

Digital Forensics: Understanding the development of criminal law in England and Wales on images depicting child sexual abuse.

Dr Graeme Horsman

University of Sunderland
Department of Computing, Engineering and Technology
Faculty of Applied Sciences

The David Goldman
Informatics Centre
St Peter's Way
Sunderland
SR6 0DD

*Email: graeme.horsman@sunderland.ac.uk
Phone: 0191 515 2381

Abstract

In 2015, offences surrounding the possession, distributing, creation and publication of images depicting child sexual abuse (IDCSA) are prevalent. As a result, it is well publicised that law enforcement and associated digital forensic organisations are incurring substantial case backlogs in this area. As more investigations of this type are faced, it is becoming increasingly essential for practitioners to maintain an understanding of current legislative developments, as a digital forensic investigation of suspected offences surrounding IDCSA does not just involve the blanket recovery of all digital imagery on a device. Governed by this complex area of law, practitioners must appreciate the intricacies of these offences, ensuring any examination policies are correctly defined whilst recovering information which will support criminal justice processes. In addition, as triage strategies are increasingly employed in an effort to speed up investigations, it is crucial to recognise the types of evidence which are of use to a prosecuting authority in order to ensure these examination techniques are both efficient and effective. This paper offers a comprehensive analysis of legislative developments for offences surrounding IDCSA in the United Kingdom, bringing together the disciplines of law and digital forensics. Evidence of value to a prosecution for these offences is also considered taking into account existing case law precedents in line with contentious areas including the Internet cache and unallocated clusters.

Keywords: Digital Forensics; Images depicting child sexual abuse; legislation; law;

1 Introduction

In April 2015, the Internet Watch foundation (IWF) announced that due to the acquisition of new powers, the identification of websites hosting images depicting child sexual abuse (IDCSA) had increased by 137% (IWF, 2015). In addition, statistics obtained from the United Kingdom's Crown Prosecution Service (CPS) indicated that there have been almost 100,000 court hearings since 2009 involving those suspected of involvement with this form of illegal imagery. Looking further afield, the United Nations Office on Drugs and Crime (2013) documented offences surrounding IDCSA as the second most encountered by law enforcement in Europe and North America and as a result, it is well documented that law enforcement agencies are frequently reporting case backlogs of up to and over a year (BBC News, 2014b).

*Email: Graeme.horsman@sunderland.ac.uk

Estimates suggest that approximately 54% of IDCSA is hosted in North America; 37% is hosted across Europe and Russia; 1% in Asia and less in South America highlighting the global problem posed (House of Commons, 2013). There can be no doubt that despite being one of the gravest offences that can be committed, maintaining global condemnation and widely prohibited, there remains a prevalent number of individuals worldwide who seek to obtain and trade in IDCSA. Child offences have now reached such a heightened state of disgrace that even misinformed and propagandised information is enough to spark prejudicial public acts (Silverman and Wilson, 2002). Silverman and Wilson (2002) attribute the rise of public outrage against paedophilia and child offences to the abduction and murder of Sarah Payne in 2000 (BBC News, 2014c) and the campaigns by the News of the World which followed in order to 'name and shame' convicted paedophiles. Similarly the difficulty of identifying, preventing and punishing those who are involved with IDCSA, have increased society's anxiety (Ryder, 2002). Acts of public violence, community unrest and vigilantism against potential suspects are regularly witnessed even in cases following negligent and erroneous media reports (Jewkes and Andrews, 2007).

1.1 Why Images Depicting Child Sexual Abuse are Regulated

At the heart of justifications for regulating IDCSA is the need to prevent the original abuse depicted in any captured content, preventing the harm it causes both to the child and to society as a whole. Despite campaigns from groups such as the Paedophile Information Exchange (PIE) (BBC News, 2014) and The Rene Guyon Society to justify sexual interactions with those legally deemed as children (Summit and Kryso, 1978), the devastating effects child sex abuse and resulting imagery depicting this have been recognised and can be summarised into the following two areas.

Harm to the child: As the creation of IDCSA inescapably involves an act of sexual abuse, both mental and physical harm is caused to the child victim. As Ramirez (2014) indicates, often the abuse suffered by a child is not a singular event; it is one of a number, which can span across a number of weeks, months and years. Children involved in such acts are incapable of providing legal consent and therefore the pictures produced stand as a permanent representation of the abuse (Jenkins, 2013). Baroness, Lady Secombe (House of Lords, 2000) elaborated, stating "such early experience of sexual activity often leaves deep emotional scars on a child which can damage future relationships. Furthermore, the child must live with the permanent knowledge that pictures of the abuse are still circulating". It is argued that every time the material is viewed in the future, is a continuation of the original abuse. Further, once a child victim has reached maturity and is able to fully comprehend what has happened the images depicting their abuse serve as permanent source of embarrassment and distress, knowing the material is in circulation, and the potential for it to resurface (House of Commons, 2002; Michaels, 2008). Finally, Jones (1998) reported that children who have been involved in IDCSA have an increased likelihood of becoming involved in this material once they reach adulthood, repeating the offender cycle.

Harm to society: The majority of those within society have never seen IDCSA or wish to view it. Failure to regulate IDCSA may lead to a rise of easily accessible IDCSA hosted on the Internet. This in turn may increase the chance of individuals stumbling across IDCSA when browsing online, subsequently corrupting their stance on this material. In addition, failure to condemn IDCSA subsequently provides indirect justification for it, providing those involved with a greater audience in which to impose this material on. Failure to prohibit IDCSA may intensify general curiosity surrounding the material, prompting individuals to actively search

for IDCSA in absence of any legislative deterrents. The problem this causes is two-fold. First, if demand, driven by curiosity increases, so does the volume of child abuse acts carried out in order to create new material. Second, concerns surround those who view IDCSA and their underlying motive and potential to escalate their involvement in the abuse. If more individuals engage in possessing IDCSA, as a consequence, Calder (2004) suggests there is an increased chance that those individuals will participate in the physical abuse of a child.

What was once an offence regulated by traditional policing techniques, now regularly requires the assistance of digital forensic (DF) experts due to the migration of photographic technology from tangible printouts to intangible digital data. As DF practitioners remain heavily involved in the extraction and interpretation of evidence in many cases both within the UK and internationally involving IDCSA, it remains crucial for practitioners to maintain an understanding of current legal precedents. This article presents an analysis of IDCSA offences in the United Kingdom (UK), discussing the central legislative and legal developments used to regulate this material. In addition, consideration is given to the types of DF evidence needed to support the prosecution of offences of possession and making, two complex areas of law in this area, and how DF investigations can be tailored to support the application of legal powers for these crimes.

2 Preliminary Comments: Addressing Terminology Referencing Illegal Imagery

Before proceeding with discussions, it is necessary to consider the usage of terminology in this area, given that it incites controversial debate across multiple disciplines (Leary, 2007). Wortley and Smallbone (2012) refer to child sex abuse imagery as 'Internet Child Pornography' or ICP. Pritcher et al. (2013) use the term child exploitation material. UK legislation prefers the term Indecent Image of a Child. Akdeniz (2013) and Seigfried-Spellar (2014) utilise the term child pornography, which is also used frequently in foreign legislative documents, seen with the Council of Europe's Convention on Cyber Crime. There is no globally accepted term for referencing child sex abuse imagery, however, there is a growing consensus that the inclusion of the word 'pornography' is objectionable, seeking only to trivialise the severity of the material (Leary, 2007), and this article provides support for this sentiment.

It is suggested that through an inclusion of the term 'pornography' when referring to child sexual abuse images, the illegal material is being unacceptably glorified, providing support for, or condoning such acts (Akdeniz, 2013). Similarly, the term pornography seeks to lessen the seriousness of the offence or the harm suffered by the victim (Wortley and Smallbone, 2012). As a term, pornography denotes consensual, acceptable and legal acts of sexual activity and using it in relation to child sexual abuse imagery provides connotations that such abuse is also acceptable or tolerated (Quayle, 2008). The acts depicted in child sexual abuse images are neither consensual or lawful and therefore it is argued the their association with the term 'pornography' should cease, despite many jurisdictions including Canada, Ireland and the United States continuing to use this expression.

Within legislation in England and Wales, reference is made to 'indecent images of children', a phrase, which merits brief discussion. Here, reference to 'pornography' is omitted in preference for the term 'indecent'. By definition, the term indecent means 'not conforming with generally accepted standards of behaviour, especially in relation to sexual matters' (Oxford Dictionaries, 2014a). It is argued that through the use of 'indecent', domestic legislation fails to recognise the actual harm, which is caused to the child, only referencing the act itself. In addition, by the very definition, 'indecent' simply implies the act is generally

unacceptable. In reality the act of child sexual abuse is never acceptable and the term 'indecent' fails to underline the seriousness of the act. It is argued that 'images depicting child sexual abuse' (IDCSA, as defined above) is a preferable term for use in reference to such material, a stance supported by the IWF (n.d.) and Interpol (n.d.). The inclusion of the words 'sexual abuse' ensures the gravity of the act is identified without connotations of glorifying or condoning it. The inclusion of the word abuse; defined as 'to treat with cruelty or violence, especially regularly or repeatedly' (Oxford Dictionaries, 2014b), limits the chance of misinterpretation regarding the condemnation of this material whilst denoting its seriousness.

