Unlimited Editions: Three Approaches to the Dissemination and Display of Digital Art

Mark Blythe, Jo Briggs
School of Design
Northumbria University, UK
{mark.blythe, jo.briggs}@northumbria.ac.uk

Jonathan Hook, Peter Wright, Patrick Olivier
Culture Lab
Newcastle University, UK
{j.d.hook, p.c.wright, p.l.olivier}@ncl.ac.uk

ABSTRACT
The paper reflects on three approaches to the dissemination and display of digital art. "s[edition]" is a novel, web-based service that offers limited editions of "digital prints". Analysis of user comments suggests that the metaphor of a "limited digital edition" raises issues and to some extent is resisted. The second approach is the Flickr Brushes Gallery, where digital painters post images and comment on one another's work. Analysis of comment boards indicates that the shared art and comments are a form of gift exchange. Finally, the paper discusses a field study in which artists exhibited their work as it develops over time in digital frames and also in an immersive digital projection room. Analysis of field notes and interviews indicate that the digital frame approach was unsuccessful because of aesthetic and environmental concerns. The immersive projection suggested that more experiential approaches may be more interesting. It is argued that there is an inherent resistance in digital media to previous models of art commoditization. None of the approaches discussed here resolve the dilemma but rather indicate the scope and complexity of the issues.

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ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Digital technology has transformed all aspects of the creative industries: music, film, and art. It has never been easier to record a song, make a movie or paint a picture. Although digital tools mean that art is easier to make it is harder for artists to earn a living. The ease with which digital files can be copied and shared presents profound challenges for the creative industries. There has been a well-documented crisis in the music industry for something like twenty years. Statistics are produced almost annually to show how much revenue is being lost because of file sharing [e.g. 6]. Successive attempts to ban file sharing sites like Napster, Kazaa and most recently the Pirate Bay have all failed to curb the practice. Although individual outlets may be temporarily disabled like heads of the hydra new ones quickly reappear. Streaming sites such as Spotify are generating healthy profits but very little of this goes to the artists. Zoe Keating recently made her earnings from Spotify public claiming that she was paid just £179.90 for 72,800 plays [5]. According to PPL, a music licensing company 90% of musicians earn less than £15,000 a year and 90% of song-writers and composers earn less than £5000 (ibid). It is increasingly difficult for any kind of artist (novelist, actor, director, film maker or musician) to make a living wage from their work [18]. A third of visual and applied artists earn less than £5000 a year from their work. A recent survey of artists found that 57% earned less than a quarter of their annual income from their art (ibid).

This paper explores alternative models for the dissemination of digital content and takes art as a context. When artworks are created digitally the notion of an "original" and a "limited print run" begin to break down. The British artist David Hockney has received much attention for drawings he has made both on the iPhone and iPad. These images have been both produced and disseminated digitally, leading critics to ask what or where the "original" image might be [2]. In this context the notion of a digital original is at best a paradox and at worst a contradiction in terms [12, also see 8]. This may not be an issue for established artists such as Hockney but for many new and aspiring digital artists it presents serious challenges. The question addressed in this paper then is how can artists add value to digital work.

The paper reflects on three approaches. The first is s[edition] a new online service offering "limited edition" digital copies of work by very well established artists [30]. The second is the Brushes Gallery, a users' group on Flickr [15] which archives and exhibits images created by its members using the Brushes mobile painting app [14]. Finally, findings from a field study where artists were invited to show their work in digital frames and in an immersive digital environment is reported. It is argued that there are complex issues inherent in all of the approaches in terms of developing sustainable models of income generation for artists.

METHOD

A qualitative content analysis of user comments was conducted for the two online studies, s[edition] and the Flickr Brushes Gallery. Comments were assigned a category and counted to give an overall sense of the shape of the data [28]. User comments for both s[edition] and the Flickr Brushes Gallery are quoted, as posted online, complete with spelling and grammar mistakes, text speak and profanity, as translating them would risk distortion. For the field study, interviews with artists and visitors to the gallery were recorded and transcribed. Detailed field notes of observations were also made on site. A thematic analysis was conducted on the transcripts, where data was summarized in open-ended codes and grouped together into key themes [4, 16]. Each of the three case studies is followed by a reflective summary, drawing on wider literature.

s[edition]

"s[edition]" launched in November 2011 and described itself as a "revolutionary new way to collect art". An onsite video introduction explains: "*Originals by well known artists, works that would normally command astronomical prices, can be had here for as little as six Euros*". The artists' work is offered in digital format only for viewing on smart phones, tablets or TVs. Users sign up to an account and are given a "vault" where they can go to view the artwork that they have purchased. Work in the vault is shown without the copyright watermark, which runs across the centre of the publically accessible images on the site. The buyer is also sent a "certificate of authenticity" which is "signed" by the artist or at least, includes an image of the artist's signature. Still images are available as jpegs to download when purchased but video files can only be viewed online in the vault. Buyers must agree to certain terms and conditions including never printing out the jpeg of the image or the certificate of authenticity. Figure 1 shows the three best selling digital prints with the presale watermark.

Figure 1: From left: Elmgreen and Dragset "Powerless Structures"©, Damian Hirst "Xylosidase"© and Wim Wenders "Lounge Painting 1"©. Copyright retained by each artist. Reproduced on license to and with the permission of [s]edition.

At the time of writing there are eighteen artists whose works are sold on the site. There are discussion boards below each work where members can post comments. All site comments were gathered in September 2012 (last checked on the 12th). A qualitative content analysis [28] was conducted on the seventy top selling pieces.

