www.swarmtv.net : non-hierarchy through open source approaches to distributed filmmaking

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Abstract

An increasing number of filmmaking projects borrow approaches from open source programming methodologies in the practical process of film production. The potential benefits of open filmmaking include fast development times, customizable storytelling, less-biased reportage and a rich learning environment for future filmmakers, among others. There has been very little academic study about the challenges of this approach and the opportunities it affords for distributed filmmaking. This thesis explores the possibility of incorporating open source programming methodologies into the practice of distributed filmmaking. It develops a number of emergent policies and procedures that relate to this practice, and tests them out using an interactive website called "Swarm TV". This online environment acts as a prototype for these policies and procedures, as well as functioning as a probe, testing their effectiveness in the filmmaking projects. Data is collected from the website and has been used from a number of projects over the last nine years, to reflect on how these emergent policies and procedures affect the dynamics of a filmmaking community.

From the context of open source programming, the digital revolution has emphasized three main characteristics that are significant in open source methodologies: Openness, Non-hierarchy & Collaboration. These concepts are explored in this thesis to define guidelines for distributed filmmaking projects where open source methodologies are implemented. Analysis of the effectiveness of these policies and procedures is provided for filmmaking projects using Swarm TV, and conclusions are developed focused on the effectiveness of open source approaches to filmmaking projects in distributed communities. The practical research in this thesis demonstrates the extent to which open source methodologies are effective for the filmmaking process, and also, identifies the emergent policies and procedures that might facilitate distributed filmmaking in an online environment.

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Introduction

The aim of this thesis, as an exploration of non-hierarchy from open source approaches to distributed filmmaking, is to make a contribution to knowledge in the field of co-creation in digital arts. Although, the subject touches on aspects of filmmaking and also anthropology, the argument is fundamentally about ideas of co-creation and as such it is particularly significant for education and/or situations where a minority community feels that its voice is not being considered by mainstream media. It not only explores issues of non-hierarchy within co-creation, but it also provides a practical methodology for it.

Traditionally, film is known for its hierarchical structures and so it is likely that if a non-hierarchical methodology can function in the field of film, then it will be effective in other disciplines of knowledge as well.

This thesis, therefore, constructs a theoretical framework from diverse areas of knowledge and follows the implications from these areas through its argument. The principle areas of knowledge explored in this thesis are collaboration, open source methodology, non-hierarchy, self-organisation, emergence, and swarm intelligence. From these areas, characteristics are identified that may support the practice of co-creation. A number of collaborative filmmaking projects are reviewed with regard to these characteristics and, from projects organised as part of this thesis, these characteristics form a list of eighteen guidelines. These guidelines are likely to be of use, academically then, in any field of co-creation.

From the field of open source computer programming, it is claimed that the more code is opened up to public scrutiny, the more the code is likely to be robust. But how far could this be applied to a creative filmmaking process? From the field of collaboration, there is evidence that suggests that overall project time can be dramatically reduced when there are many participants doing many small tasks. But how counterproductive could this be in the area of filmmaking where an aesthetic expression needs to be consistent, in order for an audience to understand what is supposed to be represented in the film? From the field of non-hierarchy,

the effect of a leaderless organisation emphasizes the relationships between the members of that organisation. But how beneficial is this likely to be, when the primary objective from the process of filmmaking is, traditionally, just the completed film? According to these assertions, an open source approach to distributed filmmaking could produce a film faster, cheaper and at the same time encourage participation from marginalized communities. However, the most significant reason for the exploration of non-hierarchical systems of co-creation is not only the possibility of realising the potential for each member of a community, but in so doing, the whole community is best able to realise its potential as well.

The methodology in this thesis arose from the continuing trend in opening up approaches to the production of media that had traditionally been realized using very hierarchical methods. Where Charles Leadbeater explained how individuals could accumulate power by orchestrating the potential of users defining what they would like to consume (2009), Axel Bruns has argued for a model that he calls "produsage", which can block commercial agendas from exploiting user-led content creation (2013). Henry Jenkins has contrasted the difference between centralized stickiness of the broadcast era against the value of spreadability, as is becoming more prevalent in social networks (2013). This is evidence of the development to relax control over content in preference for media with the virality to spread by itself, and Yochai Benkler believed that there is a systematic operation that protects hierarchical economies against the burgeoning proliferation of distributed co-creating networks (2006). Clay Shirky considered that a better world could be built with the trillions of hours of free time that human beings have at their disposal worldwide, if civic improvements were actively celebrated (2010). But Manuel Castells asserted that there is empirical evidence that within revolutionary networks against oppression, that "the transition from outrage to hope is accomplished in all movements by deliberation in the space of autonomy" (2012).

Non-hierarchy has consequences culturally, socially and politically.

Culturally, non-hierarchy allows marginalized groups to express their concerns and voice their opinions. Their lives and experiences have formed their mindset,

and they have developed a whole set of solutions to problems that many other cultures experience, but have approached from a different point of view. It is important that marginalized groups are able to participate in the process of co-creation, so that ideas and directions are not discounted before these ideas get a chance to be realized. Non-hierarchy increases the possibilities of originality.

Socially, non-hierarchy is not a natural state of relationships. Within every set of associations, those who have the most social ability most readily influence the group. In this way, they have most power within the community and those with power are more able to influence what happens. However, the discipline of learning to negotiate opinions held by those who are not powerful, builds a richer society. Deeper relationships form; they are more diverse and so non-hierarchy builds a stronger network of relationships.

Politically, then, non-hierarchy allows more participation in decision-making processes. If this happens, then more people take responsibility for decisions and it can be argued that they are therefore more considered.

Potentially, then, understanding non-hierarchy encourages a more egalitarian society, and it is the aim of this this thesis to develop an effective methodology for employing non-hierarchy in the filmmaking process.

Chapter 1 - Three waves of the digital revolution

Rise of counterculture

You raise up your head
And you ask, "Is this where it is?"
And somebody points to you and says
"It's his"
And you say, "What's mine?"
And somebody else says, "Where what is?"
And you say, "Oh my God
Am I here all alone?"
But something is happening here
But you don't know what it is
Do you, Mister Jones?
(Dylan, 1965)

Dylan's abrupt abandonment of political songwriting in the mid-sixties caused an uproar by both fans and critics, but Marqusee has regarded it as "one of the purest songs of protest ever sung" (2005). The song seems to be about someone on the outside looking in; someone observing what is happening but who is not actually part of what is going on. Marqusee sees this song as the epitome of the burgeoning counterculture of the '60's.

In the '60s, of course, there was no Internet. However, from out of the counterculture, Stewart Brand produced a publication published between 1968 and 1972, called the "Whole Earth Catalog". It was an encyclopaedia of countercultural ideas and its purpose was to develop the "power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested." (Brand, 1968). These values sound quite familiar in the age of social networking, but at the time, this was anti-establishment. Steve Jobs compared The Whole Earth Catalog to the Internet search engine, Google, but in paperback form and 35 years before Google came along. (Jobs, 2005). In fact in 1985, Brand went on to found the Whole Earth 'Lectric Link (The Well), which is one of the oldest surviving Internet communities.

It started out as a bulletin board system and has now evolved into the website **www.well.com** and still has about 4,000 members.

Andrew Keen, the author of "The cult of the Amateur" (2007), has said *"the most concrete legacy of the counterculture is the Internet: the values, the organization, the rebellion, the resistance to authority were all encapsulated in the Internet"* (The Virtual Revolution, 2010). Fred Turner, Associate Professor at Stanford University, has also argued that it is difficult to distinguish cyberculture from counterculture and that both have used the computer as a tool for personal liberation (2008).

Although the countercultural environment around San Fransisco in the '70s was set for transformation, the term "digital revolution" does not refer to the uprising of a counterculture, even though, as has been seen, there is a relationship. Instead, it is a revolution that is still happening today. "Digital Revolution" refers to the technological move from analogue to digital since the appearance of the personal computer in the '80s. This thesis observes that there have been, at least, three significant developments to this revolution, the first being the effect of digitization.

First wave: Digitization

Digitization is the process of representing information as a series of discreet numbers, as opposed to analogue representation that represents information as continuous values either mechanically or electronically. An example of this would be the difference between sound recorded using analogue tape and sound digitally recorded with a computer. The computer breaks the signal down into discreet values, but samples those values so often and at so high a resolution that the human ear can not perceive the jumps between those discreet values.

Nyquist's sampling theorem states *"If a function f(t) contains no frequencies higher than W cps, it is completely determined by giving its ordinates at a series of points spaced 1/2 W seconds apart."* (Shannon, 1949) In short, this means that in order to reconstruct any particular frequency for human hearing, an original sound wave needs to be digitally sampled at twice the rate of that frequency.

In the same way, other types of information can also be digitized: an image or a movie clip for example. In effect, information can be stored as a series of numbers

and computers have been developed to handle numbers very easily. A computer can also manipulate those numbers: they can transform them; edit them and copy them exactly. In other words, the effect of digitization is that information can now be copied endlessly without difficulty and without degradation of that information. With analogue systems of reproduction, every time the original was copied it introduced slight alterations to the signal, so that after only a few generations of copying, it was no longer a faithful reproduction of the original. Digital reproductions, on the other hand, are exact duplicates of the very first digitized version.

The personal computer enabled anyone to duplicate digital files. This became a matter of concern for the media industries who, up until this time, had control of the media duplication processes and had built their business model around this.

Second wave: The World Wide Web

The second wave of the digital revolution came with the invention of the World Wide Web. The terms "Internet" and "Web" are often used interchangeably, but the Internet includes other technologies like email, FTP and bulletin boards. The Internet is a network of networks that connects any computer linked up to any other, but it existed before the Web. Specifically, the Web uses the HTTP protocol to communicate with other computers and employs an information-sharing model. Documents are retrieved using hyperlinks and are accessed through a web browser. Critics like Shapiro (1999) & Kass (1999) have written against the democratic proclivities of the Web calling for more regulation. However, Tim Berners-Lee, the inventor of the World Wide Web, has said that with the complex issues human beings are facing globally, a technology needs to be built that allows us to operate collectively (2010). Berners-Lee specifically designed the web as a structure for sharing information.

Today, it is estimated that about 66% of the world's population are still not connected to the Web (**www.internetworldstats.com**, Mar 2014), however, the 34% that is connected is made up of inhabitants from every country in the world. In this sense, it is known as a global medium.

For media industries, then, even though the second wave of the digital revolution offered new possibilities, it was seen as even more of a threat. On the one hand, the Internet meant that distribution and marketing of media could be global if the industry wanted to use this technology. On the other hand, it also meant that copies of any particular piece of music or movie could be accessed by anyone as long as someone, somewhere else had published it on the Internet.

The effect of the digital revolution has been a matter of concern for the software industry as well. The Business Software Alliance, whose members include Adobe Systems, Apple, Microsoft, and Symantec, has estimated that global software piracy reached a record figure of $59 billion in 2010 (2011). In 2006, the Motion Picture Association of America claimed that world losses due to piracy in the film industry was $6.1 billion (Stwek, 2006). However, it is very difficult to predict how much would have been made because even if the MPAA knew exactly how many pirate copies were in circulation, it does not mean that the owners of the pirate copies would have bought them legally for the full price. In addition, there is a good case for arguing that pirate copies serve as marketing in order for viewers to attend cinemas. Writer of television series *Breaking Bad*, Vince Gilligan states *"[Piracy] led to a lot of people watching the series who otherwise would not have". (Kastrenakes, 2013).* By the spring of 2009, in the midst of fears of financial depression, United States ticket sales were up 17.5% from the previous year to $1.7 billion; and attendance was up by almost 16% (Cieply, 2009).

Third wave: Web 2.0

The third wave of the digital revolution has come about with the rise of social networking that has been made possible through the Web. As the name implies, Web 2.0 is the second version of the web and it is in fact much closer to the Tim Berners-Lee's original vision of the Web than the first version (Berners-Lee, 1999). With the first version, individuals published their material online, and it would be accessible globally. With Web 2.0, web users are able to adapt their view of the web according to their own particular tastes; edit what is there; and contribute their own versions of material back onto the Internet as well.

Web 2.0 describes sites like Facebook, Twitter, Amazon, eBay and MySpace as well as blogs, wikis and forums. Web 2.0 refers to sites where the user's preferences are recorded so that the information on the site is served up in a manner that is specific to that user, or where the users participate in creating the content of the site themselves. They tend to emphasise relationships and how other users have responded to that content. For instance, eBay ratings enable each person to see at a glance the reputation of a particular seller. It is significant that it is the general public that has become the expert in this system rather than individual authority figures.

This third wave has become an opportunity for music and filmmaking, not so much in terms of a business model, but in terms of creativity. The fidelity of duplication and the ease of access of those duplications, mean that it has become much easier to build on the work of someone else. In the music business, for example, one musician can build a set of samples from scratch, post them on the Internet and another musician can retrieve these samples and construct them into a new composition without losing any of the original's high definition quality. It greatly facilitates the possibilities of collaboration.

In filmmaking, digital unedited material could also be distributed via the Internet. Although in practice, a film is not often produced in this way, this may present a new opportunity for creativity in filmmaking. The digital revolution has emphasized the possibility for collaboration in filmmaking via the Internet, but how could this work out in practice? This thesis will explore this question and the following paragraph defines the term 'film'.

Definition of 'film'

In this thesis, the term 'film' will mean a narrative that is told through the constructed sequences of moving images, whether on celluloid or in a digital format, usually with the addition of synchronized sound.

Other effects of the digital revolution on filmmaking

Digital technologies have also polarized the cost of film production (Puttnam, 2004). On the one hand, big budget motion pictures like "Avatar" are reported to have cost in the region of $300 million to produce (Steele 2011, Coyle 2009) because of all the high-end digital special effects that were used in production. Digital technologies have similarly transformed the games industry in the same way.

"Game design and programming has moved from a small-scale enterprise to an effort requiring many separate skills, development typically over a period of about two years and Hollywood-style budgets running up to tens of millions of dollars" (King & Krzywinska, 2002)

On the other hand, "Tarnation", made by Jonathan Caouette, only cost a total of $218 because Caouette used a home movie-camera and free iMovie software on a Macintosh computer (McLean, 2005). It was released in 2003 as an 88-minute documentary and the National Society of Film Critics voted it "Best Documentary" in 2004 (Chapman, 2009). As Taylor has stated (2004), the impact of digital technology on the film industry does not just consist of picture acquisition and distribution, but also in the narrative of the film itself; films like The Matrix Revolutions, (2003); The Lawnmower Man 2 (1996); Tron: Legacy (2010) and Untraceable (2008), present new technology as a monster.

Whether the digital revolution is seen as an opportunity or as a threat, it has certainly brought about change in the way things are produced. One of these changes that demonstrate the influence of the digital revolution can most clearly be seen in the area of software development.

Open Source Software

Eric Raymond discussed the theories of software engineering in terms of the same two fundamentally different development styles, the "cathedral" model of the commercial world versus the "bazaar" model of the open source world (1999). He showed that because the code is openly accessible, the bazaar style accelerates debugging and code evolution. As he put it: *"Given enough eyeballs, all bugs are*

shallow". In other words, the speed at which errors in source code can be found is proportional to the number of programmers who can inspect that code. The implication is that open source software is able to develop faster than commercial software.

The second potential, open source software promises to provide, is the possibility to customize software precisely to suit the needs of the user. If a particular function in the software doesn't act in exactly a desired way, it is possible to change the source code, because it is accessible to programmers.

Open source software is more likely to be future-proof, because official discontinuations of a particular version don't take place. If someone somewhere finds it useful, it is likely to have a community of programmers who also support this functionality.

Open source software tends to develop a community of users and as such, it can provide an excellent computer-programming learning environment, for those keen to learn programming skills.

Although training, maintenance and consultation may have a cost, the actual software itself is also free, and for some types of software this can be a substantial consideration.

The growth of open source software has been phenomenal in recent years. Sourceforge, the main clearing-house for open source development, provides tools for 3.7 million developers who create software in over 430,000 projects. Their directory connects more than 41.8 million consumers with these open source projects and serves more than 4,800,000 downloads a day (**http://sourceforge.net/about**, Mar 2014). Across the computer industry, open source applications are strong compared with proprietary competition. Examples of open source projects are Firefox, Linux, and the Apache Webserver (Lee, 2008). Worldwide, the Apache Webserver, overshadows the Microsoft counterpart (proprietry software) with Apache accounting for 38.2% of the global market share as opposed to the Microsoft market share of 32.8% (**www.netcraft.com**, Feb

2014). On the other hand, Microsoft claims that over 1 billion users worldwide use Microsoft Office (**www.microsoft.com**, Mar 2014), whereas about 90 million users worldwide have downloaded Open Office (**www.openoffice.org**, Mar 2014,). Firefox and Chrome (which is mostly open source), however, accounts for 83% of browsers used worldwide, whereas 10% of web browsers use Internet Explorer (**www.w3schools.com**, Mar 2014).

If the methodologies of Open Source could be applied to filmmaking, then, how would it affect the filmmaking process and what would be the emerging policies? The Open Source Initiative defines Open Source as *"a development method for software that harnesses the power of distributed peer review and transparency of process. The promise of open source is better quality, higher reliability, more flexibility, lower cost, and an end to predatory vendor lock-in."* (**http://opensource.org/about**, Mar 2014). How far would these attributes extend to the result of applying open source methodologies to the practice of filmmaking?

In this definition, the phrases "distributed peer review", "transparency of process" and "an end to predatory vendor lock-in" reflects three characteristics that this thesis will explore to derive policies from distributed filmmaking: collaboration, openness and non-hierarchy respectively. This thesis will explore these fields in the next chapter and policies derived from these areas will be employed in the distributed film projects described later in this thesis.

Key questions from the Digital Revolution

In order to explore the impact of the digital revolution on the process of making a film in this practice-based thesis, a website was developed which is designed not only to facilitate the filmmaking process, but also to act as a probe to test how effective various policies were for a distributed filmmaking process. Swarm TV (**www.swarmtv.net**) is this website. Visitors to the site are encouraged to edit the content of the site; upload and download images of audio or video anonymously; and the style and position of each element on each page in the website is dependent on the last visitor who has decided to change it. Professor Neil

Cummings from Chelsea College of Art described the environment as "scarily open" (Cummings to Mackay, 2008).

17 open projects were organised as part of this thesis since 2005. Although all of the projects are referred to in the course of this thesis, there is a particular focus on the detailed analysis of just five of these 17 projects, where a solution to the research question can be seen most clearly. They are the clearest examples of the methodology and the research results from the question:

"What emergent policies and procedures encourage distributed filmmaking?"

The other 12 projects were projects that informed the Swarm TV methodology and its interactive website technology, but were not set up as complete Swarm TV projects. For instance, the project "Possibilities" (May 2010) was a discussion documented on video and by emails between Catherine Maffioletti and myself, which looked at the possibilities of editing a video by two filmmakers using non-hierarchical principles. Another example, "Terrible tales of Hayle", was a young people's filmmaking project that tested out some early online editing facilities. Decisions, however, were mostly made face-to-face around a table, and so didn't rely on the Swarm TV website as the hub of communication. From all of the projects, there was either a finished film that was produced, or a collection of film clips that were created during the course of the project. All these films can be seen on the DVD attached to this thesis.

Having looked at the history and influence of the digital revolution on filmmaking, in the next chapter there will be an exploration of the theoretical framework that will be used in this thesis.

Chapter 2 - Theoretical concepts for distributed filmmaking

Introduction

In this chapter, several different fields of knowledge are outlined to establish the theoretical framework for this thesis, and to provide a basis for the methodology of its research. What are the emergent policies that facilitate online distributed filmmaking?

In order to define the term "policy", it is important to clarify the semantic differences between the terms characteristics, principles, guidelines and policies.

According to the Oxford English Dictionary, these terms are defined as follows:

> ***Characteristic:*** *a quality typical of a person or thing.*
> ***Principle:*** *a truth or general law that is used as a basis for a theory or system of belief.*
> ***Guideline:*** *a general rule, principle or piece of advice.*
> ***Policy:*** *a course of action adopted or proposed by an organisation or person. (OED, 2006)*

Each subsequent term develops the aspect of actively influencing the environment. A characteristic passively describes a typical quality of something. A principle builds upon that characteristic to explain why something happens in terms of cause and effect. A guideline offers active advice as to what should be done in the light of this principle; and a policy is a set of guidelines that facilitates decision-making in a particular situation.

For the theoretical concepts in this thesis, then, the characteristics of several fields of knowledge are explored. Principles are defined and guidelines are formed in order to establish the emergent policies that facilitate distributed filmmaking.

As outlined in the previous chapter, three of these fields of knowledge are collaboration, openness and non-hierarchy. However, it is also important to briefly study the term 'emergence'.

Johnson defined emergence as *"A network of self-organisation, of disparate agents that unwittingly create a higher-level order"* (Johnson, 2001:21). Johnson used the word 'unwittingly' to refer to the emergence of either inanimate objects or simple life forms like ants, slime mould and brain cells that work together to achieve very complex behaviour. However, this thesis is particularly concerned to see if human beings can collaborate via the Internet in a similar way so as to consciously form a higher-level order, so the specific term 'unwittingly' is not appropriate. De Wolf and Holvoet constructed the following definition:

> *"A system exhibits emergence when there are coherent emergents at the macro-level that dynamically arise from the interactions between the parts at the micro-level. Such emergents are novel with respect to the individual parts of the system." (De Wolf & Holvoet, 2005:3)*

In their paper, De Wolf & Holvoet differentiated emergence from self-organisation, which they defined:

> *"Self-organisation refers to exactly what is suggested: systems that appear to organise themselves without external direction, manipulation, or control." (De Wolf & Holvoet, 2005:5)*

They concluded that the biggest potential in the field of engineering appears when they both occur together. In this thesis, both characteristics of self-organisation and emergence are analysed to see how a film can be made on the macro-level using the guidelines derived in this chapter on the micro-level, and to what extent the projects can be said to be self-organizing.

Emergence is relevant to this thesis because of the possibility of defining a set of simple guidelines that can result in a complex outcome. The hypothesis is that if the right guidelines are chosen, when participants demonstrate adherence to them at a local-level, then through emergence, something different will occur at a higher-

level. In this thesis it will be the production of a film. With this in mind, this chapter explores various fields of knowledge to establish some simple guidelines that could be employed and examined in the filmmaking projects of this thesis.

The first field that this chapter looks at is the process of rhizomatic thinking. The following section looks at this concept as well as a couple of other thinking procedures, in order to develop a bespoke procedure called "Ideas Browsing" that is used in the research in this thesis. This procedure is used to form the fundamental criteria of the website environment used in this thesis, Swarm TV; and it facilitates the construction of the basic building blocks for filmmaking, the generation of ideas.

Rhizomatic Thinking

The rhizome

The Oxford English Dictionary defines a rhizome as:
"An elongated, usually horizontal, subterranean stem, which sends out roots and leafy shoots at intervals along its length." (OED, 2006)

Rhizomatic thinking, then, is the process of thinking that is horizontal, subterranean and it often develops new ideas at seemingly random junctures. Ideas can often appear disconnected from each other when they are, in fact, connected through a unseen network of thoughts.

Interestingly enough, Berners-Lee has described the World Wide Web as being a 'memory substitute' for an individual because of its rhizomatic characteristics:

I needed to be able to keep track of things, and nothing you could get, the spreadsheets and the databases, would really let you make this random association between absolutely anything and absolutely anything. (Naughton, 1999:233)

The Oxford English Dictionary also defines 'narrative' as *"an account of a series of events, facts, etc., given in order and with the establishing of connections between them; a narration, a story, an account." (OED, 2006)* This definition presents a narrative as being linear, however, in the wake of the digital revolution, narratives

can also be constructed with multiple plots interwoven with each other (Soft Cinema, 2005; Timecode, 2000; Short Cuts, 1993). These, then, are examples of rhizomatic narratives and it is the possibility of rhizomatic narratives that forms the argument for using the style of web technology developed for this thesis, based on characteristics of the rhizome.

Using these characteristics from the concept of the rhizome, a procedural set of guidelines was needed as part of the research of this thesis to facilitate thinking, both for individuals and groups. The first procedure explored, was Mindmapping.

Mindmapping

Tony & Barry Buzan, subtitled their thinking process, "Radiant thinking", as *"How to use the untapped potential of your mind in the learning process"* (Buzan, 1993). Buzan authored and co-authored over a hundred books; had a TV series on the BBC about the subject in the 70's; and many schools in the UK implement his ideas when trying to tap into the potential of creativity.

Radiant thinking is based on the idea that any field of knowledge can be broken down into smaller sections that can then be organised into even smaller sections. It is very similar to the way in which a trunk of a tree has branches and those branches have leaves on them. However, the system the Buzans outline is very hierarchical, or "arborescent" as Deleuze and Guattari would have described it in "A Thousand Plateaus" (1987:15).

SLIP thinking

John Maeda describes a different method of organizing thoughts. He uses the acronym of SLIP: Sort, Label, Integrate, & Prioritize (2006:12-14). It is much more rhizomatic than the procedure of the Buzan's mindmapping procedure, outlined above. Maeda's procedure is that there should be a blue-sky session that results in a number of ideas; these ideas should then be sorted; labelled; integrated and finally prioritized. Unfortunately this last stage, again, encourages the creation of hierarchy, and this could work against the concept of the rhizome.

Ideas browsing

The third procedure, described in this section, was developed as part of this thesis, in order to create a rhizomatic system of thinking. It is a workable system that encapsulates all the characteristics of a non-hierarchical mindmapping process.

The procedure is as follows:

1. Think through a particular issue.
2. When ideas come to the thinker, write them all down on the same blank sheet of paper so that, in effect, they are floating in space. It does not matter where on the page it is written down.
3. After you have finished the thinking session. Draw lines of association between ideas that have a relationship.
4. If there are more than three lines extending from a particular idea then draw a circle around that idea. This, then, becomes a cluster of ideas.
5. Continue doing this, if possible, until every idea is linked to at least one other idea.
6. If necessary create extra topics that serve to link different ideas together e.g. “Red”, “Orange” & “Blue” could be linked to a new topic called “Colours of the rainbow”. “Colours of the rainbow” would then become encircled and would serve as the title of a cluster (See Figure 2-1).

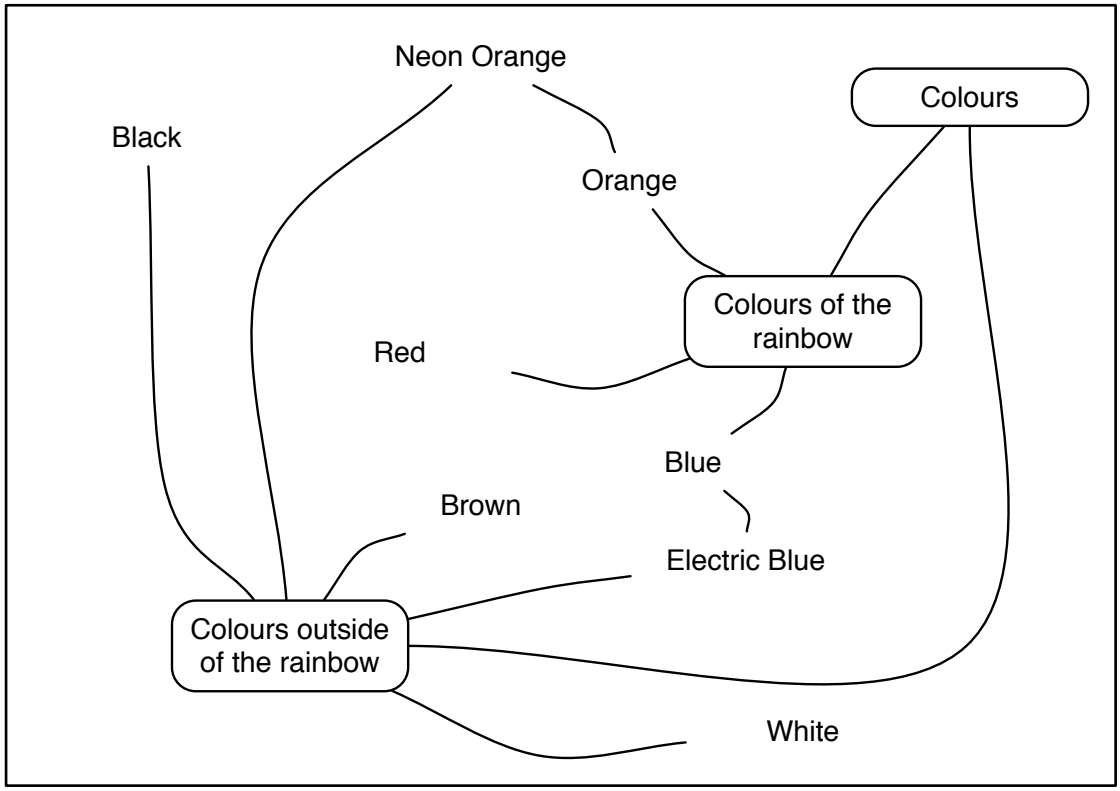

Figure 2-1 Example of a rhizomatic thought map

In this example, it would have been a neat hierarchical map if there were no links between "Blue" and "Electric Blue"; also "Orange and "Neon Orange". However, there is a relationship between these terms and the extra connections signify a relationship between these colours, outside of "Colours of the rainbow".

It could be argued that the practice of creating clusters could be seen as creating a second level of hierarchy. However, clusters are an important aspect because they serve as an index to the other connected ideas in the diagram, they are not necessarily, in themselves, any more important than any other idea on the map. According to psychologist George Miller (1956), using short-term memory, the human brain can remember about seven things or 'chunks' of information at one time. However, it is possible to incorporate larger numbers of items than those seven chunks, if 'chunking' can occur: A master chess player is able to look at a complex board configuration of over 20 pieces for only 5 seconds and then reproduce that board set up exactly. A novice, on the other hand, will normally only be able to reproduce about seven of those pieces. If the same master chess player is randomly given any 20 pieces on the board with no logic behind their positions, then the master chess player will only be able to remember about 7

pieces as well. This is because the master chess player will have stored up thousands of complete board configurations in his memory over time that can be recalled, as a single chunk, in an instant. However, if the pieces are positioned at random, then the chess player will not be able to recognise any patterns. This is 'chunking' (Chase & Simon, 1973:55-81). So then, the practice of clustering ideas is an important part of the thinking process, because it often produces a method whereby chunking can occur. Ideas can contain a lot of information.

According to Dawkins, ideas also exhibit a reproductive life cycle. He called these ideas, 'memes' (1976), and he suggested that they propagate in the same way that genes propagate. When Darwin wrote about the preservation of favoured species in the struggle for life (1859), Darwin argued that populations evolve over the course of generations through a process of natural selection. According to Dawkins, if an idea is strong, then other human beings take up that idea and it gets propagated naturally as well. In a group environment, this is an important characteristic to take into consideration. Strong ideas naturally propagate.

Summary of research into the thinking process

Later in this thesis, there is an account as to how a tool for this rhizomatic process of thinking was developed in the website environment, Swarm TV, but the three simple principles that are carried forward from this field are:

Idea generation:
Principle: Change is a fundamental part of development.
Guideline: Generate new ideas.

Idea clustering:
Principle: Ideas from a blue-sky session often overlap.
Guideline: Cluster ideas appropriately.

Idea selection:
Principle: Some ideas are stronger than others.
Guideline: Select the best ideas.

From these three principles, then, the guidelines form a policy, which will be called the Policy of Rhizomatic Thinking in this thesis, and it will be used in the filmmaking projects that are analysed in detail in Chapter Five of this thesis.

These guidelines, in fact, bear more than a striking resemblance to the process of cumulative selection used by Dawkins' Weasel program (1986:46-49) when he demonstrated the theoretical difference between cumulative selection and single-step selection. That these policies reflect the way that evolution may have occurred should come as no surprise, because a film can easily be viewed as a set of ideas that evolves into a narrative.

These guidelines will feed into creating emergent policies that will support online distributive filmmaking. This thesis will now look at the characteristic of Openness that the practice of open source programing tries to embody.

Openness

Definition

The Oxford English Dictionary defines "open" as:

1. not closed, fastened or restricted
2. not covered or protected
3. likely to suffer from or be affected by
4. spread out, expanded or unfolded
5. accessible or available
6. frank and communicative
7. not disguised or hidden
8. not finally settled

The terms that are most useful to this thesis are "not restricted", "accessible", "likely to be affected by" and "not finally settled".

'Openness' is the characteristic of making information accessible to whoever wants to inspect it. Openness was common at the start of computing when information was first being digitized. At this time, the practice was to freely pass

around software with little attention given to whether someone owned it or not. Computing was a field within the area of academia where ideas and research were largely built on the ideas and research of scholars who had gone before.

In contrast to this characteristic is the idea behind proprietary software. According to the film documentary, Revolution OS (2001), in January 1976, Bill Gates, General Partner of the recently formed Microsoft, summed up the idea of proprietary software in a newsletter of the Homebrew Computer Club. Gates wrote:

> *To me the most critical thing in the hobby market right now is the lack of good software courses, books and software itself … As the majority of hobbyists must be aware, most of you steal your software … you prevent good software from being written. Who can afford to do professional work for nothing? What hobbyist can put three-man years into programming, finding all bugs, documenting his product, and distribute it for free? (1976)*

Nearly forty years later, the answer to Gates' questions would be the idea of crowdsourcing (Howe, 2005), where work on particular tasks can be obtained by opening up the list of requirements to the public and enlisting the services of participants via the Internet. Wikipedia is such a project and is described later in this section.

However, the characteristic of openness can, of course, be found in open source software. Software is freely distributable, its source code is publicly accessible to anyone who wants to look at it and it is open for programmers to change it if they want. In a filmmaking setting, this translates to the raw unedited film material being made available to anyone to wants to access it, so that they are able to develop the film in whatever way they like.

"Openness" in this thesis also relates to open source methodologies of computer programming. As opposed to proprietary programming, where the source code is hidden away from the user, open-source programming makes the application code accessible to those who might want to develop it. It actively encourages those developers to change the code, with the aim of incorporating their changes back

into the main programme if it improves the application. Bruce Perens defines open source as:

1. The right to make copies of the program, and distribute those copies.
2. The right to have access to the software's source code, a necessary preliminary before you can change it.
3. The right to make improvements to the program. (1999)

For filmmaking then, this might be adapted as follows:

1. The right to make copies of the film, and distribute those copies.
2. The right to have access to the original raw material of the film, a necessary preliminary before you can change it.
3. The right to make improvements to the film.

In filmmaking, however, the right to make improvements to the film is not as easy to assess as in a computer program. With program code, there are a number of objective ways of assessing whether a change is an improvement or not. Does it function faster? Does it provide more functionality? Does it improve the end-user's experience? With filmmaking it is also about how well a story is told over time; what elements in the narrative resonate with its audience; and subjective decisions about when the delivery of certain pieces of the narrative are allowed to be given to the audience in order to keep them engaged and maintain their interest.

Openness is easily distinguished in the field of computing, although the definition of openness in this thesis does not just come from the field of computing, but filmmaking is creative, and the definition is also derived from the field of art. Umberto Eco examined how art in general provokes incomplete experiences. He said art *"deliberately frustrates our expectations in order to arouse our natural craving for completion."* (1989:74)

Duchamp stated:

> *All in all, the creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualification and thus adds his contribution to the creative act (1957)*

Duchamp's point is that the creative act, by necessity, has to be borne out of multiple individuals. A solitary artist cannot produce art until there is someone else to perceive it. Openness from an art perspective, according to Duchamp, is about the possibility for participation.

Another artist who has influenced the idea of openness from the perspective of participation was the musician, John Cage. In 4'33'', a composition from Cage, where a pianist played nothing for 4 minutes and 33 seconds, the audience were encouraged to listen to the incidental sounds of the world around them – the audience shifting on their chairs, someone coughing, a plane passing overhead etc. The work was deliberately left open and, incidentally, could never be experienced in exactly the same way at any other time (Godfrey, 1998).

Cage and Duchamp were from different epochs, and in neither case were their gestures about openness, in particular. However, they both exhibited interest in the audience being part of their work. For the most part, they both produced individually authored works that Eco would have described as being 'open' (Eco, 1989), in that they relied on participation from an audience in order to complete their artistic expressions.

Openness in this thesis, then, is defined as the "characteristic of actively encouraging participation from those outside the project initiators through transparency of objectives and accessibility of strategic project media and information, and decision-making opportunities".

There are, of course, challenges to openness, and this thesis now outlines three of these before it looks at three of the benefits of openness.

Challenges of openness

1. Competitive disadvantage

In nature, openness can be devastating. In a system like the human body, where a virus is prevented from entering for instance, openness could destroy sustainable conditions of health.

For similar reasons, there are also disadvantages for open communities. Take, for example, a community that exists in an environment of conflict. Historically, communities have had to defend themselves from attacks of malicious raiders. Attitudes of openness could make that community vulnerable. If, for example, a band of marauders acquires the ability to make chain mail, and they keep that ability a secret from the community that they attack, they will be at the advantage in a battle. Similarly, it can be argued that in a contemporary business environment, it could make sense to keep certain types of information secret so that a particular company has a competitive advantage.

Jargon within a specific discipline acts comparably, but on a casual basis. It is a device that deliberately closes up a community, so that only those with experience in that discipline fully understand what is being communicated. According to Peter Ives, it is a natural desire for security that makes workers want to close up their community.

> *In order to create and give strength to our own social forces we have to use ... jargons. This is true for actual institutions such as newspapers, universities or collective projects (where we have at least some influence in how they operate), and also for social forces that are more abstract (such as prevailing trends in society). (1997)*

2. Accountability

Another issue openness presents, generally, is the idea of bringing a particular participant to account. Openness, in this thesis, is about the possibility for anyone to contribute towards a filmmaking project. So if a contributor offers something that is not of sufficient quality, for example, how should their gift towards the

project be received? If the project starts to go wrong, it is difficult for any one person to be identified as being responsible and there is a fear that it would be much harder to put right. This is not such an issue with digital files, however. Whereas traditionally, when a film was edited using celluloid, it was extremely difficult to re-edit the film, with the digital format it can be re-edited as many times as is necessary. It means that individual accountability does not influence the collaborative outcome in the same way.

3. Duplication of effort

Thirdly, openness brings with it the possibility to change things easily. The tendency, then, is for participants to change things before they investigate whether anyone else has tried to change the same thing. Brian Proffitt writes in IT World that "anecdotal evidence in the open source community seems to be demonstrating that … new [computer programming] projects are often reinventing the wheel in their code, rather than partnering with someone else's project." (2011). In computing, it means that there are so many open source pieces of code that it is difficult to find what you really need in a particular situation. In filmmaking, it may well mean that participants may well tend to create a new version rather than trying to work through all the possibilities as a community.

On the other hand, three main benefits of openness are listed below.

Benefits of openness

1. Openness encourages creativity

Openness might make the human body vulnerable, but used in a particular way it can in fact prevent infection. It is because antibodies are open to creativity in their process of reproduction and not having to follow a set blueprint, that they are able to anticipate possible types of attacking organisms in order to disarm them, even before they have had any contact with them previously.

Artists Joline Blais and Jon Ippolito argue that art should imitate the openness of antibodies:

Biologist Gerald Edelman describes what he calls a genetic "jumbler". Like everything else in a cell, the exact shape of the protein dangling from a lymphocyte is determined genetically. Unlike ... the genetic material corresponding to a lymphocyte's receptor is prone to reshuffle itself during cell reproduction. As a consequence of this built-in randomizer, each of the billions of lymphocytes initially produced by the body bears a different chemical 'lure' on its surface. Even if a chicken pox virus has never entered the blood stream before, there's a white blood cell somewhere with a protein to match. That's how the immune system 'knows' what chicken pox looks like before it even encounters it. (2006:14).

Ultimately, the antibodies' ability to form new structures, continually and randomly, enables them to create a very effective means of defence for the body.

2. Openness broadens responsibility for a project

When Berners-Lee talked about his original vision for the World Wide Web (1999), he assumed each user of the web would be an active editor and contributor creating and linking content to form an interlinked web of links. He said:

"I wanted the Web to be what I call an interactive space where everybody can edit. And I started saying "interactive," and then I read in the media that the Web was great because it was "interactive," meaning you could click. This was not what I meant by interactivity, so I started calling it "intercreativity"." (1999b)

However, as a tool for a network of creative computer users, this intercreativity it affords means that no one individual's agenda is being realised, but rather it can encompass a broad range of various agendas.