As DF is a field heavily involved in the investigation of IDCSA, this article calls for the global adoption of the term IDCSA in reference to forms of illegal imagery depicting child sexual abuse. Given the volume of technical reports, statements, written material and research produced by practitioners and academics in this discipline which aid the development of strategies for preventing and patrolling IDCSA, it is argued DF should lead the transition to a more acceptable term which fully highlights the seriousness of these acts.

2.1 Influences of Technology on IDCSA

It is estimated that globally, the pornographic industry is worth 97 billion dollars (NBC News, 2014) with around 14% of all Internet searches conducted being for the purposes of finding sexual content hosted online (BBC News, 2013). Although pornography has existed in varying forms for centuries, it is only now with the substantial development of the 'porn industry' along with increased media coverage and an unprecedented demand for consumer consumption (Lambert et al., 2012), that society is becoming aware of its exploits (MacKinnon, 1985). What was once predominantly confined in the 1960's, 70's and 80's to written publications accessible only in specialist underground outlets (Wolak et al., 2007), pornography, has now found its way into the homes of many throughout Europe and the United States (US). Pornographic material has seen exponential growth; mainly due to the wide spread availability and use of affordable personal computing devices and developments in media recording devices (D'Orlando, 2011).

Pornographic content is designed to sexually stimulate, however, the type of material that achieves this purpose is subjective to each individual viewer. What constitutes pornography differs depending on the varying interests of different social groups (Strossen, 2000) and varied cultural norms (O'Donnell and Miller, 2007). This has led to what can be best described as an assorted range of obscene material surfacing across Europe and the US. In turn, increasing Internet usage has generated an incoming wave of "hard-core pornography including: buggery, cunnilingus, urination, and bondage, etc., sanitised by the terms "explicit sex", "adult entertainment" and "human sexuality" (Edwards, 1997). Further extreme examples also include, but are not limited to content such as, necrophilia, the sexual intercourse or attraction to corpses (Oxford Dictionaries, 2014c) and snuff films, "a pornographic film or video recording of an actual murder"(Oxford Dictionaries, 2014d). However, Mackinnon (1985) states that the major problem initiated by pornography, is that it has not only sexualised the abuse of adults but also that of children who are unable to consent to such acts, leading to the production of IDCSA, and now its wide-spread presence online.

The demand to obtain and view IDCSA is driven by the desire for sexual satisfaction achieved by viewing the material (Wortley and Smallbone, 2012). Despite acts of what would now be considered child sexual abuse, being recognised throughout many historical archives (Tate,

1990), as a result of technological developments, records of this abuse are now prevalent. The role of technology in IDCSA offences cannot be underestimated, where the existence of IDCSA in society and the exponential growth of this content have been blamed on the commercialisation of the Internet (O'Donnell and Miller, 2007; Johnson and Rogers, 2009), as it provides a level of perceived anonymity allowing offenders to exercise their sexual preference from within the confines of their home, potentially undetected. In addition, digital media has increased the ease and speed of creation and duplication of images, and in addition, video files have accentuated the volume of IDCSA, where from one video, hundreds of still photographic images can be extracted and circulated (Taylor, 1999).

2.2 The Internet

Prior to the year 2000 and the Internet's popularity (in comparison to what is witnessed today), IDCSA existed in tangible forms. Magazines such as 'Lollitots', 'Lolita', 'Piccolo', 'Rare Boys' and 'Tommy' were prevalent publications, along with various books depicting graphic scenes of child abuse (Holmes and Holmes, 2002). In addition, numerous paedophile organisations had formed including 'The Rene Guyon Society', 'The North American Man/Boy Love Association', 'The Childhood Sensuality Circle', 'Paedophile Information Exchange' and 'The Howard Nichols Society' (Holmes and Holmes, 2002). Also, what is termed as 'sex tourism' was emerging, often where a paedophile would visit deprived nations where laws governing child sexual abuse are limited in order to sexually abuse children and acquire IDCSA (O'Donnell and Miller, 2007). It was assumed by Quayle and Taylor (2002) that without the resources for mass communication and organisation, which has now been provided by the Internet, paedophiles as a group remained relatively isolated, although it was arguably impossible to quantify those acting illegally to validate this statement. Yet now, with the availability and ease of access to of online networks combined with personal digital device ownership, it is likely that an increase in these acts has been seen, though again, this statement remains practically impossible to confirm due to the size of the Internet and the difficulty of policing and identifying all of its users. In addition, without the use of devices capable of replicating and creating imagery within seconds, the production and dissemination of IDCSA was stunted, confined to those who were determined to actively seek it.

It was not until the UK police launched 'Operation Ore' to crack down on access to IDCSA on a pay-per-view website, that the Internet's capability for hosting IDCSA gained public attention (Carr, 2003). In fact, police manoeuvres such as 'Operation Ore' (an investigation into the Landslide Productions portal used to access images depicting child sexual abuse (Gillespie, 2011)) in the early nineties were considered rare, sparking limited public attention in comparison to the present day where such operations remain heavily in the public focus. During this period, it was acknowledged that experts investigating these offences were still significantly short of the knowledge required to fully understand and appreciate the threats posed by this new technology (Akdeniz, 2013).

Some twenty years later, the role that the Internet has played in relation to the existence of IDCSA in modern society cannot be underestimated, with it often cited as the causal factor for the exponential growth of IDCSA (O'Donnell and Miller, 2007; Johnson and Rogers, 2009). O'Donnell and Miller (2007) highlighted that in 1993, there were only fifty known websites, in comparison to the present day where due to the speed of growth, it is almost impossible to provide an accurate figure. In addition to providing many legitimate functions, the Internet has now facilitated access to IDCSA for significant portions of society, whilst providing a platform to disseminate this material and for like-minded individuals to converse

(Clough, 2012). The size of the Internet and its continued growth now means that quantification of IDCSEA online remains unknown, and is likely to stay that way as paedophile networks remain and actively seek to operate in unknown and obfuscated areas of the Internet (Akdeniz, 2013).

2.3 Digital Forensic Investigations and the Law

Now, it is arguable that large proportions of IDCSEA offences maintain some form of digital evidence, prompting significant involvement from DF experts, with a DF examination now one of the main tools used by law enforcement to obtain evidence to prosecute those involved in IDCSEA. As continued technological developments lead to the introduction of new devices, services and platforms, the methods used to access IDCSEA are constantly changing. As a result, DF practitioners are frequently required to investigate the presence of IDCSEA on new platforms and operating system locations in order to establish the process of how an illegal image came to reside on a particular device. As the number and complexity of ways in which suspects can obtain IDCSEA is increasing, so are the number of cases requiring investigation. As a result, DF organisations are challenged to provide details of prosecutable evidence quicker, leading to triage techniques being frequently implemented. Law enforcement in the UK are moving away from traditional DF investigations, involving the analysis of an entire system, in preference of a focused examination in an effort to speed up the investigatory process.

These triage procedures are an attempt to tackle the volume of IDCSEA crimes, and reiterate the importance of DF practitioners maintaining an understanding of relevant laws. Targeted IDCSEA investigations need to take into account current legal precedents in order to provide for an efficient examination process. For example, current precedent in the UK places IDCSEA found in the unallocated clusters of a device (an area of digital storage media containing deleted content) beyond the capability of being possessed by a suspect in absence of evidence suggesting they were recoverable with either specialist software or knowledge (Sections 3 and 4 provide further analysis). As a result, in cases of suspected possession of IDCSEA, it is often deemed initially applicable to exclude carving imagery from the unallocated areas of a drive for suspected offences of possession in absence of the presence of capabilities offering file recovery, in order to speed up a preliminary examination. As the DF discipline seeks to increase the use of targeted investigations, it remains vital to ensure prosecutable areas of a system and appropriate evidential artefacts are targeted in line with current laws.

Lang et al (2014) recently highlighted, it is important that those operating in the field of DF should have an understanding of legal systems and the laws they impose. This article analyses the common law legal system in England and Wales, focusing on developments in offences of IDCSEA. As a starting point, Section 3 provides a chronological review of legal developments surrounding IDCSEA.

3 A chronological overview of Legislative developments

Legislation governing IDCSEA has developed on a piecemeal basis, spanning a period of over 50 years. As developments in technology dramatically changed the way in which offences in this area are committed, adaptations in legal parameters have been witnessed in order to keep pace with prohibiting individuals from dealing in this material. This section provides a chronological analysis of the developments of IDCSEA law in England and Wales,

demonstrating key legal events (the recognition of digital imagery and pseudo-photographs etc.) and the justifications for the developments.

The Obscene Publication Act 1959 & 1964

Prior to 1978, domestic legislation in England and Wales directly addressing IDCSA was non-existent; instead reliance was placed upon the Obscene Publication Acts 1959 and 1964, which provides the starting point for discussions. In absence of the Internet and prevalent digital technologies, the Obscene Publication Acts 1959 and 1964 (OPA) were seen as sufficient for dealing with existing unsavoury content (Nair and Griffin, 2013). Although the OPA's preamble indicated its aim was to strengthen laws concerning pornography, it must be noted that the OPA was not put in place to regulate pornography alone, but for any material, which is deemed obscene (Elman, 1996).