Prices of the digital prints range from £5 to £1000. The majority (43) are less than £20. A further thirty one are priced between £20 and £125. There are only two items that are more expensive than this. One is a video called "For Heaven's Sake" by Damien Hirst. This shows a rotating baby's skull covered in diamonds and this is priced at £500. Another called "Prada Marfa" by Elmgreen and Dragset, is an image of a Prada shop in the desert priced at £1000. The more expensive works are released in smaller "editions". Hirst's video is in an edition of 500, Elmgreen and Dragset's Prada image is limited to an edition of 1000. The other artworks are in limited editions of 1500–2000, 5000 or 10,000. The site notes that once editions have sold out then collectors will be permitted to resell their editions in the s[edition] marketplace. At the time of writing the most collected item had 77% of its edition still remaining. The next most collected item (the Hirst print in the centre of Figure 1) had 96% of its edition remaining.

The number of "collectors" varies greatly. Forty-two of the artworks have between 1 and 50 collectors. Just two works have sold more than 300. One, "Xylosidase", a spot painting by Damien Hirst (the centre image in Figure 1) had 415 collectors at the time of writing. The most collected piece was "Powerless Structures" (the first image in Figure 1) by Elmgreen and Dragset, which had by far the highest number of collectors at 1172.

The number of comments posted did not reflect the number of collectors. Some of the comments indicated that site moderators were deleting more critical remarks and in total there were just 129 comments. There were never as many comments as there were collectors and 32 of the 70 images had no comments at all. Table 1 summarizes the coding of the comments.

Category	Number	Percentage
Art Appreciation	106	54.9
Idea Appreciation	26	13.5
Skepticism	21	10.9
Questions	11	5.7
Thanks to s[edition]	9	4.7
Other	7	3.6
Interpretation	7	3.6
Debate	6	3.1

Table 1: s[edition] website members' comments on artworks

Secondary codes indicated where comments could be assigned to more than one category; the table shows only the primary code that summarized the main point of the comment.

Art Appreciation

By far the most frequent kind of response was appreciation of the artwork. Often this appreciation was limited to very brief phrases such as "*love it*". Some were more detailed e.g. "*This is probably the most beautiful thing I've seen in a long time*". Some of these appreciative comments took the form of a direct address to the artist, for example "*Shepherd you can do no wrong*" to the artist Shepherd Fairey. More often the appreciation was a one word comment "*wow*" or

"*magic*" or "*like☺*". A large number used the word "love". This was sometimes in the form of a sentence e.g. "*I LOVE THIS*" or the phrase and a smiley face "*love this☺*" or enthusiastic repetitions with symbols: "*jajajajajajajaja I ♥ you*". Three of these comments were expressions of desire for possession e.g. "*want it*".

The majority of the appreciation comments then were brief statements of approbation and liking often drawing on web-based conventions of abbreviation such as smiley faces and symbols. However there were a small number of more detailed statements of appreciation. For instance, a Wim Wenders photograph received this comment: "*I like the same but slightly different cars and cropped voyeuristic letterbox framing*" (Henry Estorffe Founder, Designer HED). Similarly: "*I am mesmerized by Bill Viola's video installations and sound "environments". I said, MESMERIZED.*" (Timmy Colman). It is not possible to leave anonymous comments and many of the names and accompanying details were quite specific lending the comments an additional weight or sense of authority.

Interpretation

A small number of the comments offered an interpretation of the work. For instance this analysis of Noble and Webster's "Forever", a video of that word spelled out in flashing light bulbs: "*The cheap, Vegas-style lighting in combination with the word "forever" is what I love about this piece.* "*Forever" isn't a word that one would normally associate with glam. Energy for this type of lighting doesn't last forever, and "nothing lasts forever". Your first thought is that it's a romantic piece, then there are all these levels to consider […] In the end, it's still a romantic image*" (Laurel O Conner, University of Windsor). This level of art criticism is unusual in the comments but other briefer interpretations indicate a similar familiarity with critical discourse. For instance Noble and Webster's "Puny Under Nourished Kid", a video of a neon sculpture of a child with words like "void" across the forehead is described in one comment as "*conceptual body language*" (Jill Ellen Shulze). This kind of interpretation is similar to the onsite PR write ups about the work which follow the rhetoric of much contemporary art criticism, where work is described as "asking questions" about this or "challenging" that [23].

Thanks to s[edition]

Also related to appreciation were the comments which offered thanks to the s[edition] team. These were mainly confined to the comments in response to "Powerless Structures" (the first image in Figure 1). Some of these comments make reference to a particular event: "*I was there this morning. THANK YOU*". (Cleyenne Lazzarotto Miotto, Central St. Martins College of Art and Design). Most of these comments were made on the 23rd of February, which was the date that 5000 free limited editions of the Powerless Structure video were given away to celebrate the artists' unveiling of the piece on the empty fourth plinth at Trafalgar Square. There is a tradition that the fourth plinth in Trafalgar Square remains empty and guest artists have for many years shown temporary exhibits there. The artists made Powerless Structures in association with s[edition] and launched it as a virtual work so that the plinth remained empty except for an augmented reality image available when a phone with the Aurasma app was pointed at the space [20]. It seems likely then that the thanks come from some of the individuals who received free copies.