3. Openness minimises bias

In 2005 ZKM, the Museum for Contemporary Art in Germany organized an exhibition called "Making Things Public". It tackled the problem of representation in politics, and over one hundred artists, scientists, sociologists, philosophers and historians re-explored the term 'politics'. Bruno Latour and Peter Weibel were the

Curatorial Managers of the event, and in their book of the same name, which also serves as a catalogue for exhibition, Latour says:

> *In this exhibition, we try the impossible feat of giving flesh to the Phantom of the Public... we want to tackle again the problem of composing one body from the multitude of bodies - a problem that is reviewed here by many exhibits - but this time with contemporary means and media. (2005)*

Latour's issue was that there are many more concerns than the experts, who are supposed to be representing the public, are able to deal with. It is only through opening up the dialogue to the public themselves, outside of those who normally express their opinions, that the best possible chance can be found of understanding the complex issues of politics from the broadest range of perspectives.

Charles Leadbeater has suggested that in the past, experts have assumed that they know what everyone wants and/or needs. Relatively recently some of the best selling products have come from consumers getting together and planning what the product should be. He sites the example of the mountain bike and says that this was not built by experts, but by a group of hobbyists who felt that they were not able to buy what they would really like. Mountain bikes now account for 65% of all bikes sold globally (2009).

Having looked at the challenges and benefits of openness, the section lists some principles from the field of openness.

Principles derived from open environments

1. Quality of content

Wikipedia is probably the best-known worldwide project with an open structure. Jimmy Wales, founded it officially on the 15 January 2001, and describes it as the encyclopaedia that anyone can edit. According to Alexa web information company, the encyclopaedia is ranked 6th most popular website globally (**www.alexa.com**, March 2014). The aim of Wikipedia is to enable everyone on the planet to have free

access to an encyclopaedia, and the implications of this go far beyond just the creation of a website. However, the website grew rapidly right from the start, passed 1,000 articles around February 12, 2001, and 10,000 articles around September 7, 2001. In the first year of its existence, over 20,000 encyclopaedia entries were created at a rate of over 1,500 articles per month. In March 2014, the English Wikipedia has 4.5 million articles.

Looking at Wikipedia as an example of an open project, it can be seen that openness can refer to:

1. Openness to the impact of other participants' ideas and actions
2. Openness to making unfinished and finished work accessible for modification
3. Openness to working with other participants who might be totally unknown
4. Openness to adopting different roles for the sake of the project
5. Openness of shared objectives

Enquirers ask who is charge of a particular aspect of the organization, but this changes the whole time. It is open to change. Although they have 90 servers in 3 different locations, online volunteers manage them all. At any given time there are always workers doing something towards the project, 24 hours a day. This would be incredibly expensive if it was run as a commercial project.

It has a very open and chaotic operating model, and yet the quality is surprisingly good. Even back in 2004, C'T, the popular German magazine for computer engineering, released a study in which they had experts test the content of the three major digital encyclopaedias in Germany - Brockhaus, Encarta, and Wikipedia. Wikipedia was first choice, a significant margin ahead of the other two encyclopaedias, faring particularly well in Science topics. (Kurzidim, 2004)

Visitors are allowed to edit whatever they like, but a team of volunteers quickly cleans up what they refer to as "vandalism". Reporters have often purposefully

edited in obvious misinformation to see what happens and they have nearly always been very surprised at how quickly it is noticed and re-edited again.

Wales says that one of the reasons that Wikipedia works so effectively, is that it is not looking for definitive truth, but neutrality. Most conflicts occur, not between the right and the left politically, but between the volunteers who work towards "an encyclopaedia for all" and those that just try to disrupt it for the sake of it.

Edits, by anonymous users, account for only 18% of all the edits. Most of the content is created by between 600 and 1000 members of the Wikipedia community. Often controversial issues arise, for instance when an article about a film fails the Google Test. The Google Test is when a topic in question is typed into the Google search engine to see what results are returned. So if a film fails this test, a dialogue is set up to discuss whether or not the film is significant enough anyway, to be included in the encyclopaedia. Sometimes the film does not actually exist at all. Ultimately, there is a vote on whether the article should be included, but this happens after a discussion has happened about it. Reasons for whether it should be kept or not are logged, and if someone significant in the community wants it kept, or if there is a particularly strong reason why it should be kept, then the article will normally survive.

The principle from the characteristic of the quality of content is: "**All content can be improved upon".** So the guideline in response to this principle is that every member of the community should "**Make content editable**". In a distributed filmmaking project, this means that original content consisting of text, images, audio or video should be accessible to everyone in the community. This also applies to all the different versions of content. It could be that an edit is made that is of poorer quality than the previous version, and in some cases this may even be deliberate vandalism as described above. All versions of content should be kept and made editable.

2. The Flow of Narrative

An interesting method called 'Additive Improvisation' comes from the field of Improvisational Theatre. It is a method that helps keep improvisational theatrical narrative flowing freely. In improvisation, the actors involved are allowed to act in

whatever way they feel will enhance the narrative. They also have to respond to anything that anyone else decides to do. However, if one actor decides to negate the action of any of the other actors, the overall flow of narrative is blocked. For example, if one actor suggests that the narrative takes place in London and another actor decides that it should rather be Paris, this would be an act of negation and would block the flow of the story. The rule of additive improvisation states that if anything is suggested, then that needs to be built upon rather than negated. Perhaps the scenario in the previously mentioned example starts off in London but then there is a journey to Paris. The narrative is developed rather than negated. Keith Johnstone writes that 'Additive Improvisation' happens when each actor is able to contribute to the storyline without denying the offers made by other actors. "Bad improvisers block action, often with a high degree of skill. Good improvisers develop action." (Johnstone, 1981)

The ability to accept whatever anyone throws into the narrative is an attitude that can be explored with members of the community from the outset. Openness often brings with it unexpected outcomes and the confidence to be able to deal with fresh input with an open attitude is a skill that needs to be learnt.

The principle from the characteristic of the flow of narrative is that: "**Narrative flow can easily be blocked".** So the guideline in response to this principle is that every member of the community should try to "**Develop other members' ideas**". In a distributed filmmaking project, this would mean that each member of the filmmaking community deliberately develops ideas that they haven't initiated. It keeps the narrative flowing and emphasizes the co-operative nature of a collaborative system.

3. Rationale behind decision-making

At the Linux World conference held in San Jose on 11 August 1999, Larry Augustin from VA Linux chaired an open source panel discussion with some of the other most prominent open source practitioners at that time. This included Jeremy Allison, Co-lead Developer of Samba; Linus Torvalds, the originator of the Linux Operating System; Dirk Hohndel, Vice President of the XFree86 Project Incorporated; Brian Behlendorf, Developer of the Apache Web Server; Chip

Salzenberg, Project Manager for Perl 5; and Jordan Hubbard, Co-Founder of the FreeBSD project. Augustin summed up their Open Source models as follows:

Samba has a benevolent leadership with trusted lieutenants; Linux, a benevolent dictator with trusted lieutenants; x386, a core team with second tier of developers; Apache, a larger core team; Perl was described as having a constitutional monarchy; and Free BSD, a core team. (Revolution OS, 2001)

In open source development, then, the general operating model seems to be that there is usually a central core of committed and trusted members of the community, who can be relied upon to keep the whole organization free from harmful code. The security of a community project is derived from the assumption that most of participants want to look after their project. If there are enough contributors that have this attitude then the project will most likely succeed. If there are more committed members than participants who want to disrupt a project, then they should be able to deal with issues as they arise. This is important when using open methodologies because there may well be individuals who enter a community that are more disruptive than constructive. If there are too many of these types of community members, then the project will not function very well. So, it is a good idea for each member of an open community to take up the responsibility to specifically watch out for disruptive behaviour. An example of this has been mentioned above with Wikipedia, where journalists have deliberately sabotaged information in order to see how long it took to be corrected.

As seen from the list of open source projects above, the governance model is not necessarily non-hierarchical. However, there is a desire for leaders of open source projects to be as transparent as possible. For example, Linux developer Ean Schuessler created the Debian Social Contract in 1997, guaranteeing that Debian was committed to the principles of open source software and organizational transparency. Rather than being viewed as a necessary hindrance, transparency is promoted as a powerful value. As Noam Chomsky said to the Guardian in an interview about online openness: *"I stay transparent. When I was organising resistance against the government I was open - that's the best protection. Somebody*

will be able to overcome any encryption technique you use! Our only weapons are truth, honesty, and openness." (Chomsky to Mackintosh, 2002)

The principle from the characteristic of the rationale behind decision-making is: "**Individuals often manipulate projects with hidden agendas".** So the guideline in response to this principle is that every member of the community should try to "**Be as transparent as possible**". In a distributed filmmaking project, this would mean that individuals, possibly in the introductory stages, discuss what motivates them and why they are involved in the project, possibly in the introductory stages. It is a subject separate from the actual activity of filmmaking itself, but it is important in order to establish relationships and keep interactions between members of the community operating as smoothly as possible.

Having looked at some of the principles of openness, the three guidelines derived from the field of openness are as follows:

Content Quality:
Principle: All content can be improved.
Guideline: Make content editable.

Narrative Flow:
Principle: Narrative flow can easily be blocked.
Guideline: Develop other members' ideas.

Decision-making rationale:

Principle: Individuals often manipulate projects with hidden agendas.
Guideline: Be as transparent as possible.

From these three principles, then, the guidelines form the Policy of Openness in this thesis. These principles and guidelines will be examined in five filmmaking projects analysed later on in this thesis.

The next field of knowledge in this chapter looks at collaboration: the ability to work with other individuals to create something together. Collaboration has become much easier to get involved in and has proliferated through the social networking capabilities of Web 2.0.

Collaboration

Definition

Collaboration is derived from the latin word "collaborare", which means to work together. The Pocket Oxford English Dictionary provided the following definition for 'collaboration':

1. *Work jointly on an activity or project. (POED, 2005:140)*

This definition is relevant to this thesis, but it is broad. The Wikipedia definition for "collaboration" (which is often cited because Wikipedia is seen as a well known collaborative project), appended a few refinements to the definition:

> *Collaboration is working with each other to do a task and to achieve shared goals. It is a recursive process where two or more people or organizations work together to realize shared goals, (this is more than the intersection of common goals seen in co-operative ventures, but a deep, collective determination to reach an identical objective) — for example, an endeavor that is creative in nature — by sharing knowledge, learning and building consensus.*
> (**www.wikipedia.com**, 2014)

From this definition, collaboration imparts more of a sense of the responsibility shared in the projects, rather than simply a number of individuals working on the same project. There is more of an implication that members would feel that they own the project together.

Mattessich and Murray-Close examined more than 280 research studies of collaboration to try and identify factors that influence successful collaboration (2001). They showed that the term 'collaboration' has been used for a wide variety of group structures, but their working definition of 'collaboration' was as follows:

> *A mutually beneficial and well-defined relationship entered into by two or more organisations to achieve common goals. The relationship includes a commitment to mutual relationships and goals; a jointly developed structure and shared responsibility; mutual authority and accountability for success; and sharing of resources and rewards. (Mattessich, 2001)*

Again, there is an emphasis on each of the participants moving towards a more egalitarian acceptance of responsibility.

Pisano & Verganti categorized four models of collaboration, dictated by its style of governance and also by its style of participation (2008). Governance can be hierarchical or flat, and participation can be open or closed. These variables were formed into a matrix of categories:

1. **The Elite Circle**, with a structure that is hierarchical and closed: *"A select group of participants chosen by a company that also defines the problem and picks the solutions."*
2. **The Consortium**, with a structure that is flat and closed: *"A private group of participants that jointly selects problems, decides how to conduct work, and chooses solutions."*
3. **The Innovation Mall,** with a structure that is hierarchical and open: *"A place where a company can post a problem, anyone can propose a solution and the company chooses the solutions it likes best."*

4. **The Innovation Community**, with a structure that is flat and open: *"A network where anybody can propose problems, offer solutions, and decide which solutions to use."*

Pisano & Verganti write *"Senior managers need to be wary of the notion that one type of collaboration is superior to others. Open is not always better than closed, and flat is not always better than hierarchical." (2008:9).* However, in this thesis with an emphasis on non-hierarchy and openness, the model of collaboration that is most under scrutiny is the Innovation Community.

For this reason, this thesis defines "collaboration" as two or more individuals sharing the responsibility of working together to complete a project successfully. The term "Collaboration", nowadays, however, is often used when participants from different disciplines work together. In the film industry, this is nearly always the case. Therefore, this thesis will take the definition to refer to a situation where everyone involved is also able to input into the strategic decisions of the group.

There are opposing views about collaboration. During the Second World War, the term 'collaborator' was synonymous with 'traitor', so its not always regarded as positive. Individuals of occupied countries, for example, decided to work with the Nazi occupation rather than against it, and for this reason feelings ran high against them. Contemporarily, one view is that if you have more than one person thinking through a problem, you will naturally generate more ideas and therefore will come up with more solutions. On the other hand, if you try and cater for too many opinions, it is easy to take on board irrelevant issues and therefore solutions will not solve the primary issues effectively.

In the filmmaking projects in this thesis, successful collaboration, then, is measured in terms of whether the participants in the group are comfortable about working together and how far they actively take on the responsibility for making filmmaking decisions.

The next section outlines three challenges and three benefits of collaboration.

The challenges of collaboration

1. Communication

When you are dealing with practitioners from different disciplines, the same word can mean completely different things in different fields. A scientist, for example, can often take it for granted that everything should be 'rational'. If that person starts working with an artist who is constantly striving to take the unpredictable and irrational leaps into the unknown to express something that has not been expressed before, then the term 'rational' might take on a completely different set of values. Karen Skopa believes the importance of interdisciplinary collaborations should consciously construct a *"shared language"*:

> *The 'inter-subjective' context formed between collaborators, required complex communicative processes that went deeper than conversation, and required the development of a shared language (particularly in interdisciplinary collaboration), to establish implicit shared values between collaborators. It required 'communicative work' to develop these processes at relevant stages throughout the collaborative process, and the 'inter-subjective' context was not fixed, but fluid. (2003:148).*

Language binds human beings together, so it is important that participants are careful to use correct terminology but at the same time that they are tolerant of the way others express themselves.

2. High failure rate of multi-agency alliances

The difficulty of succeeding in collaboration has been outlined by Siv Vangen: *"In view of the substantive and procedural complexities pertaining to collaborative activities, it is not surprising that collaborative endeavours frequently fall short of the expectations of those involved*"(Vangen, 1998:6). She cites examples from multi-organisational settings, the tackling of social problems from a USA perspective as well as the UK public sector and that in both the private and the public sector there is a high failure rate. Although this is not been the experience of the collaborative projects in this thesis, Vangen's perspective may have been due to her having worked with established entities and organisations tackling particularly difficult and emotive problems.

3. Conflict in the stages of group development

According to Tuckman (1965), intragroup conflict is the second of the stages of a group's development over time. He summarized the stages as "forming", "storming", "norming", "performing & "adjourning" (1977). He proposed that before a small group functions effectively together, it often transitions through a phase when the members of the group question their roles within the wider group. Several articles published on small-group development also indicate that there is a stage where members within a group are dissatisfied, frustrated and subgroups display hostility and conflict (Yalom, 1970; Braaten, 1975; Lacoursiere, 1974). This research implies that a certain amount of conflict within a group is a natural stage that happens before it can work effectively. It means that within collaboration, conflict can be a healthy stage of the group's development and it shouldn't necessarily be avoided.

Benefits of collaboration

1. Overall project time can be dramatically reduced

Straus (2002) argues that if a particular project is going to affect a lot of participants, then the process of decision-making may indeed take longer, but the process of implementing that decision is normally quicker. Straus was the founder of Interaction Associates, Inc. and describes himself as having applied collaborative principles personally and professionally for over thirty years to companies such as the Ford Motor Company, the U.S. Environmental Protection Agency and Harvard Business School among others. He says:

> *"If the relevant stakeholders can be involved appropriately and if they can reach consensus, the solution is likely to be of higher quality and more easily implemented than if it were created and enforced by one person alone." (2002)*

2. The perspective of the bigger picture

Rheingold stated that major corporations like IBM, Sun Microsystems and Hewlett-Packard, who are all major players in fiercely competitive fields, are looking for ways in which they can co-operate with other organizations. He believes that this

is not from an altruistic attitude but rather one that will also ultimately give them a competitive advantage (2005). Rheingold's point is that, if companies were looking for ways to cooperate, then it would make sense for those organisations to think through ways in which cooperation can be positively facilitated within its policies. He cites the Prisoner's Dilemma, and suggests that there are many instances where cooperation would greatly benefit group participants, rather then being in competition.

The Prisoner's Dilemma comes from the field of Game Theory and it looks at problem solving from either a co-operative or a competitive perspective. Two persons are thought to be jointly guilty of a serious crime, but the evidence is only adequate to convict them of a lesser crime at trial, so the authorities separate them, and try and persuade them to confess. If they both confess they will both get 6 years imprisonment, if neither of them confesses, then they will both only get 2 years. If only one of them confesses, then the confessor only gets 1 year whereas the other prisoner gets 10 years. From a competitive perspective, it is a better strategy for each of the individual prisoners to confess, but taken from the co-operative perspective of both the prisoners, it would be better if neither of them confessed. (Luce, 1957) However, this value judgement has to be seen from the wider perspective, and not just from a personal point of view. In terms of total punishment, it is a question of 4 years punishment as opposed to either eleven or twelve years.

Rheingold states that in order for this to happen, however, a track record of cooperation between the two prisoners is important. This is why it is in the interests of major corporations to cultivate cooperation.

3. The wisdom of the crowd can reduce risk in decision-making

Another benefit of collaboration is the potential reduction in the risk in decision-making. Jack Traynor expresses an argument for group effectiveness (1987:50-53). He talks about an experiment where participants estimate the number of jellybeans in a jar. A number of approaches to this could be taken. One would be that you hire a jellybeans expert, who has dealt with jellybeans for a while and ask that person to estimate the number for you. On the other hand, you could ask a

large number of participants at random to guess the number and then take an aggregate of their suggestions. If you were able to ask a large enough number of volunteers, this would be the most predictably accurate method, because as Traynor says: If you run ten different jelly-bean-counting experiments, its likely that each time one or two volunteers will outperform the group. Nevertheless, they will not be the same volunteers each time. Over the ten experiments, the group's performance will almost certainly be the best possible. Strictly, using the wisdom of the crowd is a mathematical solution rather than collaboration. However, the principle holds that at the time of decision-making, by using enough participants, you can obtain a similar normal distribution curve for many different types of decisions as long as they can be expressed linearly.

In the case of the jellybean count, if there are any wildly inaccurate suggestions made by any members of the group, and there will inevitably be some, they will generally cancel each other out. Some will make wild guesses below the actual amount and some will make wild guesses above. Smaller inaccuracies below will cancel out smaller inaccuracies above, leaving a group of estimators in the middle that, between them, will have guessed the number quite accurately. This does assume, however, that most of those involved in the estimation have a reasonable amount of knowledge about the particular subject in question. In the case of making creative decisions, however, decisions are not necessarily based on a finite selection of same-type solutions and they don't always lead to a set of linear outcomes. Some solutions to problems may exist on a numerical continuum, where an arithmetic mean can be calculated. But they may involve a simple binary decision where a suggested solution is either appropriate or not; or perhaps it involves a series of discrete solutions where an aggregation is meaningless.

In these cases, it could be said that voting is a way of tapping into the wisdom of the crowd. The solution to a particular problem can be found by using the solution that most participants choose.

Surowiecki, in "The Wisdom of the Crowds" (2004), cites an extraordinary example by Sontag and Drew (Sontag, 2000). A number of groups of experts from different disciplines, Mathematicians, Submarine Specialists and Salvaging Technicians

were asked by the US Navy to work out the location of a submarine called the 'Scorpion' that had disappeared in the North Atlantic in 1968. Each group of experts made their suggestions, but it was only the aggregate of all the groups, made through Bayes' theorem, that proved the most accurate. Bayes theorem, in fact, specified where the submarine would be, and the submarine was found within 200 yards of this aggregate. Incidentally, no one person or group had proposed this location at all. (Surowiecki, 2004:xxi).

The main advantage to collaboration is the wealth of knowledge, skills and experiences that the numbers of participants can bring to a particular problem. If problems can be framed so that this can be brought to bear in finding a solution, then there is less risk in making the appropriate decision.

Having looked at the challenges and benefits of collaboration, the next section defines three principles that can be derived from the field of collaboration.

Principles from the field of collaboration

1. Aggregation of opinions

The aggregate of a whole group of human beings could well be a good option, but it is not always easy to work out in practice particularly when solutions are discrete. Perhaps the easiest approach to facilitate a group decision is to generate a list of options and then to simply vote on those options.

However, for many participants who are trying to implement collaborative practice, voting is regarded as the least preferable way of accomplishing this task. One reason for this is that there are too many losers in the process. For instance, take a situation where there are three options and each option is strong enough to draw roughly about a third of the votes. The winning option results in the option that may have had the most votes (just over a third of them), but at the same time, the majority (just under two thirds) has not actually voted for this option at all. Most of the voters would not get what they want.

Voting can sometimes be a tool in the collaborative toolkit, but it is often as a last resort to achieve a decision in the time that is available. The threat of voting, then, can sometimes become a motivator to try to work it out between the parties concerned within the time allotted. Dissent, however, is an important aspect to collaboration, rather than being something to be avoided.

Collaborations often prefer to build consensus. Butler & Rothstein defined formal consensus as:

> *"A decision-making process whereby decisions are reached when all members present consent to a proposal. This process does not assume everyone must be in complete agreement. When differences remain after discussion, individuals can agree to disagree, that is, give their consent by standing aside, and allow the proposal to be accepted by the group." (Butler, 1987:34)*

Potential ideas should not be treated as discrete alternatives, but if possible they should evolve from ideas previously generated. Ideas should fit increasingly comfortably with everyone in the group with each consideration. Those who are not happy with a particular solution need to be listened to; their apprehensions should be discussed; worked through and, if possible, new possibilities should be generated.

Straus proposed that consensus should be developed in small steps (2002). Straus worked with councils and governmental situations where the parties involved were initially not willing to work together in any way. The first step, he says, is to agree to try to work together, and to build trust around the possibility of interaction happening at all, before advancing on into possibilities of creating a viable solution together.

> *"The process of building small agreements, one at a time, begins the first time stake-holders get together. The first agreements should be about process (e.g., ground rules, agendas, roles, desired outcomes, time frame). Once a group reaches agreement about how it's going to work together, it can move on to the substantive issues at hand. When discussing the content of an issue a group*

should generally begin by perceiving, defining, and analyzing the problem ... before entertaining alternatives and solutions. So, a corollary to the second principle is: If you can't agree on the problem, you won't agree on the solution." (Straus, 2002:60)

In order to aggregate opinions in an online environment, three considerations need to be implemented. Firstly, there needs to be the facility to discuss issues. Secondly, users need to be able to express their opinions anonymously, if they want to. Thirdly, users should be able to express more than one opinion. After everyone has expressed their opinions and discussion has ensued, if any individual cannot agree with the ideas of all the other members, strict consensus will not be reached. However, it is possible to reach rough consensus in this situation, where an individual doesn't agree with the rest of the community but doesn't want to stand in the way of the consensus of everybody else. In this thesis, the advantage of working with digital files is that any individual can start working on a new version at any time, without having to reach total consensus.

Effectively, this has happened with the Linux operating system. There are many different versions of the Linux Operating System, each with their own special functionality. As of March 2014, according to **http://futurist.se/gldt**, there are almost 500 distributions of the GNU/Linux Operating System. Some are more popular than others, however, each version may be more appropriate in different situations. For distributed filmmaking, then, allowing different versions may well be the most natural method of completing a project without necessarily having to choose a definitive version of a filmmaking project.

The principle from the characteristic of the aggregation of opinions is: "**Not everyone knows why certain opinions are held".** So a guideline in response to this principle is that every member of the community should "**Discuss rationale behind different opinions**". In a distributed filmmaking project, this is particularly pertinent when it comes to deciding on factors that affect the strategy of the whole project, for example what the main theme of the film will be.

2. Working relationships

Another important principle on the issue of collaboration comes from the fact that many times there are situations where the participants involved are not fully convinced of the advantages of collaboration. Straus talks about the need to allow members of a community to slip in and out of collaboration and back to the scenario where an individual can make decisions by themselves. He calls this the Accordion Approach to planning.

> *The fallback is that if 'consensus can't be reached, each stakeholder and his or her organization have the freedom to act independently.*

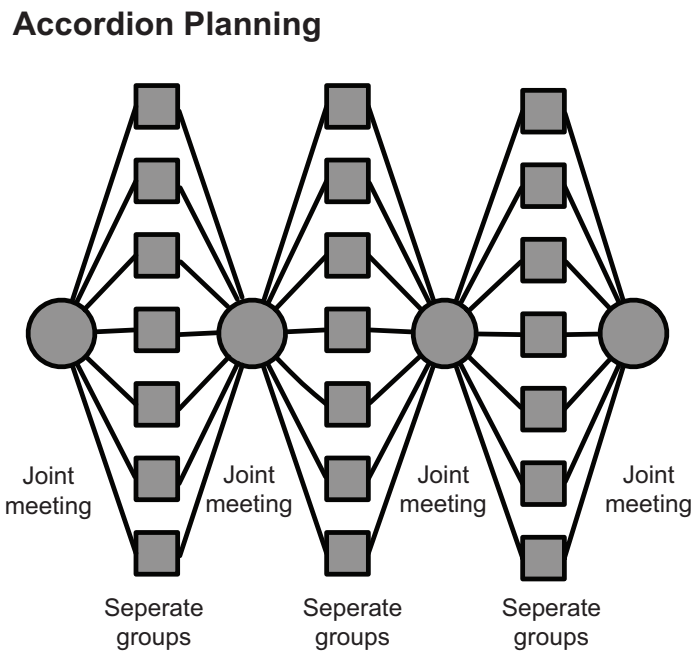

Figure 2-2 Accordion planning

> *We call this pulsating process of convening and then dispersing an accordion planning process, because of the shape of the graphic that diagrams it (Figure 2-2). It's what allows win-win collaborative processes to coexist with the fallback, win-lose processes of the formal horizontal and hierarchical organizations. The same people participate in both types of structures in parallel. It's the accordion-like movement between these parallel structures that breathes life and power into the process of collaborative action. (2002:77)*

It would be difficult to empirically argue the case for Accordion Planning from just Straus' experience, because organisational scenarios are not easily repeatable. Unfortunately, Straus doesn't make a systematic study of this model, but it has been employed in this research because of his thirty years of experience as a collaboration consultant, and the fact that Accordion Planning takes into consideration the resistance that many individuals experience with collaboration.

However, in education where the curriculum is often repeated every year, there is much more evidence supporting the benefits of allowing participants to shift between collaboration and individual work in an environment of learning. Cuseo, who created a taxonomy using approximately 90 different collaborative learning structures, wrote:

> *"Furthermore, structures go beyond merely facilitating peer interaction by providing conditions that foster peer interdependence and teamwork, promote mutual support, and encourage students to take reciprocal responsibility for one another's success." (Cuseo, 2002:8)*

Cuseo's structures were designed for various curriculum activities, and throughout, there is a constant emphasis on shifting between dispersal and convening of the individual within the group. For instance, in one of the more straight forward activities documented, "Think-Heads Together" (Kagen, 1992), students are allotted a preparatory period of private, individual thinking time to work through a solution to a problem before joining in with a team discussion (Cuseo, 2002:33).

The Accordion Approach to planning can lead onto the practice of versioning. It may well be more of an expectation within group members than a facility that can be coded into an online environment. But it means that if individuals want to work on their own in some part of the filmmaking process, then they are welcome to do so. They should create their copy and then work on that. This is productive in that at a later stage they might want to submit their work back into the community. So then, as individuals approach a filmmaking project, they look for something that they feel they could improve. They need to be able to take the initiative to improve

it without having to ask anyone else's permission. Finally, they then submit their work back to the community, and if others feel that it provides a better version then it can be taken on board either as the master version, or as a version that others can use for a specific aspect.

The principle from the characteristic of working relationships is that: "**Some prefer to work through particular problems on their own"** So the guideline in response to this principle is that every member of the community should "**Share work that is done individually back into the community**". In a distributed filmmaking project, this means that any raw material to complete a task should be available to download and therefore there should be a method for posting any solutions that individuals create, back into the website environment.

3. Value of collaboration

Managing a collaborative process is controversial. However, in an interview, Timothy Spall (Spall to Mackay, 2005) discussed his involvement with Mike Leigh's unique collaborative method of film directing. Spall talked about how Leigh would ask the actors to think of a character that they knew personally, and that they felt would fit in with a general scenario. Leigh would give the general scenario of the idea of the film but no more than that. The actors were given time before filming, not to learn lines as would be done in traditional filmmaking, but to develop the character of their particular roles.

Whether Leigh is adopting a very authoritarian role or simply facilitating as much contribution from the actors as possible is debatable. Rehearsals, however, comprised of Leigh giving the actors different scenarios in which they could experiment with the development of their characters, rather than practicing a specific script. Spall recounted how the well known barbecue sequence of the film 'Secrets and Lies', which in the finished film lasted no more than a few minutes, took place over the time span of a whole day. The actors were in character the whole time, and Leigh would only let the characters know what would happen when he felt he needed to.

At another point in the film: Hortense, a young black woman, breaks the news to Cynthia, an older white woman, that she is in fact her daughter. During the filming,

Cynthia or rather the actor Brenda Blethyn, had no idea that this was going to be part of the narrative. The reaction in the film clearly takes on a documentary type feel to it; and the finished scene was filmed in a single uninterrupted take of almost 8 minutes.

Spall's conclusion is that not every actor can collaborate in this way, and needs to have a commitment to the collaborative process itself. This is true of collaboration in general. Everyone involved has to have the commitment to make the collaboration itself work in order for the whole team to function and reach it's full potential.

One of the core problems, educators have noted, when students are asked to collaborate in group activities is that some participants do not pull their weight in the project (Clark, 2006). This, however, is only an issue when the participants involved are expected to contribute. In contrast to this, in the research presented here, each participant contributes purely on a voluntary basis. Many are motivated by the notion of working in collaboration.

The principle from the characteristic of the value of collaboration is that: "**Some individuals don't want to collaborate".** So the guideline in response to this principle is that members of the community should "**Be committed to the collaborative process**". In a distributed filmmaking project, this is probably best dealt with towards the beginning of a project, when the advantages and disadvantages of collaboration can be discussed so that participants can make up their own minds as far as where they stand in relation to the value of collaboration.

From the field of collaboration, then, here are the three guidelines that will be employed and tested in this research:

Opinion Aggregation:
Principle: Some members will not know why certain opinions are held.
Guideline: Discuss rationale behind different opinions.

Working Relationships:

Principle: Some members will prefer to work through particular problems on their own.

Guideline: Share work that is done individually, back into the community.

Collaboration Value:

Principle: Some individuals don't want to collaborate.

Guideline: Be committed to the collaborative process.

From these three principles, then, the guidelines form the Policy of Collaboration in this thesis.

Another area that the digital revolution emphasized was the possibility of being able to organise through networked structures rather than centralized and hierarchical structures: non-hierarchy.

Non-hierarchy

Definition

The word "Hierarchy" is derived from the Greek words hieros, meaning 'sacred', and arkho, meaning 'rule'. It has strong connotations with religion and the positions of power within religious orders. Kathleen Iannello defines hierarchy in her book "Decisions without hierarchy" (1992) as being *"any system in which the distributions of power, privilege and authority are both systematic and unequal"*. The Oxford English Dictionary doesn't list the word 'non-hierarchy'. It defines 'hierarchy' as *"a system in which people are ranked one above the other according to status or authority."* (OED, 2006) So apophatically, 'non-hierarchy' would mean that members are not ranked in terms of their status or authority. This thesis will define the term "non-hierarchy", then, as the characteristic of distributions of power, privilege and authority being as equal as possible.

According to anthropologist Harold Barclay, every community has natural leaders, although there are many indigenous cultures that proactively balance out those power structures, so that no one person acquires too much social power; and in

fact in those communities, individuals with too much power are regarded with suspicion (1990).

Ianello asks whether it is possible to create new structures that will not replicate the hierarchical, competitive, power-saturated institutions that have been oppressive to women in the past. She brings together feminist theory and organization theory in what she terms the "modified consensus" model: Critical decisions that have the potential to change the direction of the whole organization are made by the entire membership, whereas routine decisions are delegated to a work group within the organization (1992). Throughout, however, there is an ideological commitment to egalitarianism. Rebecca Bordt contends that it remains to be seen whether Ianello's model can be used with heterogeneous groups of human beings (1994).

In the past, hierarchy may well have been the most efficient way of organizing communities, as communication was largely a one-to-many paradigm. Information was confined to individuals or small groups of decision-makers. They necessarily had to make most of the decisions, and then communicate those decisions to the many. Technologically, however, as information is becoming increasingly accessible to anyone who wants it, it should be possible for direct democracy to occur, where everyone in the community that is affected by it can decide each strategic decision.

Traditionally, filmmaking has often been hierarchical. The film director takes full responsibility for creative control. For the sake of decision-making, different members of the crew are carefully defined. For instance, in the production department there is a Director of Photography, then Camera Operator, 1st Assistant Camera, 2nd Assistant Camera etc. During the course of this thesis, discussions with filmmakers have nearly always centred around the impossibility of non-hierarchical filmmaking. The argument is that production is a complex process and organization of this process inevitably involves different levels of authority. However, in an online environment this is not necessarily the case, where anyone can upload material, and where participants may not even know each other personally. Raw film material needs to be assessed for what it is rather than who

created it. Non-hierarchical filmmaking, then, doesn't try to make the distinctions between which participants have more or less authority.

In order to understand the characteristics of non-hierarchy, the next section looks at the challenges of non-hierarchy as well as the benefits that non-hierarchy affords. From these characteristics, this thesis derives some guidelines that will be used in the formation of policies in the filmmaking projects of this thesis.

Challenges of non-hierarchy

1. Non-hierarchy is viewed as being idealistic

Occupy Wall Street is a real-world leaderless resistance movement based in New York with members of many ethnic backgrounds and political persuasions (**www.occupywallst.org**). Occupy protestors promised that it would be an anti-capitalist, non-hierarchical utopia (Doyle, 2011). It has been criticized for being plagued by the hierarchy it seeks to destroy (Carlson, 2011). Carlson argues that the idea of non-hierarchy, per se, is utopic; that it is unrealistically idealistic and impossible to achieve. In 1516, when Sir Thomas More wrote the book, Utopia, he described a fictional island in the Atlantic Ocean where there was a perfect political system (More, 1992). There was no poverty and very few laws were ever needed. The word itself, Utopia, comes not only from the Greek for "good place" - eu topos, but also from the Greek for "no place" - ou topos. The implication, perhaps being made by More, is that there is no place that is a good place.

2. Non-hierarchy is not the natural state of human relationships

Areas of the brain specifically deal with hierarchy. According to the National Institute for Mental Health in the USA:

> *The processing of hierarchical information seems to be hard-wired, occurring even outside of an explicitly competitive environment, underscoring how important it is for us. (National Institutes for Health, 2008).*

Researchers at the National Institute of Mental Health (NIMH) identified areas in the human brain that respond specifically when issues of hierarchy affect human

beings. Under an fMRI scan, they found that specific parts of the brain are activated when a person moves up or down in a pecking order and that behaviour was highly influenced by the perception of position within an implied hierarchy. *"Our position in social hierarchies strongly influences motivation as well as physical and mental health"* said NIMH Director Thomas Insel.

3. Hierarchies increase individual accountability

Elliot Jacques has written that businesses employ individuals and not groups. Groups are not promoted or fired, individuals are recompensed in this way, therefore, this is the fairest method of management. Jacques bases his argument on the assumption that in a properly functioning hierarchy, a manager should have enough authority to ensure that subordinates are able to do the work they are assigned and this includes the following elements:

> *(1) the right to veto any applicant who, in the manager's opinion, falls below the minimum standards of ability;*
> *(2) the power to make work assignments;*
> *(3) the power to carry out performance appraisals and, within the limits of company policy, to make decisions —not recommendations-about raises and merit rewards,- and*
> *(4) the authority to initiate removal-at least from the manager's own team-of anyone who seems incapable of doing the work. (1990:130)*

He states:

> *"[Hierarchy] is the only form of organization that can enable a company to employ large numbers of people and yet preserve unambiguous accountability for the work they do." (1990:127)*

Richard Scott writes in favour of hierarchical structures:

> *The centralized structures rapidly organize to solve the problems. Participants in peripheral positions send information to the center of the network, where a decision is made and sent out to the periphery. Furthermore, this pattern of*

organization tends to be highly stable once developed. In less centralized structures the organization problem is more difficult and observed interaction patterns are less stable and less efficient. (1981)

In contrast, there are studied benefits of non-hierarchy.

Benefits of non-hierarchy

1. Non-hierarchy humanizes the workforce

Kathleen Ianello writes that there is a growth in consensual organisations (1992:31), and that it is due to an attempt to put meaning and values back into jobs so that the worker is reconnected to society. Hierarchical structures tend to hold workers to account for the work that they do, whereas non-hierarchical structures emphasize the quality of relationships within the workplace. She cites the example of the Israeli kibbutz organisations, where the *"work life, family life and social life are closely integrated"* (1986:100). She writes:

In order to achieve this, decision-making is shared and an egalitarian system is strived for in every aspect of the organisation. "Decision-making is generally face-to-face, leadership positions elected and rotated, and hierarchy is actively discouraged … It is important to recognise that that the system of rewards are linked to the collective, not to the individual … the highest reward is simply membership within the collectivity. (1992:32)

2. Non-hierarchy encourages participants to take responsibility

In a non-hierarchical project, the responsibility of ensuring it achieves its objectives, does not reside in the hands of one person. If the group feels that it is important to achieve, then the responsibility is naturally distributed amongst its members. It means that when an issue arises, individuals within the community will tend to use their own initiative or bring it to the group to decide, rather than refer it back to an individual to make the decision. As Ianello stated, *"the highest reward is simply the membership within the collectivity"*. So there is a social sense of accountability about how an individual within the community responds to a particular issue. In theory, it means that individuals practice responding in a way

that would be approved of by the community. This means that an issue does not always have to go before the whole group in order to make a decision, and issues can be dealt with faster.

3. Non-hierarchy makes cooperation more productive

Anderson & Brown contend that, depending on the nature of the task, hierarchical groups and organisations don't necessarily perform better than those with flatter structures: *"when group members worked interdependently, steeper hierarchies tended to predict worse performance" (2010).* According to Lawrence & Lorsch (1967), flatter structures are more advantageous when co-workers must work in a coordinated fashion and Shaw found that in complex tasks, it was less productive in groups to have centralized channels of communication where one person behaves as the hub of communication. (Shaw, 1964).

Anderson & Brown suggest that although there has been an *"explosion of research on hierarchy in the last decade"*, most of this research has focused largely on the individual and very little has examined the effect of hierarchy at the group level (2010). However, the existing research suggests that cooperation is likely to be more successful in a non-hierarchical structure, so it may well benefit the complex and highly coordinated process of film production.

Principles derived from non-hierarchy

1. The phantom of power

In his paper entitled "Notes on the Theory of the Actor Network", John Law wrote about the way in which some of the apparent superpowers in the world's recent history had disappeared within hours (1992). He talked about the way the Soviet Union seemed to dissolve and how it must have been built on imaginary presumptions that were given to it by other national powers. In the light of current events, this may not have been so, however, Law was one of the main thinkers behind Actor-Network Theory, which has become increasingly influential in describing social networks. It attempts to describe the network of forces that make up a social situation. It starts by defining the different points of force within the networks through looking at what actually takes place. It also makes no distinction

between animate and inanimate objects. A video camera, for instance, could play an important part in a news report for example, and the quality of that camera would affect the content that is communicated.

Actor Network Theory describes a social situation in terms of single 'actants' (or agents) that, by themselves, are no more or no less influential to the whole network than any other 'actants' within that network. That is apart from the accumulation of forces granted to it by other 'actants'.

It forces you to look at the influence of particular nodes of a social network and to see whether its influence is based on merit or just hearsay. Hierarchy based within an organization is not necessarily based on merit at all. Members of the workforce are assigned positions of power for various other reasons: how well they relate to those making the decision; whether they can perform well in an interview situation; whether they have enough money to buy themselves into a position of power etc.