In the lead up to the enactment of the OPA, attention was focused on the suppression of pornography (Daily Mail, 1958; Times, 1958), with no commentary directly addressing IDCSA both in media and Parliamentary discussion. It is arguable that at this point, the problem of IDCSA was unforeseen, yet literary records of such acts were not. As a result, booksellers were subject to increasing scrutiny over the material they were retailing (Times, 1958; Scotford, 1961). At the heart of arguments for invoking obscenity legislation was the fictional publication 'Lolita', a novel focusing on a man's obsession for a 12-year-old girl, with speculation surrounding the potential for such literature to corrupt those who read it (Wilson, 1959; Allsop, 1958). As a result, written articles were deemed the main pornographic threat in need of regulation (Times, 1961), with subsequent books such as 'Fanny Hill' invoking similar levels of inquiry in 1964 due to its pornographic descriptions (Times, 1964). Following growing media stigma about pornography (Times, 1958; Scotford, 1961), the UK government opted not to legislate to restrict the publication of particular genres of pornography, but to prohibit material, which it deemed obscene under Section 2(1) OPA.

Under OPA59 Section 1(2), an article includes anything "containing or embodying matter to be read or looked at or both, any sound record, and any film or other record of a picture or pictures". For an article to be illegal it must pass the 'obscenity test' defined in OPA59 Section 1(1) where it must "tend to deprave and corrupt persons who are likely, having regard to all relevant circumstances, to read, see or hear the matter contained or embodied in it". Obscenity is a significantly broad term covering more than the depiction of sexual acts (Cheng, 2002), demonstrated in *R. v Gibson (Richard Norman) [1990] Crim. L.R. 738*, where questions of obscenity were raised over the act of displaying foetus earrings in a public gallery.

As Nair and Griffin (2013) state the OPAs were designed to only focus on the 'distributor of content', not the collectors and end-users. Arguably, the motive for the OPA only prohibiting publication of obscene material is best addressed by Rowbottom (2006) who states the following.

"Stopping the material being distributed in the first place will clearly be more efficient than trying to control it once it has been widely disseminated. The number of producers and distributors will be fewer than the potential possessors of the material. The producer and distributor also take greater responsibility for the harms caused by such obscene material."

The decision to focus exclusively on prohibiting publication must be considered against technological advances and society's stance regarding IDCSA in that era. It was not until the 1970s that the true severity of IDCSA and child abuse was beginning to be understood (Jenkins, 2003), undoubtedly a factor in the government's failure to directly address IDCSA offences prior to this time. In addition, pornographic material at this time was predominantly in the form of paper-based publications, backed by media reports at this time (Daily Mail, 1964) with forms of digital imagery not envisaged. This form of media is difficult to produce and duplicate, with additional speed and cost implications, despite reports that from 1961-1964, Scotland Yard seized around five hundred thousand magazines, which breached the OPA (Times, 1964b). In absence of technology such as the Internet and personal computers (which were mainly confined to defence industry and business sector (Rojas and Hashagen, 2002)), it is difficult to imagine the mass distribution of IDCSA or the hoarding of this material by individuals at this time. Perhaps a founding argument lay with the perceived (and potentially accurate) view that limited obscene material (specifically IDCSA) was in existence at that time (thoughts echoed some 15 years later (Home Office, 1979)), and as a result, prohibiting the publication of IDCSA alone may have been viewed as a sufficient method of stemming access to it and further creation of the material.

Although there is limited commentary on the matter, it seems logical to surmise that IDCSA would be categorised as obscene at this time and therefore anyone seeking to publish IDCSA would be found in breach of the OPA. However, it is key to note that only an act of publication constitutes an offence and acts of private possession were permissible. The OPA remained the main tool for regulating IDCSA for some 15 years before the UK government introduced the Protection of Children Bill, regarded as a finger-in-the-dyke, protecting the UK against what was beginning to be recognised as an impending flood of IDCSA (House of Commons, 1978). Subsequently, the Protection of Children Act 1978 was enacted.

Protection of Children Act 1978

It was not for a further 14 years after the OPA that the next milestone in the regulation of IDCSA was established, with the UK refusing to tolerate child abuse imagery (Harrison, 1977). Calls had been made to extend the OPA to make pornography, which directly depicts children, illegal, despite reports that the current government was devaluing the significance of harm caused by such material (Butt, 1977). Wide spread public anxiety surrounding the use of children in pornographic material and the negative impact this has upon a child's wellbeing was beginning to be reported in the media (Times, 1977), along with increased public comment from soon to be Prime Minister, Margret Thatcher (Butt, 1977; Young, 1977). In addition, an increase in sexual offences against children stemming from 1965-1975 was being witnessed, with the number of people found guilty for gross indecency with a child increasing almost five-fold over this time period (House of Commons, 1978b). Further, concern surrounding the use of bribes to encourage parents to allow their children to engage in acts of sexual abuse in order to produce IDCSA lead to calls for the implementation of tougher penalties (Harrison, 1977). However, comments from the Home Office Committee on Obscenity and File Censorship suggest that despite these apprehensions, doubt existed as to whether there was an actual need for legislation governing IDCSA and in turn, whether the UK faced an issue with the material at all, in the absence of any empirical evidence (Home Office, 1979).

Arguably, recognition of the need for legislation governing IDCSA was likely influenced by the United States' position, and their move to enact legislation prohibiting IDCSA at this time (House of Lords, 1978). Despite the true scale of IDCSA at that time being largely unknown

(Smith, 1991), Baroness Faithful (House of Lords, 1978) stated that there was child pornography in the UK 'which is-or has often been-private business: just one passing a photograph to another'. Further comments from Symon (1978) suggested that around 80% of IDCSA was imported into the UK with concerns raised by Sir Bernard Braine MP (House of Commons, 1978c) that IDCSA was becoming a billion dollar industry in the United States. These observations must be treated with caution, as in the absence of a reliable system for monitoring and quantifying this IDCSA (something which we still have been unable to do with sufficient accuracy), they may have been subject to media hype and speculation. A general consensus was beginning to emerge surrounding an increase in prevalence of IDCSA and concern over its potential links to paedophilia (Clark, 1977; Noyes, 1978; Gibbons, 1995), ultimately leading to the enactment of the Protection of Children Act 1978 (PCA78) (Antoniou, 2013), the first piece of domestic legislation in England and Wales directly designed to control and criminalise the acts of making, distributing and publishing this content (Section 1 PCA78).

At this time, those guilty of an offence under this Act, were subject to a maximum custodial sentence of three years. Despite clear recognition of the dangers of IDCSA, one substantial omission at this time was the absence of a private possession offence, leaving those with a desired interest to acquire private collections of IDCSA for personal use. It could be argued that at this point, possessors of IDCSA were limited to small pockets of individuals, typically those who could afford to engage in purchasing the material. As the volume of IDCSA in circulation at this time was not fully appreciated, coupled with existing legislation prohibiting distribution, it is arguable that the UK government perceived those who maintain private collections of IDCSA were in small numbers, with limited ability to spread the material without being apprehended.

The Criminal Justice Act 1988

In 1984 and 1985, Dickens (House of Commons, 1984; House of Commons, 1985) proposed the need to prohibit the possession of IDCSA, suggesting all access to it would encourage offenders to physically abuse children. Despite such comments it was a further three years (and ten years after the PCA78), till the UK Government opted to legislate in order to extend the range of offences surrounding IDCSA by enacting the Criminal Justice Act 1988 (CJA88). An apparent problem with the PCA78 lay with its omission to make what is termed as 'private possession' an offence in light of comments from Millwood and Livingston (2009) who suggested those who possess IDCSA drive the demand for it and ultimately increase acts of child abuse. The Metropolitan police commissioner's report (MET, 1987) indicated that an increasing use of video recording devices and associated copying facilities were leading to more IDCSA in circulation, driving concerns.

Despite statistics highlighted by Ferrers (House of Lords, 1988) directly prior to the CJA88's passing showing limited prosecutions brought under the PCA78 (significantly less than for acts of physical child abuse (House of Commons, 1988)), the enactment of a possession offence was seen as necessary to completely suppress the trade of IDCSA. Comments from then Home Secretary Douglas Hurd indicated that a possession offence would allow law enforcement to prosecute individuals involved in underground paedophile groups, where proving distribution or taking may be difficult but possession easier to establish (Wood, 1987). In doing so it prevented those who produce and distribute IDCSA from claiming that the material in their possession was solely for private use, an act which was at that time, not prosecutable (House of Commons, 1988b).

Private possession describes those who maintain IDCSA for their own personal use, for only them to view, and act which under the CJA88 Section 160 is prohibited. However, the enactment of the CJA88 was not without concern, with Lord Monson indicating that prohibiting access to IDCSA may lead to a greater number of individuals seeking actual children to abuse (House of Lords, 1988b).