Idea Appreciation

After art appreciation, the next most frequent comments were related to the idea of the website itself, in the main these comments praised it for innovation. For instance shinyart writes "*Transforming flat screens into "canvases" for video art. Now that's an initiative we can support"*. A later comment from the same user restates the idea and notes that they are "committed" to it. Such comments were from those involved in technology and arts businesses. Alex Morrison the Managing Director at Cogapp writes "*s[edition] digital art market. This is a really extraordinary idea. How wonderful!"* Similarly Keiko Noah, listed as the owner of Mouche gallery writes" "*This is wild, new, fresh, so coming into our lives! Limited Edition Digitals.*" Lo Ba of Oxford Royale Academy notes "*it is a so new concept. it going to revolutionnate art! you are inspirators for tomorrow artists!"* Most of the comments praising the idea were made by people affiliated with art related institutions or businesses.

Broadly supportive comments sometimes also contained doubt: "*now electronic art... trying to wrap my head around 'owning' but not 'having'. I like the concept and yet find myself very uncomfortable with the intangible (pretty sure this is how we wake up old*)." (Kristen Corning Bedford, Seattle, Washington). Critical reflection on the notion of owning but not having was taken much further in directly skeptical and dismissive comments as outlined in the next section.

Skepticism

More than a tenth of the comments were skeptical and critical of the idea. This criticism is perhaps best expressed by George Nada who does not disclose where he works but does list himself as "58 years old" above the following terse comment: "*£50 for a jpeg! GREAT DEAL*!" Elsewhere, Jessica Greenman of the University of Bristol notes "*This leaves me in no doubt about the power of stupidity*". Similarly an Associate Professor at Penn State Harrisburg asks "*Are you people on drugs?*" One of these comments notes that it is an interesting new idea but adds "*interesting to see if there will be enough crazy people*" (Signe Rirdance). Several comments though broadly supportive, are critical of pricing. A Tracey Emin print is described as a "*great idea, bit pricey though*". Similarly a Shepherd Fairey print attracts this comment: "*for the price, seems to me only hipsters will be buying this*." Other criticisms were of particular artists and pieces.

There was a long and detailed accusation of plagiarism leveled against Shepherd Fairey's "Peace Guard". Petra Lichtenecker alleges the work is a: "*copy of the costume/image of a Japanese guitarrist from the 90s: Mana of Malice Mizer.* […] *That's not only unoriginal, it's downright plagiarism*." The member goes on to link to source material and challenge the webmasters: "*gonna delete this comment again like last time?*" Shepherd Fairey is best known for the Obama "Hope" picture, which also caused controversy when the original Associated Press (AP) photograph was discovered. Fairey was recently fined $25,000, given 300 hours of community service and two years probation in a criminal contempt case after he pleaded guilty to destroying documents and fabricating evidence in his court battle with AP [7]. The copyright sign immediately below his s[edition] limited prints takes on an ironic significance in this context.

The use of source material is a complex issue for graphic designers and artists alike. The point at which a source becomes new work is debatable. But the relatively rigid terms of copyright on the s[edition] site itself provokes this response: "*Shepherd Fairey, I was one of your biggest supporters back in the day. You have lost all credibility with me joining this site and selling movies of your work. Ten years ago you would have laughed at this stupid idea*." (Chris Rockwell Breshears). Such critiques indicate central issues with the metaphor at the heart of the site. This metaphor equates a limited print edition with a limited digital edition glossing over the inherent reproducibility of the digital.

Other comments were questions about the site, several wanted to know what the size of the piece was and attracted puzzled responses such as "*not sure I understood your question correctly, but the Vault version of this image is at 3000x3000 pixels*." (Konstantin K, The University of Edinburgh). There was also some debate about e.g. the merits of the artist Yoko Ono. A small number of the comments could not be coded because resources were not available to translate them and two because they were ambiguous e.g. beneath Hirst's £500 video called "For Heaven's Sake" someone had written: "*for heaven's sake*" which could be read equally as praise or blame.

REFLECTION ON S[EDITION]

Though s[edition] is undoubtedly innovative its approach is largely based on old production models of paper printmaking. Older models exploit the "Veblen effect", where value is perceived in an object because the price is high and availability is scarce [25]. Although the prices in s[edition] are undoubtedly high the images are not scarce. Removing a digital watermark on an image and capturing a video are relatively simple procedures. The certificate of authenticity aims at providing the kind of connection with an artist that a signature on a paper print might evoke, but that signature is also just another digital image.

"s[edition]" is curated by people, "cultural intermediaries" in Bourdieu's [10] sense of the "taste makers" or "gate keepers" who arbitrate the taste of the bourgeoisie. But this is not a venue for new or aspiring artist: all of the contributors are well established. It may be that the concentration on established artists lends the concept credibility. The institutions with which the users are identified indicate they are highly educated people with affiliations very often to higher education or technology.

Although the comments are moderated and sometimes made by cultural intermediaries who are broadly supportive of the initiative there nevertheless remain issues with the notion of the limited digital edition, or, "having and not owning". A recent initiative by [s]edition includes a "buy for free" offer, whereby new members to the site are given an introductory $10 voucher with which they may "purchase" a print. This "buy without buying" scheme perhaps indicates the difficulty of the notion of owning but not having.

Slavoj Žižek [34] has argued that there is a crisis in IP generally because digital technology itself tends towards communal ownership. The following section then considers an alternative economic and cultural model: an online gallery that is based on freely displaying art in an open community.