The phantom of power around certain actants, according to Actor Network Theory, is created because other actants allow this to happen. It is therefore important within a non-hierarchical filmmaking project to ensure each participant involved in a project feels empowered and self-confident enough to take the project on to the next step without having to ask permission of anyone else. This is often quite a paradigm shift, but it is important to instil in members.

A second point about the implementation of non-hierarchy, regards the responsibility that each individual takes within a group. In a hierarchy, the person at the top should take ultimate responsibility, but workers lower down the structure are actually directly responsible. Within collaboration, this responsibility should be equally shared between everyone involved. One method of ensuring this is for each participant to accept responsibility for the entire project, whilst at the same time to accept that everyone else is also attempting to do this. Alternatively, if participants don’t attempt to take responsibility, there is a tendency for everyone involved to wait for someone else to make the project happen.

The principle from the characteristic of the phantom of power is: "**Authority is often gained by an individual because others simply allow it".** So the guideline in response to this principle is that every member of the community should "**Take full responsibility for the whole project**". In a distributed filmmaking project, this would mean that each member of the community should consider the non-hierarchical, open collaborative project as theirs, and ask themselves the question as to what would they best do to help it along?

2. Distribution of power bases

Charles Darwin believed that hierarchies were necessary for groups to succeed. He wrote: *"The perfect equality among the individuals composing the Fuegian tribes must for a long time retard their civilization."* (1839:144). In fact, a number of theorists have argued that hierarchies are biologically driven in human beings and part of our evolutionary heritage (Barkow, 1975, Eibl-Eibesfeldt, 1989). Anthropologists, David Graeber and Harold Barclay, dispute this. Both of them cite polities that exist without official forms of leadership: the Inuit, the San, the Pygmies, the Yurok, the Lugbara, the Konkomba, the Tiv, the Tonga, the Anuak, the Ibo, the Ifugao, the Land Dayaks, the Nuer, the Samek, the Lapps, the Imazighen, the Santels, the Piaroa, the Malagasy. Interestingly, Graeber argues in his book "Fragments of an Anarchist Anthropology" that it is precisely because these communities are non-hierarchical that their communities are not very well known. Hierarchies are easier to categorize and therefore easier to talk about. They perhaps take less time to rise, but also less time to fall as well.

Barclay talks about four main types of leadership, which continually bubble away underneath the skin of these 'leaderless' communities. However, each of these power bases work to keep each other in check.
Barclay lists them as:

1. **The Big Man** - "the one who acquires a central position of influence in the community and a following of clients as a result of his wealth, his ability to persuade and to orate"
2. **The Technician** - "one who is a good hunter collects around him a following which is willing to do his bidding and be fed"

3. **The Holy Man** - "through some religious ideology ... a prestigious person to whom all voluntarily defer, particularly as a mediator of disputes"
4. **The Old Man** – "the leading member of the community simply by being the senior male member of the kin group" (1990:133)

It is immediately noticeable that these types of leadership are male oriented. Barclay writes at the beginning of his book: *"While these societies lack government, as we shall see, patriarchy often prevails; a kind of gerontocracy or domination by the old men is not uncommon; religious sanctions are rampant; children are invariably in a second class' position; women are rarely treated in any way equal to men."*

If the gender is stripped away from these potential types of leadership, then, the list of power sources is as follows:

1. Wealth
2. Skill
3. Morality
4. Wisdom

The possession of any of these resources generates respect from others within a community. A non-hierarchical structure should not ignore these potential sources of power, but rather should try and use them in a different way. Whereas Barclay defines 'power' as *"the ability to get others to do what you want them to do"* (1990:20), Ianello writes that power could also be defined as *"Any activity where there is accomplishment, satisfaction of needs, mutual attainment of goals not distorted by unfortunate – that is thwarting – experience"*(1992:43). Rather than having the ability to dominate others, power can be defined as the ability to get something done.

If the latter definition is taken, each of these four resources is desirable for the whole community, even if individuals seek to attain them. In a non-hierarchical environment, then, those with possession of these areas of power should take the responsibility to ensure that their particular area of leadership is an asset for the whole community.

Within any group of individuals, some are more capable than others. Group members will naturally have, therefore, differing levels of power. The key principle here, then, is that they do not use their power to dominate others in the group, but instead that they use that power so that the project, as a whole, achieves new objectives. Secondly, as has been seen, there are a number of different types of power. It should normally work most smoothly if an individual ensures that their power is used mostly in a project in only one of the areas: Wealth, Skill, Morality or Wisdom. In the case of distributed filmmaking, perhaps these could equate to:

1. Participants who provide a budget
2. Participants who have particular filmmaking skills
3. Participants who upkeep the principles of openness, collaboration and non-hierarchy in filmmaking
4. Participants who understand how to take a project forward as a group

It is clear from this list that participants in a non-hierarchical system should try and share the load wherever possible, but given the load is likely to be unequal amongst any group of human beings, then a distribution of power bases is better than an individual in control of the whole project.

The principle from the characteristic of the distribution of power bases is: "**Power naturally accrues more power".** So the guideline in response to this principle is that every member of the community should "**Avoid dominating others**". In a distributed filmmaking project, each member has a certain amount of power to do something towards the goals of the project even if it is just the expression of an opinion. However, this should not be used to stop other members from achieving what they want, but rather should achieve something alongside the achievements of other members.

3. Suspicion of power mongers

In a hierarchical community, the higher up the scale that an individual climbs, the more 'status' an individual accrues, and the more respect that other community members are coerced to offer to that individual. However, values are inherently different within a non-hierarchical system. Both Graeber and Barclay write about

reciprocal relationships being crucial in a leaderless community. Both also point out the importance of attitudes of suspicion that arise when someone starts to become visibly more powerful than the rest of the community. It is the responsibility of each member of the rest of the community to look out for this happening to other members and to point out the situation if an individual, either consciously or inadvertently, is built up in this way. This is obviously not going to happen productively if there is not a relationship structure to support this. So rather than actively building an environment of suspicion, the key to enabling this to happen most effectively is by developing the relationships between community members.

The principle from the characteristic of the suspicion of power mongers is: "**Claims of power-mongering can often offend".** So the guideline in response to this principle is that every member of the community should "**Develop critical relationships within the community**". In a distributed filmmaking project, this happens naturally if participants interact with each other, rather than just with the facilitator. Therefore activities that support the building up of relationships within the community but outside of the facilitator should be encouraged.

Having looked at some of the principles of non-hierarchy, a set of guidelines can be derived from the field of non-hierarchy:

Power Phantom:
Principle: An individual often gains authority because others simply allow it.
Guideline: Each member should take full responsibility for the whole project.

Power Distribution:
Principle: Power naturally accrues more power.
Guideline: Avoid dominating others.

Suspicion of Power Mongering:
Principle: Claims of domination can often offend.
Guideline: Develop critical relationships in the community.

From these three principles, then, the guidelines form the Policy of Non-hierarchy in this thesis. These guidelines are tested in five online distributed filmmaking projects later in this thesis, and the results will feed into the creation of emergent policies that support online distributive filmmaking.

Having looked briefly at non-hierarchy in general, this thesis now looks at how multiple agents make decisions and create on the micro-level, and how they might be able to contribute towards a macro-level solution to a particular problem. For this it looks to the field of swarm intelligence, and defines three more guidelines for distributed filmmaking.

Swarm Intelligence

Definition

Before the term "Swarm intelligence" is defined, the concept of the swarm itself should be explored. Parunak and Brueckner define "swarming" as *"useful self-organization of multiple entities through local interactions"* (2004:341). Buhl et al. (2006:1402-1406) demonstrated that there was a critical density for the onset of coordinated marching in locust nymphs. From this it can be seen that there is a difference between a collection of individuals and the behaviour of a swarm. Reynolds (1987) was able to simulate the motion of a swarm in a computer program using each entity implemented as an independent actor that navigates according to its local perception of the dynamic environment. He identified that only three behaviours were necessary to simulate a swarm:

1. *Collision Avoidance: the ability to avoid collisions with nearby flockmates*
2. *Velocity matching: the attempt to match velocity with nearby flockmates*
3. *Flock centring: the attempt to stay close to nearby flockmates*

In order to use swarm dynamics in the process of filmmaking, then, this thesis now looks at the intelligence that can be derived from a swarm.
Swarm Intelligence describes the collective behaviour of decentralized, self-organized systems, natural or artificial. Deneubourg demonstrated that through

swarm intelligence, ants can determine the shortest path between two points (1990); insect-like robots can influence the behaviour of live cockroaches (Caprari, 2004); swarms of robots are able to cluster objects autonomously without being pre-programmed or directly controlled (Beckers, 1994); Similar types of data can self-organise and be clustered in a software environment (Lumer, 2004).

Jelmer van Ast describes swarm intelligence as:

> *The intelligent behavior of groups of individuals that may in themselves have only a very limited intellectual capacity. A good example is the behavior of ant colonies. While individual ants have only very limited capabilities of sensing their environment, making decisions, and storing information, the colony as a whole is very capable in these respects. Seen from a distance, the colony almost acts as one organism searching its environment for food with its many sensors, storing information in its structure and in the chemical patterns inside and surrounding it. (2010).*

One particular area where research into swarm intelligence has been put to good effect is in telecommunications networks. Ducatelle et al (2010 p.) stated that in comparison with top-down approaches to deciding the best route through these networks, Swarm Intelligence shows itself to be more adaptive, more robust, more scalable and also more portable. Ducatelle looked at natural social structures that ants use and applied the principles to telecommunications networks to find the quickest communication routes between two nodes in a network. Ants are interesting in this respect because each ant by itself has little brain capacity.

Similarly, Slime Mould as a group has evolved complex self-organizing structures in order to find food. Toshiyuki Nakagaki, professor of Future University Hakodate, Japan, has discovered that although the mould is a brainless organism, it can self-organize to solve the problem of finding its way out of a maze. (Demetriou, 2011).

If ants can benefit from acting as a collective through swarm intelligence, are there policies that can be derived from this field that could help members of a distributed film collective make a film?

Swarm intelligence is not just crowd sourcing, where a controlling party organises a work force to participate in their agenda. The agents in swarm intelligence are not committed to any high level plan, but perform simple policies on a local level that amount to a complex solution at a higher level. Take for instance the termite helping to construct very sophisticated anthills, thousands of times bigger than they are, with elaborate tunnel systems that even incorporate the complexities of air-conditioning.

Swarm intelligence stands in opposition to traditional models that have an emphasis on control, pre-programming and centralization compared with processes that feature autonomy, emergence and distributed functioning, which would suit the aims of this thesis.

> *Swarm intelligence was first used … in the context of cellular robotic systems, where many simple agents occupy one- or two-dimensional environments to generate patterns and self organise to nearest-neighbour interactions. … [It includes] any attempt to design algorithms or distributed problem-solving devices inspired by the collective behaviour of social insect colonies and other animal societies. (Bonabeau, 1999:7)*

Swarm intelligence is about the potential intelligence that can be derived from collectively structuring simple agents, but could these same structures be employed with intelligent agents to augment and enhance their collective wisdom?

The next section outlines three challenges and two benefits of swarm intelligence

Challenges of swarm intelligence

1. Lack of Control

There is no authority in a swarm, so it cannot be controlled from a single entity or from an outside source. Although it can be influenced by an agent within the swarm, if an agent becomes too unlike those of its neighbours it may be rejected as

being part of the swarm. This is not to say that it is out of control, but that the swarm as a whole becomes its own authority.

Charles Green (2001) puts forward the idea that collaboration between two artists sets up a 'third hand' that exists outside of those involved. This idea is also expressed in Gestalt Theory, in that the sum of the whole is different to the elements involved (Wertheimer, 1924). When you have a number of members involved in a project you also need to respect the aggregate of that group as an entity within itself. It may play an unexpected and undefined, yet important role in the achievements of the group.

2. Inefficiency of the system

In a swarm intelligent system, as there is no control from an overarching perspective, agents within the system act autonomously in relation to their local neighbours, so resources are allocated at random; there is often a problem in the duplication of effort; and in this way the system can be inefficient.

3. Unpredictability

Thirdly, swarms are generally unpredictable. There is not a linear causality that makes a swarm behave in a particular way. Each agent within the swarm builds its own layer of intersecting logic into the system as a whole, so that it is impossible to know the precise trigger of a particular behavioural event of the swarm. This can be clearly seen in John Conway's Game of Life (Gardiner, 1970), where cells within a grid are either activated or not according to whether their neighbouring cells are activated. A simple set of rules, followed by individual agents can create highly complex and intricate behaviours in the group that they inhabit.

Benefits of swarm intelligence

1. Information dispersal

The ant's foraging technique is described succinctly as follows:

> *"Ants are always searching for food outside the nest. They sometimes go quite a distance away, laying a chemical trail so that they can find their way home. When they come across something edible, they eat as much as they can before*

returning to the ant colony ... More worker ants then leave the nest, follow the trail laid by the successful group, and the process is repeated." (Paull, 1980)

The simple action of 'laying a chemical trail' (or depositing pheromones), that dissipates over time means that an incredible amount of information can be communicated between thousands of agents (ants in this case). Other ants are able to determine the direction of the food source, how recently it was accessed and how many other ants are now using this trail.

2. Originality

Another benefit, particularly from a filmmaking point of view, is the originality that can come from the introduction of very small differences in the initial set-up. As mentioned in the problem of unpredictability from swarm intelligence, each new individual that is interlinked into the swarm creates exponential combinations of possibilities. Small imperfections in an individual, then, can create relatively large variations of behaviour, though unpredictable, which can then lead on to further innovative scenarios.

The next section in this thesis presents four principles from the field of swarm intelligence from which three more guidelines will be derived.

Principles of swarm intelligence

Bonabeau et al propose that self-organization relies on four main characteristics:

1. Positive feedback
2. Negative feedback
3. Fluctuation
4. Multiple interactions

(1990:9-11)

The first two characteristics listed above are closely related, so they will be dealt with together in order to form a principle and a guideline that will be used later on in this thesis.

1. Feedback

In an apiary, if a bee finds a new source of nectar, it will return with the nectar to its hive and will perform a waggle-dance in front of other bees to indicate exactly

where the new source has come from; the distance it is from the hive; and how good a source it is. Each bee that takes in this information will then go to the new location, return and through their waggle-dances will notify more bees of this new source of nectar. If this new source is better than any other source of nectar, the information of this new location drowns out the waggle-dances from other locations, which are seen to be not so lucrative. It creates a feedback loop that spreads this new information quickly throughout the whole community.

When the bees exhaust a supply of nectar, however, their consequent waggle-dances indicate to other bees that that particular source of nectar is not as bountiful as it once was. The information about it becomes overshadowed by waggle-dances that other bees perform about new and richer sources of nectar that have been found. The information about the original source becomes 'forgotten' because each bee will pursue the most lucrative sources at any given time. In this way, information about where the most fruitful effort can be applied is amplified throughout the bee community whilst information about less lucrative sources, becomes discarded.

The principle from the characteristic of feedback is that: "**Actions within a swarm escalate".** So the guideline in response to this principle is that members of the community should "**Publicize successes as well as failures**". In a distributed filmmaking project, on the one hand this could be about processes that have saved time, techniques that produce higher quality media content, or links that access useful or interesting information. On the other hand, if members try out a link and then find that it doesn't in fact lead to anything at all interesting, then the user should be able to return to the previous page and remove this link or at least reduce the size of this link. Of course, in a website situation this is not the normal behaviour for visitors. Generally, users of websites are used to being handed information to them, rather than taking an active role in tidying up the website for other users. However, this is an interesting attitude that could be encouraged and cultivated within a community. For instance, if a link is never used, it could be coded to gradually disappear. In this way, hyperlinks could be acting in a similar way to the bees waggle dance.

3. Fluctuation

Fluctuation is crucial to the discovery of new solutions. If a bee forager gets lost, for example, instead of following previous indications of previous sources of nectar, they may well find new unexploited food sources in the process.

The principle from the characteristic of fluctuation is that: "**Randomness can be a valuable asset".** The guideline in response to this principle is that members of the community should "**Embrace fresh perspectives**". In a distributed filmmaking project, objectives might be set within specific time-spans to ensure the project steadily progresses. However, if an individual wants to shoot some material at a time that has officially been dedicated to thinking through ideas, then this should be encouraged as it may well stimulate originality.

4. Multiple Interactions

Multiple Interactions is about the fact that a swarm can achieve its goal much faster than if an individual approached the same task. This is not simply that there are more involved in doing the task but also that when each individual makes informed use of the information available, it accumulates from the activities of others in the swarm.

The principle from the characteristic of multiple interactions is that: "**Many hands make light work".** The guideline in response to this principle is that members of the community should "**Split tasks down into mini-tasks that can be done by many participants**". In a distributed filmmaking project, if there is more than one editor, different editors could edit different scenes. If different editors edited the same section, it may be deemed as inefficient because it is a duplication of effort. But, on the other hand, it offers a vital comparison of how ideas could be connected together. Participants should be aware that their personal work might not ultimately be used. They should also take into consideration that there is intrinsic value in the existence of an alternative way that the narrative is told. This in turn, will have an influence on the final edit. Multiple versions, at the very least, provide the filmmaking process with a richer variety of choice.

In terms of the questions that this thesis seeks to address, then, swarm intelligence will help inform the policies that the Swarm TV online environment will implement. In Swarm TV, Bonabeau's four characteristics could be developed into three principles:

Feedback:
Principle: Positive and negative actions within a swarm escalate.
Guideline: Publicize successes as well as failures.

Fluctuation:
Principle: Randomness can be a valuable asset.
Guideline: Embrace fresh perspectives.

Multiple-Interaction:
Principle: Many hands make light work.
Guideline: Split tasks down into mini-tasks that can be done by many participants.

From these three principles, then, the guidelines form the Policy of Swarm Intelligence in this thesis. In the next section there will be a summary of all the principles derived from the various fields of knowledge this chapter has covered.

Summary of selected principles from theoretical framework

Having looked at five fields of knowledge that have the potential to support distributed filmmaking, a provisional list of all the principles derived from these fields is listed below:

Policy of Rhizomatic Thinking		
Characteristic	**Principle**	**Guideline**
Idea generation	Change is a fundamental part of development	Generate New ideas
Idea clustering	Ideas from a blue-sky session often overlap	Cluster ideas appropriately
Idea selection	Some ideas are stronger than others	Select the best ideas

Policy of Openness		
Characteristic	**Principle**	**Guideline**
Content quality	All content can be improved	Make content editable
Narrative flow	Narrative flow can easily be blocked	Develop other member's ideas
Decision-making rationale	Individuals often manipulate projects with hidden agendas	Be as transparent as possible

Policy of Collaboration		
Characteristic	**Principle**	**Guideline**
Opinion aggregation	Some members will not know why certain opinions are held	Discuss rationale behind different opinions
Working relationships	Some prefer to work through particular problems on their own	Share work that is done individually back into the community
Collaboration value	Some individuals don't want to collaborate	Be committed to the collaborative process

Policy of Non-hierarchy		
Characteristic	**Principle**	**Guideline**
Power phantom	Authority is often gained by an individual because others simply allow it	Each member should take full responsibility for the whole project
Power distribution	Power naturally accrues more power	Avoid dominating others
Suspicion of power mongering	Claims of domination can often offend	Develop critical relationships in the community

Policy of Swarm Intelligence		
Characteristic	**Principle**	**Guideline**
Feedback	Positive and negative actions within a swarm escalate	Publicize successes as well as failures
Fluctuation	Randomness can be a valuable asset	Embrace fresh perspectives
Multiple interactions	Many hands make light work	Split tasks down into mini-tasks that can be done by many participants

Table 2-1 Policies from theoretical framework

The principles above, therefore, form a creative set of policies that should theoretically work through every stage of a filmmaking process, and collectively, they should be able to realize an idea into becoming a media clip; a media clip into becoming an edited section; edited sections into becoming a finished draft; and a finished draft becoming a completed version of a film.

Having looked at the conceptual framework for this thesis, and derived a set of policies for distributed filmmaking, the next chapter explores five open filmmaking projects, and they are analysed as to how each stage of the filmmaking process is governed.

Chapter 3 - Five existing open filmmaking projects

Introduction

In this chapter, five open filmmaking projects are analysed. Some of them are online projects and some are physical, face-to-face projects. However, the different stages and structures of these projects and the various styles of inclusivity of the various points of decision-making within each project are in focus.

The following is an excerpt from a Simpsons episode where Springfield is being persuaded by an outside entrepreneur, Lyle Lanley, to build a monorail through their town. It demonstrates the way in which a 'democracy' can be manipulated through peer pressure.

The Simpsons on mob rule

Lyle Lanley: Well, sir, there's nothing on earth
Like a genuine,
Bona fide,
Electrified,
Six-car
Monorail! ...
What'd I say?

Ned Flanders: Monorail!

Lyle Lanley: What's it called?

Patty+Selma: Monorail!

Lyle Lanley: That's right! Monorail!
[Crowd chants `Monorail' softly and rhythmically]

Miss Hoover: I hear those things are awfully loud...

Lyle Lanley: It glides as softly as a cloud.

Apu: Is there a chance the track could bend?

Lyle Lanley: Not on your life, my Hindu friend.

Barney: What about us brain-dead slobs?

Lyle Lanley: You'll all be given cushy jobs.

Abe:	Were you sent here by the devil?
Lyle Lanley:	No, good sir, I'm on the level.
Wiggum:	The ring came off my pudding can.
Lyle Lanley:	Take my penknife, my good man.
	I swear it's Springfield's only choice...
	Throw up your hands and raise your voice!
All:	[singing] Monorail!
Lyle Lanley:	What's it called?
All:	Monorail!
Lyle Lanley:	Once again...
All:	Monorail!
Marge:	But Main Street's still all cracked and broken...
Bart:	Sorry, Mom, the mob has spoken!
All:	[singing] Monorail!
	Monorail!
	Monorail!
	[Big finish]
	Monorail!
Homer:	Mono... D'oh!

(The Simpsons, 1993)

In this episode of The Simpsons, the town of Springfield has just been given 3 million dollars from a fine due to Mr Burn's illegal disposal of nuclear waste, and is deciding how they want to spend it.

In Vanity Fair, John Orvted listed this episode, Marge vs. the Monorail, in third place out of 10 of the funniest Simpsons episodes. He writes*: "Besides being replete with excellent jokes, this episode reveals the town's mob mentality and its collective lack of reason. This is the episode that defines Springfield more than any other."* (Orvted, 2007) It is a disturbing aspect of collective thinking that individuals can be whipped up into a frenzy, losing sight of objective rationality in the emotion of the moment. Mob mentality can often be chaotic, unpredictable and dangerous. Another example of this is the historical play by Arthur Miller called The Crucible.

It is about the Salem witchcraft trials of the seventeenth century, and is meant to be an allegory of McCarthyism of the late 1940's (Miller, 2000). When a mob takes on hysterical characteristics, it can be very difficult to stop.

On the other hand the Internet, with its potential of asynchronous communication, does not have to be an emotionally charged medium, and it enables individuals to deliberate. In her doctorate thesis, Yoohee Kim argues that the Internet plays a key role in the deliberative democracy of South Korea (Kim, 2007). In which case, it is through using the medium of the Internet that the wisdom of the crowds could most easily be harnessed as written about by James Surowieki (Surowieki, 2004). This could lead to an alternative outcome, rather than communities degenerating into mob rule, similar perhaps to the events that happened in New Orleans during the Katrina flooding (Buncombe & Gumbel, 2005).

Categories of Governance

In order to analyse the projects in this thesis, the various styles of inclusivity that can be used by groups when they are making decisions need to be categorized. In his book, Models of Democracy, David Held defines nine models of democracy. Four of these are historical models (Classical Athenian, Republicanism, Liberal and Direct Marxism) and four are contemporary models that relate to the historical models (Completive Elitist, Pluralism, Legal and Participatory). The ninth model, Deliberative Democracy, is 'an imaginative rethinking of democracy offering a new kind of participation' (Held, 1996: 235). It leads to an even more egalitarian direction than the others. Jan van Dijk used these last five models in his publication entitled "Digital Democracy, Issues of Theory and Practice" to explore the most likely developments in ICT in relation to politics and democracy in the future. However, he also added an additional model: Libertarian Democracy, which he described as "autonomous politics by citizens in their own associations using the horizontal communication capabilities of the Internet" (van Dijk, 2000: 45).

In their paper entitled "Democracy Squared", Jeremy Rose and Øystein Sæbø used four different democracy models again to quantitively analyse contributions to a Norwegian political online discussion forum (Rose, 2005). These models consisted of Consumer, Demo-Elitist, Neo-Republican and Cyber-Democratic taken from

Bellamy (Hoff, 2000). Broadly speaking, these range from representational democracy through to direct democracy - representational democracy being where an expert or politician is elected by the public to make political decisions for them. Direct democracy being where citizens are personally involved in making their own political decisions. Similar to van Dijk's model of Libertarian Democracy, then, is Bellamy's model of Cyber-Democracy. It is a much more participative model than the other models and one that considers the Internet specifically.

In all of the above models, there is an indication of a level of inclusivity. But all of the above models are also multidimensional in that they also look at the type of influence the participants have within the democratic processes – whether, for instance, they simply elect others to make decisions for them or whether they make the decisions themselves. This chapter is concerned about the participatory level at decision-making points of the project. Therefore, electing someone else to make the decision for you, implies involvement, but is not actually making the decision itself. There is a need to look outside democratic practices as well, because individuals outside of a democratic process often make decisions within a group.

In order to define the categories for this taxonomy, this thesis looks at the different types of leadership structures whose names are mostly derived from the Greek word *"arkhos",* which means 'ruler' (Oxford English Dictionary, 2006). These are Monarchy, Oligarchy, Democracy, Omniarchy and Anarchy.

- **Monarchy** would describe a structure where a single individual decides on behalf of the whole group.
- **Oligarchy** occurs where there is an elite subgroup that decides of behalf of everyone else.
- **Democracy** exists where the largest subgroup that agrees, decides for the rest of the group (this is often done by voting).
- **Omniarchy** happens where everyone has a direct involvement in the decision-making process (for instance where it has been agreed that the group needs to reach consensus before a decision is made).

- **Anarchy** categorizes a structure where the decision-making is decided as individuals and not as a group at all.

The table of categories used are listed as follows:

Monarchy	One individual in the group makes the decision
Oligarchy	An elite subgroup makes the decision
Democracy	The largest subgroup of members that agree makes the decision
Omniarchy	Everyone is directly involved in making the decision
Anarchy	No group decisions are made at all

Table 3-1 Categories of decision-making

Stray Cinema

Stray Cinema (**www.straycinema.com**) is an ongoing filmmaking project that was initiated by Michelle Hughes and Tom Goulter in 2006. They describe the project as *"an open source film".* It is an experiment that combines filmmaking with online information sharing." (Hughes, 2006). Hughes and Goulter now live in New Zealand, but the first project from Stray Cinema was shot in London, UK. Unedited video material was released to the public as digital clips for anyone to download from the Internet. This material was then edited by individuals on their own platforms and applications, and 63 finished edits were uploaded back onto the Stray Cinema website. Attached to the website was a forum and an online community then voted on the best edits. The best five were screened at a special film night organized by Stray Cinema in London in 2007. The Director's version can be seen at **http://www.youtube.com/watch?v=gTYvFU_wUmk**. It is a montage of shots that follows a day in the life of a woman who works in the city but who also plays the guitar and sings. It lasts 9 mins 9 seconds.

There were several decisions that had to be made during this project. The first decision was how to generate the original raw video material. Secondly, it was how to edit the material. Thirdly, there is the question as to which five films were the best to be screened. At each of these stages, using our taxonomy, the decision-making style can now be assigned.

Camerawork

Stray Cinema had a core team of five filmmakers that collaborated closely. They all knew each other face-to-face and they clearly had different skill-sets. Hughes and Goulter organized the project and Hughes directed the initial video material; a Web Developer created the Internet presence; a Camera Operator shot the initial material and a Sound Engineer had responsibility for the sound. It was structured in much the same way, as a traditional film would have been made, with a Camera Person, Director and Sound Engineer. It was filmed on a low budget and would probably have meant that everyone involved at this stage of the film would have had to deal with a very flat hierarchy. It is also true that everyone would have been directly involved in some aspect of generating the original material within their different roles, within this small group it could be argued that this stage should be classed as an Omniarchy. However, as more participants became involved, the new participants could not participate or revise the decisions that made up this stage of the project. It was also out of this subgroup, that the rules for the rest of the project were formed. Therefore, for this reason it has been classified in this thesis as an Oligarchy.

Editing

At this point in the project, Hughes and the subgroup opened up their project to everyone on the Internet and anyone who wanted to take part in editing was able to do so. Unedited video material was posted online under a Creative Commons License. There was a small amount of decision-making that would have been done by the original subgroup in order to keep what was made available to the public to a minimum file size download. Participants had to register with the project in order to obtain this material, but once these sections had been downloaded, it was then completely open to anyone as to how they would put the material together. The project allowed 20 per cent of new material. This stage can be classified as Anarchy, because although there were definite rules about how each person was allowed to use the material (for example, they could only use 20% of new material in their edited film), each person was allowed to interpret the material in whatever way they liked. There was no accountability or interactivity with any of the other

members of the project, and so there was no collective decision-making in this stage. Participants were able to decide for themselves.

Choosing the Best Edits

63 versions were uploaded to the Stray Cinema website and then discussion was encouraged about the quality of each version on a Stray Cinema forum. Members were then asked to vote for their favourite edit and the five with the highest number of votes were screened. This stage of decision-making would have taken place as a straightforward Democracy. Interestingly enough, the original subgroup created a version, and this version was screened as well. Again, there is an Oligarchy appearing alongside the Democracy. In this way, Stray Cinema set up a competitive characteristic to their project. All the way through, there were undertones in the promotional material that challenged newcomers to create a better edit than the core team. There was no iterative process, so versions were not re-edited in any way.

The following table categorizes these stages:

Camerawork	Oligarchy
Editing	Anarchy
Choosing best edits	Democracy

Table 3-2 Inclusivity of Stray Cinema

In an interview with Hughes, Mackay asked her why she called herself the Director of what she called an open source filmmaking project. She said:

> *The term originally came about when I directed the film footage, but I guess there were two meanings to that. Literally, I did direct the film footage, but I guess the second thing is that I felt that I was directing and overseeing the project as a whole. While I believe that it is important that any type of project is collaborative, taking ideas from lots of different people, I still think its important that you've got somebody who is bringing those ideas together, and making sure those ideas work in with the vision that you have for the project or the vision you first created for the project. Otherwise it gets really out of focus,*

> *and people don't understand what you're doing or what you're trying to achieve. So I guess I would see myself as literally the director of the film footage for the first year, but also directing the project as a whole.* (Hughes to Mackay, 2008)

Therefore, in order to summarize the governance of Stray Cinema, then, an Oligarchy consistently kept the project going although it opened itself up both to Anarchy as well as Democracy at different times.

Digital Tipping Point

Digital Tipping Point (DTP) is a project *"to create the world's first open source feature film-length documentary"* (Einfeldt, 2008), and its method of production closely follows the way that Open Source Software is produced. Christian Einfeldt, who calls himself the Producer, initiated the project. He uses various websites for different functions. There is the main information website at **www.digitaltippingpoint.com**, a user editable website for discussion between members, and over 1000 segments of video interviews stored at the Internet Archive - Digital Tipping Point (**http://archive.org/details/digitaltippingpoint**, Mar 2014). This material is available to everyone on the Internet and at the time of writing, there are about 360 hours of material. All this material has a Creative Commons License, and anyone can post new material to this archive as well. Digital Tipping Point follows the Open Source software model so closely, in fact, that they intend to release iterations of the film and follow Debian code versioning nomenclature: buzz, rex, bo, hamm, slink, potato, woody, sarge etch and lenny. That is their first efforts will be code-named DTP buzz, then DTP rex, then DTP bo etc. (**http://en.wikipedia.org/wiki/Debian#Releases**, Mar 2014).

Einfeldt has accumulated a great deal of interview material and has now subdivided the project into five sub-projects: Transcription, Translation, Video Editing, Creating the Plot, and Music. A video of proof of concept from this project can be seen at **http://archive.org/details/proof_of_concept_four_mins.mpg** . It is 4 minutes 57 seconds in length and it consists of a number of well-known figures talking about the open source movement.

Camerawork

Einfeldt interviewed a number of applicants and also enlisted the help of specific experts to help him with video issues relating to the Open Source movement. Mackay asked Einfeldt how he chose who was appropriate to interview and he said:

> *"Our first priority was to interview people who are the giants of the Free Open Source Software industry. We are also interested in documenting how Free Open Source Software is changing the way that people relate to one another (culture) and so we interviewed end users."* (Einfeldt to Mackay, 2010)

Originators that set up any project have an innate authority in the project, purely because they started it off. A strong direction is necessary to be set out in the initial stages for others to want to join in, and in this project, Einfeldt videoed figures like Lawrence Lessig, Larry Augustin, Richard Stallman, Victor Stone & Ken Starks. This follows the model of an Oligarchy because of its strong lead, however, this part of the project is actually still open to anyone to submit more material, if contributors want to. However, in the course of my research, participants haven't chosen to follow this through.

Transcription

For Transcription, Einfeldt has opened up the task to anyone. Participants who want to contribute are asked:

1. To pick a video from the 1000 segments online that they are particularly interested in;
2. To read some tips about transcription practice;
3. To upload the finished transcription in an accessible file format like RTF.

Mackay participated in this, working on a lecture by Lawrence Lessig and found that Einfeldt was personally very appreciative.

This section of the project should be categorized as following the Anarchy model, as each person is free to do whichever task they want to as individuals. However, at some stage, this work would inevitably need to be tested for quality. It is not mentioned on their website how this would take place, however, as all the video

and transcriptions are accessible to everyone, it could well be that quality control could also take place within the Anarchy model again. Participants could choose, for instance, to check other contributor's work against the video for themselves and upload a revised edition. As soon as there are multiple versions of a single transcription, however, there would need to be some sort of judgment made as to the best 'official' version.

Translation

Translation is a very similar process. Here the process is even more problematic, as either English or the language that they are translating into would inevitably be the participant's second language and therefore discrepancies could well be introduced. Einfeldt was asked about quality control in this stage. He replied:

> *You have correctly identified this as a key issue. One of the reasons for using a wiki is that it will allow the community to check the work. There is a saying in the FOSS community: "Given enough eyeballs, all bugs are shallow". That means that if you have a sufficiently large and active community, you will be able to solve even the toughest problems.* (Einfeldt to Mackay, 2010)

This stage follows the Anarchy model for the most part. However, if a translation was contested in any way, then it might come under an Oligarchy model where experts in a particular language might be called upon to verify someone's work.

Editing

In the Video Editing section of the project, Einfeldt suggested that participants edit their favourite segments into 30-second sound bites. Again, at this stage it is still following the Anarchy model.

Creating the Plot

In creating the Plot, Einfeldt writes on his wiki:

> *It has been said that a film or a book can't be created in an open source fashion, because a story inherently MUST be created from one perspective by one mind.*

> *According to this theory, only one or two minds can be sufficiently familiar with the transcripts and the footage to create a coherent plot. If too many people get involved, the plot will lose focus, and become a mish-mash. I disagree. I think that many people can brainstorm about a plot, although ultimately a core group will decide the script. For right now, we are collecting ideas about what you think would make a good plot. You can view the footage on-line at the Internet Archive's Digital Tipping Point Video Collection; and you can read the transcripts by going to our wiki Transcriptions Catalogue; and you can comment on the plot by going to our Digital Tipping Point Plot Forum. (Einfeldt, 2008)*

This is not easily executed according to an Anarchy model, and as Einfeldt says, many scriptwriters will have written their plots using a Monarchy model. Einfeldt acknowledges the difficulty here, and although he would like as many members to be involved, he seems to suggest that the decisions here will realistically be made in an Oligarchy.

Music

The final section that Einfeldt discusses is Music. Here he declares, *"Adam Doxtater is heading up the musical score"* (Einfeldt, 2008). Again, Einfeldt leans towards encouraging as many contributors to participate in this aspect of the film. He asks for *"input from lots and lots of people"* but he clearly feels that a Monarchy model is the best decision-making structure here.

The following table categorizes these stages:

Camerawork	Oligarchy
Transcription	Anarchy
Translation	Anarchy
Editing	Anarchy
Creating the Plot	Oligarchy
Music	Monarchy

Table 3-3 Inclusivity of Digital Tipping Point

To summarize, then, Digital Tipping Point, seems to want to follow the Anarchy model as much as possible but sees that there are stages within the project where it is most practical to have an Oligarchy and also a Monarchy at different times.

A Swarm Of Angels

The third project is A Swarm of Angels. At the time of writing this website is currently being moved to a different host and so is unavailable. However, digital film festival organizer, Matt Hanson, initiated this project. The vision behind this project was to create a *"£1 million feature film and [give] it away to over 1 million people, using the Internet and a global community of members"* (Hanson, 2009), but instead of going to the movie moguls to invest in it, Hanson has gone to the public. He offers a £20 subscription to the project. The idea being that if he can find 50,000 members of the public to participate then the whole project would have a £1,000,000 budget. To date about 1,000 members have subscribed and the project is at the stage where members are deciding on the plot.

In .net magazine, Hanson said:

> *"I need 50,000 people to fund this £1m project, and those 50,000 are an exclusive community. That's about the size of a football crowd on a Saturday afternoon, but on the Internet and with a global audience, that's not very much; and there's a lot of people who are excited about the idea of being part of an exclusive community and wanting to be involved in a very innovative feature film." (Hanson, 2006)*

As regards its governance structure, Hanson has described himself as a *"benevolent dictator",* as do many leaders of large Open Source projects. In an interview with Wikinews he states, *"My vision will lead the project forward and define the parameters, but the Swarm can influence that (and indeed offer improvements or insights one might not think of alone)"* (Hanson, 2006). He has the last word on everything if he chooses to, although he is very keen on his subscribers being involved in as much of the decision-making as possible. Various other participants are clearly part of an inner circle of major players within the project, and Hanson refers to these members as the *"Archangels".* Then there is a level of contributors

where members of the community from the project create posters, soundtracks, or tasks that have been pre-defined. Finally, there seems to be the voters' level of participation that votes on clearly defined strategic choices.

As far as is known, a finished piece wasn't produced in this project.

In this project the stages involved are Enlisting participants; Creating the Plot, Camerawork, Editing, and Distribution.

Enlisting participants

The subscription is open to anyone and so in this way it follows the Anarchy model. However, as soon as this is done it creates a closed circle of participants, made up of subscribers. This exclusive section of the community makes the decisions.

Creating the Plot

At the moment, two major plots are being worked through by subgroups within the project. Small subgroups are working these plots, but this is with the intention of voting for the best one by the whole group (internally referred to, as "A Swarm Of Angels" or ASOA). There is a discussion forum at their website and issues such as the name of the film, or whether they should plough any profits back into another project are voted on by ASOA. This follows an Oligarchy model as experts are actually creating the plot. Although there is a Democracy, which will ultimately decide which of these two plots to use.

Camerawork

When the film shooting stage begins, the plot will have been worked out. Hanson will employ technicians professionally and give preference to professionals from within ASOA, or the community of subscribers. This means there will a small group of experts who will be deployed to generate the video and this would fit neatly into the Oligarchy model.

Editing

Although the project is not at that stage yet, it seems implicit that Hanson will again employ professionals to do this task, similar to the previous section of the project, and so this section will probably fit into an Oligarchy model.

Distribution

Once everything has been completed, it seems that Hanson will be distributing the movie through the Internet non-commercially. He will want commercial buyers such as cinemas, TV companies and DVD Production companies to purchase the rights to the film. Presumably, the details of this decision will be settled democratically and hence fits into the Democracy model.

In .net magazine Hanson said:

> *The film industry really needs to embrace the Internet, and the way to do this isn't by licensing movie download sites, where a film costs more than a DVD. That is totally not the way to go. I think they will soon realize that, but they have not worked out their business model yet. It takes people like me, who are outside the system, to do that. A Swarm of Angels is a raptor – more agile and quicker thinking – compared to the diplodocus of Hollywood, which is ponderous because of its size, and the blockbuster model it has created where films are a big bang or a bust. (Hanson, 2006b)*

The following table categorizes these stages:

Enlisting participants	Anarchy
Creating the Plot	Oligarchy
Camerawork	Oligarchy
Editing	Oligarchy
Distribution	Democracy

Table 3-4 Inclusivity of A Swarm of Angels

To summarize, then, A Swarm of Angels is marketed as a democratic way of filmmaking. However, nearly all its decisions will be made mostly within an Oligarchy.