Criminal Justice and Public Order Act 1994

Despite taking until 1994 to act, the use of computing technology had been recognised as a device for supporting paedophile activity some eight years prior to the enactment of the CJPO94 by Chock (1987), not for the distribution of images, but as a means of communication between likeminded individuals. In addition, Conley (1987) and Gilbert (1985) raised concerns regarding computer usage to display advertisements for children to be involved in pornography, with reports of arrests for those who were running bulletin-board systems hosting such hoardings (Manning, 1986).

In the early 1990s the realisation of the number of paedophiles in existence was beginning to dawn, with estimates in 1991 placing numbers at 2 million in the US and Canada with concerns raised about the methods they used to access IDCSA (Smith, 1991). When enacted, the Criminal Justice and Public Order Act 1994 (CJPO94), section 84 was designed to 'future proof legislation' (Home Affairs Committee, 1993, pp.67) surrounding IDCSA, providing a crucial stage in the UK Government's recognition of societies migration to computing technology, with increasing reports of computing technology used to access IDCSA (Alderson, 1995; Wilkinson and Gledhill, 1996; Times, 1997). The 1990's witnessed the commercialisation of the Internet and the increased affordability of computing and digital technologies (Johnson, 1994). In turn, the creation and transmission of digital files was becoming more frequent as communication protocols such as email were increasing in popularity. As a result, computing technology and the Internet were often highlighted as portals to a repository of IDCSA (Rose, 1998; Lee-Potter, 1998). Further, as Foreman (1990) comments, the use of camera and printing devices allowed paedophiles to produce and to mass distribute imagery; with scanning devices, when used in conjunction with computer graphics packages allowing a user to produce basic digital imagery (Johnson, 1994).

Section 84 CJPO94 provides the key incremental developments in IDCSA legislation raising the following four points of discussion.

i. Section 84(2)(a)(i) CJPO94 amended Section 1(1)(a) of the PCA78 to include the phrase "to make" in the offence of taking. In doing so, the CJPO94 recognised the flexibility of digital data and the ease in which it can be created, edited and duplicated via computing devices. No longer do offenders need to be at the scene of the child abuse taking photos to be guilty of the offence, but those who make new images from existing content (i.e. when they save a new version of an image) were liable.

ii. The second addition of the CJPO94 amended both the PCA78 and the CJA88 to recognise that "data stored on a computer disc or by other electronic means which is capable of conversion into a photograph". As electronic digital code stored on forms of digital storage media constituted a permanent record from which an image could be reproduced, the argument that digital data could constitute a photo was proposed (Home Affairs Committee, 1993). As digital photographs were capable of being printed, displayed on computer monitors and subject to electronic distribution via the Internet or transferable media like

CDs, potentially increasing the prevalence of IDCSA, further justification for prohibiting digital IDCSA was provided (Home Affairs Committee, 1993). This issue was highlighted in the subsequent case *R. v. Fellows and Arnold [1997] 1 Cr. App. R. 244*, portrayed in the media as the first case of computer abuse of this kind (Midgley, 1996) involving an archive of over 10,000 IDCSA on the defendants computer system.

iii. The third addition of the CJPO94 was to amend the OPA, to identify that 'data stored and transmitted electronically' could constitute publication (Edwards, 2009), taking account of the Internet and the facilities it offers.

iv. The final key addition of the CJPO94 under section 84 is the recognition of a 'pseudo-photograph'. In 1993, the Home Affairs Committee (1993) recognised the problems posed by images that had been manipulated to look like IDCSA under current legislation, relying on the material failing the test of obscenity in order to prosecute the publishers of this material. Such images included depictions of adults to look like children, or the addition of child's head, superimposed onto an adult's body whilst engaging in sexual acts or posing (Home Affairs Committee, 1993). As Manchester (1995) stated, the effect of the CJPO94 was to remedy loop holes in existing legislation created by technological developments. The inclusion of legislation prohibiting pseudo-imagery prevented morphed images from falling outside of the range of offences in operation (Oswell, 1998). Given the existence of many complex computer-generated graphics packages capable of creating photographic representations, failure to patrol pseudo-photographs would leave a gap in the law for those capable of creating their own imagery using computer technology and distributing it. Although arguments existed that prohibiting pseudo-imagery amounted to a victimless crime as in some cases no depicted child is actually subject to sexual abuse, it is countered by concerns of harm caused to the child who is aware of being depicted as being abused (Home Affairs Committee, 1993). Further, such material was seen as a harm to society with Stone (1995) indicated that a main justification for prohibition of this material was to prevent it from being used to lure children into acts of child abuse for the production of new IDCSA.

1999 - R v Bowden

In 1999, the case of *R v Jonathan Bowden [2000] 1 Cr. App. R. 438* provided clarification regarding the duplication of IDCSA and downloading of IDCSA from the Internet. The appellant submitted a computing device for repair to a local firm, from which indecent material was discovered. Upon examination, it was revealed that numerous IDCSA had been downloaded from the Internet and stored on the appellant's digital storage media.

Following Bowden, three key issues were resolved. First, section 1(1)(a) PCA78 'now covers those involved in the creation of pseudo-photographs who may have no contact with the subjects of the images' (*R v Jonathan Bowden [2000] 1 Cr. App. R. 438 at 443*). In doing so, the courts recognised that the offence of taking (and amended to include 'making') was not only an offence that could be committed by those in direct contact with children, but by those with access to the necessary technology to create IDCSA from existing content. Second, downloading an IDCSA constituted an act of making under the PCA78 section 1(1)(a). Finally, making a copy of an IDCSA constituted could also constitute a making offence.

2000 - DPP v Atkins

In 2000, the case of *Atkins v Director of Public Prosecutions* [2000] 2 Cr. App. R. 248 provided the first clarification surrounding the offence of possession under the CJA88. It was held that unless the defendant had knowledge of the photographs in his possession, he could not be in possession of them. As the IDCSA in question were stored within the Internet cache on the appellant's computer system, knowledge of the cache and files it contained was necessary. Therefore those who were not aware of how the Internet cache worked or in turn, that it even existed, could not be in possession of files residing in there.

Criminal Justice and Court Services Act 2000

In the late 1990's media attention began to focus on penalties given to those prosecuted and their perceived lack of severity (Heffer, 1998). The UK government acknowledged increasing public concern and chose to act (House of Lords, 2000). The Criminal Justice and Court Services Act 2000 continued the UK Government's recognition of the severity of IDCSA offences, implementing stronger punishments for those guilty of offences in this area. Under section 41 of the Criminal Justice and Court Services Act 2000, the PCA78 was amended to increase the maximum punishment from three to 10 years' imprisonment for offences under Section 1. Further the CJA88 was amended to increase the maximum punishment from a fine not exceeding level 5 on the standard scale to five years imprisonment for possession offences. Increases in punishments also coincided with the Governments substantial investment in provisions capable of investigating those involved in IDCSA, including the implementation of the National Hi-Tech Crime Unit and incentives to support tracking IDCSA online (House of Commons, 2001).

2002 - R v Smith & Jayson

In 2002, the joint cases of *R v Graham Westgarth Smith, Mike Jayson* [2002] EWCA Crim 683 clarified the following two points of law in this area.

i. In relation to Smith, the act of opening an email with an IDCSA attached knowing that it was or likely to be IDCSA was held to constitute an offence of 'making' under the PCA78. It is key to note that the offence is not absolute, and here, evidence of the defendant (Smith) engaging in communications with paedophilic content allowed inferences of knowledge to be inferred.

ii. In relation to Jayson, the act of downloading an image from the Internet constituted an act of 'making' providing there was evidence that the act was "deliberate and intentional act with knowledge that the image made is, or is likely to be an indecent photograph or pseudo-photograph of a child" (*R v Graham Westgarth Smith, Mike Jayson* [2002] EWCA Crim 683 at 34). There is no requirement for the offender to intend to store the images for the purpose of retrieving them in the future, and further, 'it is not a requirement that the data should be retrievable'. This decision builds upon that of *R v Jonathan Bowden* [2000] 1 Cr. App. R. 438 some three years earlier.

The Sexual Offences Act 2003

The Sexual Offences Act 2003 section 45(2) amended the definition of a child within the PCA78. As a result, section 2(3) PCA78 states 'in proceedings under this Act relating to indecent photographs of children, a person is to be taken as having been a child at any material time if it appears from the evidence as a whole that he was then under the age of

18'. This is an increase from the previous position of 16, following concerns that children remain vulnerable up until the age of 18 (House of Lords, 2000).

2006 - R v Porter

In 2006, the case of R v Porter [2006] 2 Cr. App. R. 25 directly addressed what constituted possession of digital IDCSA on a digital device or computer system and sought to provide clarification on whether deleted files can be possessed. Traditionally, possession requires knowledge of and custody and control over the item in question, in order for a person to be in possession of it. Porter confirmed that this test should remain and therefore to be in possession of a digital IDCSA, the offender must have knowledge of its existence and be able to access it, therefore having custody and control of it, a fact for the jury to determine given the circumstances of the case. Notably, Porter set a precedent for dealing with deleted IDCSA, confirming that they could not be possessed unless the offender had the ability to re-access them (through specialist software) at the time of arrest.