BRUSHES GALLERY IPAD / IPHONE ART

Brushes is an iPad and iPhone app that allows the user to "paint" using a range of predefined marks which can be controlled for size, density and hue. Users can also see a "playback" of their work, an animation of the sequence of marks made building up to the final image. This can be can played on the iPad itself or exported and converted to a movie file. Still images can be sent directly from the iPad to email accounts or to the online photosharing library Flickr. The Flickr Brushes Gallery is included in this study as an example of how digitisation has fostered mass-engagement in not only the creative production but also the display and dissemination of digital art. The group had at the time of writing 4008 members. The "group pool" of images contained 41,458 items.

Figure 2: Top 3 Brushes Gallery returns for art, by, from left: Matthew Watkins, Luis Peso (9monos), suzi54241. Reproduced with the permission of the artists©.

A search was performed within the group on the word "art" which produced 8726 results that were then sorted by the Flickr "interesting" category. This is a proprietary algorithm so its operation is not known but it seems to

weight a combination of views, comments and favorites to rank the order in which search returns are displayed. The search results were last checked on the 14th of September 2012. A sample of the most popular images were selected in order to compare the kinds of comments generated here and in s[edition]. Seventy were chosen to match the number available in s[edition].

Most of the images (60 of the 70) had between 300 and 1300 views. Others had more, ranging up to 3329 views. The top 70 was dominated by a relatively small number of contributors. There were just 15 artists within the top 70 returns. Those with the most images in the group were: Suzi54241 with 20 images; Lumilyon with 11; and Matthew Watkins with 10. Eight of the artists had between two and six images each. Four had just one image each. Most of the images (57) had between 11 and 40 comments. There was no direct correlation between the number of views and the number of comments. In total there were 2127 comments. Again, a qualitative content analysis [28] was performed on the comments. Table 2 shows the most frequent types of comment made.

Comment	Number	Percentage
Appreciation	1412	66.4
Thanks	373	17.5
"Seen in" Tags	238	11.2
Subject	20	0.9
Tutorial	19	0.9
Story	14	0.7
Questions	13	0.6
Links	11	0.5
Personal	10	0.5
Explanation	9	0.4
Invitation	8	0.4

Table 2: Flickr Brushes Gallery Comments

Secondary codes were used where comments could be coded under more than one category; Table 2 shows the primary code that summarized the main point of the comment.

There is a degree of similarity with the s[edition] comments in that the majority of comments express appreciation of the work. However it is important to note that the fifteen artists themselves made many of the comments, as they regularly show support for one another's work.

Art Appreciation

There were no negative comments at all perhaps because Flickr allows comment moderation by the author of the content that is commented on. As with the s[edition] appreciative comments these were often very brief exclamations such as "*WOW!*" and "*amazing!*" Several of the comments proclaim the work as a "*masterpiece*" and the artist a "*genius*". For example "*Wow!!!!! Great mood!!!! It's magical and can smell the wood in there!! Amazing masterpiece!!!!!*" The responses from the artists indicate that the accolades of genius are not meant or received altogether seriously.

A very small number of the appreciative comments referenced other artists or art history. For example "*I can see a bit of my admired Turner there...am I wrong?*" But this kind of appreciation was unusual. More often comments would be personal reflections, e.g. "*It brings me back to my childhood*." Certain subjects would provoke appreciative comments which focused not only on the artwork but also the subject. Susi54241's work, for example, often features food or drink and this occasionally provoked comments about feeling hungry. One subject provoked more comments than any other and that was a portrait of Steve Jobs by MiaBia DC. This elicited a number of "*RIP*"s as well as tributes to the greatness of the man and the sadness of the loss. Similar non-art related comments referenced the short stories that accompanied one of the artist's work.

There were no instances of art criticism or interpretation sometimes invoked in the s[edition] comments. This absence will be returned to in the second reflection.

Thanks

Perhaps the most striking difference between the comments here and those on s[edition] is thanks by the artists themselves. Often the thanks would include mutual appreciation, for example "*Great thanks my friends ! Both love your works ;)".* There is evident pleasure in the exchanges "*Huge thanks my friends, for your feedback and compliments!"* This on occasion became slightly flirtatious, e.g. "*Oh Luis, I love a man who shivers..... and is so good with kind words! Thank you."* Susi54241, one of the most prolific and popular artists returned in the search is also one of the most generous commenters on other people's work. Susi54241 reflects here on the value of the support: "*I'm very lucky. And I'm even luckier to have such a supportive team of artists around. How cool is that. AND have you all noticed how much better we're getting, especially from our first posts?"* There is then personal support but also technical and practical support as evidenced in the questions and explanations.

This generous praise and gratitude perhaps indicates that the principal economy here is gift exchange. Gift exchange has previously been identified as an important motivation amongst teenagers sending one another texts and in other social networking contexts [19, 32, 33]. The "gifts" here are in the form of social-relational transactions, rather than being purely about or driven by money. This kind of exchange has been referred to as a "renaissance of the commons" [17]. This will also be returned to.

Questions and Explanations

It is clear that the artists here follow one another's work and notice when something technically new has been accomplished. Although this is the Brushes group the artists use this app in conjunction with other apps such as

Autodesk's Mobile Sketchbook, here referred to as SB: "*first brushes and then SB? Why? What you find in SB that you are not in brushes? Not problem with definition exporting through ipod gallery? Skin colors extracted from a photo or selected with color editor? Wow, I want to learn from you*." Susi54242 responds with a 499 word account of her process which details the use of particular apps and tools. Another of her posts is titled "tutorial" and provides examples and illustrations of her process. This has over 2000 views though the number of comments remains small and they are from the usual friends or community of practice.