Elephant's Dream

Elephant's Dream (**http://orange.blender.org,** Mar 2014) was a project that was completed in eight months. The movie was premiered in March 2006 and the idea behind it was to restrict the software used in creating the 3D animation short to Open Source software. It was produced by Ton Roosendaal, the lead developer of Blender, a 3D modelling, animating, and rendering application that was the main software that was used in the project. Both the Blender Foundation and the Netherlands Media Art Institute funded it. The Blender Foundation raised their half of the finance by selling pre-ordered copies of the finished DVD and anyone who bought the DVD by the 1st September 2005, was added to the list of film credits. Roosendaal employed one technician and five artists from the Blender online community to work with him on the film for seven months. The six members were selected from the Blender online community, and the successful applicants came from Netherlands, USA, Germany, Australia and Finland. It was the winner of the award for "Best Use of CGI with Linux/Open Source" at the UK Linux and Open Source Awards 2006. Losing nominees in this category, were Dreamworks' Over the Hedge and Sony/Imageworks' Monster House.

The finished piece from this project can be seen at **http://vimeo.com/1132937**. In the story, two strange characters explore the inner working of a huge and seemingly infinite machine. The elder, Proog, acts as a tour-guide, showing off the sights and dangers of the machine to his initially curious but increasingly sceptical protégé, Emo. It is 10 minutes and 54 seconds in length.

The stages of this film project were as follows: Enlisting participants, Film Production, Music and then Distribution

Enlisting participants

In order to recruit the workforce for this project, Roosendaal advertised for six workers from the Blender online community, and he selected whom he wanted to work with on this project. Ultimately, one person made this decision and so this stage would follow the Monarchy model.

Film Production

As the pre-sales of the DVDs made the project possible, they needed to be included in the credits of this film. Therefore, in this sense the film was made by quite a small group of experts in comparison to the whole group and so follows the Oligarchy model. There were times when, during the production, there was also a call for other members of the Blender community to get involved in some translation work and providing photographic textures. So there were times when this stage touched on the Anarchy model as well.

Music

The music for this project was outsourced from this small artist community, and Wikinews asked why proprietary software was used in this stage, given their original aims. Roosendaal replied:

> *We've limited the "Open Source tools" requirement to our own Studio Orange only. That was what we could keep in control at least, and I can tell you it was not always easy even... :) For sound and music, we have decided from the beginning to seek an external sponsor. We have chosen to work with the best quality studio and composer we could find, preferably using open source, but not as a prerequisite. My own competence is solely within the CG [computer graphics, Ed.] side of movie making. When it comes to music editing, or video encoding and DVD authoring, I could only decide to choose to work with external parties with proven competences in that area. I have to be practical in projects like this, especially to ensure it will be realized.* (Roosendaal, 2006)

There are many specialized skills involved with filmmaking, so it is normal practice to bring in experts for a particular aspect like music and sound effects. This stage fits in the Monarchy model.

Distribution

All the material that went into making the film, including the sound track has since been released under a Creative Commons license, so that it is now possible for

anyone to revise the story and make their own version of the film. In fact, several members of the public have since made their own versions, following the Anarchy model.

The following table categorizes these stages:

Enlisting Participants	Monarchy
Film Production	Oligarchy
Post-production	Monarchy
Distribution	Anarchy

Table 3-5 Inclusivity of Elephant's Dream

In summary, then, Elephants Dream mainly worked according to the Oligarchy model, as the majority of the project consisted of the Film Production stage.

The Be Kind Rewind Protocol

Lastly, the Be Kind Rewind Protocol is a book written by Michel Gondry in order to *"put the tools of filmmaking in the hands of as many people as possible"* (Gondry, 2008). He wrote it after he directed the film "Be Kind Rewind" in which he facilitated a real community in Passaic, New York to create a film about Fats Waller. At New York's Deitch Projects, Gondry took this concept further in February and March of 2008, and constructed a do-it-yourself film studio in which any visitor could assemble their own film. This was not an online project, but Gondry's book documents how he arrived at a process of how members of the public can make their own films in 2 and a half hours. Therefore, it would be very much in keeping with the type of clips that you might expect on YouTube.

In the introduction to his book, Gondry writes:

> *In order to provide a minimum number of restrictions and a maximum amount of fun, the protocol consisted of two workshops in which participants followed instructions that guided them as they brainstormed ideas, created a storyline, and then planned out the other various narrative and production details. I worked very hard to find the best balance to stimulate everyone's imagination and avoid inadvertent domination of the creative process by stronger or more*

compulsive members of each group. Basically, the rules were devised to allow the community to be the leader. (Gondry, 2008: 5)

In the back of his book, Gondry lists his protocol.

An example of a film that followed the Be kind Rewind protocol can be seen at **http://www.youtube.com/watch?v=yUs08usTcmY** It tells the story of a brother and sister fighting over their mother's soul. It lasts 6 minutes and 6 seconds.

There are three sections to this protocol: Creating the Plot, Storyboarding & Camerawork.

Creating the Plot

Gondry recommends that the first task for the group to decide is to settle on a genre, then a title and then the storyline. At each of these decisions, Gondry says that everyone should propose their ideas and then should vote on each one. This follows the model of Democracy. In his protocol, this stage should take 45 minutes.

Storyboarding

In this stage, the storyline is broken down into each scene, about eight to twelve in all and each scene should list the time of day; the location; the action; the character names and who will play them; what costumes they will be wearing; and any narrative cards that can be used to help tell the story. Gondry allocates another 45 minutes for this, and recommends that everyone gets involved in this in some way. One person will write out the decisions the whole group makes and the others make sure that the narrative cards are written out, or what props will be used etc. Everyone's direct involvement follows the Omniarchy model.

Camerawork

The cameraperson, Gondry suggests, should direct the filming stage, as they will know what has been filmed and what is happening to the story. He says that this person should edit it in camera (i.e. shooting everything in sequence and using the pause button in between clips, without ever retaking a scene) and that this stage should take no more than an hour to complete. Gondry says that the cameraperson should never retake any shots and that they should embrace imperfection if things do not quite go right. At first glance, this stage seems to follow the Monarchy

model, however, all the strategic decisions have already been made by this stage, in fact the cameraperson is executing the whole group's decisions and so should be classified as an Omniarchy again.

The following table categorizes these stages:

Creating the Plot	Democracy
Storyboard	Omniarchy
Camerawork/Editing	Omniarchy

Table 3-6 Inclusivity of Be Kind, Rewind

In summary, the Be Kind Rewind Protocol is a very inclusive project structure.

Conclusions from these open filmmaking projects

It can be seen from these five examples that even though each project boasts of being open and participative, all of them have decision-making stages within their production process that rely on there being a powerful minority who will make decisions on behalf of the whole group.

According to the taxonomy, then, the most inclusive online project listed here would be the Be Kind Rewind Protocol, where it is structured so that everyone in the group can contribute at every stage. The task for Swarm TV and for the research in this thesis, then, is to design the process for filmmaking so that at each stage the decision-making is as also as inclusive as possible. It is important that it will be using models that follow Democracy, Omniarchy or Anarchy, and avoiding stages of Monarchy or Oligarchy.

Each of these stages needs particular contributors with specific skills, so the key to avoiding Monarchy or Oligarchy is to

1. Open up the work to as many participants as possible;
2. Work through as many of the strategic decisions with the whole group as possible;
3. Actively avoid individuals or minority subgroups forming that work themselves into a position of authority, and make decisions throughout the whole project.

The first guideline here highlights a fourth principle to do with Openness:

Inclusivity
Principle: Monarchies and/or Oligarchies form easily.
Guideline: Open up the work to as many participants as possible.

The second guideline highlights a fourth principle to do with Collaboration:

Strategic Decisions
Principle: It is easier to make strategic decisions with fewer participants
Guideline: Work through as many of the strategic decisions with the whole group as possible.

The third guideline highlights a fourth principle to do with Non-hierarchy:

Cliques
Principle: Subgroups easily form positions of authority
Guideline: Actively avoid individuals or minority subgroups forming that work themselves into a position of authority, and make decisions throughout the whole project.

The other information that can be drawn from out of the analysis in this chapter is a list of the crucial stages of filmmaking that need decision-making. This thesis will particularly be making use of this in analysing the thesis filmmaking projects. From a combination of all these projects, it can be seen that the decision-making areas in filmmaking in general are as follows:

1. Enlisting participants
2. Creating the plot
3. Storyboarding
4. Camerawork
5. Editing
6. Post-production
7. Distribution

These stages form a rough structure of the Swarm TV filmmaking projects analysed in this thesis. Along with an initial list of emergent policies derived from the theoretical concepts that support distributed filmmaking in Chapter Two, the stages will be adopted in the methodology for this thesis and will be discussed in more detail in the next chapter.

Chapter 4 - Methodology

Introduction

In the previous chapters of this thesis, five fields of knowledge were explored and from these fields, 5 policies were derived. Also, five open filmmaking projects were analysed as to their governance models and seven stages of the filmmaking process were identified. So given this set of policies and procedures, the methodology used in this practice-based thesis was to develop a website environment that both facilitated these policies and was able to incorporate the different stages within its technology. This website environment is called Swarm TV (**www.swarmtv.net**).

From the 18 principles derived from the fields of knowledge in Chapter Two and analysis of open filmmaking projects in Chapter Three, some of the guidelines relate directly to the type of online environment that is needed. Some of the guidelines relate to activities that a community facilitator might set, and some of the guidelines are general guidelines about how members should treat other members. This can be broken down as follows:

Guidelines that influenced the type of technology the website was built from:

1. Generate new ideas (principle of Idea generation from the policy of Rhizomatic thinking)
2. Cluster ideas appropriately (principle of Idea clustering from the policy of Rhizomatic thinking)
3. Select the best ideas (principle of Idea selection from the policy of Rhizomatic thinking)
4. Make content editable (principle of Content quality from the policy of Openness)
5. Share work that is done individually back into the community (principle of Working relationships from the policy of Collaboration)

Guidelines that influence the type of activities set by the facilitator:

1. Develop other member's ideas (principle of Narrative Flow from the policy of Openness)
2. Open up the work to as many participants as possible (principle of Inclusivity from the policy of Openness)
3. Discuss rationale behind different opinions (principle of Opinion aggregation from the policy of Collaboration)
4. Work through as many of the strategic decisions with the whole group as possible (principle of Strategic Decisions from the policy of Collaboration)
5. Develop critical relationships in the community (principle of Suspicion of power mongering from the policy of Non-hierarchy)
6. Actively avoid individuals or minority subgroups forming that work themselves into a position of authority (principle of Cliques from the policy of Non-hierarchy)
7. Split tasks down into mini-tasks that can be done by many participants (principle of Multiple interactions from the policy of Swarm intelligence)
8. Publicize successes as well as failures (principle of Feedback from the policy of Swarm Intelligence

Guidelines that members of the community should continually bear in mind:

1. Each member should take full responsibility for the whole project (principle of Power phantom from the policy of Non-hierarchy)
2. Avoid dominating others (principle of Power distribution from the policy of Non-hierarchy)
3. Embrace fresh perspectives (principle of Fluctuation from the policy of Swarm intelligence)
4. Be as transparent as possible (principle of Decision-making rationale from the policy of Openness)
5. Be committed to the collaborative process (principle of Collaborative value from the policy of Collaboration)

From the first set of guidelines, then, the website needed to be a tool for rhizomatic thinking. Members needed to contribute their ideas, cluster them and then select the best of them. It lent itself to a webpage where members could edit text onto a

webpage, where media elements could be dragged and dropped around the screen, and where comments could be made alongside each media element on the page. It also indicated that it should be easy for members to upload different types of media files. The different types of technologies explored to do this are now listed.

Software Requirements

When Marshall McLuhan said *"The medium is the message"* (1963), he was not talking about the Internet in 1963, but this is still just as true of online environments. The medium of an online environment, and how it is constructed, is a message that is communicated to its audience. In 2006, ten different types of technologies were inspected to see how appropriate they might be for the environment for this thesis. These were Flash, Director (Lingo), SVG/XML, Processing, Puredata/Gem, MAX/Jitter, PHP/mySQL, ASP, Java and Python. There were possibilities for crossovers between these technologies, but five definite characteristics were looked at:

1. The ability to play videos;
2. Whether the technology was Open Source;
3. Whether it was accessible on the Internet;
4. Whether it could connect to a database; and also
5. Whether media elements could be dragged around the screen as discreet objects.

	Ability to play videos	Open Source	Internet Format	Database Connection	Object manipulation
Flash	✓		✓	✓	✓
Director	✓		✓	?	✓
SVG/XML	?	✓	✓	✓	✓
Processing	?	✓	✓	?	✓
Puredata/Gem	✓	✓			✓
MAX/Jitter	✓				✓
PHP/mySQL	✓	✓	✓	✓	
ASP/Access	✓		✓	✓	
Java	✓	?	✓	✓	✓
Python	✓	✓	✓	✓	✓

Table 4-1 Technology platform capabilities as of 2006

"Flash" is proprietary. "Lingo" is the language used by Director, which is proprietary software, and at the time, "Puredata/Gem" did not substantially exist in a web format ("Lily" was still in beta version). "Processing" looked promising as it felt very similar to "Flash", but at the time of choosing the technology, it could not cope very well with video. Both "Python" and "Ruby-On-Rails" were very powerful open source languages and were both used in developing web applications. In the end, PHP was opted for, as it is Open Source and was also more common than the other two languages on the Internet. It also had the ability to manipulate objects on a webpage using JavaScript.

One of the main prerequisites was that text could be dragged and dropped across the screen. In order to do this in a web browser it is conventionally difficult within a normal HTML environment, so dynamic HTML or DHTML was explored. There was a JavaScript library written by Walter Zorn (**www.walterzorn.de**, Mar 2014) that enabled elements to be dragged and dropped across the screen and this could be linked up to a database on a server, so that actions could be stored centrally and accessed universally. In the website environment, however, if any person moved an object around the screen, this movement was sent to the central database and was then updated for other web users who next visited the site. Using this method,

then, the experience of rhizomatic thinking could be recreated within an Internet browser with the additional possibility of other members joining in the experience.

Collection of data

The methodology for this thesis was concerned with six main areas of data collection:

1. *Why certain data was collected*
2. *What data was collected*
3. *From whom it was collected*
4. *When it was collected*
5. *How it was collected*
6. *How it was analysed*

(Hussey & Hussey, 1997:54)

These six areas are specified in relation to the research of this thesis. This can be seen in Table 4.2 (For the ease of specification, the first two areas have been reordered, so that it is understood **what** is being collected before listing reasons **why** they are being collected).

Data collected	Why was it collected?	From whom was it collected?	When was it collected?	How was it collected?	How was it analysed?
Web logs	Used to judge the popularity of the use of the website in conjunction with the activities set in the filmmaking projects	It was collected from the web hosting server	Continually collected, mainly during the length of the project, but also during the start of one project and the start of the next project	It was automatically collected as part of the service of the web host server	It was used to generate charts and statistics about the project
Database information on page reviews	Used as a back up to the server weblogs, which were not always available	This data was collected from the website database itself	Continually (as above)	The data is available from inspection of the appropriate table on the database	Used to form charts about use of the website according to timed intervals of activities set
Website contributions	1. To see the frequency of contributions and participation & 2. To safeguard previous contributions if necessary	Collected from the website database	An email was sent whenever a change was made to the database	Email was sent to Mackay from admin@swarmtv.net	During the project it would give Mackay a running gauge on how things were developing. Also, the frequency of contributions was charted.
Communications from facilitator to participants	All group emails were collected to document how the project was facilitated	Collected from facilitator	Collected as each email was sent to the project group	Collected from the Sent Box of the facilitator's email account	Used to document statistics of activities within the project
Communications from participants to facilitator	Useful as a feedback mechanism	Any of the participants	During the project and also after the project had officially ended	Emails sent to Mackay were categorized according to the project name	Used to find out how the project could improve
Raw production material	Collected to help morale & to create a resource for other participants to use	Collected from participants	Normally, collected at the end of set activities, but available to upload at any time	Material could either be uploaded directly or sent to the facilitator	Groups would inspect raw material for ideas, and moderation. Frequency could also be obtained
Finished edits	Finished edits proved the project to be successful	Open to anyone to create a finished edit. Mostly however it was down to Mackay to do it technically.	Collected at the end of the project	It could be sent to the facilitator via YouSendIt or on a hard drive or it would already be in his/her possession	Versions were reviewed and feedback from it was collected either by email, on the website or by word of mouth.

Table 4-2 Collection & Analysis of data

Types of data collected

Three types of data were collected. These were website statistics; communication from any of the participants; and production material. Website statistics were gathered automatically from the website server as well as from the database engine. Communication from the participants was largely done on the website itself, although there was sometimes feedback sent by email to the facilitator of the project. Production material was also collected - both raw unedited material, edited sections and finished versions.

Rationale behind data collection

Website statistics mainly were collected so that it could be seen how frequently the website was used in the process, and when members of the public interacted with the project. This formed most of the data. Secondly, any communication from the participants was documented, particularly between individuals, so that it could be seen how much of a community of participants was being constructed through the project. It also served as a feedback mechanism so that if there were any issues arising from participation, then this could be fed back into the project. Lastly, production material was also collected: raw unedited video, images, audio and text as well as any finished film(s) from the project.

Schedule of data collection

Data from all of the above was collected on a continual basis. Using a website environment, normally meant that members of the community could asynchronously discuss issues. So contributors could participate whenever they had free time.

Method of data collection

Most of the information was communicated through email or edited straight into the website itself; Weblogs were retrieved through an FTP client; Database statistics were retrieved using SQL queries; and larger files were either sent through Dropbox, Yousendit, or uploaded to a public iDisk account. They were also physically handed to the facilitator of the project on data DVDs or on portable hard drives.

Analysis of data collection

Statistics were transformed into bar charts, and production material was uploaded, as soon as possible, so that everyone could see what other members had been doing in recent activities. Any interplay between participants is particularly noted and recorded; significant quotes were uploaded onto the website to feedback into the project; questionable material was highlighted and fed into the community for discussion; and production values were talked through and commented on.

Being a website, statistics were saved as to the number of requests the website received; participants could communicate to each other via the website, and via email; and production material could be uploaded and shared.

Having looked at the methods of collection of data, this thesis will now look at the first attempt to encapsulate rhizomatic thinking, in order to develop the methodology used in this thesis.

Initial software

Initially, a draft application was built in Flash called 'Mindmapper' that enabled thoughts to be listed, moved around, and to be connected up in order to document

a thinking session. Figure 4-1 is a screen-grab from a session on the 25 Jun 2007:

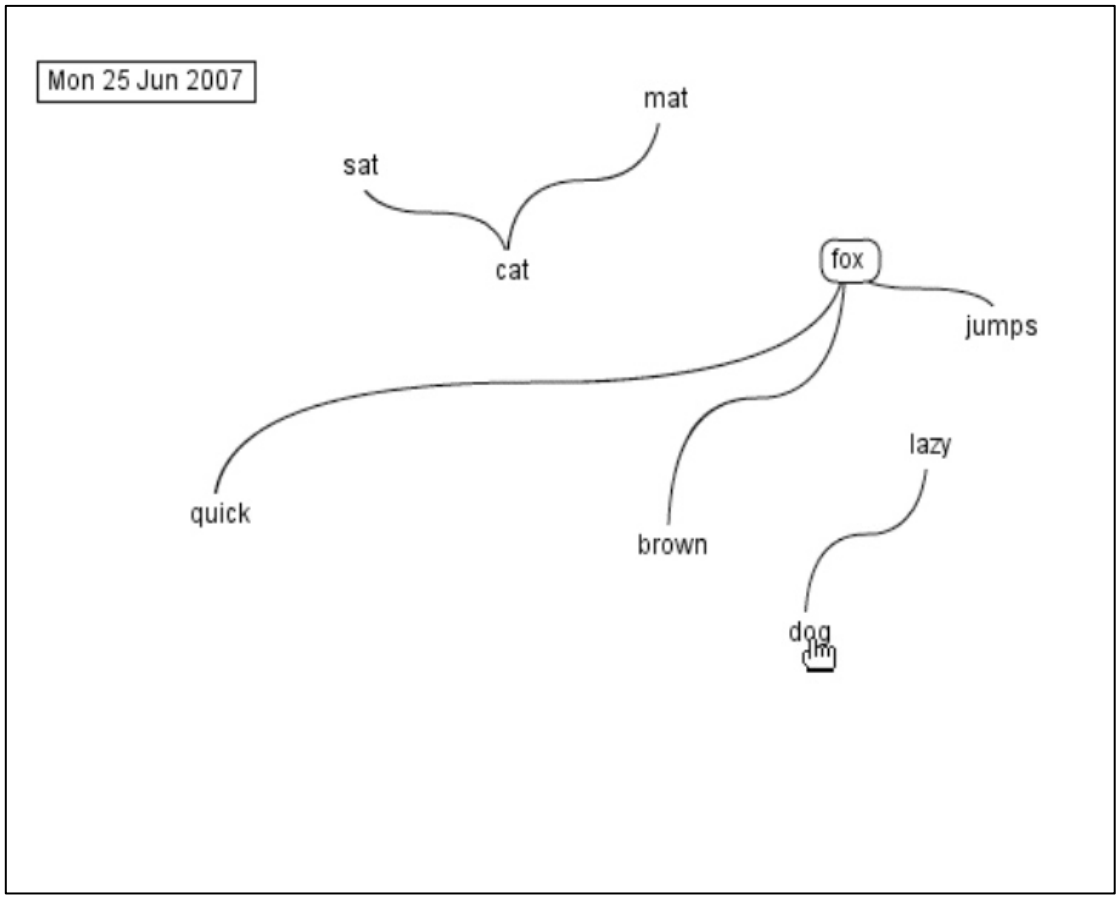

Figure 4-1 Screengrab from early Mindmapper software developed in Flash

It was found that by using a drag-and-drop interface for structuring thoughts, it greatly facilitated the process. It meant that at the time of generating thoughts, the user did not have to worry about its position on the page, as long as the thought was listed. The Mindmapper application solved the issue of being able to drag and drop ideas around into different positions, but at the same time, it did not deal with the possibility of collaboration very easily. This application worked well in being able to create a mindmap, but once the map had been 'completed', the only output was through a screen-grab of its current state. It was not easy for anyone else to work together on the same thinking task.

This Mindmapper application needed more development. But there was also a fundamental question about whether it was using the right technology for such functionality. Flash is proprietary software and further development in that environment implied at the very least that that the application may not be perceived as being very open. Although, this could possibly have been handled in a similar way to the way Peter Small advocated, Small wrote about a unique way of

opening up proprietary technologies, specifically the software "Director", in his book called "Magical A-life Avatars" (1998).

The activities of developing this initial application can be overviewed as follows: A hypothesis was formed; it was planned how to test it out; it was implemented; and then this implementation was reflected upon according to Kolb's Learning cycle.

Kolb's Learning Cycle

The cycle of activities in this thesis closely follows Kolb's Learning Cycle (Kolb, 1984): where learners extract a theory from their experience (Abstract Conceptualization); they plan how to put this theory into practice (Active Experimentation); they implement this plan and gain a new experience (Concrete Experience); and then they reflect back on that new experience (Reflective Observation); At this point the learning cycle can start again. John Dewey had a similar perspective. He defined the educational process as a *"continual reorganization, reconstruction and transformation of experience"* (1916:50). However, in his book "How we think" (1933), he writes that reflection itself comprises of a whole host of processes that often occur unconsciously during activities and that they occur in phases that can be jumped and bypassed.

> *The fact that reflection originates in a problem makes it necessary, at some points consciously, to inspect and examine this familiar background. We have to turn upon some unconscious assumption and make it explicit.*
>
> *No rules can be laid down for attaining the due balance and rhythm of these two phases of mental life. No ordinance can prescribe at just what point the spontaneous working of some unconscious attitude and habit is to be checked till we have made explicit what is implied in it. No one can tell in detail just how far the analytic inspection and formulation are to be carried. We can say that they must be carried far enough so that the individual will know what he is about and be able to guide his thinking; but in a given case just how far is that?* (Dewey, 1933:215)

It could therefore be argued that Kolb's theoretical perspective is too simplistic and he has been criticized for defining the four stages too strictly. *"In reality, these*

things may be happening all at once" (Jeffs, 2005). Kolb's theory may well be fragmented, and it has been said, *"learning includes goals, purposes, intentions, choice and decision-making, and it is not at all clear where these elements fit into the learning cycle"* (Rogers, 1996:108). These areas, however, are able to fit into the planning stage for the research in this thesis, and so Kolb's process still provides a good model for this thesis.

Philip Dearden has, in fact, augmented Kolb's learning cycle with Honey and Mumford's concept of different learning styles: Activist, Theorist, Pragmatist & Reflector (Honey, 1982), as a basis for workshops in Project Management (Dearden, 2003:7). His diagram is as follows:

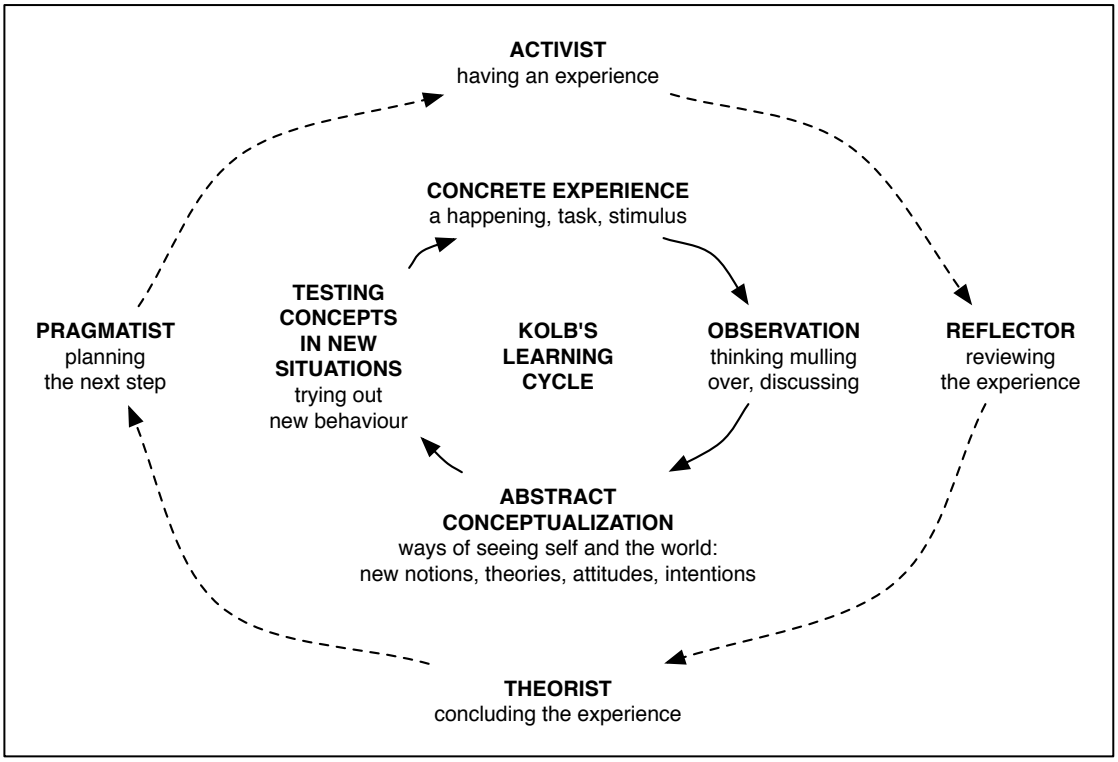

Figure 4-3 Kolb's Learning Cycle adapted with Honey & Mumford's Learning Styles (Dearden, 2003)

The addition of Honey and Mumford's Learning Styles, then, take into account the various types of approaches that different participants are likely to use within a project, so it is useful for collaborative filmmaking.

For this reason, Swarm TV adopted Kolb's Learning Cycle as its process of development. It is applied to the projects in this thesis, using the four stages as sections to document how each project progressed, but more importantly to

observe how far the policies and procedures derived in the Chapter Two and Three were significant in the completion of each project.

Instead of relying on the Flash application mentioned above, it was subsequently decided that a website environment could produce much richer data and also have more functionality. It is called Swarm TV and it is a website environment specifically designed for collaborative filmmaking. Swarm TV is not only be a prototype website environment for distributed filmmaking, itself; but it is also a probe in order to test out how the policies were employed in practical filmmaking projects.

In this chapter, Kolb's Learning Cycle was introduced as part of the methodology; various technologies were compared and the chapter also outlined how a suitable technology was chosen for this research. The methods of data collection were covered, and an initial software prototype was developed. In the next chapter, five filmmaking projects that were organised as part of the research of this thesis will be analysed to test out the policies and procedures that support distributed filmmaking.

Chapter 5 - Analysis of research projects using Swarm TV

Introduction

In this chapter, the research of the Swarm TV projects is documented. Five projects are analysed in detail, and they are chosen because they were the most pertinent to deriving and testing out the emergent policies and procedures of distributed filmmaking.

Description of Swarm TV

Swarm TV is an interactive website environment that has been developed to facilitate distributed online filmmaking. It is both a prototype website environment as well as a probe to test whether effective collaboration is happening within the website environment. Visitors are encouraged to contribute to the various projects that Swarm TV is facilitating, and they are able to upload their own text, images, audio and video under a Creative Commons license, with the idea that other visitors will download this material and work on it before uploading it up onto the site again for others to re-use. It has a drag and drop interface, so that media elements on the screen can be dragged and dropped around the page enabling users to cluster media elements together and so that general subject matter can emerge without the visitor necessarily having to determine a linear order for each element before contributing. Participants can also comment on any contribution offered. Members' contributions are also as anonymous as each member would like them to be. Similar to a Mediawiki (**http://www.mediawiki.org**) visitors don't need to log into the environment at all before they participate, and they are able to create new pages, delete content, maintain links between pages and populate the website with their own content.

Evolutionary changes to Swarm TV

During the course of these projects, the website Swarm TV underwent a number of changes in order to reflect some of the characteristics of the emerging policies more closely. For example, one change was the recoding of the website from ASP, a Microsoft and hence proprietary technology, through to PHP, which is an open source coding language. It was subsequently also rewritten in the CodeIgniter framework and is now made available on GitHub, so that programmers are able to

access the website coding and modify their own version, if they wish. The target audience for these projects was a cross section of the general public. It may well have been that within the members of the public invited to join the project, there were programmers, filmmakers or other participants with specific skills. But the concept of distributed filmmaking should allow access to whoever is motivated to become involved. Different projects targeted different people groups, for example teenagers or art students, but not contributors with specific skillsets.

List of Swarm TV projects

Since 2005, the Swarm TV environment has been involved in 17 projects. Most of them have been filmmaking projects, although some have had a focus of a different art form that involved video. For example, **www.williamstopha.com** (now unaccessible), was a collaborative poetry site, but it incorporated video clips.

This is the list of projects that Swarm TV was involved in:

Name of project	Starting date	Duration	Description
Counterpoint Counterpunch	Aug 2005	4 days	Art exhibition with Kelly Chorpening at the House Gallery, London
Legend of King Arthur 2.0	Oct 2007	5 days	Part of a wider exhibition in Falmouth Poly called "Participation"
Resource camp on open budgeting	Mar 2008	1 day	Series of talks organized by Critical Practice, Chelsea
Market of Ideas	Mar 2008	1 day	Ideas fair at Chelsea
Ecoes	May 2008	4 months	5 PhD students looking at ANT theory to edit video
Project 2008	Jun 2008	7 weeks	Project with core group of online MA Digital Arts from UAL
Aspects of Happiness	July 2008	4 weeks	Short film project with one other filmmaker
Zebs Music	Aug 2008	3 years	Young people's music website using Swarm TV engine
William Stopha	Nov 2008	4 years	Collaborative poetry website using Swarm TV engine
Democracy is …	Jan 2009	6 weeks	Film selected from UK in global competition
Terrible Tales of Hayle	Jul 2009	2 weeks	Youth project working with about 12 young people

			between 11 and 14
This Weekend?	Aug 2009	2 months	Funded art project using Swarm TV engine
Collaborative Practice	Nov 2009	3 months	2nd year BA elective looking at the practice of collaboration
Possibilities	May 2010	6 weeks	Video Discussion about non-hierarchy with one other PhD student from UAL
University of the Village	Dec 2011	4 months	Funded research project using Swarm TV
AIR:Pressure	Apr 2013	5 days	Filmmaking project about climate Change
ISEA Swarm	Jun 2013	10 days	Funded research project sponsored by BT and Falmouth University

Table 5-1 Projects involving Swarm TV

Swarm TV projects

Each of these 17 projects played a part in the investigation into how distributed filmmaking projects could work, and they are briefly listed below.

Counterpoint Counterpunch, August 2005

This project was a 4-day collaborative art exhibition with sculptor Kelly Chorpening at the House Gallery in London. 200 friends and contacts were invited through email to submit digital art to be projected through a constructed network of pipe cleaners and onto a street-facing window of the gallery. Art could be either posted on the Swarm TV website or delivered to the gallery itself. Four emails were sent out, one each day of the exhibition, and they invited recipients to the private view (which was on the final day of the exhibition), as well as detailing what had been contributed and the contributors involved. There were 24 contributors in all and the contributions consisted of videos, a sound-piece, a screenplay, web-links, Internet art, drawings, photographs and website discussion. All of these were uploaded onto the Swarm TV website; this was projected through the installation onto the gallery window; and a film was made of the piece of art as a whole. Data was collected via the website logs such as the time and date when pages were visited, which pages were visited, the order of pages they visited, the number of different web users who visited the site, the browsers they were using and the page that referred them to the site in the first place.

Everyone's work was shown in the gallery, so in this way the activity of the participants was open, however, the film that was made about the exhibition was edited by an individual, so as a filmmaking project there was a two level hierarchy. It was also participative rather than a collaborative project, because although all contributors had their work displayed, they did little to build upon each other's work.

Legend of King Arthur, October 2007

This project is analysed in detail later on in this chapter

Resource Camp on Open Budgeting, March 2008

This was a series of lectures about the principles of open budgeting, that were filmed and uploaded to the Swarm TV website. This added to the video resources on the website, that visitors to Swarm TV are able to download and edit if they want to, but this has not yet happened.

This project was open in that anyone on the day could present a session. It was non-hierarchical in that no one made any more decisions than anyone else, however again it was not collaborative apart from the fact that a number of speakers' presentations formed the proceedings of the conference.

Market of Ideas, March 2008

This was an Ideas Fair that was held at Chelsea School of Art. Participants booked out stalls and presented their ideas from their stalls. Three different camera people filmed this, and a number of photographic stills were taken. This material was all put on the Swarm TV website and contributors were asked to comment on the material that was uploaded online. Although this material has been viewed from the website regularly since this event, there was very little interaction on the website to do with this material.

This project was open because anyone who felt they had an idea that was marketable via a stall was able to register and have their own stall. It was non-hierarchical, as no stalls had priority over the others, but apart from a few

comments about the material (incidentally mostly received through emails rather than through the website itself), this project in terms of filmmaking produced very little collaboration.

Ecoes, May - August 2008

This was a project where 5 PhD candidates from the University of the Arts, London and University of Westminster were exploring Actor Network Theory to edit a video. The process was presented as a panel in the Networks of Design 2008 conference in Falmouth and the finished video was also exhibited as an installation there. There was a great deal of face-to-face discussion to do with this project, but relatively little was documented using Swarm TV, although this was an initial intention behind the project. Each of the candidates made their own section to the final video.

This was not an open project, there was never going to be more than the five initiators of the project, however, it was non-hierarchical in that no contributor's ideas were superseded by anyone else in the group except through group consensus. It was also collaborative in the sense that there were several meetings where the format of the final film was discussed. However, as a filmmaking process it was not collaborative because each candidate created his or her own section from start to finish.

Project 2008, June 2008

This project is analysed in detail later on in this chapter

Aspects of Happiness, July 2008

This was a short collaborative film project involving two filmmakers. It was documented on Swarm TV, but most discussion and filmmaking decisions were made face-to-face.

It wasn't an open project, it was non-hierarchical and it was also very collaborative.

Zebs Music, August 2008 – 2011

This was a website using the Swarm TV website code for young people in Cornwall. It was open for anyone to post text, images, audio and video; although it was only advertised locally through a young people's club in Truro called Zebs. It wasn't specifically a filmmaking project although film clips were often posted onto the site. It was particularly interesting because although the site was completely open, there was very little offensive material posted on it. There were two periods, of about a week each, when this did happen. But due to the open nature of the site, web users who were offended were easily able to delete the offensive material within a very short space of time.

The site was totally open to anyone on the Internet. It was almost non-hierarchical except that those web users who knew the technology had more power to express their control than those who didn't; however there were no official hierarchical roles for instance like an official "moderator". Pages were collaborative. Some young people would post an image and someone else would comment on it. There was no specific aim for the project, however, so participants weren't particularly encouraged to build on the work of others in the community.

William Stopha, November 2008 – 2012

This was a website that used the Swarm TV technology, and encouraged visitors to collaborate in writing poetry. Film clips were also uploaded to the site, but this was not a filmmaking project. It was introduced to young people at school and was used as an educative tool.

Like Swarm TV, this website was totally open to anyone, it was non-hierarchical and it was used collaboratively. It was a sustainable project, although it wasn't used to collaborate in filmmaking.

Democracy is…, January 2009

This was a project similar to Aspects of Happiness (see above). It involved two filmmakers again, and most of the decision-making was done face-to-face. It was documented on Swarm TV and raw material was uploaded to the site.

Like the project "Aspects of Happiness", it wasn't open; it was non-hierarchical and it was collaborative but not through the Swarm TV website.

Terrible Tales of Hayle, July 2009

This was a specific young people's filmmaking project. It was a closed group of young people that met face-to-face every day for two weeks, and the project was documented on Swarm TV. As there were vulnerable young people in the group, it was decided that the documentation needed to be kept private as well. Most of the decision-making was made around a table, although the two weeks followed the stages of filmmaking listed in Chapter Three and culminated in an open screening of the film that was made together in a local village hall.

This project was not an open project. It was relatively non-hierarchical although the editor had the final say as to the content of the film, but it was collaborative.

This Weekend, August 2009

This project is analysed in detail later on in this chapter.

Collaborative Practice, November 2009

This project is analysed in detail later on in this chapter.

Possibilities, May 2010

This was a project involving two filmmakers, one male (Jem Mackay) and one female (Catherine Mafioletti), and it consisted of an hour and a half discussion about the possibility of non-hierarchy in filmmaking decisions. There were two cameras involved, one that took a wide shot of the proceedings, and the other was handheld and was passed between the two filmmakers whenever it felt appropriate. This raw material, then, became the subject of discussion as to how this could be edited non-hierarchically.

This project was not an open project, but it was non-hierarchical and collaborative.

University of the Village, December 2011 – March 2012

This project is analysed in detail later on in this chapter.

AIR:Pressure, April 2013

This filmmaking project was part of a conference called AIR:Pressure at Falmouth University about climate change. Over the five days of the conference, a different stage of the filmmaking process (as discussed in Chapter Four) was set as the agenda. Contributors could participate online or they could participate at a Swarm TV stall that presented the Swarm TV website as a kiosk. On the final evening, films that were created during the conference were screened to an audience of around forty members of the public.

The project was totally open, it was non-hierarchical although web users who knew the technology were at an advantage, and it was also very collaborative. One of the finished clips, in particular, involved a number of different participants building on each other's ideas and also resulted in different versions being created.

ISEA Swarm, June 2013

The final project of this thesis was a filmmaking project about the International Symposium of Electronic Arts that was held in Sydney, Australia. BT and Falmouth University sponsored it and it involved a filmmaker going to the conference, but being directed by a group of contributors who met up every day in Falmouth University, UK for an hour. During this hour, five stages of the filmmaking process were followed and the group made face-to-face decisions. This process was documented on Swarm TV. These participants then made the edits, and a finished film was made using decisions from the whole group.

