make the spectacle cheaper and therefore more economically viable for the cinema? '*Spy Kids 3D: Game Over*' (Rodriguez, 2003) was commercially successful in cinema release, although not so successful on DVD as suppliers did not want to deal with paper spectacles (Valentine, 2006, 10). Indeed, when juxtaposed alongside the historical development of other technologies within cinema, 3D seems to make sense as the next logical step. After all, using Bordwell and Staiger's model, it offers novelty to audiences. Using Bazin's argument, it extends cinema's development towards a verisimilitude with the 'real' world. But Corliss' assertion that form is defining content is perhaps a little premature. Steven Spielberg recently said that he makes movies 'for a movie theatre… but I also realise on a laptop on an airplane or, even worse, an iPod, they

are never going to see that character and an element of the story will be lost' (Corliss, 2006, 41). This suggests that filmmakers are *not* shifting their practices to take into consideration the other platforms that it may be consumed upon. Furthermore, it cannot be really be argued that they are making films to 'exploit their technical capabilities' (2006, 41) when the first rumoured releases in 2007 are supposedly re-releases of films such as 'Top Gun' (Scott, 1986), and once again, the 'Star Wars' trilogy. Indeed, the recently digitally shot movie 'Superman Returns' (Singer, 2006) got simultaneous release upon 3D as well as conventional print earlier this year. Whilst it may have pushed the envelope in terms of what digital can achieve, the re-make is hardly a quantum leap in terms of narrative. Perhaps the technology is changing, but the stories stay the same.

IMAX

Once again IMAX offers spectacle and novelty to the audience, but simply on a larger scale. IMAX uses a 70mm negative and therefore offered a future to celluloid film that digital could not manage until recently because of resolution (Gluckian, 2006). This has subsequently changed, 'Superman Returns' (Singer, 2006) is now the first feature length film to be released upon 3D IMAX, and it was shot upon the Genesis camera. However, IMAX is hardly a new spectacle (it was exhibited in a Canadian Expo in 1967) and it has so far not offered a secure future to cinema exhibitors. It has become, and may remain, a niche that operates alongside conventional cinema as opposed to a replacement.

Indeed, if we acknowledge that cinema has undergone various technological changes over the past century, why are we now associating any further development with some kind of loss? Is it not just another change? Whether 3D or IMAX supplants

conventional cinema arguably has little to do with the development of digital, but perhaps more to do with the need for cinema to reinvent itself and do something different in the climate of a changing society, either with narrative, spectacle or some kind of other novelty. After all, as examined in Chapter One, that was a contributory reason behind the development of sound, colour and widescreen, which have all subsequently become assimilated into the cinematic experience.

Addressing and reinterpreting the language of loss

As mentioned in the introduction, Kipnis argues that the 'language of crisis, loss and uncertainty is endemic to anything connecting to film these days' (1998, 596), and we subsequently explored whether these elements should all be construed as negative. Could they not be perceived as positive, in that change can be positive?

After all, does it really matter if we see a disintegration of cinema multiplexes? Won't the economic rule of supply and demand balance the amount of screens available to the amount of people who want to watch things upon them? Admittedly a reduction in screens would suggest a reduction in choice, but with digital distribution it would be possible to call in films largely upon demand as opposed to waiting for a physical print. Therefore, if a film was performing successfully it could be screened for longer as there would not be another cinema in the chain requiring the print. Similarly, if a film was performing badly it could be swapped for another, with very little notice.

It is similar arguments for whether we see the use of film diminish – does it really *matter*? It seems almost inevitable, as we have seen, that traditional celluloid film as a means of cinema production is coming to an end. Whether the format lives on as a

means of archiving remains to be determined, although with 100 years of developmental history, it seemingly makes more sense to use celluloid than hard drives or tape. Is it that there is a generation of conventional cinemagoers who cherish the cinematic 'experience' and the 'aura' that would not like to see it lost? Does it need preservation, like some independent cinemas are developing in opposition to the multiplexes in the same ways that train enthusiasts maintain private branch lines to operate steam locomotives?

There seems little point in speculating whether the communal act of watching a film in a cinema will end or not. What is for certain, as we have seen, is that cinemas are, and will continue to be, pressured by the proliferation of other entertainment streams, that not only vie for our time, but most importantly our cash. It is most likely that cinema will continue as a process if for no other reasons than it generates marketing and attention for the product that will eventually be released on DVD. As mentioned in Chapter Three, the 'long tail' still needs a mainstream, and that alone may secure the future of conventional cinema. Indeed, in the current corporate climate of 'horizontal integration', the big companies like Time Warner have investments across all of the entertainment platforms and therefore, as illustrated earlier, a loss in one area is made up elsewhere (Pramaggiore & Wallis, 2005, 385). If more people buy DVDs and less go to the cinema the corporation has still sold the product (albeit not twice).

Back To The Future

Elsaesser argues:

> That cinema in the age of digital will remain the same. Yes, it will remain the same and be utterly different. For… digital is not only a new technique of post-production work or a new delivery system or storage medium, it is the new horizon for thinking about cinema, which also means that it gives a

vantage point beyond the horizon, so that we can, as it were, try to look back to where we actually are, and how we arrived there. The digital can thus function as a time machine, a conceptual boundary as well as its threshold.

(1998, 204)

Perhaps it is this factor that is the greatest impact that digital will have upon the filmmaking production process. As explored throughout this study, the consumption of film is by no means diminishing, and if anything, it is increasing. Digital has enabled audiences the ability to find whatever films they want, enabled the audience the opportunity to skip, pause, scrutinise images and sequences in ways that not been available before. Digital has enabled audiences to explore their own creativity more easily and affordably, using film as a medium upon which to communicate and express their observations. Digital has enabled choice, a proliferation of markets that can now be catered for, an increase in production and an increase in consumption.

Indeed, the adage that quantity does not equal quality may be true, but audiences do not seem to find current cinema to be of much quality either. Finding good material and challenging and exciting narratives amongst the 'long tail' may be like finding a diamond in the rough, but perhaps that is the next novel experience to replace the 'aura' of cinema, or the 'aura' of owning the DVD box set.

> Although many speak apocalyptically of the end of cinema, the current situation uncannily recalls that at the beginning of cinema as a medium. "Pre-cinema" and "post-cinema" have come to resemble each other. Then, as now, everything seemed possible. Then, as now, filmed "neighboured" with a wide spectrum of other simulation devices. And now, as then, film's pre-eminent position among media arts seemed neither inevitable nor clear.
>
> (Stam, 2000, 318)

Whilst perpetual uncertainty will always continue in a changing world, it would be fair to say that digital has arrived and will not be going away in the near future. How it evolves is yet to be determined, but the changing technologies will arguably

continue to make an impact upon the filmmaking production process for as long as changing technology has some impact upon the rest of society.

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