The standard of photorealism which Luis Peso achieves in "The Dancer" leads one user to ask what kind of lens he used to take the shot. Peso responds: "*I would say immediately, but I did not use any lens, just my finger and a stylus with Brushes on iPad (it's a painting) but I highly appreciate your comment!! ;)*". Peso also posts a link to YouTube [29] where a movie of its creation can be viewed. A number of responses to questions and comments point to such links. These are to other media e.g. a news interview where an artist was featured.

Seen it Tags, Invitations and Personal Comments

"Seen it Tags" refer to automated messages that are posted from other groups. This allows users to "like" the work without sending their own message. Invitations referred to such groups asking particular artists to join them. Often membership seemed to boost viewing figures. Finally there were a small number of personal comments such as exchanges of happy birthday and responses to a question one contributor asked about whether to become an artist or a scientist.

REFLECTION ON BRUSHES GALLERY

The Brushes Gallery provides an online venue where hobbyists and practicing artists can meet [13], share techniques, compliment and encourage one another. It has been argued that the explosion in social media has effectively turned the gaze of what Guy Debord described as a society in thrall to mass media spectacle [26]. Michon et al claim: "the individual has become the spectacle and data its currency" where the only measure of success is peer recognition. It is interesting to note that, in stark contrast to the total disclosure of identity in s[edition] users here do not for the most part identify themselves except through screen-names. Just three of the fifteen artists work under anything remotely resembling a real name. Most of the artists have assigned their works as rights protected or "some rights protected". But the use of anonymous nametags suggests that financial returns are not the main concern for these artists. The economy appears to be one of gift exchange where the images facilitate sociality and the formation of a group identity.

The myriad of digital resources spanning open-source and commercial proprietary tools have enabled mass participation in activities which involve the generation and display of artefacts and identities online. These digital cultural practices are not exclusive to "cultivated" or educated individuals. As Bourdieu has noted (in relation to the popularity of hobbyist "camera clubs") [11] wider socio-cultural groups are enabled to explore more aesthetic interests. While the Brushes Gallery artists present their work on the World Wide Web, prospectively exposing their work to scrutiny and critical feedback, they also exert some level of "reputation management" by controlling total personal identity disclosure by using screen names.

Cultural intermediaries such as curators and collectors have long been criticized as expressing and promoting little more than class taste [10]. In the Brushes Gallery group, networks of users and search algorithms occupy a curatorial role but it is not organized in a hierarchy of cultural legitimation as with traditional galleries. This may appear then, to be a communal artistic utopia but it is important to remember that space here must in effect be rented from Flickr which is now owned by Yahoo. The identity of artist may be easier to adopt but harder to sustain. To paraphrase Andy Warhol, in the future everyone will be an artist for fifteen minutes.

The intangibility of files was a concern in some s[edition] comments and Flickr artists such as BueJayWay make the work tangible by making large prints when they attempt to sell it [13]. Studies of file sharing amongst music fans have suggested that making digital content more tangible might be a means of adding value [e.g. 1, 21]. The final section of the paper then considers a field study where artists were encouraged to display digital work in the tangible form of interactive digital frames in a physical gallery and later in a four wall projection room.

DIGITAL ORIGINALS EXHIBITION

The final study was a piece of "in the wild" field work which was inspired by the Brushes "replay" function. We exhibited off the shelf prototypes in an art gallery in order to examine audience responses to notions of digital authenticity and originality. An artwork called "Layered Landscapes" was developed with Mike, a local digital artist [9]. Mike produces his work by making initial sketches on paper and then scanning these into Photoshop before adding layers of line and colour to build up a final piece. He then makes high quality "giclee" prints of the work which he sells in local shops and art galleries. Working with the project team, Mike outputted separate image files of each Photoshop layer (see Figure 3) and these were loaded onto digital frames. This showed how the work built up in the manner of a Brushes animation to reveal the process and development of the work. Following the notion of "Autobiographical Design" [31] the first author lived with this "layered landscape" for several months before the exhibition [9].

For this study, seven off-the-shelf digital frames were purchased and preloaded with content. Cheaper frames were loaded with image sequences from a single picture,

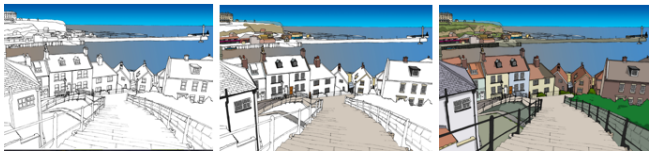

Figure 3. Images from a Layered Landscape© presented in digital frames. Copyright the artist.

more expensive frames were loaded with multiple images of up to five sea and cityscapes, with each image constituting around 20 individual layers.

Two of the digital frames featured images from one other local artist, Jim, who had been loaned an iPad as part of the project. Jim was of interest to the team as he worked entirely in traditional media but had made some forty abstract iPad paintings using the Brushes and ArtRage apps. Selections of still images were shown in two frames, and additionally, Brushes movies showing the creation of the images were shown on an iMac. The exhibition was held in the print section of a gallery in the north of England for a period of three days from the 25th August 2012 (Figure 4).

Figure 4: Digital Originals Exhibit: Layered Landscapes©.

Fields notes were made by two researchers throughout the exhibition. Discussions and interviews were transcribed for thematic analysis [4]. Categories of codes were developed to summarise the data and organized into themes (ibid).

RESPONSES TO THE EXHIBITION

Discussions in the art gallery with the artists, gallerists and public, centered around *resources* in terms of time and the environment, the art *market* in terms of copyright and authenticity, and *aesthetics* in terms of sensuality and experience.