Coroners and Justice Act 2009

The final development in legislation surrounding IDCSA to be considered is the introduction of the concept of a 'prohibited image of a child'. Such images include cartoon, drawings, computer-generated images and manga (CPS, n.d. b) described in R. v Palmer [2011] EWCA Crim 1286 as "stylised fantasy images in graphic cartoon format". These images do not necessarily depict a real-world child, and can be one that has been created solely via computer graphics programmes. A prohibited image of a child also includes those that are a by-product of real IDCSA, such as tracings, items that were unregulated (Antoniou, 2013). The enactment of this offence allowed for the regulation of IDCSA, which would not otherwise fall under the category of an indecent photograph or pseudo-photograph under the PCA78 and CJA88. Following CPS (n.d. b) guidance, "possession of a prohibited image is an either way offence and the maximum penalty on summary conviction is six months' imprisonment or a fine or both. On conviction on indictment, the maximum sentence is 3 years' imprisonment, a fine, or both." In 2011, Steven Freeman, a former head of the Paedophile Information Exchange (PIE) was the first to be prosecuted under the act for possessing approximately 3000 drawings (BBC News, 2011).

It was not until 2009 that the Coroners and Justice Act 2009 (CJA09) addressed content of this type, with Section 62(1) of the Act introducing an offence of possessing a prohibited image of a child. A prohibited image is distinguished from previous illegal forms of imagery and defined under CJA09 Section 62(2) as an image which is pornographic and grossly offensive, disgusting or otherwise of an obscene character and falls one which falls within Section 62(6) CJA09. Under Section CJA09 62(3), an image is pornographic "if it is of such a nature that it must reasonably be assumed to have been produced solely or principally for the purpose of sexual arousal". Section 62(6) CJA09 requires the image to focus solely or principally on a child's genitals or anal region. If the image does not maintain this focus but depicts an act under Section 62(7) CJA09, then the image is still classed as prohibited, where acts include the performance by a child of an act of intercourse with an animal. As with the possession offence set out in the CJA88 (see Section 4.2), a defendant may raise one of the three available defences, including one of legitimate reason, failure to know they possess the images and deletion within a reasonable amount of time. The justification for regulating this material stems from a 'concern that such material reinforces inappropriate feelings towards children' with fears that prohibited images of children could be used as tools to groom victims (Home Office, 2007).

4 Current Legal Precedents: Where do we stand now?

Section 3 has documented the substantial changes in this area of law, and as a result, what remains is a complex area of legal precedents surrounding digital evidence. Ensuring DF practitioners produce an effective and efficient investigation requires understanding what evidence can be used to support criminal justice systems in their processing of suspects. In order to provide this, Section 4 provides breakdown of the key offences surrounding IDCSA, with reference to current day precedents, beginning with the task of defining IDCSA.

4.1 Defining an Illegal Image

One of the starting points in any investigation into IDCSA involves identifying these illegal images on the device. For an image to constitute IDCSA in England and Wales, it must first depict a child, and second, be indecent, two concepts which are not without difficulty when attempting to establish.

i *Are they a Child?*: As noted previously, the Sexual Offences Act 2003 section 45(2) legally defines a child as anyone under 18. However, determining age from a photograph is not always straight forward and following the case of *R v Land* [1998] 1 Cr App R 301, determining the age of a person in a photograph is a question of fact for the jury. There is no requirement for expert evidence to support this process.

ii *Is the photograph indecent?*: For the most, this question will raise few arguments, yet it is key to note that legislation in England and Wales omits to define what constitutes an indecent image. Although for the purposes of sentencing and assessing case severity, the case of *R. v Oliver (Mark David)* [2002] EWCA Crim 2766 provided some initial guidance by submitting the following five categories which IDCSA can fall within:

- Level 1. Images depicting erotic posing with no sexual activity;
- Level 2. Sexual activity between children, or solo masturbation by a child;
- Level 3. Non-penetrative sexual activity between adults and children;
- Level 4. Penetrative sexual activity between children and adults;
- Level 5. Sadism or bestiality.

However, as of April 2014, The Sentencing Council's Sexual Offences Definitive Guidelines (Sentencing Council, 2013) have since amended guidelines, producing the following three categories of IDCSA:

- Category A: An image depicting penetrative sexual activity and sexual activity with an animal or sadism.
- Category B: An image depicting non- penetrative sexual activity.
- Category C: Any other indecent images not falling within categories A or B. (CPS, n.d.)

4.2 Possession

Possession offences in England and Wales are the second most prominent in this category. For the period 2014-2015, the UK crown prosecution service recorded 5451 instances of offences charged and reaching a first hearing at magistrates' courts for possession of IDCSA or a prohibited image and 27,238 instances since 2009 (CPS, 2015). Table 1 defines the current key components of an offence of possession in England and Wales.

Table 1: Offence of Possession of Indecent Images / Prohibited Images	
Key Facts	
Offence Outline	<p>Criminal Justice Act 1988 Section 160(1) "It is an offence for a person to have any indecent photograph [or pseudo - photograph] of a child (meaning in this section a person under the age of 16) in his possession"</p> <p>Coroners and Justice Act 2009 Section 62(1) "It is an offence for a person to be in possession of a prohibited image of a child."</p>
Key Interpretations	<p>Criminal Justice and Public Order Act 1994 Section 84 "“Pseudo-photograph” means an image, whether made by computer-graphics or otherwise howsoever, which appears to be a photograph."</p> <p>Coroners and Justice Act 2009 Section 62 – "A prohibited image is an image which—</p> <p>(a) is pornographic, (b) falls within subsection (6), and (c) is grossly offensive, disgusting or otherwise of an obscene character."</p> <p>Coroners and Justice Act 2009 Section 62(3) – "An image is "pornographic" if it is of such a nature that it must reasonably be assumed to have been produced solely or principally for the purpose of sexual arousal."</p> <p>Coroners and Justice Act 2009 Section 62(6) – "An image falls within this subsection if it—</p> <p>(a) is an image which focuses solely or principally on a child's genitals or anal region, or (b) portrays any of the acts mentioned in subsection (7)."</p> <p>Coroners and Justice Act 2009 Section 62(7) – "Those acts are—</p> <p>(a) the performance by a person of an act of intercourse or oral sex with or in the presence of a child; (b) an act of masturbation by, of, involving or in the presence of a child; (c) an act which involves penetration of the vagina or anus of a child with a part of a person's body or with anything else; (d) an act of penetration, in the presence of a child, of the vagina or anus of a person with a part of a person's body or with anything else; (e) the performance by a child of an act of intercourse or oral sex with an animal (whether dead or alive or imaginary); (f) the performance by a person of an act of intercourse or</p>

	oral sex with an animal (whether dead or alive or imaginary) in the presence of a child.”
Available Defences	<p>Criminal Justice Act 1988 Section 160(2) “it shall be a defence for him to prove—</p> <p>(a)that he had a legitimate reason for having the photograph [or pseudo-photograph] in his possession; or (b)that he had not himself seen the photograph [or pseudo-photograph] and did not know, nor had any cause to suspect, it to be indecent; or (c)that the photograph [or pseudo-photograph] was sent to him without any prior request made by him or on his behalf and that he did not keep it for an unreasonable time.</p> <p>Coroners and Justice Act 2009 Section 64 – same layout as Criminal Justice Act 1988.</p>
Sentence Length	<p>Possession of IDCSA - Criminal Justice Act 1988 Section 160(2A) – Maximum 5 years</p> <p>Possession of prohibited image - Coroners and Justice Act 2009 Section 64 – Maximum 3 years</p>
Key Precedents	<p><i>Atkins v Director of Public Prosecutions</i> [2000] 2 Cr. App. R. 248 & <i>R v Porter</i> [2006] 2 Cr. App. R. 25</p> <ul style="list-style-type: none"> • Suspect must have and ‘custody or control’ over IDCSA in order to be in possession. If a defendant can’t control the file, they can’t possess it. As a result: <ul style="list-style-type: none"> ○ Deleted files are generally not possessed. However, the presence of file recovery software or if it can be shown that the defendant knew how to recover such files may suggest the contrary. ○ Files in the Internet Cache can only be deemed in possession if the user has knowledge of the cache.

4.3 Taking and Making

An offence of taking IDCSA is England and Wales most prominent offence in this category. For the period 2014-2015, the UK crown prosecution service recorded 14,518 instances of offences charged and reaching a first hearing at magistrates' courts for making IDCSA, and 86,547 instances since 2009 (CPS, 2015). Table 2 defines the current key components of an offence of making in England and Wales.