The process was fully open, in that anyone was able to join in the video conferencing of this decision-making group. However, they wouldn't have had as much social power within the group, so it wouldn't have been completely non-hierarchical. It was, however, structured as close to a non-hierarchy as possible

and the strategic decision-making was collaborative, in that it was continuously building on the work achieved from the previous day.

Five projects in more detail

Having outlined the projects that involved Swarm TV, it is clear that some of the projects were not as open, non-hierarchical or collaborative as others. So in order to see how these three characteristics can be employed for distributed filmmaking, this thesis will analyse just five of these projects, for the sake of being able to demonstrate with more clarification, how the emergent policies, derived from the theoretical framework in Chapter Two, related to the process of distributed filmmaking.

The analysis of these projects follows Kolb's Learning Cycle: Active Experimentation, Concrete Experience, Reflective Observation and then Abstract Conceptualisation. Within each stage of this analysis, the events of the project are documented and significant behaviours of the community described and then related to the theoretical policies and guidelines gleaned from the theoretical framework of this thesis in Chapter Two.

This is the list of projects analysed in detail:

1. Legend of King Arthur 2.0 (2007)
2. Project 2008 (2008)
3. This Weekend (2009)
4. Collaborative Practice (2009/10)
5. University of the Village (2011/12)

Legend of King Arthur 2.0

Concepts behind the project (Active Experimentation)

The first project, analysed in detail in this thesis, was called "Legend of King Arthur 2.0". The concept was to look at how something as traditional as a legend can be

handled by Web 2.0 technologies. Legend of King Arthur 2.0 (LoKA 2.0) was summarized in its exhibition catalogue as follows:

> *"In an age of reproduction, most people are familiar with the idea of 'the complete story'. People buy stories; they buy books or watch films. They all have fixed beginnings, middles and endings. Before the age of print, however, stories were much more fluid. They largely existed in an environment of oral folklore where the story changed as often as the story was told and then retold. With this piece, Mackay explores the openness of a legend and how it can be applied to stories within our new technologies."*
> (**http://ires.falmouth.ac.uk/Participation/index.php**)

The project was part of a public art exhibition entitled "Participation" at the Poly Gallery, Falmouth. It involved nine pieces of work from different artists, whose work explored the concept of participation. LoKA 2.0 was one of these projects.

The methodology used involved re-editing a short film called "Dynamic Narrative", created previously by Mackay in 2005. The film documented the history of the legend of King Arthur, demonstrating which parts of the legend had been added by whom and in what year from 800AD to the present day. LoKA 2.0, then, would incorporate the public's reactions to this. The intention was to emphasise the open and changeable nature of legends, and how they are modified whenever they are retold. The interactive multimedia website, Swarm TV (**www.swarmtv.net**), was projected onto a screen in the gallery with the initial film 'Dynamic Narrative', and the public from the exhibition were encouraged to revise it by engaging in five stages of the filmmaking process via the website:

1. Ideas
2. Visualization
3. Filming
4. Editing
5. Completion of the project

Each stage took place on a different day of the exhibition. The public was introduced to the project at the exhibition, and then they would be able to continue

their involvement in the project, in their own time on their own Internet browsers. They were able to upload and download material through Swarm TV, and cards with the website address were given out to all interested parties. It was emphasized throughout the project that all contributions would come under a Creative Commons License, which allows others to reuse material submitted for any non-commercial media projects.

In order for members of the public to have enough motivation to participate, it was felt that two things were necessary:

1. There was as much face-to-face interaction with the visitors to the exhibition as possible.
2. Each day of the exhibition, everyone on the mailing list would get an update on the project.

There was an mailing list of about 250 addresses, and each day a brief email would be sent out with the email number over the total number of emails that would be sent out e.g. “email No. 3 of 5”. There would be a relevant image in the email, which would summarize what had happened over the last 24 hours; reflections on this; and possible tasks for contributors to do over the next 24 hours.

The main question that this project explored was:

How effectively could Swarm TV encourage distributed filmmaking by the general public?

Events of the project (Concrete experience)

The exhibition happened between the 25th and 30th October 2007. On 25th October, at the Private View, the project idea was presented to the visitors to the exhibition.

On Day 1, visitors were asked to submit possible ideas as to what part of the Legend of King Arthur they wanted the film to be about. Eight participants responded to this and posted their contributions on the website.

On Day 2, visitors were asked to visualize how a chosen idea could be realized on video; whether that would be a storyboard, a word for word script, or a method of filming that will produce the shots needed to tell the story (In filmmaking, this is called a treatment). There were 4 different treatments submitted, and it was at this stage that it became clear that there probably was not going to be just one film coming out of this process. Several films were going to be made simultaneously.

On Day 3, the physical exhibition was not open to the public. Participants were set a filming task instead for the day, via email. Specifically, this was to take an idea that had been posted on the website, preferably someone else's idea, and film it. Several images were uploaded. There were also video clips contributed that had obviously been created beforehand. It meant that at this stage, nothing was specifically filmed for this project. These contributions were sent to the project via email rather than being uploaded through the website.

On Day 4, the task was to download some of the films from the website and edit them together. No one did this. However, on that day a workshop was run at the exhibition, called "Make a film in an hour". The participants who turned up for this workshop, used resources from the Swarm TV website. They took what they needed and created their own idea for their own film. This was then uploaded to the website.

By Day 5, the project had produced a number of different film clips. They had been submitted and were based on very different ideas.

Analysis of the project (Reflective Observation)

Website statistics

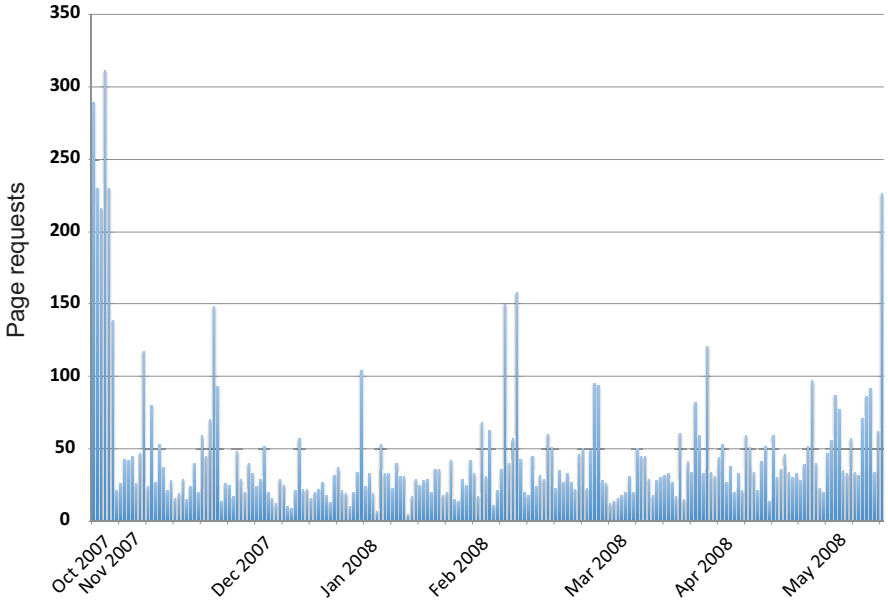

Figure 5-1 Page Requests during project

Figure 5-1 shows the numbers of pages that were requested from the website **www.swarmtv.net** between 26 October 2007 and 16 May 2008. During the exhibition, itself there was an average of 225 page requests each day. Subsequently, the page requests were lower, but they were maintained with an average number of 39 page requests each day for the following 6 months.

It can be seen that during the exhibition there were over five times as many daily page requests as the number of visitors who logged on the website server after the exhibition had ended. This can certainly be assumed to be an indication of the public's interest in the project during the exhibition. However, it has to be taken into consideration that the process of explaining the project to the public would have created page requests in itself. Another indication of the public's interest in collaborating in this film project is the number of contributions made to the project.

Project outputs

The results of the project were as follows:

	Amount	Additional comments
Hits	Over 8,000	Pieces of web material requested from the server
Page Requests	1,276	
Editing Interactions	3,250	Changes made to the website
Email Communications	80	Including emails from London, Ireland, the U.S & Australia
Ideas posted	8	
Treatments submitted	4	
Significant Text contributed	1	A 1000 word monologue
Images uploaded	14	
Film clips created	9	

Table 5-2 Outputs from LoKA 2.0

The number of website "Hits" are a common way of assessing how popular a website is, and so it has been included in the table above. However, this can be misleading because this is not the same statistic as for "Page Requests". Each page that is requested brings in with it a number of digital files to be displayed on a webpage – CSS files, JavaScript files, image files etc. On average, in this project, each "Page Request" generated nearly 8 times as many "Hits".

What this thesis is particularly concerned about, is the number of editing interactions. An editing interaction is peculiar to Swarm TV in that it occurs when a visitor to the site either changes the content, or the way a piece of content is displayed on the website. During the exhibition, then, this happened 3,250 times. As an editing interaction can only occur when a user double-clicks on the page, it means that this figure is very unlikely to include statistics from automated web robots, in their general search for new content. This figure can therefore be

assumed to be an accurate indication of the amount of interest there is in the project by human beings.

Originally, the project was scheduled to stop with the end of the exhibition. However, the exhibition had generated interest from the public, and because a central theme of the piece was about exploring openness, it was decided that the project time limit should be extended. One participant, who had written a 1000 word monologue for the project, subsequently wanted to film this and their completed film was shown at the PZ Gallery in Penzance, Cornwall on the following weekend.

From the number of media outputs that occurred during the course of this project, it can clearly be seen that Swarm TV engaged the public in being interested in participating in a collaborative filmmaking project. The fact that there were emails from across the world also indicates a global nature of this interest.

However, on Day Four, no one attempted to edit the clips together. This suggests that perhaps this part of the filmmaking process was not as accessible as the other areas to the general public and this will need more attention in future research into online filmmaking.

Subsequently, the 9 different film clips that came out of this project were edited into the original film "Dynamic Narrative". This created a representative film of the whole project. This film, entitled "Legend of King Arthur 2.0", can be seen at **http://youtu.be/AWpTvl_zhQY** (also #3 on the DVD). It lasts 9 minutes and 33 seconds, and intercuts the history of the legend of King Arthur, with contemporary stories, opinions, images and film clips. The clips submitted were of varying quality and the finished film incorporates mobile phone clips alongside Standard Definition clips.

Project feedback

During the exhibition, the public were certainly interested in the project. There were numerous conversations about it, as well as the concepts behind its activities and many attendees of the exhibition promised contributions.

One member of the public emailed the following:

> *"To be honest, Art House films leave me cold and I rarely get them … your project however, has made me think about film again. Most film directors control the experience of the audience, aiming to evoke emotion, laughter, etc. at a given point. The result of this is very controlled, leaving very little room for audience engagement. Your project has shown me otherwise."* (October, 2007)

From this feedback as well as conversations during the exhibition and the web statistics shown in Figure 5-1, the Swarm TV interface provided enough interest from the public to support further collaborative filmmaking ventures. Additionally, the email quoted above shows that this kind of undertaking also shows an additional potential for learning.

Conclusions from the project (Abstract Conceptualisation)

This project set out to test the viability of distributed filmmaking using the Swarm TV interface and the results of this research were encouraging. Participants were not only willing to participate, but also it was shown that they were prepared to license their own work under a Creative Commons License, in order to participate in the study.

This project will now be discussed using the policies, principles and guidelines derived from the theoretical framework in Chapter Two

Rhizomatic thinking

Generation of ideas

LoKA 2.0 worked extremely well as an exhibition that elicited ideas from the general public. The subject of King Arthur was strong, in that it seemed that everyone had something to say about the legend, from school-aged children through to senior citizens. It was also appropriate that the exhibition was organised in Cornwall because traditionally a number of locations in the legend have geographical locations in Cornwall. There were 8 ideas suggested for the film.

Clustering ideas

Drawing the different ideas together, images, stories and video clips were mostly about everyday contemporary life in Cornwall, presented alongside reflections and ironies of the original story of King Arthur. The 1000 word monologue, for instance, was a piece that sounded as though it was part of the legend, with familiar Arthurian names, but towards the end it is revealed that it was actually a story from the present-day.

Selection of ideas

Everyone who submitted work was represented in the completed edit. The original film that was updated during the course of this exhibition was already a montage of video clips recounting the history of the legend itself, so inclusion of new clips and stories were weaved into the updated version of the film very easily. Although the editing was open to the public, no one offered to do it and so the facilitator of the project selected the contributions.

Openness

Editability

The 1000 word monologue that was submitted was editable. An edited version was actually re-used by other members, and as such it became a significant resource in this project. The website itself was editable, and during the course of the project, over 3,000 edits were made to the website. It was more difficult for images, audio or video clips to be edited. It was, however, possible for them to be downloaded, then edited on a local computer, and then uploaded again. However, this happened infrequently.

Development of other members' ideas

Development of other member's ideas happened once in the project when the 1000 word monologue was re-edited. The facilitator, of course, was also able to integrate everyone's work into the final film, but the guideline "Develop other members ideas" is likely to develop the quality of emergence only when it is performed a number of times amongst many different members of a community.

Transparency

The time-span for this project was short. Five days was barely enough time to get to know what the project was about, let alone any individuals taking an opportunity to maliciously manipulate the project for the sake of it. In practice, members of the public encountered the project, made their response to it and then moved on to the next exhibit in the gallery, so there weren't any problems to do with transparency. In future projects, an opportunity for transparency to be an issue needs to exist. Perhaps this could be incorporated in initial activities set by the facilitator.

Inclusivity

Everyone on the mailing list was sent a list of events that had happened in the previous 24 hours, reflections on this and also the tasks set for the following 24 hours.

Collaboration

Rationale behind opinions

LoKA 2.0 turned out to be a project that was not very collaborative. The opportunity was there, but it behaved much more like a participative project. There was very little discussion of issues and visitors to the website operated as multiple individuals rather than as a community. The public largely kept their opinions to themselves, they expressed their own ideas, and they implemented their own ideas. There were no comments about other participant's ideas. In this way, as there was little debate, there was little necessity for rationale to be expressed concerning opinions.

Sharing work

From the outset, the project stipulated that any work on the website would come under a Creative Commons License. Contributors mostly shared clips that they had done individually. These were frequently photographs or video clips that they had taken previous to this project, but that they felt had some connection with the legend of king Arthur: pictures of spiders webs; submerged cars in a river; a video clip of balloons. The most useful contribution was the 1000-word monologue. It

was written as an individual, but then shared back into the community, and used by other members.

Commitment to collaboration

As stated above, this project was more participative than collaborative in that contributors offered their own work for inclusion, but they didn't suggest ways of how their work would be incorporated into a completed edit alongside other members' offerings. Perhaps the facilitator should specifically explore this avenue of enquiry with the contributors?

Strategic Decisions

There were no group wide discussions as to how the new material would be incorporated into the new version. The task of editing the new version was offered to the whole community, but no one took the responsibility to do this.

Non-hierarchy

Responsibility for the project

The general public participated in this project, but there was no evidence that any of them took responsibility for the whole project. There were two video sequences, however where the contributors took full responsibility for their particular sections. The 1000 word monologue, for instance, was filmed and edited specifically for this project. As stated above, it worked independently and was screened as a work in itself at the PZ gallery in Penzance a week later.

Domination

In this project, there wasn't enough of an interactive community to raise a problem of members dominating each other. Most of the participants related to the facilitator rather than to each other.

Relationships

As stated above, participants related to the facilitator rather than to each other. This is probably because none of the activities set by the facilitator specifically asked the members of the public to do so. This expectation was not clearly

promoted and so it didn't happen. It is an important part of the process, and so this needs to be integrated into activities in the future.

Cliques

The project was not long enough for cliques to form in any way.

Swarm intelligence

Publicity of successful activities

At the end of each day of this project, the facilitator sent an email to a mailing list of about 250 addresses with a summary as to what had happened over the previous 24 hours in the project and a list of possible tasks that contributors could participate in over the following 24 hours. This seemed to be very effective and it would have been interesting if the community had publicized their own achievements on the website itself. Again, the public did not know this to be an expectation of the project, so the facilitator did a fair amount of this on the website.

Fresh perspectives

The brief for participants for this project was to watch a short video about the history of the legend of King Arthur and for the public to make their own contribution in response to this piece. Contributors posted images of barbed wire, chandeliers, dew on a spider's web and a clip of the release of hundreds of blue balloons. By indicating no rationale behind this collection of images, the piece became surreal. All of these images were incorporated into the completed edit and made an interesting art-house film collage.

Manageable tasks

As the workforce in a project of this nature is completely voluntary, contributors will spend any amount of time on their contributions. Some happened to have a few images lying around, others spent days on making their contribution. So it is important that when activities are communicated to potential participants, that it is possible that they can be completed quickly. At the same time, they could take a lot longer if the contributor is motivated to do so. Tasks that were set in this project were very specific.

Overall, then, this project was non-hierarchical even though the facilitator had to define the outcome of the contributions at the editing stage, as the responsibility was not taken up by anyone else. Every contribution to the project was included in the finished piece. So in terms of openness, it was a very open project. Unfortunately, however, there was little collaboration involved, it was much more of a participative project, because there was no debate about how contributions should be involved. The project was promising in regards to demonstrating aspects of swarm intelligence, although this is unlikely to occur effectively if collaboration isn't happening.

At the start of this project, there was already a short film to focus potential participants' interest. This could have been an important consideration in inadvertently setting up an inherent hierarchy in the filmmaking project. So the following project analysed in this thesis, Project 2008, began with no initial material at all. It particularly explored how this factor might affect the participation in an online filmmaking project.

Secondly, there were indications that contributions were being made from parties in the U.S.A., as well as Australia and not just from a localised targeted geographical area. This would indicate that this type of project could take place totally online, without face-to-face interaction. It also implies that developing a filmmaking project using swarm dynamics could occur across different cultures, filmmaking traditions and possibly language barriers. This would be an important aspect if the idea of recruiting very large numbers of participants was an objective of a particular filmmaking project. For these two reasons, the next distributed filmmaking project explored how global a participative project like this could be, and whether it would work if there were no initial material to start with. This effectively would suggest that a project of this kind is not necessarily limited to a small set of contributors, where physical relationships between participants were already established.

Project 2008

Concepts behind the project (Active Experimentation)

"Project 2008" is the next major project documented in this thesis. It lasted six weeks this time, so that there would be more time for participants to get involved and get engaged at a potentially deeper level. It was organized to involve a core group of five MA Digital Arts (online) students participating from Camberwell, University of the Arts, London with the idea of inviting a strong core of suitable participants at the start who were able to serve as a stable base for the lifespan of the project. The reasoning behind this was that the group dynamics of a community of online students should already have settled down as a group and would be ready to "perform" according to Tuckman's phases of "forming", "storming" & "norming" before "performing" (1965). To enhance the possibility of performance further, an extra introductory stage was also added before the five stages used in the project, Legend of King Arthur 2.0. So in all, this project differed from the Legend of King Arthur 2.0, in that:

1. A topic for the collaborative film was deliberately not chosen beforehand, to see how much of that was a necessary motivational factor.
2. The process was scheduled to last six weeks rather than just five days, to try and deepen the interaction between participants
3. It was built around a small core group of an existing online community, to give it a sense of stability
4. An extra introductory stage was scheduled into the process, to allow relationships to form before the actual activities of the project
5. The project was aimed at a global audience, instead of a local audience, to explore how the difference between online relationships and offline relationships might affect the process.

About 300 potential participants, who were also known personally to the facilitator, were also contacted via email to invite their help for it. They were each asked if they wanted to be included in the mailing list and receive updates about the project as it progressed.

Here is a copy of the introductory email:

Over the next six weeks, www.swarmtv.org will be facilitating an open filmmaking project that we will enter into the Cornish Film Festival this year, and we would love you to get involved. The aim is that however much time or however little time you have to contribute to this project, if you want to be involved, we will try and facilitate it.

The next six weeks will be loosely structured around six stages of a filmmaking process:
Introductions
Ideas
Treatments
Filming
Editing
Finishing off

Each week Swarm TV will suggest a choice of activities to do with the theme of the week, but it will be totally up to you how much or how little you take part in.

Please feel free to dip into any section at any time.

Jem

This is part of a research project by Jem Mackay who is studying for a PhD with the University of the Arts London, looking at effective structures for open and non-hierarchical collaborative filmmaking. (If you don't want to receive these updates over the next six weeks, please reply with "please don't update me" as the subject)

Each stage in this project lasted a week, and every week there was also an hour's chat with the core online MA Digital Arts community. This provided a feedback structure, so that issues arising could be discussed as a group.

Following the structure of Legend of King Arthur 2.0, each subsequent weekly email gave details of what had happened over the previous week, reflections on this, and potential tasks for participants to get involved in, over the following week.

Specifically, this project explored the question:

How effectively could Swarm TV draw participants into an interactive online community from different filmmaking traditions and different cultures?

Events of the project (Concrete Experience)

Events of this project were summarised and documented as a series of emails that were sent out to everyone on the mailing list as the project progressed, and so these emails will be referenced to give the details of the project. The email at the end of the first week stated that the project had had "four video uploads, five images and an audio file uploaded … a thousand page requests and about 6000 hits." It explained that the project was looking for ideas for the film project and that they could be submitted to the project on the website.

The email at the end of the second week listed five ideas that contributors had had:

1. *The value of water within the context of global warming*
2. *The change of power structures within the media system*
3. *Using blogs and vlogs as material for a soap opera*
4. *A global remake of a Shakespeare piece*

5. *Trying to combine all submitted ideas together in an Alice-through-the-looking-glass type scenario.*

It also discussed the nature of a treatment for a film, and how it visualizes the method by which the ideas could be videoed. It asked for participants to contribute towards this, and additionally there was a section on how participants were getting involved in the project from all over the world.

The email at the end of the third week listed three tasks that participants could film (taken from participants' contributions of treatments to the website):

1. *30 seconds of a dripping tap*
2. *Someone speaking Shakespeare's Sonnet 18, framing just the mouth.*
3. *A landmark or something that locates the contributor to a particular geographical area.*

Videos could be uploaded to a public Mac Account and the URL was given to the participants.

The email at the end of the fourth week stated that 24 film clips had been uploaded; that the site had had 18,500 hits since the start of the project; and that the project had been viewed in 33 different countries. It highlighted that the following week was editing week and that any of the videos uploaded could be downloaded and edited by anyone who had a video editor and then uploaded to the Mac Account again.

The email at the end of the fifth week recorded that clips had been shot in Sydney, Uganda, Hong Kong, Seattle, London, Cornwall, Durham, the French Riviera and San Francisco. It also repeated possible ways in which the clips could be transferred back to Swarm TV.

The final email thanked everyone for their contributions and detailed: *"Over the last seven weeks, 50 people contributed from 40 places in 10 different countries around the world."* It gave its readers the URL to see a finished piece from the project, edited by Mackay, but it also encouraged anyone to submit their own version as well.

Analysis of the project (Reflective Observation)

Web Statistics

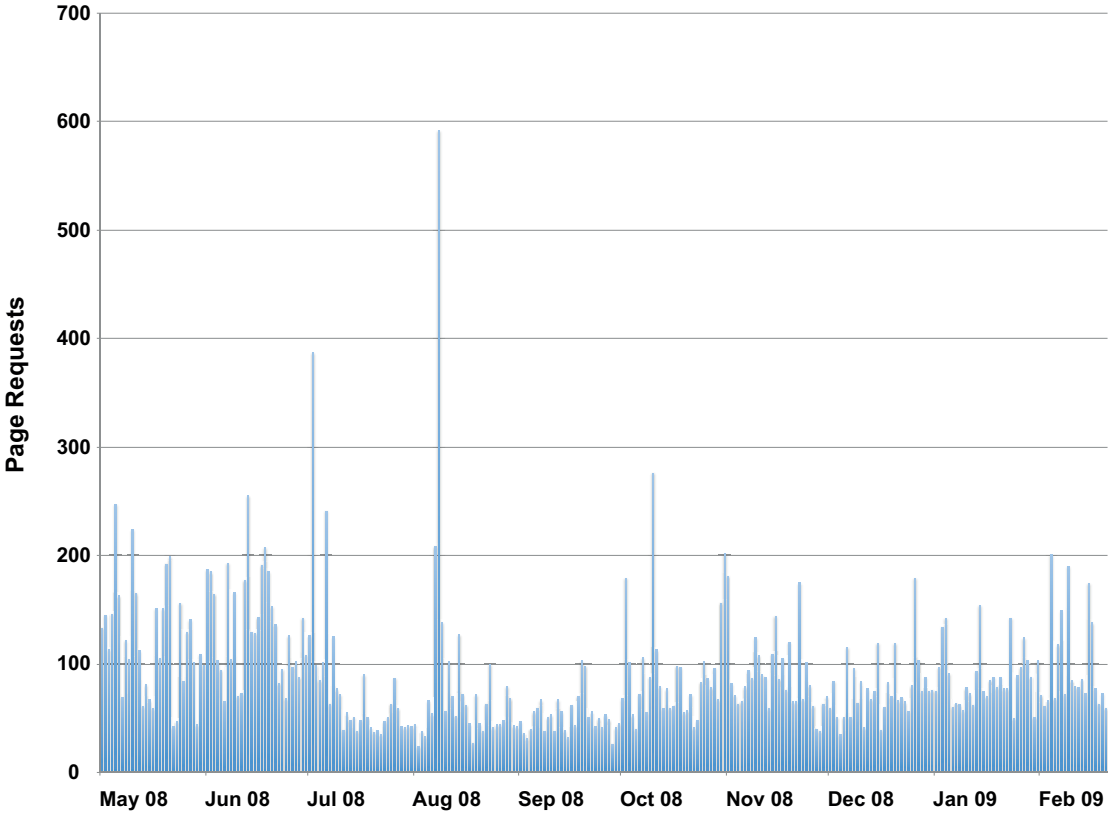

Figure 5-2 Daily Page Requests from Swarm TV

In Figure 5-2, the daily page requests from Swarm TV can be seen. Project 2008 took place between 17 May 2008 and 3 July 2008. It is assumed that the participants are likely to take up to a week before they visit the website, so the average number of page requests during the project was 129 each day. Subsequently, until the 8 March 2009, the average number of requests was 82 each day.

As with the "Legend of King Arthur 2.0" (LoKA 2.0), the number of page requests during the project was significantly higher than the general interest in the site shown after the project. "Project 2008" was seven weeks long rather than the 5 days of "LoKA 2.0" and the interest was about half as strong on a daily basis (129 page requests per day [pr/d] as compared with 225 pr/d), but the general interest shown in the site as a whole doubled from 39 pr/d to 82pr/d.

From Figure 5-2**,** it can be seen that the project increased the interest in the website by over 50%. This suggests that participants are more interested in current activities and that continual feedback on the project was probably a significant motivating factor.

The other statistics that were monitored closely in this project were the unique IP addresses from different countries that viewed the site, and also how many times they requested specific pages from Swarm TV.

In order to get this information, the server logs were stored and imported into an Excel spreadsheet. The spreadsheet was then filtered so that only logs that requested an actual page remained. The IP address from each log was then converted to a decimal number; and then using an open source CSV GeoLite database from **www.maxmind.com**, this number was converted to the country from which the IP Address was derived.

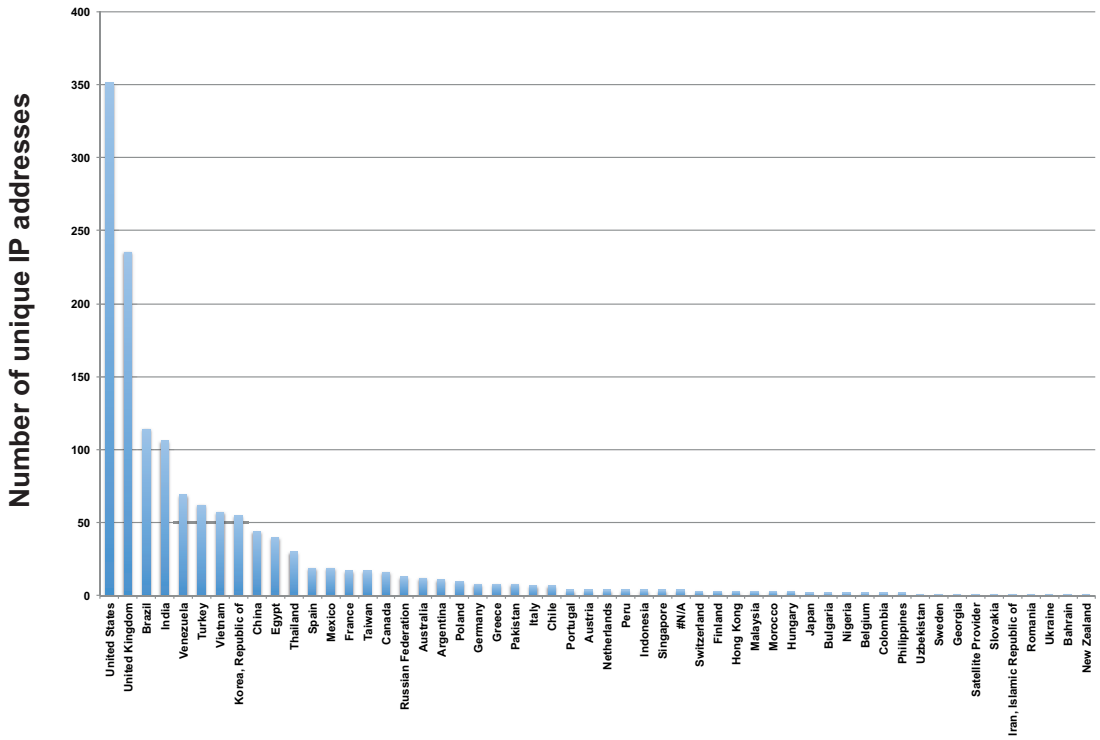

Figure 5-3 Numbers of unique IP addresses from different countries

In Figure 5-3, the numbers of different IP addresses from different countries can be seen. These IP addresses would normally be from different computers, and so

will relate to the numbers of different visitors viewing the site. However, visitors are quite likely to visit the site using different computers, and different visitors may use different computers from within the same institutions. If this is the case, this would not be an exact figure of the numbers of different viewers, but it can be used as a rough estimate. It can be seen that the US probably had about 351 different users and the UK had 235. It can also be observed that there were over 50 different countries specifically viewing the site during Project 2008.

From Figure 5-3 it is estimated that nearly 1500 viewers browsed this project, and less than 250 of these were from the UK. This indicates that this kind of project creates a strong global platform. From Figure 5-3 & Figure 5-4, the United States proves to be a significant audience.

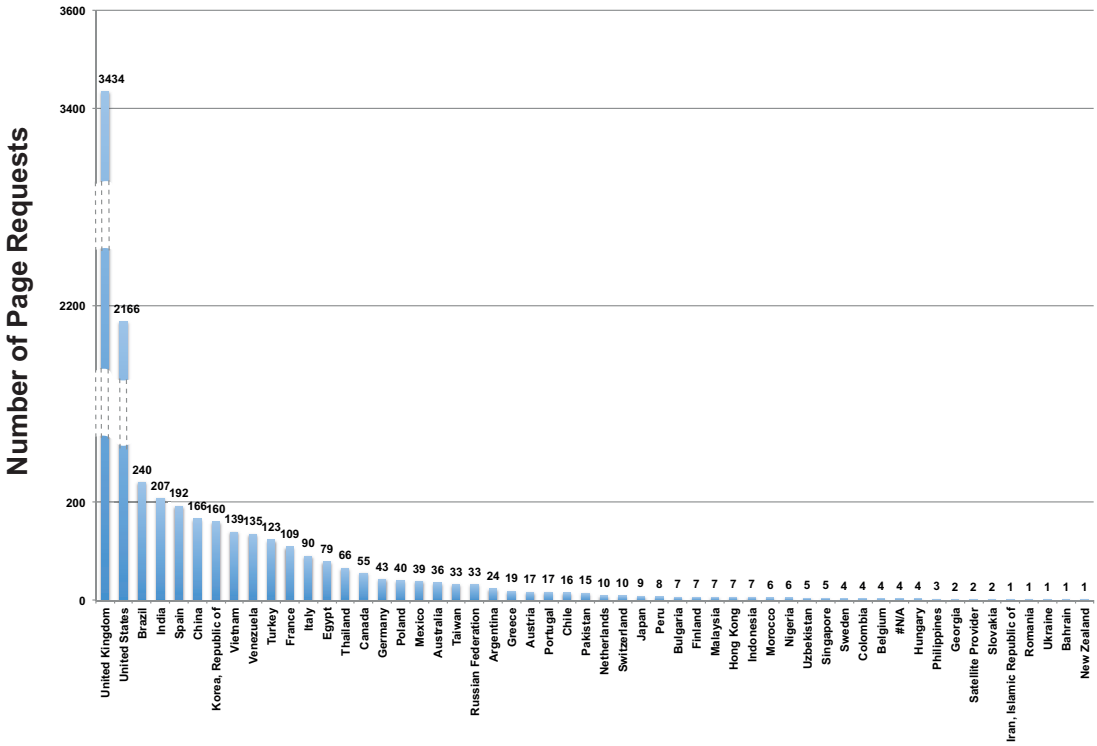

Figure 5-4 Numbers of page requests from different countries

Figure 5-4 is a chart of the numbers of pages requested by each different country. As it was a project based in the UK, it was expected that the UK would be most interested in the project (3434 page requests), however the United States also showed a relatively keen interest and requested over 2000 pages during the project.

The data derived from "Project 2008", relies on information obtained from IP address databases. This is because the project's aim was to find out how global the project could be. IP information is not always precise as to where the user is situated. Many Internet users, for example, have server hosts that exist hundreds of miles away from the user's computer. An IP address of 78.145.138.250, for example, could obtain a result of the IP address being located in Cardiff, UK whereas the user for this address could actually be in Cornwall, UK. However, on the MaxMind website, where this database information has come from, they state that by country, the results from their database are 99.5% accurate. In the above case, it can be seen that the database would indicate correctly that the IP address from Cardiff, in the example given above, would have been correctly located in the UK.

Project Outputs

The results of the project were as follows:

	Amount	Additional comments
Hits	42,000	
Page Requests	6,200	
Website editing interactions	6,000	Changes made to the website
Email communications	18	Including emails from London, Spain, Hong Kong, France, Australia, New Zealand & New York
Ideas posted	17	
Treatments submitted	7	
Images uploaded	10	
Audio clips uploaded	1	
Film clips included	61	

Table 5-3 Outputs from Project 2008

There were several small edits of film clips submitted to this project, and one edit of all the submissions together. This edit lasted 3 minutes 49 seconds and was a collage intercutting between the three treatments that were submitted in week 3.

The outputs from this project reinforced the findings from LoKA 2.0, the first project analysed in this thesis. Swarm TV certainly encouraged enough interest in this type of project to make it viable, but also it was evident that the project had a global participative nature in that 50 different countries viewed the project online. Contributors came from 12 different countries. Once again, the editing aspect of the project is the stage with the weakest support from contributors.

The film that was created from this project can be seen at **http://youtu.be/pvYuTh03OXw** (also #4 on the DVD). The film is a montage of clips from around the world that are loosely connected with the various stages of the water cycle, interspersed with Shakespeare's Sonnet 18 and an Irish folk song entitled "Wild Mountain Thyme". The quality for the video clips submitted varied a great deal, but they were digitally filtered so that in the end they all conformed to DV PAL Standard Definition format. Mobile phone clips had visual digital noise introduced so that they were aesthetic at a higher resolution.

Project feedback

The final email in this project sent participants four questions and asked them to rate what they felt about the project on a scale of 1 to 5. However, only one participant returned the questionnaire:

> *How successful do you think the project was?*
> *4*
> *How easy was it to get involved in the project?*
> *5*
> *How easy was it to guide the project along?*
> *4*
> *How easy was it to build on other people's work?*
> *Don't Know (or 1 as I didn't have editing facilities)*
>
> *I found it very easy to take part in, and was surprised I could be a part of it despite not having a proper camcorder. My films looked fuzzy but were still included. I don't have editing facilities so couldn't be a part of that process.*

The 3-minute film I have seen of the clips was excellent, engaging and pretty well edited, and I really like the final clip of the dripping tap.

Although, the survey did not work as intended, the questionnaire that was filled in and sent back is the only documentation of participants' feedback from the project. The respondent felt that is was a successful project; that it was easy to get involved in; easy to guide the project but difficult to build upon other members' efforts because of their lack of editing facilities.

In terms of actual contributions, which could also be seen as a form of feedback, participants decided to send in clips of geographical landmarks that would locate the user in their own country. In the finished film, there were clips of countries' environments from the USA, Australia, Germany, France, Portugal, Spain, Hong Kong, Uganda as well as the UK. This supports the findings from the data in Figure 5-3 about IP addresses from different countries.

Conclusions from the project (Abstract Conceptualisation)

There were a number of areas of interest in "Project 2008".

The first question that this project explored was whether participants would still get involved in a project like this from Swarm TV, if unlike Legend of King Arthur 2.0, there was no set theme beforehand. Would this make for a richer set of interactions between participants? On the other hand, would potential members of the community be deterred by a lack of predetermined aims for the project? It was deliberately entitled "Project 2008," so that it left the subject matter as open as possible. Just like Legend of King Arthur 2.0, however, a significant number of contributors were prepared to contribute to the project and donate their work to be reused under a Creative Commons license, so this seemed to make little motivational difference.

Secondly, the project aimed to explore how global the exchanges of participation could be in a project from Swarm TV. 50 different countries viewed the project, and 50 participants contributed from 40 locations in 12 different countries around the world. This suggests that participants in this type of project do not already

need to be part of an existing face-to-face community in order to be interested in making a film through an online collaborative environment.

The timespan of the project was seven weeks. This means that even though the take-up was quite international, it was quick in engaging the participants and involving them in the project. However, it did not seem to deepen relationships between the different participants. Most participants related back to the facilitator of the project rather than between each other. This was possibly due to the way the participants were recruited. Individuals, who were somehow known to be interested in this type of project, were contacted by email. The marketing of the project didn't exhibit a viral nature. Perhaps this might have happened if the theme for the film had been carefully chosen beforehand. Although the Swarm TV environment allows for discussion between participants, these kinds of interactions didn't happen much in this project.

The extra introductory stage, in the schedule of the filmmaking process, was not necessarily essential to the project, but it gave the project a better context and the participants were keen to become actively involved as soon as possible.

In the next section, the relationship between the project and the guidelines derived from the theoretical framework in Chapter Two is now discussed.

Rhizomatic thinking

Generation of ideas

This project had no pre-determined idea set for it at all, and yet it was able to recruit a community of online members and these members readily came up with many ideas that they could try and achieve during the six weeks of the project. But idea generation was not limited to the ideas stage of filmmaking. Throughout the project, every video clip and every edit is, of course, derived from an idea. So during its six weeks, this project generated many ideas.

Clustering ideas

The five ideas that were submitted for the film project were very diverse:

1. *The value of water within the context of global warming*
2. *The change of power structures within the media system*
3. *Using blogs and vlogs as material for a soap opera*
4. *A global remake of a Shakespeare piece*
5. *Trying to combine all submitted ideas together in an Alice-through-the-looking-glass type scenario*

So there was no clustering to do. However, both Idea #1 and Idea #4 included a global context and in fact these ideas were combined in the final treatment for the film.

Selection of ideas

Selection of these ideas happened without a discussion of which one would be most appropriate. The community was asked to provide a treatment for each of the ideas and this only happened for Idea #1 & Idea #4. This was perhaps an indication of where the motivation in the group existed for each of the ideas.

Openness

Editability

The advantage of documenting the whole process of making a film means that at any stage a member of the community can revisit any stage of the way in which decisions were made, and revise something along the way. This is why it is important that original material is made accessible to the whole community. For example in this project, one of the filming tasks, published as a voluntary task, was to film someone's mouth speaking Shakespeare's Sonnet 18. Everyone filmed the whole sonnet and yet in the completed edit, each person only spoke one line. It meant that if anyone was not satisfied with the section that was chosen, that they could insert their preferred option. This didn't happen, but it was possible to do this.

Development of other members' ideas

When it came to publishing the options for filming tasks, these were based on suggestions that had come out of the community. For example, in the ideas stage someone suggested that the film should be about "The value of water within the

context of global warming". Someone else suggested that one way in order to do this (in the visualization stage) was to show different taps dripping. Someone then added that if in any way this task could incorporate the country where the tap was dripping, then this would refine the idea still further. The variety of film clips of taps that the community produced was perfect. Someone filmed an open community tap in Spain; someone else filmed a bubble bath; someone else filmed a garden hose; someone else filmed a tap from below the water level; and someone else filmed a tap upside down from Australia.