Resources: time and environment

One of the artists, Jim, had been highly skeptical about selling work in a digital frame. Although he had produced over forty digital paintings on the iPad he pointed out that he had spent years mastering oil paint and only months with the new digital media. Yet he was pleased with the work he had produced and agreed to show it in the exhibition.

The exhibition ran over a public holiday which coincided with a major local racing event. Although many tourists passed the shop very few came in. There were around 30 visitors on Saturday, fewer than 20 on Sunday. On Monday there was a drinks reception event where the artists invited friends and colleagues and around 50 visitors attended.

Most of the visitors over the first two days spent no more than four minutes walking around the sales area of the gallery where the digital frames were displayed. They would typically circle the room at walking pace looking at giclee prints on the walls as they went, sometimes pausing to look more closely at a particular wall hanging but usually for no more than a few seconds. They would usually end in the far right hand side corner and spend most time looking at postcards, which were the cheapest items in the gallery. Some would linger over the racks of giclee prints before leaving. Very few people looked at the work in the digital frames at all. Although the layered landscapes were conceived as changing slowly the frames were set at a maximum speed of every three seconds to highlight the changes. However most visitors did not notice that the images changed because they did not look at them for longer than three seconds. At night the frames stood out against the dark street and some passers by were observed to pause to see the changes. Doormen outside a nightclub on the other side of the street crossed the road to look more closely. But in the day it was not obvious that there was anything to look at and most passed by.

During the day glare from the window meant that the images did not show up well. The frames were moved to the back of the gallery and this improved visibility but no sales were made. Indeed there was only one sale during the whole of the three days. This was of a giclee print of the image in the window poster (see Figure 4) and the couple who bought it did not notice the digital frames.

One visitor was shown what was happening and she immediately responded very positively: "*Oh I see. Oooh I seee! Oh! Right! "I think that's quite amazing actually.*" But it was clear that most people did not notice or were not interested. Rather than unduly influence reactions the researchers refrained from explaining or pointing out the frames at all. The speed of the visitors did not surprise one local artist, William who visited Jim on the third day: "*That's the problem you've got with all visual media. […] Artists know this. Mike knows it, I know it. […] People do not spend very long, they don't, they scan, they walk away. […] We do it. I go to the National Gallery. I know what I want to see."* He argued that every aspect of our environment, the streets we walk down, the screens we work on, are saturated with visual media. The environment was also discussed in relation to energy consumption as well as visual overload. The gallery staff were particularly concerned about the environmental impact of viewing pictures through a machine rather than on paper or canvas. This concern was echoed in a number of discussions with artists and visitors.

Market: copyright and authenticity

Jim was not optimistic about sales; he had asked several people if they would buy work in a digital frame and received a flat "no". Mike was more optimistic and insisted on raising all of the prices on the first day. The two most

expensive frames were loaded with five layered landscapes each. One was a set of coastal landscapes and the other was a set of places within the city. Each could be observed in various states of completion cycling through the layers so there were approximately fifty to sixty image files in each. Mike suggested £395 because he would sell single giclee prints for £80 each. Smaller cheaper digital frames which retailed at £20 each were loaded with a single image sequence and Mike suggested £80 for these.

Visitors generally agreed that they were very expensive items. The artists maintained that they were cheap even though none of them sold. There were cheaper versions of Jim's Brushes movies available at £2 each. Jim was happy to sell files in this way but Mike did not want to sell the files directly because people could "*do what they wanted*" with them. He was in effect selling the files on the SD cards in the frames but this did not worry him so much because it was not explicit. By contrast, William, the artist friend, was deeply concerned about the possibility that someone would take the SD card out and copy the work. He suggested sealing the SD cards in so that it was impossible to remove without damaging the frame. Jim objected that if the frame broke then the customer would lose the work but William thought that this would be fair enough: "*You can't have the thing removable and lose you're integrity. […] They're buying that as a thing and at unit price — hundred and twenty pounds, it's a bargain. If it's got twelve images on it and that's an artefact in their home that's a bargain. That's how I see it. If it busts it busts*." William returned to the idea of integrity many times and his notion of this was closely related to forms of copyright.

William discussed two forms of revenue for artists: royalties and sales. He had recently been approached by a publisher who supplied prints to architects. He had turned them down because "*the print prices were pennies*". Although there was a possible income it was tiny. Jim asked: "*What if ten thousand people had nicked* [stolen] *my stuff? I'd be quite chuffed*". William replied "*I wouldn't*" and maintained: "*Software can be seen as the new panacea: it isn't. [...] Aesthetics haven't changed since time immemorial.*" The topics of copyright, technology and aesthetics were fluid and slipped easily from one to the other.

Aesthetics: tangibility and experience

Ewan is a painter working in the urban realist tradition whose work is sold in international markets from a major London gallery. He has mentored both William and Jim and is the most successful of the local artists and his opinion is respected. Ewan also visited on the third day and for him Jim's Brushes movies playing on the iMac were very successful. The Brushes movies held his attention and he stood watching them for fifteen to twenty minutes. He also responded positively to Jim's still iPad paintings in the digital frames and noted that they were recognizably Jim's although he usually worked in oil paint. He was more critical of Mike's work, because of the use of recognizable Photoshop filters.