Table 2: Offence of Taking / Making	
Key Facts	
Offence Outline	Protection of Children Act Section 1(1)(a) “It is an offence for a person to take, or permit to be taken [or to make], any indecent photograph [or pseudo-photograph] of a child.
Available Defences	No statutory defence to normal suspects. Section 46(1) of the Sexual Offences Act 2003, essentially

	permits the making of IDCSA if it is in the interest of crime detection and prevention by UK bodies.
Sentence Length	Protection of Children Act Section 6(2)– Maximum 10 years
Key Precedents	<p><i>R v Jonathan Bowden</i> [2000] 1 Cr. App. R. 438 & <i>R v Graham Westgarth Smith, Mike Jayson</i> [2002] EWCA Crim 683:- IDCSA intentionally downloaded from the Internet constitutes making. No need for images to be retrievable.</p> <p><i>R v Harrison</i> [2007] EWCA Crim 2976: - Access to a pornography site, knowing that they will be subjected to 'pop-ups' likely to contain IDCSA commits an offence of making every time an IDCSA appears.</p> <p><i>R. v Steen (George)</i> [2014] EWCA Crim 1390: - Prosecution must prove that the defendant 'knowingly or intentionally' made the indecent photograph(s).</p>

4.4 Distribution

For the period 2014-2015, the UK crown prosecution service recorded 1610 instances of offences charged and reaching a first hearing at magistrates' courts for distributing IDCSA and 6,887 instances since 2009 (CPS, 2015). Table 3 defines the current key components of an offence of distribution in England and Wales.

Table 3: Offence of Distribution	
Key Facts	
Offence Outline	<p>Protection of Children Act 1978 Section 1(1) - It is an offence for a person</p> <p>(b)to distribute or show such indecent photographs [or pseudo-photographs]; or</p> <p>(c)to have in his possession such indecent photographs [or pseudo-photographs], with a view to their being distributed or shown by himself or others; or</p>
Available Defences	<p>Protection of Children Act 1978 Section 1(4)</p> <p>(a)that he had a legitimate reason for distributing or showing the photographs [or pseudo-photographs]or (as the case may be) having them in his possession; or</p> <p>(b)that he had not himself seen the photographs [or pseudo-photographs]and did not know, nor had any cause to suspect, them to be indecent.</p>
Sentence Length	Protection of Children Act Section 6(2)– Maximum 10 years
Key Precedents	<i>R v Dooley</i> [2005] EWCA Crim 3093 - "the mental element required for the offence of possession of indecent photographs of children with a view to distribution was considered. It was held that leaving a selection of indecent photographs of children in "My Shared Folder", for others to view, using a peer to network would only attract liability, if it was proved that one of the defendant's purposes for keeping or leaving the images in that location was to enable

	others to view them” (CPS, n.d.)
--	----------------------------------

4.5 Publication

For the period 2013-2014, the UK crown prosecution service recorded 1 instance of offences charged and reaching a first hearing at magistrates' courts for publishing and only 8 instances since 2009 (CPS, 2015). Table 4 defines the current key components of an offence of possession in England and Wales.

Table 4: Offence of Publication	
Key Facts	
Offence Outline	Protection of Children Act 1978 Section 1(1) - It is an offence for a person (d)to publish or cause to be published any advertisement likely to be understood as conveying that the advertiser distributes or shows such indecent photographs [or pseudo-photographs], or intends to do so.
Available Defences	None
Sentence Length	Protection of Children Act Section 6(2)– Maximum 10 years

5 Evidential Challenges

Prosecuting individuals involved with IDCSA is not a straightforward process of identifying the existence of the illegal content on a device. A DF practitioner must find digital evidence that a suspect has carried out one of the offences defined above and the applicability of evidence which may suggest a suspect maintains a defence. This raises a number of challenges which can be summarised into the following areas:

i Identifying who created/acquired the IDCSA: Before delving into the legal intricacies of establishing the offences surrounding IDCSA, the DF practitioner is faced with the task of identifying which user was responsible for creating or acquiring any IDCSA present on a digital device. Failure to ascertain this information will almost certainly prohibit the case for prosecution of a given suspect. Where devices such as mobile phone handsets are involved, the task is relatively straight forward, with such items typically being associated to one person, often protected by password locks which now include biometric forms of authentication, containing unique handset and SIM card information can be used to tie a device to a specific network provider, and ultimately a user (although concerns are raised with pay-as-you-go handsets). However, in cases where a computing device is utilised to commit these offences, multiple users could have access to the system (for example, Microsoft Windows operating system’s user profile functionality) where only one may be responsible any resident IDCSA material. In order to tackle this problem, the DF practitioner must interpret the available digital evidence to identify which actions were responsible for the presence of IDCSA and attempt to associate them with a given user, utilising all available intelligence surrounding the investigation. This involves identifying the location of IDCSA on the system, the particular user profile containing the IDCSA and the time, date and method by which the IDCSA came to be on the device (for example, in a particular user profiles internet browser cache). In addition, establishing who had potential access to each user profile can be of assistance, for example, where a user profile contains IDCSA, yet it was not password protected, this makes it more difficult to definitively tie actions on the device to a user, where potentially anyone could have accessed the device. Once collated, this

investigative data may provide support for establishing on of the offences surrounding IDCSA.

ii *Custody, control and the overlap with making*: Although not defined in the Criminal Justice Act 1988, following *Atkins v Director of Public Prosecutions* [2000] 2 Cr. App. R. 248 and *R v Porter* [2006] 2 Cr. App. R. 25, the possession offence requires a defendant to have custody and control over a file before it can be possessed. As a result, the hypothetical computer user is unlikely to be deemed in possession of IDCSA contained within operating system files (like the Thumbcache) and the unallocated areas of their digital storage medium. The challenge here remains that if a defendant has successfully removed IDCSA from normal accessible areas of their system (the My Documents folder in Windows systems for example), and demonstrates no evidence that they are recoverable, then any traces of these actions are not prosecutable under Section 160 CJA88. As a result, the scope for prosecution under this offence is arguably limited (even more so given the ease of file deletion and availability of file wiping software) and it is necessary to assess whether there is evidence of the user having control over IDCSA found on the system. What may be viewed as a compromise to this perceived gap is provided by the CPS (n.d.) prosecution guidelines, where if a defendant has demonstrated intent to obtain the IDCSA (via an admission, or where there is digital evidence documenting this), then a charge of 'making' may be appropriate as custody and control is not a component of this offence. In addition, the Internet cache also provides an area of contention, as cached files are a representation of what has been browsed online. Unless it can be shown that a suspect had knowledge of the Internet cache, again, files residing here are likely deemed to not be in possession. Yet, if evidence of Internet history artefacts demonstrates intention to obtain IDCSA (for example, indicative search terms), then a charge of making may be raised as an alternative, regardless as to whether the defendant knew of this content in the cache (CPS, n.d.).

iii *Proving a suspect's knowledge*: To be in possession of IDCSA, a suspect must have custody and control over them, a concept which requires the suspect to have knowledge the files in question. For example, possession of the Internet cache content is only inferred when the suspect demonstrates they have knowledge of the Internet cache and are therefore capable of having custody and control of files in it. To establish a suspect's knowledge requires a subjective evaluation of the defendants skillset, a task that is arguably impossible to establish accurately in all cases. Therefore DF investigators may only be limited to analysing timestamps of cached files to see whether a user has re-accessed this area of their system in order to establish knowledge, or evidence of relevant Internet history inferring the suspect has tried to remove this content. As a result, in many cases, a charge of possession for IDCSA in the Internet cache is unlikely to be raised.

iv *Defence 160(2)(c) Criminal Justice Act 1988*: In essence, a suspect has a defence against an offence of possession if they can show they did not keep an IDCSA an unreasonable amount of time (i.e. deleted it). However ambiguity remains as to what constitutes an unreasonable time (CPS, n.d.), and further, there are difficulties in establishing how long a file resided on a particular system due to unallocated data losing its file system metadata and only minimal internal metadata may be present. Although in theory, system files such as volume shadow copies (on Windows operating systems post-XP) may indicate the existence of IDCSA on a system over a period of time, in practice, their use may offer limited support. Therefore it remains possible for suspects to maintain possession of IDCSA for lengthy periods of time, before deleting it prior to any devices being seized, actions which may not be easily detected during forensic analysis as when a file is deleted effectively (via secure methods, overwriting file content), recovery is beyond current DF techniques. As a result, emphasis is placed on

police recognisance and their timing of device seizures to ensure that arrests for these offences are timely and effective in an effort to preserve as much digital evidence on a system as possible, before user deletion can take place. Given that those involved in these offences may be part of a larger network, where numerous offenders may converse, simultaneous arrests may prevent suspects being 'tipped-off' about an impending raid on their property and ultimately purging the content from their devices.

v Limited use of system artefacts: Due to the limitations of the possession offence, IDCSA found system artefacts are often non-prosecutable due to an absence of custody and control. The frustration remains that many artefacts maintain a history of a user's interactions on their device, and potentially their illicit behaviour, but potentially cannot be penalised for it. This leaves a DF practitioner having to establish evidence of intent to acquire IDCSA in order to potentially provide for an offence of making to be raised.

6 Conclusions

The prominence of IDCSA offences in both the UK and worldwide have strained law enforcement resources as they seek to tackle mounting caseloads. With a large proportion of instances involving digital content, it remains crucial for DF practitioners to understand the current laws surrounding IDCSA in order to effectively and efficiently carry out IDCSA examinations. As the volume of offences surrounding IDCSA and the number of IDCSA in circulation show no sign of decreasing, pressure is mounting on the DF practitioner to process investigations more quickly in order to tackle increasing case backlogs. As the field of DF is more frequently utilising triage strategies to decrease the time taken to carry out an investigation, it is vital for practitioners to understand the types of evidence which will support the prosecution of those involved in offences surrounding IDCSA. In doing so, practitioners can efficiently utilise their available investigatory resources to provide for an effective examination of suspect media. To support the DF practitioner in this task, this article has presented an analysis of historical developments and current precedents for the offences of possession, making, distribution and publication of IDCSA in England and Wales. The discussion of potential DF evidential challenges has also been presented which include analysis of the concept of possession and prosecution for IDCSA in the unallocated clusters and Internet cache of a digital device.