Transparency

The weekly email for this project was especially important in order to keep everyone in the loop. The website itself can get quite chaotic with everyone posting snippets of text and movie clips everywhere. So the email seemed to level the playing field. It meant that everyone would understand what was happening without having to learn the technology of the website. So although rationale behind any decisions was posted on the website, the email ensured that everyone involved knew exactly what had happened, why it occurred and what the next stage of the project was.

Inclusivity

In order for this to happen in this project, the feedback email seemed essential. It gave a summary of what had happened on the website and broke down the following weeks tasks in a way that encouraged 52 contributions by the members of the community.

Collaboration

Rationale behind opinions

There was a page created for each week of the project and it was entitled with the name of the stage the project was at, for instance, "Project 2008 Ideas". On this first page there were 17 ideas posted. Each of them could have been chosen as the central idea for the film. However, 17 ideas were too many to put before everyone to get them to work on visualizing them. These ideas were not deleted on the website, but the facilitator felt it would have dissipated the effort too much to

include all 17 in a summary email. So the method by which 5 were chosen was to see which ideas re-occurred the most by a number of different contributors. There was one person, for instance, who was very keen to use the Jabberwocky by Lewis Carroll as the poem to illustrate, and wrote about this on several different pages on the website. However, this was not listed as an option because no one else had taken him up on this idea whereas a number of contributors were discussing the theme of global water. This rationale, however, was not posted online neither was it in the emails sent out to all the participants. This rationale remained hidden and therefore it could have caused a certain amount of friction in the community. This is something to watch out for in future projects.

Sharing work

The accordion approach to collaboration can clearly be seen in the clips that contributors filmed and then uploaded onto the website. Each clip was created away from the community, but then shared back into the community. There were 21 location clips, 22 sonnet clips, & 9 tap clips. This was a total of 52 clips uploaded to the website, specifically as a result of collaborative planning. It is important to understand that some things have to be done individually and then shared back into the community.

Commitment to collaboration

Central to the guideline of commitment to the collaborative process is the theory that what comes out of effective collaboration is something different from the sum of its parts. If this theory is correct, then if individuals try and promote their own ideas, and if others run with them, then it will be an individual's ideas that everyone else goes along with. What collaboration offers is an idea that is developed between the individuals involved. It exists because members of a community have worked on the idea together. In the example above, about an individual wanting to use the Jabberwocky, it was not promoted in the email (although it was still published as an option on the website) because it is important that different members need to combine together to create the finished product and this needs to run through each stage of the filmmaking process.

Strategic Decisions

In this project, as already mentioned in the section entitled "Rationale behind opinions", it might have been more collaborative to discuss whether the Jabberwocky should have been used as a community idea. However, there is always a tension between what might be more appropriate and the project milestone deadlines that ensure the project is on track. Time is naturally the facilitator's responsibility, so in this case the decision was made.

Non-hierarchy

Responsibility for the project

Individuals started to take some responsibility in this project. There were a couple of video clips, for example, uploaded before the facilitator asked for them. The facilitator's job was to stimulate activity rather than to ensure events happened in a specific order, so this was definitely appreciated. However, it could be argued that the facilitator made strategic decisions, which were not contested. For instance, there was no debate about whether the community should pursue a single idea for the film. Therefore, the facilitator presented only the ideas that had been given a treatment back to the community. This decision was not contested. At other times in the project as well, the community seemed to think that because the facilitator had initiated the project, then the responsibility of the project ultimately lay with the facilitator. This suggests support for the principle of Phantom Power from the policy of Non-hierarchy that "Authority is often gained by an individual because others simply allow it".

Domination

There was little domination happening between the members of the community. This was probably due to the fact that interactions in the project were largely between the facilitator and the community rather than between each other. There was very little sign of conflict in any of the posts that members of the community made. However, according to Tuckman's model of small group development, this implies that as the group didn't have a stage of "storming", the group might not be 'performing' as a normal group (1977).

Relationships

As part of this project, the facilitator held a weekly chat session with the core group of MA Digital Art students where some of the members of the community discussed what was happening in the project. This deepened relationships, and the project was richer for it.

Cliques

Project 2008 didn't really form cliques in terms of making decisions about power structures. Perhaps 7 weeks is still too short for this to happen, with members of the public from different countries. Potentially, the MA online course could have formed such a sub group, but this didn't seem to happen.

Swarm intelligence

Publicity of successful activities

The main publicity of successful activities occurred, like the previous project, in the feedback email for each stage. Creating a page for each stage of the filmmaking process was also another way in which participants could catch up on what was happening and offer their opinions about contributions. However, in this project there were no comments about the quality of what others had posted. Members of the community were very polite about each other's contributions. There were, however, criticisms about the rationale of the project itself. For instance, someone posted:

> *"Every editor has a mini agenda - to please the prospective audience. In this instance non- hierarchical and collaborative film-making is a nonsense, you try to please the contributors and the audience - or you invalidate the concept, in the end someone has to edit!" (anonymous)*

To which the facilitator replied:

> *"You CAN change things. People always have to edit! The problem is that not enough people are bold enough to edit. I wish more people would, of course. ...*

at any stage anyone is able to swap what is on the website, upload anything on the website, or at least comment on what others have presented."

It seems that both members of the community were talking at cross-purposes. Non-hierarchy shouldn't mean that everyone is powerless to do what they think is right, but that the more contributors are involved in making strategic decisions the better and more refined they will become.

Fresh perspectives

If one of the filmmaking ideas is explored, the fluctuations that happened to it can be defined. Let us take the idea from the ideas stage that someone posted *"Water - its always raining on the wrong days"*. This utterance prompted another utterance: *"Dripping taps from different countries...a brilliant allusion to the way in which mankind has gradually eroded his environment."* To which someone else posted: *"Following on from the water theme, why not write about Noah's flood or the Epic of Gilgamesh and Uptnapishtim, which is a story in many different cultures (the Babylonians[Atrahasis] and the Greeks [Decalion]) that some say came from the last time the glaciers melted! Now that has to do with global warming."* This idea was finalised as *"The value of water within the context of global warming"*. It can be seen that each time, the idea is fluctuating. Each of these utterances is in fact quite a separate idea, and yet the "water theme" is consistent between them and is creating new iterations of it each time.

Manageable tasks

A good example of manageable tasks is the email that set three suggestions for members to film. The three options were:

1. *30 seconds of a dripping tap*
2. *Someone speaking Shakespeare's Sonnet 18, framing just the mouth.*
3. *A landmark or something that locates the contributor to a particular geographical area.*

Each of these suggestions could either have been shot in minutes, at the same time it gave members of the community, the opportunity to spend as long as they wanted to on it. As there were 52 clips uploaded from this task, it meant that this particular activity was very successful.

Overall, this project was a lot more collaborative than the last project. Participants were starting to take responsibility for the project, they were aware of other members' contributions and there were some good film clips uploaded onto the website. The areas that could be improved are: Making the rationale behind decisions more obvious to members of the community; throwing more of the responsibility of decision-making on the members themselves wherever possible; and also developing an environment where members can critique each other's work. This is probably not possible in a short project. However, it might be possible in an environment that the public uses regularly.

This project's aim was to make a single film as its outcome. In the next project, this thesis analyses the website itself as an interactive tool, without any facilitated process for making a film. It was called: "This Weekend?"

"This Weekend?"

Concepts behind the project (Active Experimentation)

In the previous project analysed, it was found that participants didn't need a particular topic set in order to be motivated enough to collaborate in making a film together, and that contributors were prepared to engage internationally in order to do this. For "This Weekend?", there was no filmmaking facilitation and individuals were left to upload their own media content using the Swarm TV technology.

"This Weekend?" (archived at **http://www.bosarts.org/www.thisweekend.org.uk/website-7534.php.html**) was a series of arts events funded by the Cornwall Area of Outstanding Natural Beauty (AONB), FEAST, the Arts Council England, Cornwall County Council, University College Falmouth and the National Trust. It used a bespoke version of the Swarm TV website in which anyone could edit any media content into the website.

"This Weekend?" consisted of six temporary site-specific art events that were organized by six different artist teams on six sites across Cornwall over six weekends during August and September 2009. For the sake of clarity, the overall series of activities will be referred to as the *"project"* and the individual artistic initiatives within the project will be referred to as *"events"*. It also included a seminar weekend and an exhibition in Falmouth Poly Art Gallery that documented each event.

The website was created with the intention that different authors would edit the site and independently deliver information for their own weekend event and that would form the content displayed on their section(s) of the website. Each set of artists from each weekend event uploaded their own photographs and text, and the site, like other Swarm TV projects, was open for anyone to edit anything into the site.

This project is analysed in this thesis because Swarm TV projects normally use the facilitation of the filmmaking process as well as the website technology to create media content. As there was no filmmaking facilitation in this project, the website technology could be analysed to see how it worked specifically for a decentralised structure. It did, however, used the different media elements that might go towards making an online collaborative film. Also, each arts event needed to create a narrative about their weekend event to inform potential attendees. This involved text, images, audio and video clips from the six art projects, an exhibition and a seminar weekend. The advantage of using the Swarm TV technology was that each of the events and aspects of the project could publish content, without having to be moderated centrally. Each event and also aspects of the project were organised by a different set of artists, and it was felt that they were the most informed to know the story behind how to present their own events. Like the other projects in this thesis, anyone was allowed to edit the website without logging in.

As far as this thesis is concerned, this project addressed the question:

How effectively could the Swarm TV technology be used in decentralized narrative creation?

There was a strong emphasis in this project to encourage as much communication as possible with the general public, and so the website also incorporated a texting facility so that if a specific number was texted, the text would appear on the website on a specified texting webpage.

Events of the project (Concrete Experience)

On the weekend of the 8th & 9th August 2009, contemporary dance artist Gemma Kempthorne choreographed dance performances and created installations in and around Boscastle.

On the weekend of the 15th and 16th August, artist collaboration "Wanderer" created a performative installation at St Agnes Beacon.

On the 22nd & 23rd August, Janet McEwen created a landscape intervention around the Godrevy headland.

On the 29th and 30th August, Anne-Marie Culhane organised field sensing in Bodmin Moor.

On the 11th to the 13th September, the project organised a seminar weekend where speakers and artists explored the theme of "The rural as an increasingly contested territory".

On the 19th and 20th September, Jennie Savage created an installation at Zennor head.

On the 26th and 27th September, a collective of visual artists working in five different countries across three continents, "Continental Breakfast", organised an audience participation arts event at Cape Cornwall.

Each event was performed or installed outside and encouraged the general public to engage with the various art forms. Events were advertised using posters, flyers,

the website (as mentioned above), and a texting service that potential attendees could sign up for.

Analysis of the project (Reflective Observation)

Web statistics

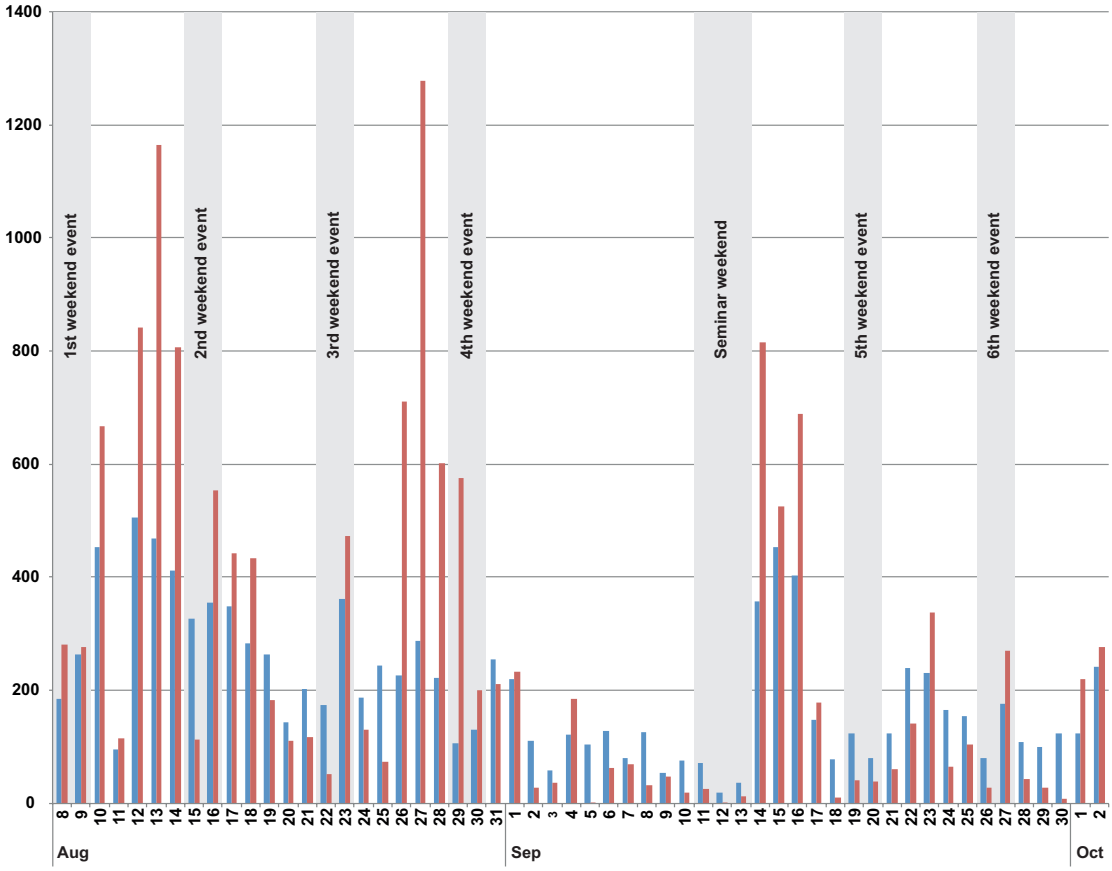

Figure 5-5 Page requests (red) and interactions (blue) during the project

Figure 5-5 shows the number of Page Requests (red) and the number of Edits (blue) in relation to the events that were organized (grey). It can be seen that there was a lot of interest around the start of the project, after the third event and it also peaked just after the seminar weekend. Each event generated additional interest in the following week. The lowest number of page requests and edits being during the Seminar Weekend. This could be accounted for by the fact that the Seminar Weekend was in a location that had no Internet connection and most of the contributors were present at the weekend seminar event. However, it can be seen that there was in fact more interest in editing the site than in requesting pages. On average, 190 pages were requested each day, whereas 255 edits were generated

every day of the project. This is probably due to the amount of effort each set of artists gave to documenting their events.

For the sake of analysis, each page of the website was categorised into 11 different sections. There was a category for each of the events (1st Weekend, 2nd Weekend, 3rd Weekend, 4th Weekend, 5th Weekend, 6th Weekend and Seminar Weekend); a category for the Gallery Exhibition, a category for Administration; one for Sponsorship and one for Information about the Website Technology itself. Edits for these categories were then allocated a colour, and these are displayed in Figure 5-6.

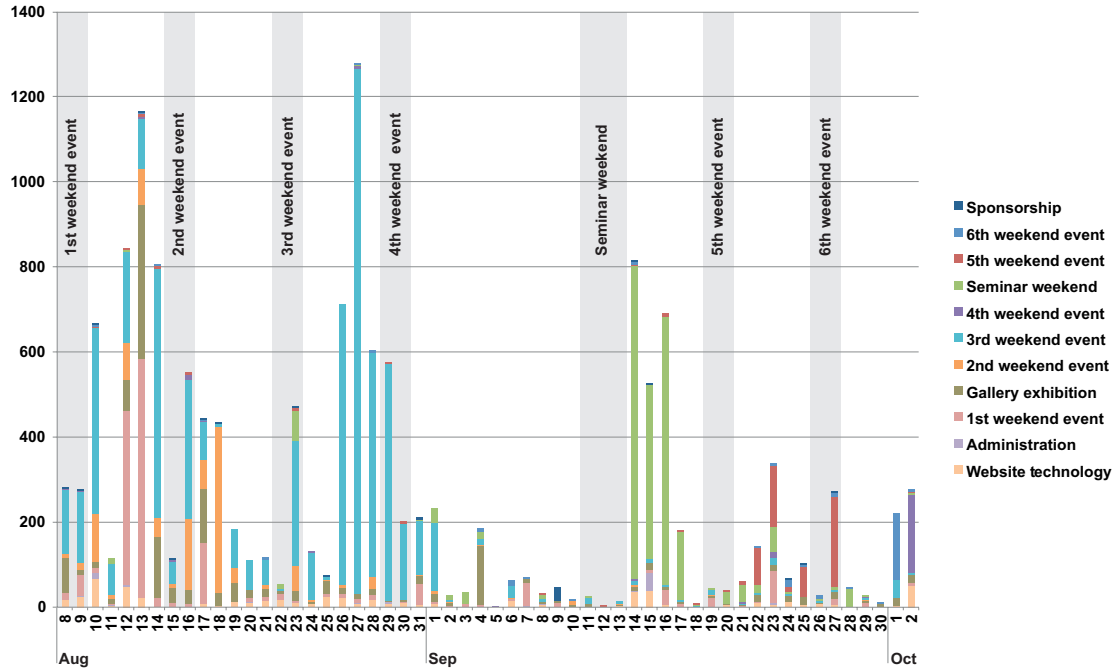

Figure 5-6 Numbers of categorised interactions

From Figure 5-6, it can be seen that most interactions about a particular event happened in the week following that event; there were regular edits throughout the project for both the Gallery exhibition and the Website technology.

Finally, in order to analyse this data, the IP addresses from most of the logs were also processed. 13,562 edits were logged, of which only 80 in this project appear to have come from abroad, according to **www.phpace.com's** implementation of the open source IP address location data from geoLite (MaxMind Ltd.). These 80 edits appear to have come from the following countries:

Germany	24
Australia	19
South Africa	14
Belgium	6
Spain	6
United States	5
Austria	4
Greece	1
India	1

Table 5-4 Edits from abroad

What is significant from the IP addresses collected in this project is that although the "Project 2008" logs listed 50 different countries requesting pages from the project website, the vast majority of participants in the "This Weekend?" project seem to have come from the UK according to the Maxmind geoLite database. There were only 80 edits from users outside the UK as seen in Table 5-4, compared to well over 13,000 edits from users inside. The project was based in Cornwall and targeted Cornwall specifically, so this tendency was expected although not to this extent. Many of the edits from outside the UK look as though they were related to the 6th weekend event organized by Continental Breakfast, which was a collective of visual artists working in South Africa, Russia, Poland, Australia and Belgium. The data lists the edits from external countries as: Germany, Australia, South Africa, Belgium, Spain, United States, Austria, Greece and India.

In relation to the previous project analysed, Project 2008, where there was a large international uptake, it can therefore be said that online projects like these can also be very targeted.

Each edit on the website was created because a computer mouse double-clicked on a page or on a media element on a web page. This, then, brought up an edit box where the user could save whatever alteration they wanted to make to it. In other words, each edit was almost certainly a considered action by a human being and would not have occurred with normal automated web crawling technologies.

There were 353 different IP addresses logged. Of these, the top 250 IP addresses, that were responsible for most edits, were colour coded and the website categories were charted against the number of edits. Figure 5-7 shows this information.

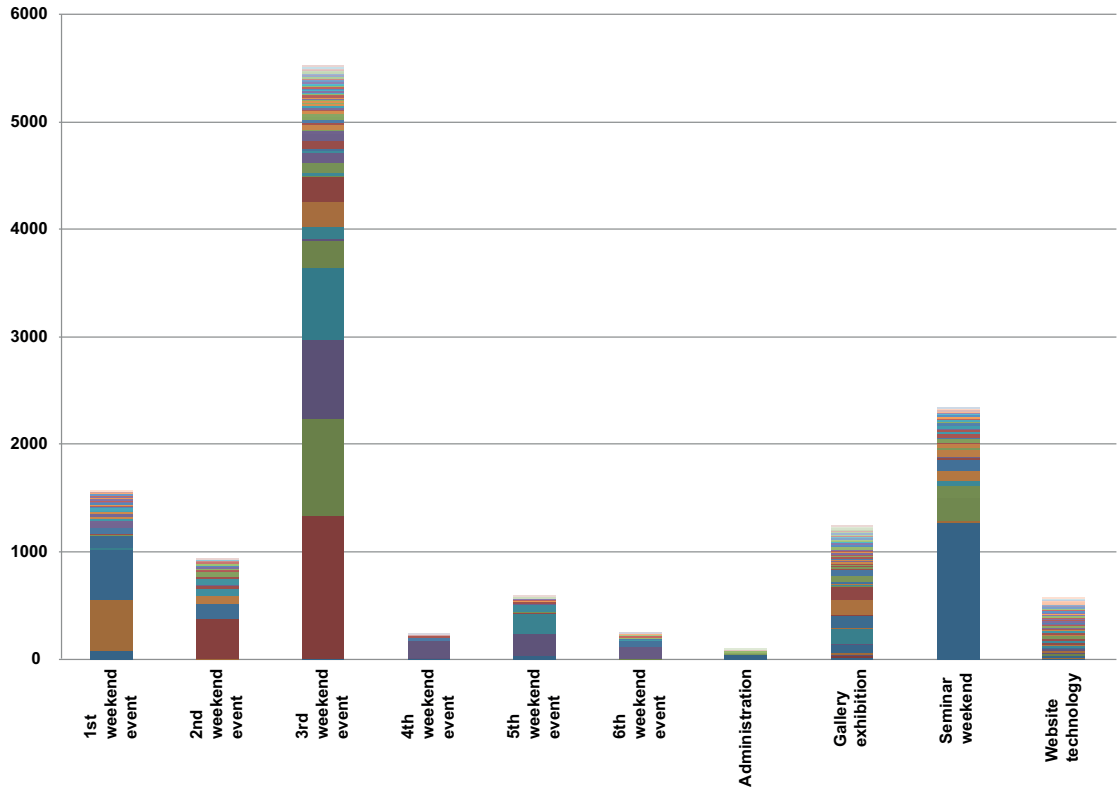

Figure 5-7 Number of edits from each separate IP address

Figure 5-7 displays the number of edits within each of the categories allocated to webpages in Figure 5-6**.** With each IP address in a different colour, however, the relative numbers of edits created from the same IP address can be seen. For instance, in the 3rd weekend event pages, there were about eight main IP addresses that were used to edit the website from and then lots of small numbers of edits from many different IP addresses. On the other hand, there were only small numbers of edits from many different IP addresses that were made on the Website Technology pages. In this way, the dispersed nature of the interest in editing between the different events can also be compared.

For the Seminar Weekend, then, it can be presumed that there was one main editor and lots of minor edits from elsewhere. This is similar to the 2nd Weekend Event. The 1st Weekend event seemed to have two computers editing and the 3rd weekend event had four or five different computers doing the majority of edits. However, in the 3rd Weekend Event there was also a great deal of interest from many other IP

addresses as well. This could be accounted for by the collaborative nature of this particular event, where contributors were asked to submit their own photos of their geographic area.

Project outputs

As mentioned in the "Concepts behind the project" section for "This Weekend?", there was a facility whereby participants could enter their own comments about events by texting their opinions to a specific number. During the project, there was a total of 12 texts sent to the website. Also, there was a facility introduced to the website where interested parties could sign up for texts about forthcoming events. 15 members of the public signed up to this.

	Amount	Additional comments
Hits	156,000	
Page Requests	9,600	
Website editing interactions	13,600	Changes made to the website
Email communications	16	
Pieces of text created	467	
Images uploaded	515	
Audio clips uploaded	1	
Film clips uploaded	11	
Texts sent to website	12	
Pages locked	11	There were 91 pages in all

Table 5-5 Amounts of outputs from This Weekend

Over the course of the project, the website was built up to 91 pages (users could add as many pages as they wanted to) with 994 different media elements across the whole site. There were 515 images uploaded; 467 pieces of text; 11 video clips and 1 piece of audio. 16 members of the public signed up for email updates.

From these numbers of outputs, it can be seen that the website environment was considered to be a very useful medium to document this arts project.

Project Feedback

Most of the project feedback came spontaneously from the main contributors of the website. These were the artists and curators who were keen to promote their individual events, and therefore wanted the website to be as effective as possible. The main concern from two of the main content providers were about the open nature of the website, and that anyone could disrupt the documentation of the project, inadvertently or otherwise. This is reflected in an email from one of them:

> *"I am enjoying playing with the site technology … I totally understand and applaud the democratic concept behind the website...but also the feeling when someone knocks down the sandcastle you've been labouring over for hours...*
>
> *I know that a number of people have visited the Godrevy pages and read the diary, which is helping folk grasp the nature of the project, and follow the development. This success of this project will be reliant on contributions from lots of people...so I want to keep the process as 'transparent' as I can...I also do feel sure that Trinity house are permitting me to go to the island partly as they have visited the site and are taking the project seriously …*
>
> *Would it be a good idea to lock the front page, and programme... I do feel a bit anxious that documentation can be wiped out, not necessarily intentionally, but by someone trying to grasp the technology and like me inadvertently making mistakes."*

There were a few reservations by some of stakeholders about the website's emphasis on openness. For this reason, an additional feature was built into the website so that when an author was satisfied that their page was complete, and they did not want anyone else to edit it, they were able to "lock" down their page and a padlock would appear next to the title of the page.

Out of the 91 pages created during this project, users locked 11 pages down. This is about 12% of the pages in this website. Users could have locked any pages down, but in general the pages that were locked down were pages that were deemed as one-way communication: pages, for example, that gave specific information about

when and where events were taking place. Most of the pages were left unlocked and this indicates an invitation, perhaps, for discussion and/or interaction by viewers to the website.

As an extra precaution, every edit that was made to any page on the website was sent to the web developer by automatic email so that any particular version of a page could be re-implemented if necessary.

Conclusions from the project (Abstract Conceptualisation)

Although "This Weekend?" was first and foremost an arts project, it used the Swarm TV technology to document its activities and it also produced several film clips in the course of events. The project was particularly useful at demonstrating the decentralized possibilities of the Swarm TV website. It was a localised project that was targeted specifically at the county of Cornwall, and yet there were on average more than 250 editing interactions every day of the project. This suggests that the technology is both highly interactive and functional as a means of decentralized content management.

From the pages that were edited, in Fig 5-6, it can be seen that certain arts events used the site more than others. This might suggest that some participants were more comfortable about using the application than others. This aspect seems to be supported by the project feedback.

Over 350 different IP addresses were used to introduce content on the site. It is unlikely that this reflects 350 different editors, but considering the project only lasted two months in total, it means that the Swarm TV technology was again quick to establish itself and this was possibly because content creation was so decentralized. In this aspect it was similar to "Project 2008". Stakeholders took up the responsibility to create content and, from the amount of media uploaded, they clearly felt that Swarm TV served the projects needs.

The relatively small numbers of international participation on this project in comparison to "Project 2008", imply that participants need some kind of motivational interest in order to participate. Perhaps with Project 2008, the global

nature of the project's theme provided this, whereas this project just focussed on Cornwall.

Rhizomatic thinking

Generation of ideas

This project did not set out to generate ideas as a collaborative activity. However, it is clear that generation of ideas was happening on this website as the artists involved explored how they could use its technology.

Clustering ideas

As can be seen from the statistics of types of contributions to the website, the majority of contributions were images (515 were uploaded). On each page, where there are a number of images, the clustering of images with similar themes can be observed. Captions, which are essentially text next to photographs, are another example of clustering.

Selection of ideas

In general, the website was not concerned about selecting different ideas because the artists did this. However, the page where the texting facility was incorporated was an example of ideas being selected. There was a number that phone-users could text, and this text would appear on this page automatically. It appeared at random across the page, but then someone needed to make sense of what appeared on this page. Most of the texts were all the same size type, but there were two texts that had been enlarged. One was a heading of the details of the number to text, and another was the phrase *"What was gone?"* It had obviously been texted in reply to another text that read: *"I thought the photograph exhibition was excellent: so much so that I took my wife to see it today and they were gone! AC". T*his was a conscious effort to emphasize this question. In this way, it seemed to be selected above the other pieces of text.

Openness

Editability

In this project, 12% of the pages were locked down so that they couldn't be edited. It made a distinct difference between two types of information on the site: information that was fixed and information that was discursive. Information that was fixed comprised of details of events, when and where they would take place and artists' statements about their work. If pages weren't locked down, however, it implicitly invited visitors to ask questions about the artists' work. There were fears that visitors might deliberately disrupt artists' pages, but this didn't happen at all.

Development of other members' ideas

Although this project was not concerned about collaboratively developing ideas, for each event there was a critical response written about it, and a curated exhibition that was based upon it. They each developed the idea of another member of the same event.

Transparency

Again, this project was not concerned about collaborative development, however, each of the artists wrote something about what they did and the rationale behind it.

Inclusivity

Although the artists involved handled the actual creative work of this project, the project was promoted to the general public through flyers, posters and emails, inviting potential contributors to attend the different events over the various weekends of the summer of 2009. The visitors to these events were considered to be part of the project and there were several ways in which they could contribute artistically to it. In the third weekend event, for example, the public were asked to submit photographs to the event, and these were exhibited along the coastline on specially constructed placards.

Collaboration

Rationale behind opinions

The "Texts" page gave a variety of opinions about at least two of the projects. This is likely to have been the public feeding back as to how they experienced these events. There were comments like *"I really liked the beach with all the pictures"* and *"I think that both projects so far have been great. A breath of fresh air in more ways than one!"* These both serve to encourage the artists involved in this project. In collaboration, however, the second comment is more beneficial than the first because it gives the rationale behind why it was liked. In the second comment, they say that it was because it was a *"breath of fresh air".*

Sharing work

The website was the central archive of this project where activities and events were displayed and written about; where the team involved were documented and where you could find any information needed about each event. There were over 500 images posted, nearly as many pieces of text and 11 video clips. Each of these media elements represents work that was done by an individual, which was then shared back into the community. If this project had been concerned about developing collaborative narrative, then the website would have been an ideal place to do it.

Commitment to collaboration

Each of the events of this project had some element of collaboration involved. There was a commitment to collaboration, although it wasn't expressed through the website, itself.

Strategic Decisions

This project is a good example of how strategic decisions were made by the whole community, whereas the artists made localised decisions about each individual event. Aspects of the website, promotion, the project exhibition and the seminar weekend was all discussed face-to-face, whereas the decisions made about each event were left up to the artists. This ensured that the project could happen as fast

as possible without all the decisions having to be made by everybody. This was also particularly true of how quickly the website developed its content.

Non-hierarchy

Responsibility for the project

Each set of artists took full responsibility for their section of the website. There were a few individuals across the project who took an overall responsibility for the website (the Exhibition Curator, the Principle Investigator and the Website Developer). This also included the artists' sections, but the artists were given complete freedom to present their project as they wanted to without it being centrally moderated. One of the artist events did not want to document their art and so there was some discussion about what should happen on their pages. In the end, it was decided that the event had agreed to document something of their work as part of their contract for being involved.

Domination

The incident just described above demonstrates that there was a power structure in this project, although the website technology constantly worked towards a more egalitarian environment. The facility to lock pages away from editing, at first seems to create a hierarchy. However, this facility was available to everyone and so power structures were balanced. As far as is known, there were no deliberate edits to disrupt the project.

Relationships

For each of the artists' events there was a critical response written about their work. Also, during the project, there was a seminar weekend where most of the artists came together with members of the public who were interested, and there was a series of talks about art in the environment. This developed a critical environment and deepened relationships in the community.

Cliques

This project was not trying to be non-hierarchical, so there was a Principle Investigator and a subgroup that supervised the whole project.

Publicity of successes and failures

The website served very well as a platform to publish how each event succeeded. The photographs were full of happy faces of the public participating in the events and pieces of text that showed how effective the artworks had been. If this had been a learning project, however, it would also need to discuss how the events didn't work as expected and what could be learned from it in order to enhance the project next time around.

Fresh perspectives

Incorporated into this website, there was a page with the facility to chat. It is a page where the contents of the page is updated automatically every 3 seconds. It means that if there is a visitor viewing the page and someone else is posting a comment at the same time then the comment will appear on the page automatically without the visitor actively refreshing the page. It wasn't promoted and so it wasn't used as part of the project. There were, however, two comments on this page: *"Hi Bruce!"* and *"Boing".* Making sense of these comments is where the guideline to "Embracing fresh perspectives" could progress collaborative thinking. They could be dismissed as meaningless, however, they are inevitably there for some reason. In a collaborative filmmaking project, this could be an important step in the creation of an idea that exists outside of the individuals involved.

Manageable tasks

Finally, in the project the public were invited to achieve a number of different objectives. They could visit the events as they happened; they could attend the exhibition at the gallery; they could camp for a few days at the seminar weekend. Each of these tasks would enhance the project and a number of members of the public participated in these ways.

Overall, this project was not one that collaboratively created a film together, but it had a lot of the pre-requisite elements that could have done so, and still could, if anyone decided at a later date to piece some of the video clips together.

Although these three projects so far, can be seen to have brought together individual strands to make a composite product, it is difficult to see where collaboration rather than participation happened in order to do this. The next project analysed in this thesis, was a project that happened with a group of BA Honours art students from University of the Arts London that met face-to-face, once a week for twelve weeks. This gave them every opportunity to collaborate.

Collaborative Practice

Concepts behind the project (Active Experimentation)

The fourth project analysed in this thesis is called "Collaborative Practice". There was a strong face-to-face element in this project, and it gave the opportunity for the Swarm TV environment to document the collaborative stages of the project as well as facilitating the collaboration itself. It was a useful project to see how individuals could interact with each other using the Swarm TV website as a social environment.

In October 2009, the Swarm TV website was introduced to 20 2nd year BA art students from University of the Arts London, in an elective teaching module called "Collaborative Practice". It was introduced to the students as the course whiteboard in face-to-face teaching sessions. Notes were made of group discussions on the site itself, so that the students learnt how to use the technology as quickly as possible. The course lasted twelve sessions and the students decided to collaborate in creating a film together. The same six stages of filmmaking were used as listed in Project 2008 above, but there were two weeks allocated for each stage.

In relation to this thesis, then, this project was an opportunity to get regular face-to-face feedback on how the site functioned as well as to explore the capabilities of the social media aspect of the website environment.

Specifically, it explored the question:

How effectively could Swarm TV facilitate the possibility of building upon each other's work?

Events of the project (Concrete Experience)

In Week 1, positive and negative aspects to collaboration were looked at as well as the different structures that groups use in order to work together successfully.

In Week 2, ideas for a collaborative film were thought up and students were asked to create their own Name Page and to post a few facts about themselves, so that students could get to know each other. This meant that the students, who had come from different artistic practices, would get to know each other as quickly as possible.

In Week 3, the many different film ideas were looked at and discussed, to leave the three most popular ideas. All the students were split up into three groups and each had to work through one idea for the film. The three groups then had to present their ideas to the rest of the students. They all came up with their strongest idea. However, each group became quite possessive about this idea and no group wanted to take on board another group's ideas. This led to a deadlock in the progress of making a film as a whole, and it took an additional session to overcome this obstacle.

In Week 4, these three ideas were again discussed and a treatment was defined that everyone felt that they could buy into. But it took a member of the group who had not been involved in the four-group split activity from the previous week, to voice an additional idea before everyone realized in the group that there could be no more progress until everyone agreed on a single idea. The idea mooted was for students to document their trip to the "Collaborative Practice" session on a Friday. Some said that they would make it up; others that they would animate it; do it on their mobile phone; shoot someone else entirely; fly into college; take the riverboat etc. Then it would be put all together with shots of Big Ben letting viewers know what the time was at any given moment in the film. It would end with the trainer asking the students in the group what kind of film they would like to make together.

In Week 5, the final scene was filmed together as a group so that the students knew how the film was going to end and how their individual contributions would fit in with this.

In Week 6, the grammar of filmmaking was discussed and how the viewer's attention is engaged by constructing a series of questions, then gradually, the answers are fed back to the viewer in a controlled and calculated manner.

In Week 7, the group were taught how to edit.

In Week 8, the film "Shortcuts" by Robert Altman was discussed as an example of how to integrate different storylines into a single narrative. Some students had shot some material, which they brought in and the students critiqued it as a group. This was difficult to achieve successfully as students were not used to openly discussing pros and cons about other student's work.

In Week 9, there was a discussion about the issue of conforming material that students had created into a single format and on one computer. One issue that was an important aspect in the filmmaking process was the audio side of the material shot, particularly the music. Students would bring in material that worked really well with a famous piece of music only to learn that they could not use it unless they were willing to pay for the copyright. However, this inspired a great deal of creativity and motivation in producing individual clips. Therefore, the well-known pieces of music were substituted for similar styles of Creative Commons licensed music from **www.jamendo.com**. This is a music website that showcases artists on the site who allow public use of their music as long as they are credited.

In Week 10, there was a field trip to an exhibition created by collaboration. Students continued editing their separate sections.

In Week 11, a finished draft was edited and there was discussion as a group about how it could be improved.

In Week 12, the finished edit was screened to an audience of 300 art students.

Analysis of the project (Reflective Observation)

Website statistics

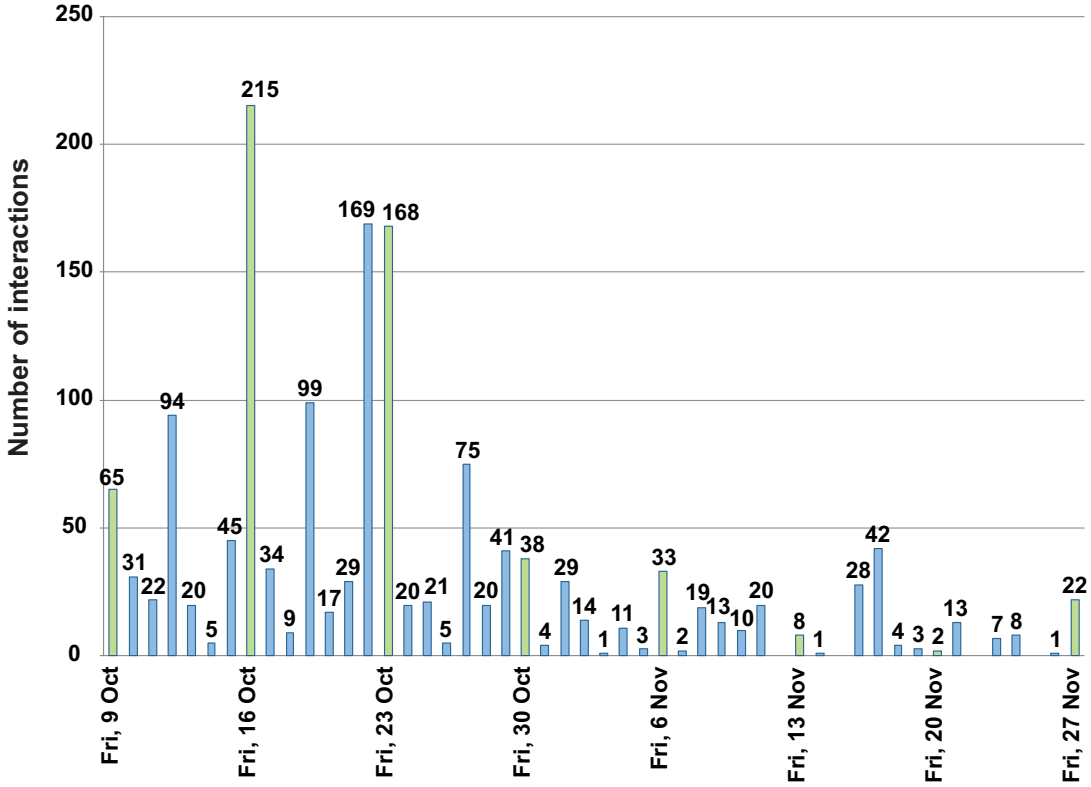

Figure 5-8 Numbers of interactions during project

In Figure 5-8, the interactions on Swarm TV can be seen. An interaction being defined as when an element of content that the website displays is changed. This could include new pages, new or edited pieces of text, uploaded images, audio and video clips as well as when any of these were re-positioned on the webpage or were styled differently by a user.