The frames themselves attracted some very negative aesthetic judgments from Ewan and many others. One of the larger and more expensive frames was mounted in a walnut veneer. This was described by the gallerist as "*horrendous*". Another visitor said that he didn't like digital frames because they were "*a fad*" and thought that the cheaper ones displaying single works looked like "*a sat nav in a Jaguar".* Several visitors compared some of the frames to TVs. One of Mike's friends said he preferred to see a still image on a wall and sequences in a book. A minority thought they were "*great*" and preferred the incomplete stages of the pictures with colour and white line. This was however a small minority of visitors.

Despite the lack of sales Jim was influenced by Ewan's reaction and considered the event a success. Ewan suggested projecting Jim's work on a large scale and this led to a further intervention at a university facility equipped with a four-wall immersive projection environment called the 3sixty room. Experimenting in this environment the artists found a space for digital painting that they found aesthetically and experientially satisfying (Figure 5).

Figure 5: The artists painting on walls in the four wall projection "3sixty" room.

The 3sixty room at York University provides an immersive environment in which it is possible to project images and film onto all four walls from floor to ceiling. An iPad was connected to project live images on to one wall and Jim's previous iPad paintings were displayed on the three others. Jim and William gasped when they first saw the work appear and were clearly delighted. Jim immediately began to paint, throwing light up the wall as he brushed his fingers over the tablet. The spectacle was powerful and the researcher remarked that it was like standing inside one of Jim's paintings. William, who had been consistently skeptical about becoming involved in the project admitted "*I came here to sneer, but I'm a convert."* Both artists immediately expressed interest in creating an exhibition of digital work in the 3sixty room. This was for the artists and researcher a far more direct experience of the work. This was not a jpeg or mpeg but immersion in the work where the art was the only light source in the room.

Unlike the metaphor of the digital limited edition in s[edition] or the more tangible digital frames this was

experiential [27] in the sense that it was time limited and confined to a particular space.

REFLECTION ON THE FIELD STUDY

In a study of amateur multimedia production [3] Bardzell pointed out that the identifiable use of presets in software such as fades and transitions sometimes signified the work of an amateur. Ewan was similarly critical of the content of Mike's work for the use of pre-set filters. But the use of off the shelf frames also perhaps signaled amateurism. More successful was the experimentation in the 3sixty room which indicated the potential of more experiential approaches.

The development of VHS technology was seen by many as the beginning of the end for cinema. Yet cinema endures because it offers a particular kind of experience not available in other forms: the group consumption of media on a very large screen. Similarly, live music continues to provide a source of income for musicians because it offers a unique experience not available in other formats. The 3sixty room enchanted and excited the artists and it is possible that such environments may offer opportunities for art making and viewing. Although environments such as the 3sixty room are not widely available it is not unique and it seems likely that screens in home environments are likely to enlarge until they occupy whole walls. It is possible to imagine then, services like Spotify for art, where users rent or subscribe to work, or bodies of work, and form relationships with particular artists or studios. Like the social exchanges observed in the Brushes Gallery, experiential approaches to digital art may be a route to value different to models like s[edition] which attempt to replicate older forms such as the limited edition.

DISCUSSION

This paper has considered three potential approaches to the dissemination and display of art, and reflected on how each model upsets traditional economic and cultural models. The first, s[edition], is largely conceptual and attempts to reproduce previous forms of commercially-viable limited editions. But the comparison of a digital edition to older forms of limited print editions is strained and resisted. The second, a Brushes Gallery group on Flickr, operates through forms of gift exchange. These are of clear social value but profits accrue to the owners of the aggregating site Yahoo, from whom the artists effectively rent space. The third approach attempted to embed digital content in tangible formats through utilization of digital frames. The intervention was crude and reliant on off the shelf technologies but nevertheless provoked enough responses from artists and visitors to indicate issues with this approach in terms of a negative environmental impact as well as poor aesthetic effects. The gallery exhibit led to further experimentation with immersive projection environments that perhaps suggest the potential value of experiential approaches.

Each of the approaches discussed are responses to the resistance of digital material to standard models of commoditization in the art market. Digital artwork presents difficulties for models of value based on scarcity because any digital file is infinitely reproducible. The digital also presents challenges to theories of value in terms of labour as digital methods makes the production of images faster and easier.

As noted in the introduction, many of the issues discussed here also affect the music industry. In a recent polemical book Joran Lanier argues that career options in the music industry are now very narrow [24]. He claims that the "giant musical act" dominates having become successful in the pre-digital era. He acknowledges new roles for aggregator websites that collect the music of thousands of others and also new opportunities for different forms of vanity career but these offer him little hope. There are parallels to Lanier's analysis of the music industry and the approaches to art considered here: s[edition] features work by "giant" artists primarily known for non-digital work; the Brushes Gallery is an aggregator site collating the work of thousands of artists and the artists could be seen as enjoying a form of vanity career. Approaches to making the digital more tangible did not generate sales. The reasons for this may be multiple but this initial investigation suggests that experiential approaches may be more promising.

The issue of how artists are to make any kind of living from their work may seem trivial. We are used to the notion of artists starving in garrets and new technology has not really changed this. However the art market is increasingly polarized. A small elite of art superstars makes obscene amounts of money in an unregulated market [23]. The function of the work of art is now to hang on a wall and become more valuable [22]. A society where only a tiny elite can make a living in this way is culturally diminished and impoverished.