Acknowledgments

I would like to thank Professor Clare McGlynn and Erika Rackley for their support and guidance with this research.

References

Akdeniz Y. *Internet Child Pornography and the Law: National and International Responses*. Ashgate Publishing; 2013 p. 326

Alderson, K. *Businessman, 48, collected child porn from Internet*. Times [London, England] 27 Oct. 1995: 3. The Times Digital Archive. Web. 12 Feb. 2015.

Allsop, K. *The row about Lolita*. Daily Mail [London, England] 18 Dec. 1958: 4. Daily Mail Historical Archive, 1896-2004. Web. 21 Feb. 2015.

Antoniou, A. Possession of prohibited images of children: three years on. *J. Crim. L.*; 2013: 77(4) 337-353, p. 338

BBC News [Internet]. Ex-paedophile group leader Freeman jailed over child rape drawings. 2011.

[cited 2015 May 25] Available from: <http://www.bbc.co.uk/news/uk-england-london-14169406>.

BBC News [Internet]. Web porn: Just how much is there?. 2013. [cited 2014 September 12] Available from: <http://www.bbc.co.uk/news/technology-23030090>

BBC News [Internet]. How did the pro-paedophile group PIE exist openly for 10 years?. 2014. [cited 2015 May 25] Available from: <http://www.bbc.co.uk/news/magazine-26352378>

BBC News [Internet]. Police 'overwhelmed' by number of child abuse images. 2014b [cited 2015 May 25] Available from: <http://www.bbc.co.uk/news/uk-29470001>

BBC News [Internet]. Timeline: The Sarah Payne tragedy. 2014c. [cited 2015 February 14] Available from: <http://news.bbc.co.uk/1/hi/england/1703534.stm>

Butt, R. Stamp it out, this abominable evil of using children for pornography. *Times* [London, England] 24 Nov. 1977: 18. The Times Digital Archive. Web. 12 Feb. 2015.

Calder, M. The internet: Potential, problems and pathways to hands-on sexual offending. In M. Calder (Ed.) *Child sexual abuse and the internet: Tackling the new frontier* (pp. 2–23). Dorset, UK: Russell House Publishing Ltd; 2004.

Carr, J. *Child abuse, child pornography and the Internet*. London: NCH; 2003.

Cheng, Y E. Pornography: women matter. *UCL Jurisprudence Review*. 2002: 144

Chock, P N. The Use of Computers in the Sexual Exploitation of Children and Child Pornography. *Computer/L.J.*; 1987: 383

Clark, G. Political Correspondent. Tory call to strengthen law on child pornography. *Times* [London, England] 15 Nov. 1977: 2. The Times Digital Archive. Web. 12 Feb. 2015.

Clough, J. Lawful Acts, Unlawful Images: The Problematic Definition of Child Pornography; *Monash U. L. Rev.*; 2012: 213

Conley, P. C. Behind Closed Doors-The Clandestine Problem of Child Pornography. *Creighton L. Rev.* 21; 1987: 917.

CPS. [Internet]. Indecent photographs of children. n.d. [cited 2015 May 14] Available from: http://www.cps.gov.uk/legal/h_to_k/indecent_photographs_of_children/

CPS b. [Internet]. Indecent photographs of children. n.d. [cited 2015 November 2] Available from: http://www.cps.gov.uk/legal/p_to_r/prohibited_images_of_children/

CPS [Internet]. Violence against Women and Girls Crime Report. 2015 [cited 2015 Nov 30] http://www.cps.gov.uk/publications/docs/cps_vawg_report_2015_amended_september_2015_v2.pdf

D'Orlando, F. The demand for pornography. *Journal of Happiness Studies* 12; 2011: 51-75.

Daily Mail. Obscene books Bill gets reading. [London, England] 19 Nov. 1958: 9. Daily Mail Historical Archive, 1896-2004. Web. 21 Feb. 2015.

Daily Mail. 'Jail filth tycoons'. Daily Mail [London, England] 4 Feb. 1964: 9. Daily Mail Historical Archive, 1896-2004. Web. 21 Feb. 2015.

Edwards, S. S. M. A safe haven for hardest core. *Ent. L.R.* 8(4);1997: 137-42

Edwards, L. Waelde, C. *Law and the Internet*. Hart Publishing, 3rd; 2009: p. 632

O'Donnell, I. Miller, C. *Child Pornography; Crime, computers and society*. Willan Publishing, 1st: Devon; 2007: p. 259

Elman, R. A. *Sexual Politics and the European Union: The New Feminist Challenge*. Berghahn Books, 1st: Oxford; 1996: p.73

Foreman, J. Can We End the Shame?--Recent Multilateral Efforts to Address the World Child Pornography Market. *Vand. J. Transnat'l L.*; 1990: 435

Gibbons, T. Computer generated pornography. *International Review of Law, Computers & Technology*; 1995: 85

Gilbert, J. Computer bulletin board operator liability for user misuse. *Fordham L. Rev.* 54; 1985: 439

Gillespie, A. A. Incitement to distribute indecent photographs of children revisited. *J. Crim. L.* 75(3); 2011: 168

Harrison, J. Whitelaw urges child porn blitz. Daily Mail [London, England] 15 Nov. 1977: 11. Daily Mail Historical Archive. Web. 12 Feb. 2015.

Heffer, S. Don't Let Them Slip the Net. Daily Mail [London, England] 5 Sept. 1998: 15. Daily Mail Historical Archive, 1896-2004. Web. 2 Mar. 2015.

Holmes, S. T.; Holmes, R. M. *Sex Crimes Patterns and Behaviours*. Sage Publications, 1st: London; 2002: p.291

Home Affairs Committee 1993/94 HC 126 Home Affairs Committee. First report. Computer pornography. p.67

House of Commons Deb, 10 February 1978, vol 943, col 1832-744 at 1837

House of Commons Deb, 10 February 1978, vol 943, col 1832-744 at 1833-1834 (b)

House of Commons Deb, 14 July 1978, Vol 953, col 1919-848 (c)

House of Commons Deb, 27 June 1984 vol 62 cc1014-6

House of Commons Deb, 29 November 1985 vol 87, col 1117-718

House of Commons Deb, 22 December 1988 vol 144 cc426-7W

House of Commons Deb, 28 June 1988 vol 136, col 177-344 (b)

House of Commons Deb, 18 December 2001 vol 377 cc251-2W

House of Commons Deb, 08 May 2002 vol 385 c233W

House of Commons Deb, 12th June 2013, vol 564, col 383

House of Lords Deb, 5 May 1978, vol 391, col 527-670

House of Lords Deb, 17 March 1988 vol 494 cc1251-3

House of Lords Deb, 22 July 1988 vol, 499 col, 1583-1710 at 1674 (b)

House of Lords Deb, 04 October 2000 vol 616 cc1564-89

Home Office 1979/80 Cmnd. 7772 Home Office. Report of the Committee on Obscenity and Film Censorship

Home Office. Consultation on Possession of Non-photographic Visual Depictions of Child Sexual Abuse. Home Office: London; 2007. Available at:
<http://www.scotland.gov.uk/Resource/Doc/1099/0048474.pdf>

Interpol. Appropriate Terminology [cited 2015 November 2] Available at:
<http://www.interpol.int/Crime-areas/Crimes-against-children/Appropriate-terminology>

IWF. About Us. n.d. [cited 2015 May 14] Available at: <https://www.iwf.org.uk/about-iwf>

IWF. New tactics mean 137% increase in identified child sexual abuse imagery. 2015 [cited 2015 June 5] Available at: <https://www.iwf.org.uk/about-iwf/news/post/407-new-tactics-mean-137-increase-in-identified-child-sexual-abuse-imagery>

Jauron, J. Paperless Pornography. EDI L. Rev.: 1994: 163

Jenkins, P. Beyond Tolerance: Child Pornography on the Internet. NYU Press:1st;2003: p.260

Jewkes, Y.; Andrews, C. Internet Child Pornography: International Responses in Willian (eds), *Crime Online*. Willan Publishing:1st; Devon: 2007.