Each Friday there was a face-to-face session, and the green bars signify these days. The website was used as the main teaching tool at the beginning of the course, and this accounts for the relatively high number of interactions. This would be particularly at the beginning of the second week (Fri, 16 Oct) when the students were introduced to the website; shown how to use it; and encouraged to create their own Name Pages.

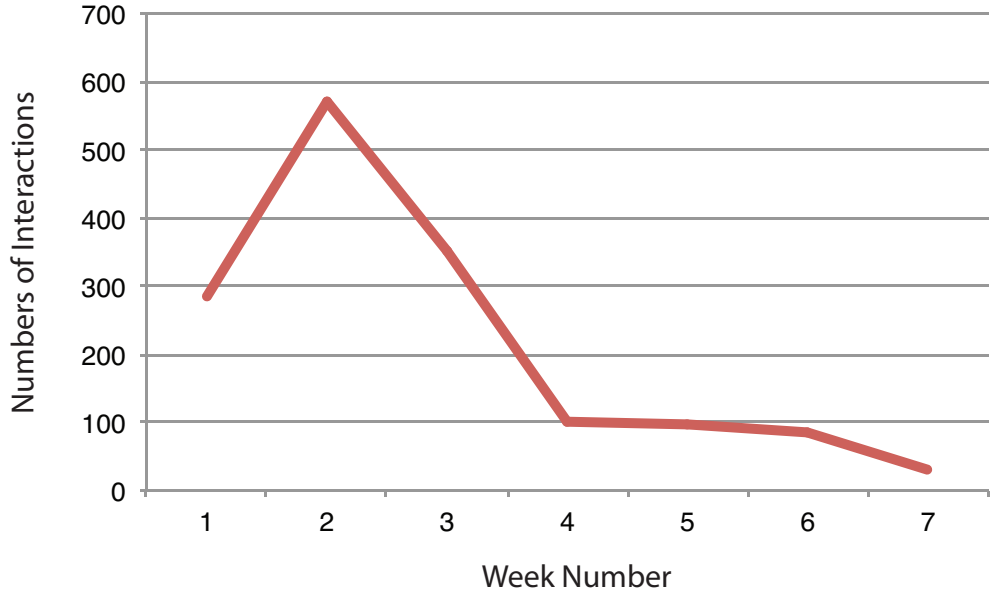

Figure 5-9 Numbers of Interactions per week

It can be seen from this figure that after an initial burst of interactions after Swarm TV was introduced, that the interest in interacting with the website wanes. However, there is a significant proportion of the envelope where the number of interactions sustains for three weeks (i.e. weeks 4,5 & 6). During this phase, the numbers of interactions each week are consistently between 85 and 100. This suggests the possibility that the website environment could sustain itself, if it reached a critical mass.

During the course, twenty of the students created their own Name Pages on the Swarm TV website and it started to act like a social media website.

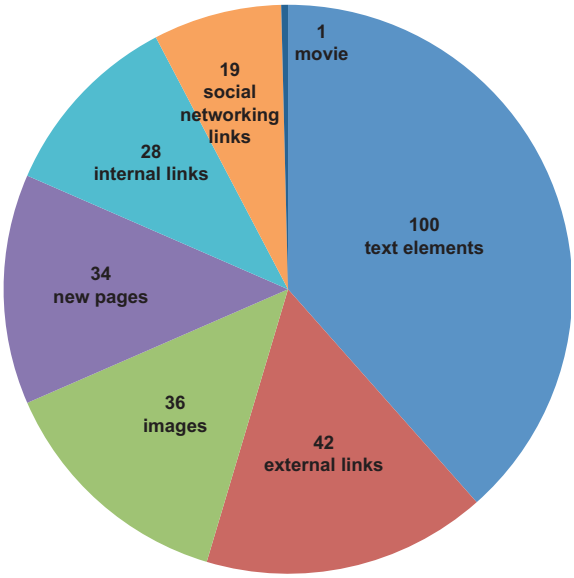

Figure 5-10 Ratio of types of media elements used on Name Pages

Figure 5-10 shows that between them, on their Name Pages, students constructed: 100 text elements; used 42 links to external websites; used 36 images; created 34 new pages; referred to 28 other pages inside Swarm TV; referred to 19 other social media sites (including YouTube, Twitter and mySpace); one participant used a video; and no one used any audio elements directly.

If a typical Name Page is looked at more closely, it can be seen how the editing process works. Figure 5-11 focuses on a student's Name Page whose name has been changed to "Rosie" for the sake of anonymity, and corresponding social networking site links have been changed as well.

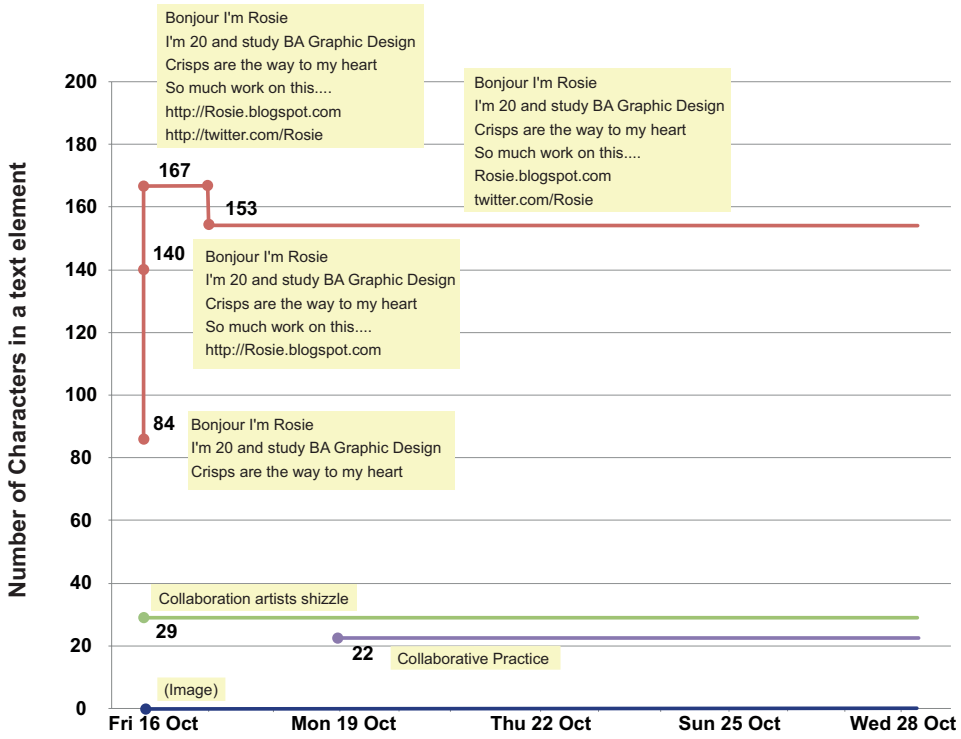

Figure 5-11 Interactions on Rosie's Name Page

Rosie used an image of herself, and had three text elements on her Name Page. Two of which were links to two other pages: *"Collaborative Practice"* and *"Collaboration artists shizzle".* Rosie started a text element on Fri 16 Oct with 84 characters:

"Bonjour I'm Rosie

I'm 20 and study BA Graphic Design

Crisps are the way to my heart"

The same day, she decided to add her blog spot to this first attempt and raised the number of characters in the text element to 140. She then included her twitter account. Finally, the next day, she decided that she did not need to include *"http://"* at the beginning of her links to other social networking sites and completed her text element with 153 characters.

Figure 5-12 charts the interactions that occurred for all twenty Name Pages.

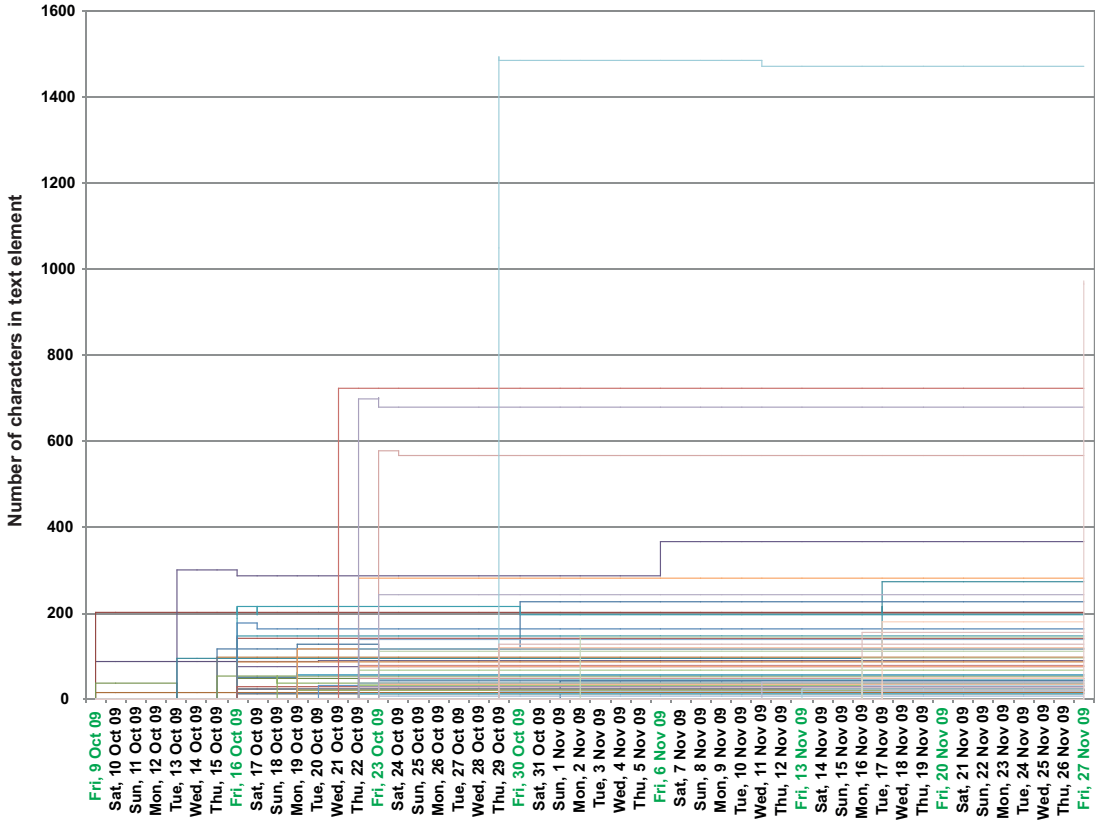

Figure 5-12 Text contributions on all Name Pages

Days shown in green are the days when there were face-to-face sessions with the students. From this it can be seen that four text elements across all the Name Pages used over 500 characters; most interactions occurred in the second and third week; most text elements used less than 50 characters. Although the project carried on until 18 January 2010, no one made any interactions after the 27 November 2009.

Interpersonal conversations are possible in Swarm TV, and in fact, it does have the facility to chat online synchronously, although this did not take place in this project apart a brief demonstration by the facilitator. The students did not use the website to interact with each other and it could be the reason why interactions on the website died out before the end of the project.

Project Outputs

The results of the project were as follows:

	Amount	Additional comments
Hits	63,500	
Page Requests	10,700	
Website editing interactions	1,540	Changes made to the website
Email communications	40	
Ideas posted	22	This was subsequently whittled down to three, but could not be reduced any further
Treatments submitted	1	
Images uploaded	36	
Audio clips uploaded	0	
Film clips included	1	

Table 5-6 Amount of outputs from "Collaborative Practice"

The film that was created from this project can be seen at **http://youtu.be/c4T1gFYXx2k** (also #5 on the DVD). It is called "Getting There" and it is 21 minutes and 37 seconds long. It consists of a number of stories of students making their way to university (both factual and fictitious) in the morning. It is intercut with Big Ben chiming on the hour, and when they eventually reach university, they attend a class called "Collaborative Practice". The tutor then asks them for ideas about how they could go about making a film together, and that is the end of the film.

Project Feedback

On the final session on 29th January 2010, the students were asked about their experience with Swarm TV. This is a transcript of the discussion:

> ***Facilitator:*** *How did you feel about creating your own pages on the website?*
>
> ***Student 1:*** *Yeah, I thought it was a good idea.*
> ***Student 2:*** *Yeah. I really liked it.*

Student 3: *We're talking about Swarm TV?*

Facilitator: *Yeah, Swarm TV.*

Student 3: *I couldn't get it to work!*

Student 4: *I couldn't really find other people's work. I only managed to find your page [The facilitator's page]. It was just a little thing really ... But it was a really good idea. I've tried to do a similar thing before in a different situation, but that didn't feel like you were doing the work. You just gave a bit of your work to someone else, who put it on the website, whereas this was you doing it yourself.*

Facilitator: *OK. Do you think it would have worked if Facebook had been used instead?*

Student 2: *Maybe.*
Student 5: *No. I'm not on Facebook and this might force people to use it.*
Student 2: *Facebook is limited, I suppose.*
Student 5: *... And its a corporate thing.*
Student 1: *Yeah!*
Student 5: *It shouldn't be a course requirement.*

Facilitator: *Did anyone have any problems with the fact that anyone could change other people's information?*

Student 6: *No! I couldn't even change my own!*

Facilitator: *Oh! Sorry about that.*

Student 5: *Maybe in one session it could have been taught specifically with people. Maybe there could have been a lesson about how to set up your own page and it might have been easier. I might have used it a bit more. It's only because I'm computer illiterate. It's ridiculous really.*

Student 4: *It couldn't have worked in Facebook because people can't redesign things. I was getting into the fact that I could design it myself.*

Student 7: *Maybe you could have some sort of tree view, so that you could change the view of the page and you could see all the links to complimentary pages?*

Facilitator: *So there were problems with people looking for other people's pages, is that right?*

Student 4: *Well, if it was on the first page I could, but then I couldn't after that.*

From this transcript, it can be seen that some participants weren't sure about how to use the website. This was obviously a huge obstacle in using the site as a social media network. There was a session, in fact, devoted to how to use the site, which Student 5 didn't attend. However, this does indicate that the students were attempting to find other members' pages. They also particularly appreciated the flexibility of being able to customize the design of "their" pages in Swarm TV.

One student was asked why she had created her own home page when she did not have a Facebook account, and she replied that she did not want her personal information to be accessible on such a global platform as Facebook. However, she felt comfortable about it being on an unknown platform like Swarm TV.

As well as the above discussion, each student wrote 500 words about their Collaborative Practice experience. Here is a selection of key points that they made:

"I felt that making new relationships (through collaboration) with artists outside of my practice would be exciting" **– Student 1**

"I had some confidence issues at first, but after getting to know the group, I let these go and was able to communicate my suggestions." **– Student 2**

"It is not always the loudest, most assertive person who has the most to contribute." **– Student 3**

"Some people always try and get their own way, others don't do anything." **– Student 4**

"It was fairly difficult for us to come to a consensus of everyone agreeing on one idea." **– Student 5**

From these points of view, the interest from students in exploring new relationships can be seen. But also that there was a confidence factor that several students wrote about, that inhibited participants' expressions of creativity. This meant that the ideas that were decided upon were not necessarily the best ones, and that there was a feeling that some students were more powerful in the group than others.

Conclusions from the project (Abstract Conceptualisation)

As far as this thesis is concerned, Collaborative Practice was a useful project to see how individuals interacted with each other using Swarm TV as a social network environment. In most cases, it was very similar to Facebook. They posted photos, their interests, and links to favourite websites.

Swarm TV served effectively as a way in which the students could introduce themselves to each other. However, from the feedback there seemed to be a problem in finding other participants' pages.

The website served as an effective interactive application during the stages of the filmmaking project that were about introductions and thinking up ideas, but as soon as the stages became more practical, the students interest in the website seemed to diminish. There was little need for it as the project was being discussed in the face-to-face sessions anyway.

Like "This Weekend", the students involved a broad range of media elements to describe themselves, but there was little interaction between the students on the

website itself. There was definitely an interest in individuals creating their own Name Pages on the website, and from the feedback students were interested in developing new relationships. However, the website was not the place where that happened.

Rhizomatic thinking

Generation of ideas

The face-to-face nature of this project meant that it was relatively easy to generate new ideas for each stage of the filmmaking process. This happened in each face-to-face session, and as long as Swarm TV was used to document participants' discussion, this worked very well. The students, however, did not use the website in the latter stages of the filmmaking process.

Clustering ideas

At the beginning of this project, the entire group came up with 22 ideas for the film. They were very disparate but if they are clustered, then in the act of clustering, an overarching idea forms. For instance, two of the ideas were: *"24 hour film of really boring things"* and *"really annoying film that irritates everyone*". If these two were clustered together, it could possibly come under the idea of *"Make a film that no one wants to watch".* This new idea, then, is a product of collaborative thinking. It might not be that interesting to implement, but it is a collaborative idea. Incidentally, there were two ideas proposed at this stage which were pretty close to the final piece: *"each person films a minute"* and *"documentary on Camberwell art students".*

Selection of ideas

In the process of selecting the main idea, the facilitator split the whole group into smaller groups and asked them to come up with the ideas that they would like to film. This was a problem and a lesson to be learned in collaborative practice. By doing this, it meant that each group felt attached to their idea and they naturally wanted to defend their idea against the other ideas that other groups were proposing. It was possible to cull the 22 ideas down to 3 ideas, but then there was

no progress made after that. It was no longer a selection by the quality of the idea, but a selection by the fact that each smaller faction now defended their idea.

Openness

Editability

The idea that was settled on for the whole group involved each member of the community creating their own section for the completed film. Students were allowed to team up with each other, and film it in groups if preferred, but what this meant, is that for most of the film the idea didn't actually need much content to be editable. There were few sections that could be edited slightly differently. There were some shots of Big Ben, and the final scene where everyone arrives in a lecture room. But apart from this, members just took complete responsibility for their own sections. The face-to-face nature of the group meant that editing could be discussed as a group. Sections could be played and then critiqued and subsequently edited as a group.

Development of other members' ideas

This activity was most obvious in this project in the initial idea setting stage. The whole group held a blue-sky session and came up with 22 ideas. These were culled down to three, and then the final idea was decided upon. The reason the final idea was chosen was primarily because the group felt they had not seen it before, and it was not already owned by any of the smaller groups from Week 3. However, if you trace the ideas back, there were very similar ideas at every stage. The final idea was finalised on Week 4 as *"We each make a 2 minute film about how we get to the Collaborative Practice Elective on a Friday"*. Even in Week 3 when it seemed that the group as a whole could not decide on a single idea, the three ideas were:

1. *"Each person does their own thing within a specific time span and within a theme."*
2. *"We have a single narrative that slips between different genres."*
3. *"We create a fairy tale or a music video together."*

There were certainly elements of each of these in the final film. Previous to that, as already discussed, there were two ideas originally that were both very similar to the final idea:

1. *"Each person films a minute."*
2. *"Documentary on Camberwell art students."*

It appears that outside of any individual or small group agendas that a collaborative idea was forming naturally. If this were the case, then this would be an emergent idea.

Transparency

During this project, there was very little in terms of individuals manipulating the project with hidden agendas. This is probably due to the brevity and the novelty of the entire project. 20 individuals created their own Name Page, and published their own personal interests for the rest of the community to see. The community seemed to be very transparent.

Inclusivity

This project worked very well in terms of allocating tasks to as many students as possible. Everyone had a clearly defined responsibility, and they all finished off their section of the completed film to a high standard.

Collaboration

Rationale behind opinions

In Week 8, there was a session where the members were presented with three different options as to how to present the final film:

1. *"To create a normal film that intercuts through all the different stories along with the time on Big Ben."*
2. *"To split the screen up into four so that multiple stories could be told at once."*
3. *"To project the material onto four different screens in order to tell multiple stories at once."*

This time, the group stayed as a single group and time was devoted to talking through the different options and coming to a single decision that everyone could agree upon. Ultimately, it was decided *"to create a single film but to project that film onto four different screens, starting at different points in the film so that there was the same feeling of multiple narratives being told."*

The rationale behind each option was discussed and the group made the decision unanimously.

Sharing work

The central idea for the film was to share what individuals created back into the community. It gave participants clear boundaries, and they were able to be as creative as they chose to be in their own sections.

Commitment to collaboration

The commitment to collaboration was evident from the fact that each student had chosen the "Collaborative Practice Elective" out of a range of different options. Some of the students were placed in the group by default for differing reasons, but there was a clear expectation from the start that the elective was about collaboration and that students would get involved in it, practically.

Strategic Decisions

On week 3 of this project, it was because the whole group hadn't made the decisions together, that it was so much of an issue to attempt to dovetail the three smaller subgroups' ideas together. By dividing the whole group into subgroups, each subgroup was competitive about their idea being chosen as the main idea for the film. In Week 8 a similar decision had to be made involving three different ideas again. This time it was made by the whole group together and it was decided unanimously, relatively easily.

Non-hierarchy

Responsibility for the project

The manner, by which an individual can take full responsibility for a project, was demonstrated by how the impasse in this collaboration was solved. There was one student who didn't attend the session where the whole group was split into subgroups. She suggested an idea that everyone liked and it was decided as a whole group together that it would be the central idea for the film. This student was clearly thinking about the whole project and how each person could play their part in it more effectively.

Domination

Although a face-to-face group is more interactive and it can be more effective for group discussions than an online environment, those members who are able to express their opinions eloquently are more likely to get their ideas propagated. If power accrues more power, then in that scenario, they become the dominant party. Employing a website environment means that a less vocally articulate member of the community might be able to express their ideas. If ideas have to be written down, there is time to think through the implications as well, and it can redress an imbalance of power.

Relationships

Relationships are always very important to develop in any project. In this project, each student was encouraged to create their own Name Page, and just like Facebook, list a few details that might engage another member's interest. This worked well in this project. However, on the whole, other members of the community didn't want to engage in conversation on a page that wasn't their own. Out of 20 Name Pages created, none of them had any explicit evidence of other members communicating to them. As an introductory activity, there probably should have been the expectation instilled in the members of the group that pages on this website are like pages on a discussion forum rather than a blog, where it is an easy method for individuals to publish their own material.

Cliques

Smaller subgroups formed naturally in this project, although they were not working themselves into positions of authority. They were more like smaller collaborations, helping each other out in areas where individuals were not as experienced as other members, or just as friends. They were co-operative rather than competitive.

Publicity of successes and failures

In the face-to-face group, sharing achievements and issues became a natural part of reviewing the on-going work, and the direction that the project was heading towards. If any individuals were facing particular problems as part of the filmmaking project, then a small feedback session at the beginning of the training session would bring these issues before the whole group and individuals could be advised as to what to do. For instance, one of the members offered to film Big Ben chiming every hour, but didn't own a camera or a tripod. Therefore, the equipment could be borrowed from someone else. Also during this session, when members had finished their section, they were able to show it to the rest of the community, so others could get an idea of how their sections would work together.

Fresh perspectives

The guideline, *"Embrace fresh perspectives",* was important to this project, because each member of the community had to think through how they were going to create a video of their journey to university. A lot of the clips were fictitious. Some were literal documentations. One student 'flew' in; another didn't make it because she committed suicide; a lot of them woke up in the midst of rubbish from a party the night before. The final piece worked because of the diversity of all the different video clips edited together.

Manageable tasks

Once the final idea had been settled in Week 4, the task for each member was clearly defined and each of the contributors accomplished what they had to do in the time available.

As each participant filmed and edited their own section, there was a great deal of parity between participants. However, even though the final edit was discussed in detail as a group, it was, like the previous projects, left up to the facilitator to implement. In the next project, "University of the Village", the participants themselves edited the final video.

University of the Village

Concepts behind the project (Active Experimentation)

The final project that this thesis analyses is the "University of the Village". It is a significant project for this thesis, because it was not set up for Swarm TV at all. It was an initiative that explored how university training could be deployed to rural areas using superfast broadband. However, Swarm TV was introduced because it solved several issues that arose from the local community wanting to make a film together about their village. These issues are listed below after a short introduction about the project itself.

“University of the Village” was funded through the AHRC Connected Communities programme and was a collaboration between Falmouth University, University of Surrey, University of Glamorgan and BT. This thesis presents the research of one of these universities, Falmouth University, and the village of St Agnes on the north coast of Cornwall.

Participants from St Agnes were asked what they would like to learn and they decided that they would like to make a film. The villagers had seen the documentary film ‘Life in a Day’ (McDonald, 2011), which had just been broadcast on television and although they were very critical of it, the group were keen to make a documentary about the Spirit of St Agnes in a similar style.

The project started off as a series of video-conferencing sessions about filmmaking, transmitted from the University to a village pub in St Agnes. However, it was important that interaction was possible in both directions, so that the villagers could ask the lecturers questions when they needed to.

This was adequate whilst the villagers were learning about film theory, but as soon as the villagers wanted to work practically on the project, they realised that they needed a central repository and documentation of the project so that any of the villagers could refer to it at any time during the week. To this end, Swarm TV was introduced.

The main issue was one of being able to review clips, but there were four issues that needed to be resolved in order for this project to progress satisfactorily.

The first was the availability of the public's time. It was clear, early on into the project that the villagers did not have much more time available outside the times of the actual training sessions. Making a film is an ambitious objective and it would have been very difficult even for an experienced filmmaker to put something together, of any quality, purely within the 10 hours of training sessions planned. It was felt that some means of asynchronous discussion would be useful that could take place outside of the sessions, so that any spare time could be utilized for the project.

Secondly, the problem of filmmakers centralizing high definition material was impractical. Villagers gave up long before their files had been uploaded, and downloading files presented an additional problem. There was no indication, for example, from the index in Rapidshare (a technology used as the central repository) whether someone else's files were worth the time it would take to download, let alone downloading 500Gb of all the video files that had been created. The community did have a physical hard drive where this material was stored as well, but it had been formatted only to be compatible with PCs, and a number of the villagers used Mac computers. Consequently, this was not readily accessible to everyone.

Thirdly, ideas, comments, opinions and group discussion about clips needed to be visible and accessible to everyone in the group, if it were to be a productive collaborative filmmaking environment.

Fourthly, and most crucial to this project was the issue of editing tools. There were a number of relatively expensive industry standard editing applications available: Avid Media Composer, Final Cut Pro & Premiere Pro for example, but they are all quite technical and they each take practice to be able to realize meaningful editorial decisions. In addition, it was a consideration in the project that any software that was used should be freely available to everyone in the group.

Swarm TV was introduced, then, to address these four issues for the following reasons:

1. Swarm TV is an asynchronous environment where participants are able to respond to someone else's comments whenever they have time, rather than having to do it when all parties of the conversation have to be online at the same time.
2. For this project, 500Gb of high definition video files were re-encoded into much smaller file sizes, so that all video clips were immediately viewable. Each clip had a poster image of the clip so that it was immediately recognisable, without having to download the material first.
3. With the editable textual interactivity of the website, it was possible for members to publish their own comments about any particular clip.
4. When Swarm TV was introduced to the project, it was not an online editor. It was able to start the process off and get members thinking along the right lines. For instance, users were able to express their opinions about which clips they preferred. They could also cluster those clips together and order them so that they began to form the basis of a narrative. During the project, however, this facility was extended so that it was possible for members to make precise editing decisions that constructed trimmed pieces of video and played them back together.

It was decided that for this project, Swarm TV would employ a log in process, but that everyone in the group would have the same log in. This was in order to maintain as much of the sense of openness as possible, and yet confining entry into the website to the stakeholders within the St Agnes project. Therefore, although everything was open to those involved in the group, it was not accessible to the general public.

The main question that this project explored in relation to this thesis is:

How effective could Swarm TV be in facilitating collaborative decision-making throughout the filmmaking process?

Events of the project (Concrete Experience)

The first session on 22 November 2011 covered the trajectory of narrative within a film.

On the 29 November 2011, the villagers had been asked to watch a number of short films that were available on YouTube, and learnt about "Picture Composition for Video".

Two weeks later, on the 13 December 2011, practice clips that the villagers had shot and uploaded to a Rapidshare account, were critiqued. The villagers decided to make a film about the Christmas festivities that were just about to happen in the village.

There was a month before the next session, on the 17 January 2012. The villagers, by this time, had filmed a great deal, and collectively had selected the material that they knew they wanted out of all the clips that were shot. This amounted to about 500 Gb of high-definition video files. The villagers were up-loading their video to Rapidshare, and it was taking a considerable amount of time to upload or download a single video clip. Swarm TV was introduced at this point of the project.

The final training session happened on the 7 February. Seven of the villagers had selected the clips that they wanted to be included in a final edit, although, at this time some footage had already been edited by the villagers.

As this was the last session before the screening, two villagers personally took up the responsibility of finishing off the film as individuals in their own time. Two others had worked on sequences as well, so that on the 28 February, four short versions were screened to about 25 villagers.

Analysis of the project (Reflective Observation)

Website Statistics

Under observation, there are a variety of different types of expressions on the Home Page of the St Agnes Swarm TV site (Figure 5-13). Some are links to pages

that acted like video folders e.g. *'Unsorted Videos'* and some are links to members' Name Pages e.g. *'John and Robin'*. Both of these are likely to be permanent expressions. Another example of this type of stable expression can also be seen by the 3-column list of links on the left of the screen grab in Figure 5-13. Their spatial positioning below the text: *"Names of folders on the hard drive"*, signifies the type of link below it.

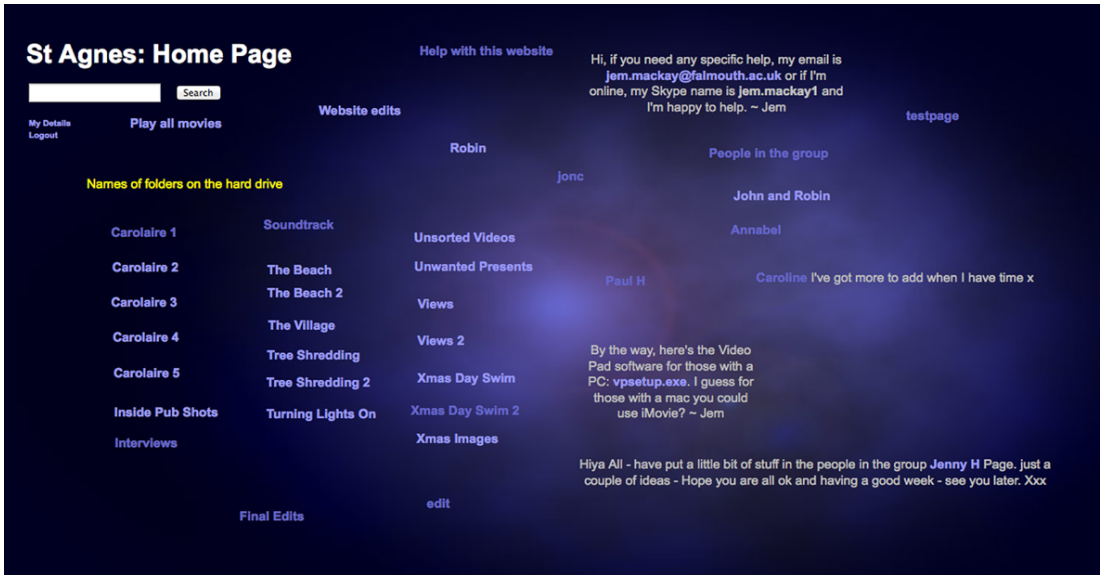

Figure 5-13 Screen grab of St Agnes Home Page

However, some expressions are transient comments from individuals e.g. *'I've got more to add when I have time x'.* It can be seen from this image, that asynchronous discussion was starting to be constructed in this environment. Take for example, the question *"I guess with a mac you could use iMovie?"* from the text element in the middle of the page. It encourages a response and by editing in a piece of text after this question, it reads as a question and an answer. Conversation in this environment is asynchronous and does not necessitate both parties being online at the same time. The environment was being used as an interactive communication tool, and this starts to develop an environment that can support the principle of building on other contributors work.

In Figure 5-14, the interactions that happen on the Home Page are charted by looking at the number of characters in each expression against the time at which each editing interaction took place.

Looking at the chart overall, there is a burst of editing that starts on this page when this website was introduced to the villagers on the 17 January. This carries on until about the 28 January, when the expressions that form the Home Page settle down and form an aggregated expression of what the Home Page should include.

The lifespan of each text expression on the Home Page is shown in this figure. Expression "a", for example, signifies an expression that started with 170 characters on the 19 January. It read:
"Jem Mackay is online at the moment until about 20:00, if you want to ask any questions about the website via Skype. His Skype name is jem.mackay1 ~ Jem (at 18:32 19/1/12)"
It was edited on the same day down to 159 characters to make it more personal. It subsequently read:
"I'm online at the moment until about 20:15, if you want to ask any questions about the website via Skype. My Skype name is jem.mackay1 ~ Jem (at 18:32 19/1/12)" The main idea behind this expression stays the same: to let web users know that Jem Mackay was online at a particular time. However this expression was edited to make the statement more personal. It is possible to view this expression as evolving into its final state to fit its function more precisely. It was then deleted completely, again on the same day at 20:17.

The theoretical implication from this is that ideas can be regarded as needing to evolve along the lines of Dawkins' concept of memes (1976:192). Just as an expression of an idea normally needs to be revised in order for it to be as effective as possible, each utterance of an idea can be regarded as being a new stage evolving towards a more appropriate expression. Sometimes, as in this example, the expression also has a lifespan that renders it invalid after a certain time.

Similarly, expression 'b' was created with 8 characters on the 22 January. It read:
"Caroline"
It was a link to her Name Page. The same day it was edited to read:
"Caroline I've got more to add when I have time x"
It remained with 48 characters until the end of the project. In this case, the final expression was reached quickly and must have been deemed totally appropriate

until the end of the project. If an expression was inappropriate, it is likely to have been edited in this open environment.

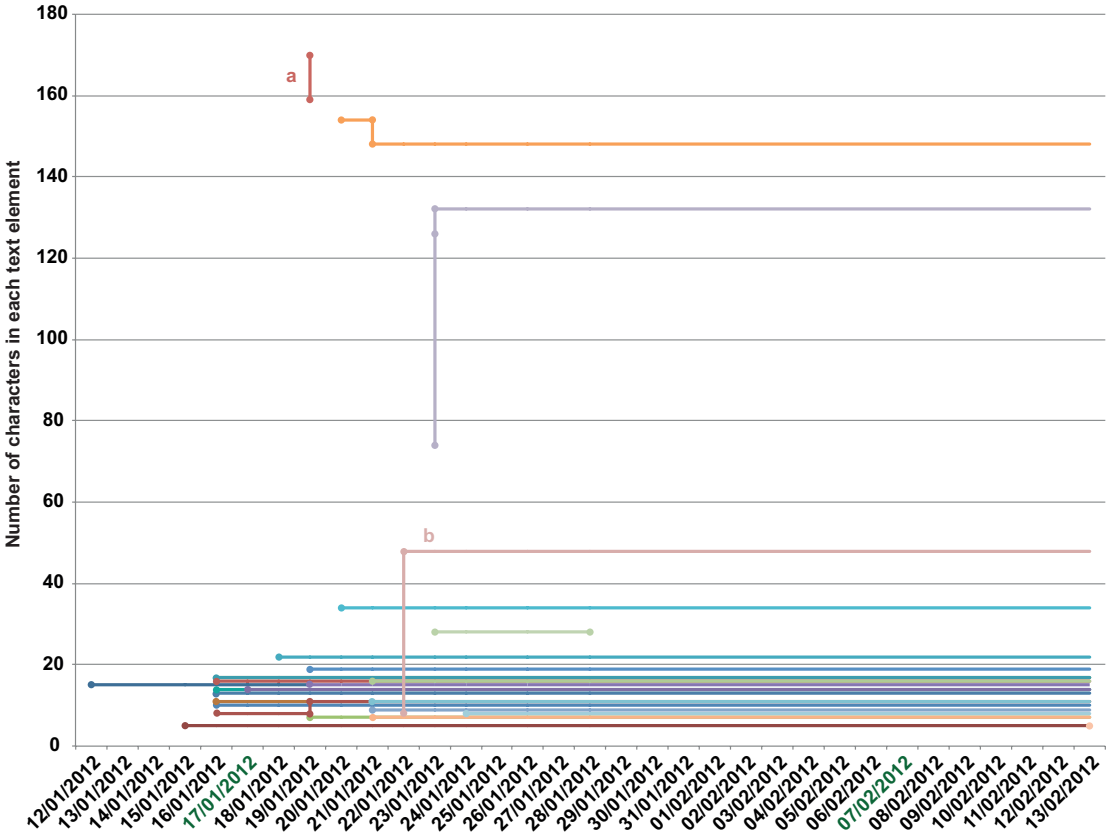

Figure 5-14 Interactions on the Home Page

Each expression on the page has a life span. They are created; they can be changed; and they can also be deleted, if they have served their purpose. If they have a function on the page, then members in the online community tend to look after it and hone it so that its purpose serves others more appropriately. Take for example, the possibility of spelling mistakes. Another member of the community can identify this, and correct it so that it makes better sense to the rest of the community.

The ability for anyone to be able to edit expressions on the website is an important factor. It serves as a tool for evolving ideas. Normally, in an editable environment, the main idea of the original expression stays the same, but the number of characters that are used to express that idea changes. Most times in Swarm TV it was the person who originally authored the expression that made any alterations, but other members of the community corrected spelling mistakes, changed emphasis or developed ideas with this facility to edit the website. Being able to edit

encourages the principle of building on other contributors' work; it encourages fresh perspectives in any problem solving activities; and it encourages participants to act as if they had full responsibility for the whole project.

Figure 5-15 is a page that incorporates video clips. From this image, it can be seen how individuals are able to comment on their favourite sections of video. Here Jenny H declares, for example, that she '*loves the comment on the number of people on the beach'*. Participants are able to express decision-making opinions with others in the group using this interface. If an opinion is a good idea, then it serves in a similar way to the concept of the meme. Others in the group take this up and reuse what they feel is worth holding onto. Ideas that are not so strong are forgotten.

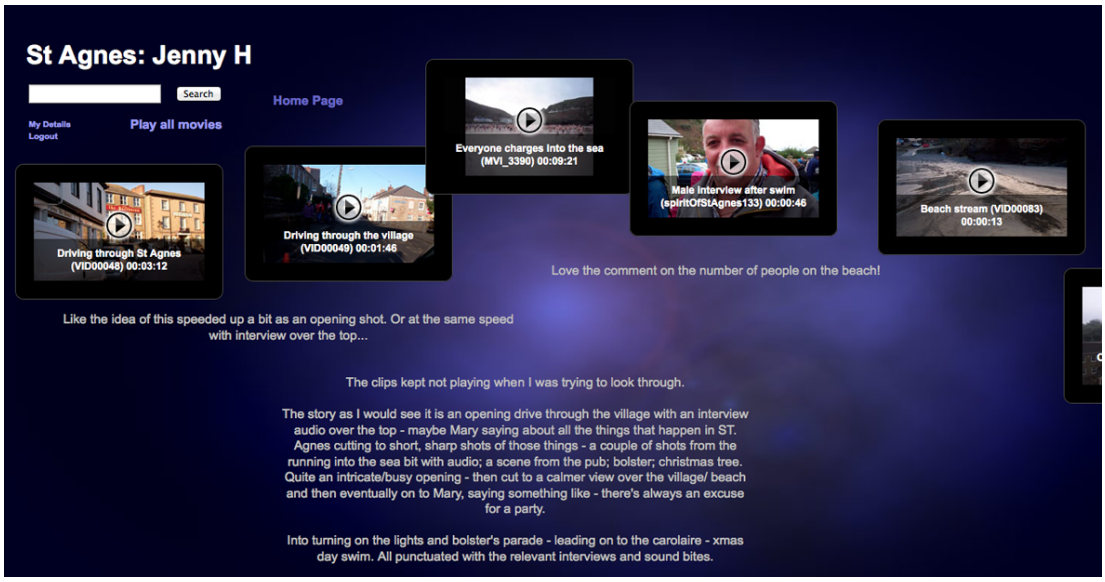

Figure 5-15 Jenny H's page in St Agnes Swarm TV

By the end of the project, the St Agnes section of Swarm TV held 46 pages. These pages are categorized and represented in the pie chart of Figure 5-16.