CONCLUSION

This paper has reported findings from three related studies of digital art. Each of these focused on the ways in which artists might address the contradictions inherent in the creation of digital media. "s[edition]" offers users a metaphor where access to a digital file is equated with the ownership of a limited edition paper print. This is conceptually difficult entailing the idea of "owning but not having" as one user put it. The Brushes Gallery offers users a valuable social experience and operates as a form of gift exchange. However, the main beneficiary of this model is the aggregating site. The field study explored the strategy of making digital files more tangible by making layers of images available in digital frame. This was largely unsuccessful due to aesthetic and environmental issues but it suggested further possibilities for experience based approaches. It is not clear that any of approaches discussed will enable artists to make a living in the digital age and it may be that future manifestations offer combinations of

these strategies. Although it is too early to dismiss entirely any of the approaches there are clearly issues with models that simply attempt to reproduce pre-digital models.

REFERENCES

1. Alonso, M.B. and Keyson, D.V. (2005) Music Cube: Making Digital Music Tangible. *CHI '05*, ACM Press (2005), 1176–179.
2. Appleyard, B. David Hockney Interview, *Sunday Times* 30 Jan 2011, available: http://www.bryanappleyard.com/david-hockney-interview/
3. Bardzell, J. Creativity in Amateur Multimedia: popular culture, critical theory and HCI. *Human Technology 3.* 1 (2007) 12–33.
4. Braun, V.A. and Clarke,V. Using thematic analysis in psychology. *Qualitative research in psychology*, 3 (77), (2006), 77–101.
5. *BBC*. Streaming Revenues Up 40% globally in 2012. http://www.bbc.co.uk/news/entertainment-arts-19270362 (2012).
6. *BBC*. A Glimpse At Piracy in the UK and Beyond. http://www.bbc.co.uk/news/technology-19599526. (2012).
7. *BBC*. Obama "Hope" artist Shephard Fairey fined. http://www.bbc.co.uk/news/world-us-canada-19522210 (2012).
8. Benjamin, W. The Work of Art in the Age of Mechanical Reproduction. In: *Illuminations*. Fontana, London, (1992 paperback ed.), 211–235.
9. Blythe, M., Briggs, J., Olivier, P. and Hook, J. Digital Originals: Reproduction as a Space for Design. *NordiCHI '12*, ACM (2012), 1–10.
10. Bourdieu, P. (1986). *Distinction: a social critique of the judgement of taste.* Routledge and Kegan Paul, London.
11. Bourdieu, P. (1990). *Photography: A middle-brow art*. Polity Press, Cambridge.
12. Briggs, J. and Blythe, M. 2012. No Oil Painting: Digital Originals and Slow Prints. In: Slow Technology: Critical Reflection and Future Directions, *DIS '12*.
13. Briggs, J. and Blythe, M. Post Anxiety Art: Economies and cultures of digital painting. In *Post Digital Art, Proc of the 3rd Computer Art Congress*, Paris (2012) 161–168.
14. *Brushes App* http://www.brushesapp.com/
15. *Brushes Gallery* http://www.flickr.com/groups/brushes/
16. Charmaz, K. (2006). *Constructing Grounded Theory*. Sage, London.
17. Clippenger, J. H. and Bollier, D. (2005). A Renaissance of the Commons: How the New Sciences and Internet are Framing a New Global Identity and Order. In: R. A. Ghosh (ed.) *CODE: Collaborative Ownership and the Digital Economy*. MIT, Cambridge MA, 259–286.
18. Day, E. (2012). Can You Make Any Kind of Living As an Artist? *The Guardian*. 2012. http://www.guardian.co.uk/culture/2012/jul/29/artists-day-job-feature.
19. Faraj, S. and Johnson, S.L. (2011). Network exchange patterns in online communities. *Organization Science*, 22(6), 1464–1480.
20. *Gadgetspeak* 5000 Free, Limited Edition Artworks to celebrate Trafalgar Square Sculpture Unveiling. 23 February 2012.
21. Gallardo, D. and Jordà, S. Tangible jukebox: back to palpable music. *TEI '10*. ACM (2010), 199–202.
22. Hughes, R. (1990). *The Shock of the New: Art and the Century of Change*. Thames and Hudson, London.
23. Hughes, R. (2008). *The Mona Lisa Curse*. Director Chang M. Oxford Film and Television.
24. Lanier, J. (2010). *You Are Not A Gadget: A Manifest.* Allen Lane. Penguin Group, London.
25. Lidwell, W. and Holden, K., (2003). *Universal Principles of Design*. Rockport Publishers Inc., MA USA.
26. Michon, A., Flazinski, C. and Chalubert, C. On the Separation Between the Aesthetic and the Functional and how the Digital will Steal Form. In *Post Digital Art, Proc of the 3rd Computer Art Congress*, Paris (2012).
27. McCarthy, J. and Wright, P. (2004) *Technology as Experience*. MIT Press, MA USA.
28. Mayring, P. (2004) Qualitative Content Analysis. In U. Flick, E. von Kardoff, and I. Steinke (eds), *A Companion to Qualitative Research.* Sage, London.
29. Peso, L. (2011). *The Dancer* retrieved from: http://www.youtube.com/watch?v=okhhY-sTe0k&feature=youtube_gdata_player
30. *s[edition]* http://www.seditionart.com
31. Sengers, P., Boehner, K., David, S. and Kaye, J., Reflective Design. *CC 2005* ACM Press (2005) 49–58.
32. Skågeby, J. (2010). Gift-giving as a conceptual framework: framing social behavior in online networks. *Journal of Information Technology*, 25(2), 170–177.
33. Taylor, A. and Harper, R. (2003). The Gift of the Gab?: A Design Oriented Sociology of Young People's Use of Mobiles. *Computer. Supported Cooperative Work* 12, 3 (2003), 267–296.
34. Žižek, S. (2008). *Living in the End Times*. Verso, London.