Johnson, D. B. Why the Possession of Computer-Generated Child Pornography Can Be Constitutionally Prohibited. Alb. L.J. Sci. & Tech; 1994: 311

Johnson, M.; Rogers, K. M. Too Far Down the Yellow Brick Road - Cyber-Hysteria and Virtual Porn. J. Int'l Com. L. & Tech; 2009: 61

Jones, L. M. Regulating Child Pornography on the Internet - The Implications of Article 34 of the United Nations Convention on the Rights of the Child' *Int'l J. Child. Rts.*; 1998: 55
Lambert M.; Negash, S.; Stillman, T. F.; Olmstead, S. B. & Fincham, F. D. A love that doesn't last: Pornography consumption and weakened commitment to one's romantic partner. *Journal of Social and Clinical Psychology*; 2012: 410-38

Lang, A., Bashir, M., Campbell, R., and DeStefano, L. Developing a new digital forensics curriculum. *Digital Investigation* 11; 2014: 76-84

Leary, M. G. Self-Produced Child Pornography: The Appropriate Societal Response to Juvenile Self-Sexual Exploitation. *Va. J. Soc. Pol'y & L.*; 2007

Lee-Potter, L. Depravity on the Internet. *Daily Mail* [London, England] 4 Sept. 1998: 16+. *Daily Mail Historical Archive, 1896-2004*. Web. 21 Feb. 2015

MacKinnon, C. A. Pornography, civil rights, and speech. *Harv. CR-CLL Rev.* 20; 1985: 1

Manchester, C. Criminal Justice and Public Order Act 1994: obscenity, pornography and videos. *C. L. R.*; 1995: 123

Manning, R. Plugging in to Computer Bulletin Boards. *ERIC Digest*; 1986

MET. 1987/88 Cm 389 Report of the Commissioner of Police of the Metropolis for the year 1987 at 29

Michaels, R. Criminal Law-The Insufficiency of Possession in Prohibition of Child Pornography Statutes: Why Viewing a Crime Scene Should Be Criminal. *W. New Eng. L. Rev.* 30; 2008: 817-67. p. 818

Midgley, C. Employee 'kept porn library on university computer'. *Times* [London, England] 30 Mar. 1996: 6. *The Times Digital Archive, 1785-2009*. Web. 1 Mar. 2015.

Millwood H. A. and Livingstone, S. *Harm and Offence in Media Content: A Review of the Evidence*. Intellect Books: Bristol:2nd; 2009. p.115.

Nair, A. and Griffin, J. The regulation of online extreme pornography: purposive teleology (in) action. *Int J Law Info Tech* 21; 2013: p.329

NBC News. Porn Industry Feeling Upbeat About 2014. 2014. . [cited 2015 June 11] Available at: <http://www.nbcnews.com/business/business-news/porn-industry-feeling-upbeat-about-2014-n9076>

Noyes, H. Parliamentary Correspondent. "Vote not needed on child pornography Bill." *Times* [London, England] 11 Feb. 1978: 1. *The Times Digital Archive*. Web. 12 Feb. 2015.

Oswell, D. The Place of 'Childhood' in Internet Content Regulation A Case Study of Policy in the UK. *Int'l. J. of Cultural Studies*; 1998: 271

Oxford Dictionaries. Indecent. 2014a [cited 2015 June 11] Available at: <http://www.oxforddictionaries.com/definition/english/indecent?q=indecent>

Oxford Dictionaries. Abuse. 2014b [cited 2015 June 11] Available at:
<http://www.oxforddictionaries.com/definition/english/abuse>

Oxford Dictionaries. Snuff movie. 2014c [cited 2015 Nov 10] Available at:
<http://www.oxforddictionaries.com/definition/english/snuff-movie?q=snuff+movie>

Oxford Dictionaries. Necrophilia. 2014d [cited 2015 Nov 10] Available at:
<<http://www.oxforddictionaries.com/definition/english/necrophilia?q=necrophilia>>

Prichard, J., Spiranovic, C., Watters, P., and Lueg, C. Young people, child pornography, and subcultural norms on the Internet. *Journal of the American Society for Information Science and Technology* 64; 2013: 992-1000.

Quayle, E. and Taylor, M. Paedophiles, pornography and the Internet: Assessment. *British Journal of Social Work* 32.7; 2002: 863-75.

Ramirez, J. A. Propriety of internet restrictions for sex offenders convicted of possession of child pornography: should we protect their virtual liberty at the expense of the safety of our children?. *Ave Maria L. Rev.* 12; 2014: 123-49.

Rojas, R and Hashagen, U. *The First Computers: History and Architectures*. MIT Press:1st; 2002:USA. p.18

Rose, P., Chief Crime Correspondent. "100 held in global child-porn swoop." *Daily Mail* [London, England] 3 Sept. 1998: 16. *Daily Mail Historical Archive, 1896-2004*. Web. 21 Feb. 2015.

Rowbottom, J. Obscenity laws and the internet: targeting the supply and demand. *C.L.R.*; 2006: 97

Ryder, B. The Harms of Child Pornography Law. *32 U. Brit. Colum. L. Rev.*; 2002: 101

Scotford, A., et al. Now let's have a clean-up on the bookstalls." *Daily Mail* [London, England] 18 Apr. 1961: 8. *Daily Mail Historical Archive, 1896-2004*. Web. 28 Feb. 2015.

Seigfried-Spellar, K. C. 'Distinguishing the viewers, downloaders, and exchangers of Internet child pornography by individual differences: Preliminary findings' *Digital Investigation*; 2014: 252-60

Sentencing Council. *Sexual Offences Definitive Guideline*. 2013 [cited 2015 June 11] Available at: https://www.sentencingcouncil.org.uk/wp-content/uploads/Final_Sexual_Offences_Definitive_Guideline_content_web1.pdf

Silverman, J. and Wilson, D. *Innocence Betrayed Paedophilia, the Media and Society*. Blackwell Publishing:1st; Cambridge:2002. p.193

Smith, L. S. Private Possession of Child Pornography: Narrowing at-Home Privacy Rights. *Ann. Surv. Am. L.*; 1991: 1011

Stone, R. Extending the Labyrinth: Part VII of the Criminal Justice and Public Order Act 1994. *The Modern Law Review* 58; 1995: 389-94.

Strossen, N. *Defending Pornography: Free Speech, Sex, and the Fight for Women's Rights* (1st, NYU Press, e.g. Oxford 2000) 320

Summit, R. and Kryso, JoAnn. Sexual abuse of children: A clinical spectrum. *American Journal of Orthopsychiatry* 48; 1978: 237-51.

Symon, P. "Home Office criticized on child pornography." *Times* [London, England] 4 Feb. 1978: 2. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Tate, T. *Child Pornography: An Investigation* (1st, Methuen, London 1990)

Taylor, M. The nature and Dimension of Child Pornography on the Internet. Paper presented at the international conference 'Combating Child Pornography on the Internet'; 199Times Times. Changes Proposed In Law On Obscene Publications." [London, England] 28 Mar. 1958: 4. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Times. OUR CORRESPONDENT. "Action Urged On Pornography." *Times* [London, England] 29 Dec. 1961: 4. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Times. Author Says Novel 'Fanny Hill' Not Pornography." *Times* [London, England] 21 Jan. 1964: 7. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Times. Scotland Yard Looks Into Mail Order Pornography." *Times* [London, England] 2 Sept. 1964: 10. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Times. Mr Rees willing to see if law can be tightened to tackle child pornography." *Times* [London, England] 18 Nov. 1977: 6. The Times Digital Archive. Web. 12 Feb. 2015.

Times. Bill to control child pornography makes the law more effective." *Times* [London, England] 6 May 1978: 25. The Times Digital Archive. Web. 12 Feb. 2015.

Times. Gary Glitter 'in child porn probe'. *Times* [London, England] 19 Nov. 1997: 1. The Times Digital Archive. Web. 12 Feb. 2015.

United Nations Office on Drugs and Crime. *Comprehensive Study on Cyber Crime*. 2013; pg.26

Wells, Melissa, et al. Defining Child Pornography: Law Enforcement Dilemmas in Investigations of Internet Child Pornography Possession. *Police Practice and Research* 8.3; 2007: 269-82.

Paul Wilkinson and Ruth Gledhill. "Paedophile priest circulated porn on the Internet." *Times* [London, England] 13 Nov. 1996: 3. The Times Digital Archive. Web. 12 Feb. 2015.

Wilson, Cecil. "Where can I take Aunt Edna?" *Daily Mail* [London, England] 2 Nov. 1959: 6. *Daily Mail Historical Archive*, 1896-2004. Web. 21 Feb. 2015.

Wolak, J., Mitchell, K. and Finkelhor, D. Unwanted and wanted exposure to online pornography in a national sample of youth Internet users. *Pediatrics* 119.2; 2007: 247-57.

Wood, N., Political Correspondent. "Labour backs Hurd on child pornography." Times [London, England] 17 Oct. 1987: 6. The Times Digital Archive, 1785-2009. Web. 21 Feb. 2015.

Wortley R, Smallbone S, Internet Child Pornography: Causes, Investigation, and Prevention. ABC-CLIO:1st. California;2012. p.157

Young, A. Ban child porn, demands 'shocked' Maggie. Daily Mail [London, England] 6 Sept. 1977: 15. Daily Mail Historical Archive. Web. 12 Feb. 2015.

Biography

Graeme Horsman is an EnCase Certified Examiner with a BSc (Hons) degree in Computer Forensics and PhD focusing on digital forensic triage methods. He is currently a lecturer at Northumbria University and his research focuses on digital forensic triage techniques, methods for forensically investigating mobile devices, and knowledge-based systems for improving digital forensic examinations and evidence identification.