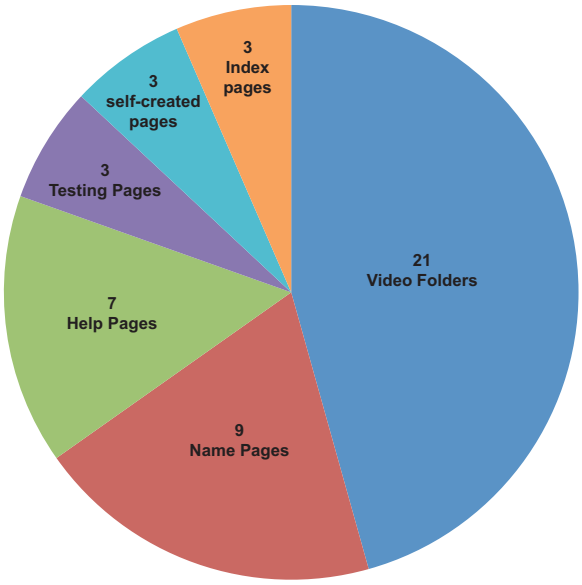

Figure 5-16 Types of pages in the St Agnes Swarm TV website

From this chart, it can be seen that the main function of the website was used as a repository for the videos that the group shot and initially selected. 21 pages held the video clips called *'Video Folders'*. The next largest category of pages was *'Name Pages'*. There were nine of these and they were pages named after villagers themselves. These were used mainly to document the different authors' ideas for the film. Seven pages were devoted to helping participants use the website technology (*'Help Pages'*). Three pages were used as *'Test Pages'*, where members of the community could practice using the technology without fear of messing up group communication on the website. Three pages were *'Self-Created Pages'*, i.e. the villagers felt the need to create these pages autonomously. Three pages that were used as *'Index Pages'* to help navigate users to the various sections of the website.

The self-created pages indicate that the users of the website were starting to use their own initiative in developing Swarm TV as a repository of information. This shows that the principle of encouraging participants to act as if they had full responsibility of the whole project was implemented effectively in this project (principle of the Power Phantom from the policy of Non-hierarchy).

When members of the community started to create their own pages with their thoughts and feelings about the clips that had been shot, they not only commented on the parts of the clips that they liked, but they also wrote down the time-codes of

sections that they liked. For example, on John and Robin's page, the authors put a comment by a video clip saying: *'Overlooking St Ag 0:13 – 0:16'*.

This type of information enables one villager to pass on precise editing details to other users and so can be seen to be making their work easier to build upon. It is, however, still time consuming for the reader to review selections in this way, and this was in fact borne out by some of the on-going feedback from the villagers. In response to this, a JavaScript library called Popcorn.js was implemented, which allows the user to select a section from a larger video file and to play just that portion.

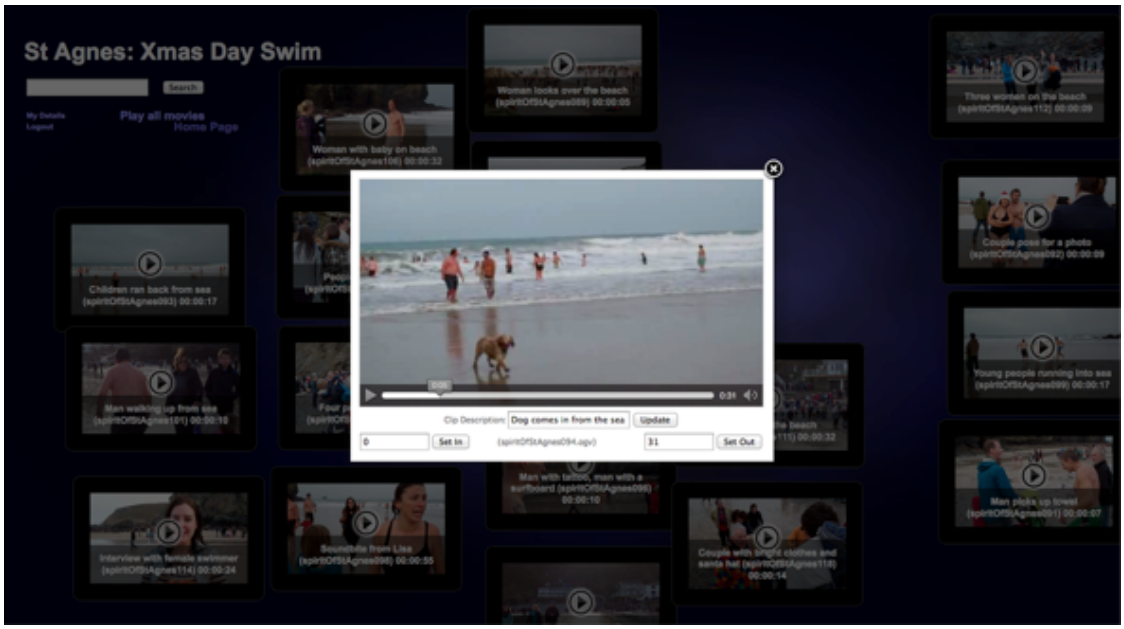

Figure 5-17 Screengrab of the editing facility of swarmTV

In Figure 5-17, the basic editing facility of Swarm TV can be seen. The user moves the timeline indicator to a position and then clicks on the "Set In" button to save the in-point. The user then moves the timeline indicator position to a suitable out-point and clicks on the button entitled "Set Out" to save the out point. When played subsequently, the video clip automatically plays just the portion between these two markers.

The next piece of feedback from the villagers was that they would like to see portions of the videos selected playing back-to-back in sequence. This too was implemented during this project, using the JavaScript library Popcorn.js. In order to create an edited sequence, then, the villagers could drag and drop the video clips

on the page, ranging them from left to right in the order they wanted them played; and then to play them back, they could click a link entitled “Play all movies” underneath the page title.

In effect, Swarm TV can be seen to be using Kolb’s Learning Cycle: Testing in new situations led to concrete experience; which led to observation and reflection; which led to the formation of abstract concepts. What is interesting about the developments, however, is that they are based on the participants desire to build upon each other’s work. They wanted to be able to document their work and their opinions, so that others could see them and take them on board into the production of the community film.

Project Outputs

The outputs from this project are as follows:

	Amount	Additional comments
Hits	54,000	
Page Requests	20,400	
Website editing interactions	1,344	Changes made to the content of the website
Email communications	70	
Ideas posted	1	The Spirit of St Agnes
Treatments submitted	1	Participants had 6 cameras to capture their Christmas festivities
Images uploaded	0	
Audio clips uploaded	12	
Film clips uploaded	225	

Table 5-7 Amounts of outputs from "University of the Village"

At the final screening, 4 different edits were shown. Each of the four films was interesting in their own right:

The first film clip was just the introduction and was the first edited sequence that the group produced. It remained unfinished, however. It started with about 200 swimmers running down the beach all together for a Christmas day swim, and then introduced someone talking about this unusual St Agnes annual tradition.

The second film was edited entirely by someone who had had no previous experience of filmmaking at all. It meant that the course had taught him enough to accomplish this task. He had the time available to create an edit and had listened to the ideas and verbal requests of other participants as to what should be included. He had also learnt through the course how to use Video Pad editing software.

An experienced filmmaker in the group edited the third film using Final Cut Pro. This was a strong piece, and also adhered to the requests of the others in the group. It was interesting to compare this film with the second film. Incidentally, both these two films incorporated the general edit of the first unfinished film of everyone rushing into the sea for a Christmas day swim and so the first film could be considered as an important stage of both of these versions.

A latecomer to the community created the fourth film. He discovered how he could get involved, from the Swarm TV website itself, and had selected his favourite clips. He had also selected his preferred sections within these clips using the new editing functionality of the website and had ordered these sections into a completed sequence. On the day of the screening, then, he was surprised to see that his selections had been made into a film and was being screened. This was particularly significant, because most of his training and a major part of his integration into the face-to-face group, had taken place asynchronously through online tutorials. The website had helped to establish him as an important part of the villager student community.

Project Feedback

On 6 March, a focus group was organized to document the feedback from the villagers about the project. BT moderated the feedback session, and six of the villagers attended. It lasted an hour and a half. The discussion was recorded and then transcribed. The following excerpts have been taken from this transcription:

Interviewer: *What did you value most?*

Villager 1: *Collaboration was key I think, and the lectures, for me.*

Villager 2: *Yes, it was really good coming down here and getting involved in something. I wasn't that interested in actually making a film, but the whole process was fun and coming down here and being part of something was fun.*

Interviewer: *What about the remote learning experience? How was that? Did it work?*

Villager 1: *It did, once the technology was actually worked out, I really enjoyed it. I felt as if the lecturer was in the room. It was brilliant. It was something completely different.*
Villager 2: *Well, I don't drive, so if I want to do anything, I have to get buses normally, in the evening. So it was nice being able to just come down here, and to the pub as well, get some wine. Normal college environment!*

Interviewer*: Did that make a difference?*

Villager 2: *Yes. Wine always makes a difference!*
Villager 1: *Yeah, if it was in a cold community hall I don't think we would have got the same experience. Like, after you've finished work, the last place you want to be is in an office environment. So this, actually, pub environment - it almost clicks your head into, oh, I'm off work. It is fun now.*

Interviewer: *What about Swarm TV? How did you find that?*

Villager 1: *It was an amazing bit of software, especially when it was made so that once the video clips were positioned … , they would play automatically in order. For me it was a step, which was great … but I probably wouldn't use it if I was editing a film for myself in all honesty.*
Villager 2: *We did that initial thing of looking at the interviews and just viewing them, and then saying which in and out points, and there was a few of us then.*
Villager 1: *I think as a group that worked quite well, didn't it? And also just having our own files. That was really useful, initially. As a community project, I thought that worked particularly well.*

The community generally regarded the third film, which was edited by the filmmaker in the community, as the finished outcome from this project. However, the group did not officially make a considered decision about this. It can be seen at **http://youtu.be/50Xbz4ujBmA** (also #6 on the DVD). and it lasts 7 minutes and 43 seconds. It starts off with the 200 swimmers running down to have a swim on Christmas day and then interviews several of the villagers about the extraordinary community spirit that is found in St Agnes at Christmas.

Conclusions from the project (Abstract Conceptualisation)

With the "University of the Village" project, Swarm TV was not there to take the participants through the whole film production process. It was introduced after the individuals had become acquainted with each other. As a result, the individual's Name Pages were not used in the same way as a Facebook page with information about individuals. Instead, pages were made where individuals personal opinions about video clips that had been shot and posted on the website were displayed. The website was used as an easy way to view the material that was available, and for members of the community to decide which material was going into the final edit and what needed to be left out.

For this project, as stated earlier, it was decided that members would need to log in in order to participate. This meant that there was a stage in which the material in Swarm TV was private. Once the project had been completed, however, the participants uploaded their finished film onto YouTube when everyone was comfortable about the edit. This implies that even in an open environment there is a good case for keeping a project closed until after a certain amount of time, when it can then be released as open content.

It can be seen that Swarm TV served very well as a flexible precursor to the editing process. It enabled the whole group to be able to view clips and discuss with each other how they could be used in a final edit. Swarm TV did not work as a serious editing application. However, as one of the participants said in their feedback, it is clearly an area where development would benefit the effectiveness of the application. As a probe to test the principles of distributed filmmaking, however, this did not affect the results. Swarm TV's editing facility was simply a means by

which members of the community could test rough edits out without too much effort, and this could serve as a subject for discussion. Swarm TV was able to open up the discipline of editing film to group activity, and considerations could be discussed as a group rather than leaving them up to a single editor to make solitary decisions.

Rhizomatic thinking

Generation of ideas

In this project, 6 video camera recorders were given to the community members to record what was happening around them, and this stimulated the generation of ideas. The members had a discussion about which Christmas events they wanted to document, and then the members with those 6 video recorders shot material about what happened around them. It meant that the villagers on video always knew the villager behind the camera and this led to some very intimate moments.

Clustering ideas

The villagers did a very rough selection of the clips they wanted to include, and then stored that material on a 500 Gb hard-drive. This was about 60 hours of video. Each clip was encoded into a more web friendly format and then these clips were made accessible on the Swarm TV site. There were 13 different categories, such as *"the beach", "the village", "xmas day swim"* etc.

Selection of ideas

The community was then asked to view as much of this material as possible and to include a copy of the clips that they liked on their own Name Page, stating what they particularly liked about it and where it was located in the clip. There were 9 Name Pages in all. During the course of the project, the clip playback facility was refined so that the clip player would store the start and end positions of the video clip, so that they played a preferred selection within the clip automatically.

Openness

Editability

The new video editing facility that was developed through Swarm TV during this project meant that every member of the filmmaking community could express their opinion about video clips very easily. It would be worthwhile to develop this, and to apply the same technique to audio files as well.

Development of other members' ideas

A good example of the development of other members' ideas can be seen from the first edit of the video. It shows about 200 inhabitants of St Agnes, running down the beach to go for a Christmas day swim. It was a great way to introduce the film. There aren't many situations where so many swimmers run down a beach screaming, all at the same time. This same idea was used in both the second and the third version because it was such a strong idea. It makes viewers want to know why swimmers are doing this and it prepares them for an interesting set of interviews with the villagers about the event.

Transparency

In a face-to-face environment, it is much easier to be transparent than in an online environment. There is more detailed communication that is able to happen. So in this project, the members of the community were naturally transparent with each other. However, there was one latecomer who joined the project, just after Swarm TV had been introduced to the community. In order to catch up with the project, he just had the information that was on the website. So it would have been very useful if each of the participants had published a few details about themselves and why they were interested in doing this project in the first place. It's an important part of a distributed filmmaking project and keeps it more accessible to newcomers. Unfortunately, it didn't happen in this project, as Swarm TV was introduced halfway through the research project.

Inclusivity

By giving the community 6 cameras to use in this project it meant that about half of the participants at any one time had access to produce video clips. Other members

of the community were comfortable using their own mobile phone cameras, so it meant that anyone who wanted to be involved in collecting video material was able to do so.

Collaboration

Rationale behind opinions

A lot of the comments posted about the clips on this project, were stating that particular sections of the clip were liked. For example, *"Love the comment on the number of people on the beach!"* In order for other members of the community to take this forward, it would have been more effective for the community, if the comment had the rationale behind the opinion as well. It would then explain to everyone else in the community more about its significance. For example, *"It shows something of the humour of St Agnes*" could well have been a rationale behind this comment.

Sharing work

Editing is a good example of a situation where work is much easier accomplished as a solitary task, and then shared back into the community for comments and feedback. Editing is a highly skilled job, as not only do you have to know the technology, but it also takes experience to edit well. If the first version hadn't been edited and then shared back into the community, then the idea of opening with the Christmas day swim might not have been implemented. It demonstrated how well the idea would work, and so the rest of the community could easily agree to use it as the start of the film.

Commitment to collaboration

In this project, as everyone was working on the same film and there was no hierarchical structure in place, it was naturally assumed that it would be a collaboration following the Consortium model as discussed in Chapter Two. It was "*a private group of participants that jointly selected problems, decided how to conduct work, and chose solutions."* What this meant in practice was not fully discussed, but it was the most natural model according to the type of activities that the university lecturers set.

Strategic Decisions

There was an unofficial policy in this project that any decisions that affected the whole community would be made during the face-to-face sessions. It meant that everyone had the opportunity to express their opinions and also any reservations about possible solutions to problems that the community was facing. Swarm TV was not used to discuss through issues at any depth, but it would have been worthwhile to introduce this environment as the place to do this type of activity.

Non-hierarchy

Responsibility for the project

The face-to face nature of this project's community meant that members were able to discuss how to edit the piece. But it needed someone to take responsibility for the whole project and practically implement the group's decisions. There were 4 versions screened at the end of the project, although only the second and third versions could really be called the group's completed edit. The second and third versions took into consideration the whole group's requirements, but an experienced filmmaker made the third one. This happened after the second version was completed, so it was clear that the third editor wanted a different interpretation to the second variant. Both of these versions demonstrate a member taking full responsibility for the whole project.

Domination

This third version could be construed as one member's domination over another member. However, it is important in an open environment that if an individual can see how they think they can improve something then they should be at liberty to try. As a result, the group ended up with two completed versions.

Relationships

The filmmaking training in this project took place in an upstairs function room of a village public house. It meant that everyone naturally developed relationships with each other, often with the help of alcohol. It also meant that members in the filmmaking community knew each other in the village community as well, so they

were more forthcoming in expressing their opinions about other members' work. They also felt able to give voice to any concerns that they may have had about anyone one person becoming too dominant.

Cliques

The St Agnes community was a creative community and as such, strong personalities set the agendas among the members. However, because Swarm TV was introduced halfway through the project, it would have been inappropriate to suddenly ask the members to avoid authoritative subgroups forming. Relationships had already formed and by the time Swarm TV was introduced, individuals within the group had already found their roles within the wider community.

Swarm intelligence

Publicity of successes and failures

By writing comments against clips that the members of the community preferred, this acted towards the guideline of Swarm Intelligence to "P*ublicize successes as well as failures"*. The editors of the completed versions carefully considered all the clips that had been selected, and posted comments next to them. No member commented negatively against any clip, however, there was a clip of a group of singers performing in a pub that was very professional. They weren't actually from St Agnes, and therefore some members commented that this clip was not the most appropriate to include.

Fresh perspectives

The facility for anyone in the group to make their own rough edit online was a way in which fresh perspectives could be introduced into the filmmaking process. Several members of the community used this facility to present their visions of what the final film could include. The fourth film, as described above, was one such film, and demonstrated a completely different version to the edit that was developed and discussed as a group.

Manageable tasks

Throughout the project, activities were set by the university lecturers at the end of each session that were deliberately chosen as activities that could be done as solitary activities. This could then be reviewed and critiqued in the following session. For instance, they asked the members of the community to shoot some material around St Agnes. On the following session, the lecturers talked through which clips worked and which clips didn't work. As such, these activities supported the Principle of Multiple-interactions. That is, the more each member does, the greater the variety of material is available to the whole community.

Overall, there was a lot of computer technology introduced to the members of the community, and very little time for them to learn how to use it. Fortunately, in the community, there were representatives who had considerable creative skills. Therefore, the community's collective experience enabled them to produce a film by the end of this course, rather than relying on the facilitator to provide an edit. The fourth version was edited by a latecomer to the project, and was created entirely using the Swarm TV technology, outside of any face-to-face sessions. The fact that it is possible to make edits using the online tools of Swarm TV means that activities set by a facilitator can now be carried out asynchronously, by individuals across the group and tasks can be set for each individual at each stage of the filmmaking process.

In this chapter, five collaborative filmmaking projects were analysed and the experiences relating to the principles derived from the conceptual framework of this thesis were discussed. This was in order to see how significant they each were in facilitating distributive filmmaking. In the next chapter, this thesis concludes by stating the main theoretical concerns, specific considerations, reflecting observations, the journey of the PhD, incidental findings and further research.

Chapter 6 - Thesis Conclusions

Introduction

In the previous chapter, the results from five major collaborative media projects were analysed and statistics extracted in order to observe how effective the emergent policies were, that were selected for distributed filmmaking in the wake of the digital revolution. In this chapter, the original contribution to knowledge from this thesis is outlined, and the findings detailed. It also looks at the significance of this research and possible areas for future research.

Original contributions

The original contributions to the field of knowledge from this thesis are based around five emergent policies derived from the digital revolution as introduced in Chapter Two, the procedures of a distributed filmmaking project and the unique characteristics of the website environment Swarm TV, which was able to facilitate these policies and procedures as well as to analyse them happening. These three contributions have been used to re-contextualize open source methodologies into the process of filmmaking practice. The policies and procedures have not only directed the architecture of the website environment, but they have also prompted the types of activities set by the facilitator for the community and able to serve as a guide to individuals as far as their attitudes towards other members of the community.

Policy of Rhizomatic Thinking		
Characteristic	**Principle**	**Guideline**
Idea generation	Change is a fundamental part of development	Generate New ideas
Idea clustering	Ideas from a blue-sky session often overlap	Cluster ideas appropriately
Idea selection	Some ideas are stronger than others	Select the best ideas

Policy of Openness		
Characteristic	**Principle**	**Guideline**
Content quality	All content can be improved	Make content editable
Narrative flow	Narrative flow can easily be blocked	Develop other member's ideas
Decision-making rationale	Individuals often manipulate projects with hidden agendas	Be as transparent as possible
Inclusivity	Monarchies and/or Oligarchies form easily	Open up the work to as many participants as possible.

Policy of Collaboration		
Characteristic	**Principle**	**Guideline**
Opinion aggregation	Some members will not know why certain opinions are held	Discuss rationale behind different opinions
Working relationships	Some prefer to work through particular problems on their own	Share work that is done individually back into the community
Collaborative value	Some individuals don't want to collaborate	Be committed to the collaborative process
Strategic decisions	It is easier to make decisions with fewer participants	Work through as many of the strategic decisions with the whole group as possible.

Policy of Non-hierarchy		
Characteristic	**Principle**	**Guideline**
Power phantom	Authority is often gained by an individual because others simply allow it	Each member should take full responsibility for the whole project
Power distribution	Power naturally accrues more power	Avoid dominating others
Suspicion of power mongering	Claims of domination can often offend	Develop critical relationships in the community
Cliques	Subgroups easily form positions of authority	Actively avoid subgroups forming that work themselves into a position of authority.

Policy of Swarm Intelligence		
Characteristic	**Principle**	**Guideline**
Feedback	Positive and negative actions within a swarm escalate	Publicize successes as well as failures
Fluctuation	Randomness can be a valuable asset	Embrace fresh perspectives
Multiple interactions	Many hands make light work	Split tasks down into mini-tasks that can be done by many participants

Table 6-1 Policies of distributed filmmaking

From the projects in this thesis, it can be seen how these policies and guidelines create an environment that is suitable for distributed filmmaking, but the biggest challenge to the practice of distributed filmmaking is actually the mindset change from the accountability of an individual to the understanding of the emergent development of ideas as a group of participants. During the projects of this thesis there are possible indications that a collective consciousness develops. However, just as it would be for a single neurone in the brain to understand how its electrical activity contributes to an existence of something as complex as an idea, it is very difficult to identify collective consciousness.

Thesis findings

During the five projects that have been analysed in this thesis, it is observable that:

1. The design of Swarm TV was of sufficient quality, such that it encouraged and facilitated online distributed filmmaking by the general public.
2. This type of project can draw participants into an online community, from individuals on an international scope, from different cultural backgrounds and filmmaking traditions.
3. Content media narratives can form rapidly, without being centrally organised.
4. Swarm TV can facilitate building upon the work of others.
5. Swarm TV is able to facilitate collaborative decision-making throughout the filmmaking process.

The design of Swarm TV was of sufficient quality, such that it encouraged and facilitated online distributed filmmaking by the general public

From the project, The Legend of King Arthur 2.0, there were over 3,000 interactions by human beings recorded during the 5-day exhibition. This was an average of 600 every day. Interested parties also uploaded 14 images, 9 video clips and videos created from this exhibition were screened at two other venues, including the PZ gallery in Penzance. When these statistics are taken alongside the general feedback received from this project, as well as the specific feedback quoted in Chapter Five, it is clear that the public were definitely interested in this type of filmmaking through Swarm TV. Perhaps this is because it is straightforward to add ideas in the form of text, image, audio or video, and because each page acts like a pin board with the facility to drag and drop these media elements around the screen.

This type of project can draw participants into an interactive online community, even on an international scope

There were indications from "The Legend of King Arthur 2.0", that this type of filmmaking project could create a substantial international platform with emails coming from Ireland, the U.S. & Australia. So with "Project 2008", the main aim was to find out how much international interest a project like this could have. The Internet is an international platform, so it would be expected that participants might view the site from all over the world. However, to participate in the project, offering up contributions through Swarm TV under a Creative Commons License is significant. It implies that the digital revolution has affected very different communities in similar ways. Over 50 different countries viewed the site and the US contributed 50% more viewers than the UK, even though this was a UK project. 72 media items were uploaded from 12 different countries and 50 contributors came from 40 different locations. Considering the project only lasted for 7 weeks, this was a great deal of interest in this project, from members around the world who were previously not in the same community together, and came from different decision-making cultures and were from diverse filmmaking traditions.

Content media narratives can form rapidly, without being centrally organised

"This Weekend" served, in some ways, as a control project to "Project 2008" because it specifically targeted the county of Cornwall UK, rather than being a global project. The effective aim of this project however, in terms of this thesis, was to see how decentralized the production of narratives could be on the site. There were six site specific arts events around Cornwall; as well as a seminar weekend; an exhibition in Falmouth documenting the whole project; and website help. Each of these needed to promote a separate marketing narrative, and in the eight weeks of the project, the website was built up to 91 pages; there were over 500 images uploaded; over 450 pieces of text as well as 11 video clips. The speed of the construction of this website was due to its decentralized moderation. Stakeholders who wanted particular information published on the website, did not have to wait for it to be approved by a central moderator before it was published. In this particular case, the artists were in fact in the best position to judge those things that were appropriate for their individual sections, and they were able to get on with the task.

Swarm TV can facilitate building on the work of others

In "Collaborative Practice", most of the students involved in the project created their own Name Pages. Together they created 100 pieces of text; uploaded 36 images of their work or of themselves; created 34 new pages; and linked to 90 webpages, internally and externally, and generally introduced themselves to each other on these pages. The example of Rosie's Name Page, described in detail in Chapter 5, not only demonstrates the editing process, but it also documents the life span of an expression and how it changes. Each edit refined Rosie's expression in some way, until it settled down with 153 characters. The stage of it settling down is an indicator that the whole community has actually agreed to the state of this text. If there were spelling mistakes, or if there was something offensive in the piece of the text, then editing may well continue until the whole community comes to some kind of agreement on it. It can be said that the community agreed about this text, because although Rosie herself is most likely to have done all of this editing, the text is still editable by anyone. It means that once there are no further edits to a piece of text then that is an indicator that the community has reached consensus about it.

The website is able to facilitate making decisions in collaboration throughout the filmmaking process

In the "University of the Village" project, the flexibility of using a system like Swarm TV was explored. It was used as an asynchronous method of communicating between individuals; it was used as a video repository; it was used to comment to the rest of the community about individual clips that could be used in the final film; and it could also be used to edit the material together, itself. This made it possible to collaborate on the types of editing decisions that are needed in order to make a film.

The motivation to be able to edit collaboratively came from the community itself. This was highlighted during the project, when the participants, first of all, required that video clips would only play between specified in and out points; also, when they wanted a number of clips on a page to play one after another seamlessly. When this coding functionality was delivered to the community, Swarm TV itself could be described as being self-organizing. As one of the participants said in their feedback, Swarm TV might not be their preferred system for editing. However, it does ensure that a group of contributors are able to input into the editing process as a collaborative process. In traditional filmmaking, on the other hand, it is often left up to an solitary editor to make sense of it all.

Over all, then, when the methodologies of open source have been applied to the field of distributed filmmaking, it can be seen that it is a very fast method of creating a film. Several projects listed in this thesis lasted less than two weeks. Secondly, the storytelling aspect was highly customisable, with most projects producing more than one film as an outcome. Thirdly, if this method of filmmaking was used to document a news story, it may well have less bias in the perspective of reportage. Also, by using the principles of openness and making the video material available as well as the code to construct Swarm TV through Github, it will ensure that the there is very little lock-in to a particular technology. This can also be seen by the fact that elements from the very first projects are still accessible 9 years later. In terms of the rate of change of the Internet, this argues strongly for the case that Swarm TV is future-proofing both the original video material as well as the

website programming that facilitates this type of filmmaking. There have been many comments throughout the projects of participants becoming more aware of both the filmmaking processes as well as understanding the nature of openness, collaboration & non-hierarchy. Finally, the application of open source technologies to the practice of filmmaking has meant that many films have been created with extremely low budgets, sometimes little more than the cost of hosting Swarm TV on a website server.

Specific Consequences

Significance of research

The digital revolution has brought about fundamental changes, not only in the tools that are used in filmmaking, but also in the operational procedures that facilitate filmmaking. It has emphasised collaboration, openness and non-hierarchy as attitudes of a counter culture. It is important that those involved in the traditional disciplines of filmmaking understand the opportunities relating to these fields of knowledge as they face the future, instead of seeing them as threats that might work against them.

The research of this thesis has integrated five questions by creating a website based on the concept of the rhizome. It has presented participants, and readers of this thesis, the prospect of thinking through their own values as far as these five areas are concerned: How can a group think rhizomatically? Can a project ever be totally open? Why is collaboration so difficult to achieve? Should differences of ability necessarily have to be emphasised hierarchically in order to achieve an objective? Can the field of swarm intelligence help online distributed filmmaking?

Emphasis on non-linear thinking

Swarm TV particularly encourages non-linear thinking. In most professional editing applications, there is a linear timeline and clips are brought into the timeline where it builds up into the narrative in a linear way, one clip after another. An existing clip on the timeline will dictate the following video clip to some extent. This needs to happen in a finished film, but at the stage of exploring which clips should be included or excluded, it is easier to think in a non-linear way.

It means that a narrative is able to generally evolve rather than being dictated to by the previous clip. This method of working also ensures that the ability to build on each other's work is kept as open as possible. So then, Swarm TV does not need a rigid timeline to convey the flow of essential concepts. Instead, narratives naturally evolve.

Reflective Observations

Procedures for distributed filmmaking

Swarm TV was built especially for the purpose of interactivity and collaborative discussion, and can be downloaded by anyone and used from Github **(https://github.com/ucfmediacentre/digitaldialogues)**. Yet a project could use a number of other existing social media technologies like YouTube and/or Facebook, if that was preferred, as most people know how to use them. Nevertheless, those technologies wouldn't be as practical in terms of attempting to edit other people's contributions.

The basic procedure of a distributed online filmmaking project from the point of view of a facilitator has eight stages:

1. Enlisting participants
2. Introductions
3. Ideas
4. Visualization
5. Filming
6. Editing
7. Completion
8. Distribution

In each stage, activities should be suggested that would encourage participants to incorporate the five policies derived from the conceptual framework in Chapter Two. These could be as follows:

1. Enlisting participants

Check through contacts for potential participants who are particularly suitable for the project. Particularly look for creative people with an interest in collaboration. Create a strong image for the project, and target potential communities who already have strong opinions about a particular topic. Most of the general public understand hierarchy and competition as a prevailing Western social contruct, for this reason a possible draw to a project like this, could be the novel experience of attempting non-hierarchy and co-operation.

2. Introductions

Ask each participant to create their own Name Page, upload a photograph if they want to, and list some of their hobbies and interests and why they want to be involved in the project. Ask them to have a look at other members' Name Pages and start a conversation with at least one other person on his or her Name Page.

3. Ideas

Ask the participants to think up some ideas for the film in question, and list them on a page specifically dedicated to ideas for the film. Encourage them to look through other members' ideas and choose someone else's idea that they think has the most potential. Ask them to develop this idea in some way.

4. Visualization

Set an activity to think through how to actually go about filming some of the ideas on the website. Ask them to either create a storyboard, or write a treatment about how they could physically get those ideas on video. Ask them to choose someone else's idea that they most prefer, and work out in detail how that idea could be realized.

5. Filming

Ask the participants to look through the visualizations and treatments and choose a section of video that they would like to video. Ask them to video it, and upload the result onto the website, writing any comments they would like to make about it.

6. Editing

Ask the community to look through the media material generated, and to choose some of the clips that they most like, again preferably from other members, and edit those clips together. Ask them to comment on them and on other participants' contributions, and also post any further ideas that this process has generated.

7. Completion

Encourage the members of the community to look through the way other members have edited the sequences; to choose their favourite sequences; and compile them into a final edit. Ask them to present this back to the rest of the participants and to comment on the strengths and weaknesses of other participants' drafts.

8. Distribution

Finally, ask each member of the community to suggest ways in which the film could be promoted and distributed. List these ideas on the website, and ask members to choose which methods they would like to use to distribute it. It will probably be best for this to be a co-ordinated process, so that the same channels of distribution don't get approached multiple times about the same film.

At the end of each stage, the participants should be detailed with what has just happened in the project, and what the next stage is going to be about.

The Journey of the PhD

Research topic and methodology

In order to explore distributed filmmaking, a website environment was specifically developed to facilitate participants working together on a filmmaking project. This thesis details the analysis of five different collaborative filmmaking projects that used the website environment, Swarm TV, and draws its conclusions from events that occurred during the course of each project.

In the course of this thesis, five characteristics were identified and were explored in order to derive emergent policies for online distributed filmmaking: rhizomatic thinking, openness, collaboration, non-hierarchy, and swarm intelligence. This thesis looks at relevant collaborative filmmaking projects and deconstructs the power structures of their various stages of their filmmaking process. Swarm TV, a website environment, was then developed both as a prototype to facilitate filmmaking using these characteristics, as well as being a probe to test out how the policies that emerged from this conceptual framework were integrated into the project.

Rhizomatic thinking formed the basis of each page, allowing contributors to upload or edit text on any page and also to create new pages if desired.

The aspect of *openness* was considered in that, like Wikipedia, anyone could edit any content on the site. Additionally, any piece of content could be dragged and dropped to any position on the screen; the style of any piece of text could be changed in terms of font, font-size, colour and transparency by anyone; visitors could create any number of new pages on the site; and the website also had its own search engine to access and retrieve any content published. In addition, Swarm TV was built upon the premise that the site should be as easy to interact with as possible. In order to create a new piece of content, the users simply double-clicked in a space. In order to edit an existing piece of content, they needed to double-click on that piece. An editing box would pop up and any user would be able to update its content.

The website encouraged *collaboration* by stating on every page that "Any contributions made to this website will come under a Creative Commons License Attribution 3.0" along with the Creative Commons logo, so that participants were continually reminded that whatever they contributed to the website should be designed to be used by other participants. Furthermore, four different types of media: text, images, audio and video clips could be deployed on the site, so that ideas could be expressed in a number of different formats, enabling participants with a wider skillset to be able to work together on a single project.

Regarding *non-hierarchy*, visitors were encouraged to view or to edit anonymously. In most of the Swarm TV projects, there was no log in process, so this meant that anyone was free to edit anyone else's material, and also delete it if they wanted to. In this way, the projects were able to avoid hierarchy as much as possible. The one person who intrinsically had more power than anyone else was the facilitator who initiated the project. For that reason, it was important that the facilitator was seen to avoid content decision-making as much as possible, so that non-hierarchy would be seen to exist amongst all participants. Ideally, these decisions should be left entirely up to the other participants, if possible, unless of course no one steps up to a particular task. If the facilitator, as happened in the

first two projects analysed in this thesis, felt that they were the only ones who could edit the film because no one else undertook to make an edited version of the film, then it would be necessary for the facilitator to step in to advance the project. The important aspect is to consider the principle of Power Distribution from the policy of Non-Hierarchy and to *"Avoid dominating others"*, as it is easy for the facilitator's decisions and skills to take priority over others.

The possibilities of *Swarm intelligence* was mainly seen in the self-organisational ability of the website to adapt to various conditions in "This weekend?" and the "University of the Village", also the emergence of a collaborative idea that seemed to exist outside of individual's ideas in "Collaborative Practice".

Evolutionary delivery

Swarm TV is more than just a probe, to test out how participants can make films in a collaborative, open and non-hierarchical way. But because it is able to act as a probe, Swarm TV has a feedback mechanism so that the environment can adapt and change with different conditions, and this is an important component of establishing swarm intelligence. Swarm TV is continually evolving in order to encapsulate some of the emerging policies that are derived from this research. During the course of the research, the technology has changed from ASP technology to PHP and also now, has been rebuilt to incorporate the CodeIgniter framework. Swarm TV began in 2005, just after YouTube had started, and it has also incorporated several functional changes. Changes to the environment were generally either enabling easier communication, or making the interfaces more intuitive. For example, text elements could be styled more dynamically in terms of font, font size, colour and typeface. At one point, for instance, the user could hold down the "S" key and drag the cursor to change the font size of a text element live, without having to view it in an editing panel. The downside to this, however, was that users had to learn more about how to use it properly as a newcomer, before they could effectively participate. In terms of communication, a live chat room was incorporated into the system. A texting facility was incorporated for one project, and different style video clip players were tried and tested. In addition, in the final project analysed, "University of the Village", Swarm TV also included a crude facility to edit film clips together.

Swarm TV now also has a search map that shows all the connections between all the pages in the website; delivers an RSS feed so that any change to the website is broadcast to anyone who sets it up in their RSS Reader; and is able to record either video and/or audio straight into a webpage from a computer's webcam and microphone. It means that for as much as possible the responsibility for moderating the site can be shared and discussed between anyone who is interested in doing so.

These were all ways in which Swarm TV adapted to changing project conditions. Some projects called for additional functionality, others didn't need it.

Incidental Findings

Security considerations

In the project, "This Weekend", one of the main concerns from the participants, was the aspect of the open policy of editing. The main challenge that users needed to overcome was one of mindset. There is, of course, a risk involved in allowing participants to contribute, upload content or edit other members' material anonymously. But it is also a major way in which the Principle of Fluctuation from the field of Swarm Intelligence can be integrated into the environment (the guideline being to *"Embrace fresh perspectives"*). It is important to understand the perspective of collaboration that the control of a project like this does not belong to any one individual, but to the collaborative community. When Swarm TV first started seven years ago it was simply a blog that anyone can edit. At this stage, it did not have drag and drop interactivity, and pages were composed in a linear style. The latest edits were positioned at the top of the page, and each previous edit was posted underneath so that you could see the exact history of edits, chronologically, as a single list. There was very little flexibility. The website has changed a great deal, and with particular regard to employing as open a standard as possible.

Hackers have tried to hack into the website many times, but only once successfully. The hacking that succeeded, however, was ironically not due to the open policies of

interactivity that Swarm TV employs, but it was due to a practical coding mistake. In the process of changing technologies from ASP to PHP, certain files were uploaded into insecure directories. The hacker replaced a refresh link to link to a disreputable site outside of Swarm TV. Although this was quickly and easily rectified, it took two months for Google to take Swarm TV off their list of untrustworthy sites!

In the five projects analysed in this thesis, however, there were no edits made that were deemed inappropriate, or that deliberately destroyed the work of someone else. This was probably because most users were personally invited and therefore interested enough to see what could be produced in an open platform like Swarm TV. The most controversial image that was uploaded in the last 7 years, was drawn on a computer in November 2007 with a woman in a yashmak thinking to herself "Kafirs your time will come" (Figure 6-1)

Figure 6-1 Most controversial image uploaded

"Kafirs" is a term that Muslims mostly use for those who are not Muslims. The cartoon is ambiguous, but in the aftermath of the 2005 bomb explosions in London this might have been perceived as quite offensive by many of the general public. It was posted a couple of months after the Legend of King Arthur 2.0 project, so it did

not seem to have much to do with the project itself. The facilitator of the site received an email of the image immediately it was posted, and tried to engage with the anonymous user who posted it, by posting a question about how much the image had to do with the Legend of King Arthur on the site. This question was posted in place of the image, so that if anyone was serious about using the image as part of the Legend of King Arthur narrative, then this new direction could be negotiated. However, as no one replied, it was deleted from the server and the post forgotten as far as the project was concerned. This begs the question, similar to the possibility of Neo-Nazi infiltration into the Wikipedia community as seen in Chapter Two, as to what would happen if the image had been much less ambiguous and much more offensive. What if the contributor had actually wanted the collaborative film to become a terrorist's statement? If it were felt that everyone else in the swarm had no particular interest in this direction, then this single direction simply wouldn't be taken on board as an aggregate aim. If there were, however, a significant number of participants all wanting to do this, there is no reason why participants, who definitely didn't want to be involved in this, couldn't simply split the project up and start a new swarm around a different concept. If it were just a solitary expression around that concept, the security model would be that if any material offends anyone, other participants are personally able to remove it from public view then and there.

Another challenge can occur if participants deliberately work against the collaborative spirit of the community. If individuals were able to destroy the core project files then this could become a problem. But this is why, in Swarm TV, it is important that all files and records are backed up regularly.

Another reason to ensure files are backed up, would be that individuals would be confident to try out new approaches to the film, safe in the knowledge that they are not destroying any useful work done up to that point.

In order to create a collaborative, open, non-hierarchical film, then, a suitable interactive website environment should be employed. In the following section, the future of research in distributed communities is discussed.

Future research

Having learned through the various projects as to the most effective policies and procedures for distributed filmmaking, the results have broader implications for online learning. The key to distributed filmmaking has proved to be about documenting and opening up the processes of decision-making. It means that anyone, wanting to learn about a creative subject that an online community could be involved in, could explore similar development processes in that field through a similar interface. The Swarm TV website is based on the principle of Rhizomatic thinking, generating new ideas, clustering those ideas, and selecting the ideas with the most potential, and as such it creates a rich environment for learning and development.

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