

**Social media and campaigning: the challenges and opportunities
of incorporating social media into existing anti-airport expansion
campaigns**

by

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A Doctoral Thesis

Submitted in partial fulfilment of the requirements

for the award of

Doctor of Philosophy of Loughborough University

December 2016

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Acknowledgements

There are many people I would like to thank for both supporting and guiding me on my PhD journey. I am enormously grateful to my supervisors. Firstly, to Lucy Budd, my primary supervisor, who has been supportive right from the beginning and has always listened intently to concerns I had and problems I was facing. I appreciate her understanding nature and willingness to help. We may have disagreed on which football team is the best in the East Midlands but without her belief I would not have got this far. Secondly, to my secondary supervisor, David Pitfield who I got to know better after giving him regular lifts into Loughborough. More recently, over the past year, his unwavering support and determination to get me through the final hurdle of my PhD has not gone unnoticed. I am eternally grateful to him for giving up his free time to help me. He has been generous, kind and patient – although I am sure I have tested his patience at times! I consider him a friend as well as a supervisor. I want to thank them both for not giving up on me when, at times, I may have seemed like a lost cause.

I am also eternally grateful to my family who have always been there for me, not just throughout the last four years, but ever since I graced this earth. They may not have entirely understood the challenges of doing a PhD or the subject area itself but their belief, support and willingness to give up anything to help better my chances of successful completion have not gone unnoticed. It is them to which I owe everything. I hope I have made them proud.

To all my friends, particularly Bev and Chris; I could not have wished for a more supportive bunch. They have picked me up time and time again, have spoken words of wisdom and have generally been amazing. Additionally to all those who I have had the pleasure of meeting at Loughborough; particularly Helen, Karen and Chloe – I want to thank you. Thank you for believing in me and showing me that there is more to life than a PhD! There are many more people who have helped me throughout my journey; I am eternally grateful to them.

There are also those who I have met through the PhD Social and Support Network at Loughborough; particularly Jordan who is as passionate about supporting PGRs as I am. We created the network together and battled through obstacles to give PGRs more of a chance at our institution. I have made numerous friends by attending the regular network sessions and I am grateful to all of them as they highlighted that I was not on my own in some of the issues I faced. Also, the members of the Graduate School: Zoe, Katryna, Kathryn, Jill, Andy and Duncan who have provided me with a means of PhD therapy as well as supporting the PhD Social and Support Network and listening to my ideas to help PGRs across Loughborough. I know I may have been an enigma at times but I really appreciated their advice, support and help.

This thesis would not have been possible without the willingness of the social media coordinators of the three campaign groups; Airport Watch, HACAN Clearskies and Transition Heathrow, to be interviewed. I want to extend huge thanks to John, Sarah and Ian who allowed me to question the operation of their campaign since the incorporation of social media.

Finally, I dedicate this thesis to, firstly, my parents who have always given me the opportunity and freedom to follow things I want to do, without question. I owe them a huge debt of gratitude. Secondly to my Auntie Maureen who is one of the most important women in my life and someone I constantly look up to - I cannot think of many more selfless, caring, understanding, kind and loving people than her. Despite the heartbreaking losses she has faced and challenges she has had to overcome, she continues to put everyone before herself. She inspires me every day to carry on and not complain, regardless of the situation. Auntie Maureen, I thank you, for being an ear to bend and for providing reassurance and love during difficult times.

Abstract

Social media has created new protest spaces and has enabled people to do things differently. The focus of the research is on campaign groups, created before social media was used as a tool for protest. It has been undertaken to achieve the aim of the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK.

Social media data was obtained from three anti-airport expansion groups which included the extraction of approximately 9,000 tweets and 8,000 Facebook posts. The data were then analysed using social network analysis, time series analysis and semi-structured interviews. The results of social network analysis and time series analysis informed the development of the questions directed at the social media coordinators of each group. The main findings are that Airport Watch and HACAN Clearskies exhibit very similar Twitter networks and favour interaction with the media, similar anti-airport expansion groups and also pro-airport expansion groups. Transition Heathrow demonstrates more varied interaction patterns. All groups dominate their respective Facebook page and group networks apart from HACAN Clearskies which has non-assigned leaders controlling information dissemination in the group. Time series analysis uncovered variations in social media usage; overall for all three campaign groups Twitter was utilised more than Facebook. Additionally, it highlighted coordination of Twitter and Facebook within each group and a difference between groups in how they responded to the Davies Commission interim report. The semi-structured interviews allowed for more in-depth investigation into certain key findings highlighted in the other methods. The reasons for the utilisation of social media as an information dissemination platform were outlined and it was highlighted that social media reluctant members prevented the implementation of social media as a means of organising mass protest. The use of social media was seen as a hobby by some and so prevented instantaneous response and interaction with others.

This research recommends that campaign groups should seek to employ a dedicated social media person who controls the publishing of content and can assist in moving their campaigns forward. Campaign groups should also remain active and consistent when preparing for and responding to high-profile events on social media to enable more people to be informed. Also, workshops and training sessions should be introduced which demonstrate the importance of social media to reluctant members of campaign groups.

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Glossary of Terms

Actor

An actor is the name given to a social entity within a social network. It may be an individual or group.

Alter

An alter is the name given, by NodeXL, to an actor.

Betweenness Centrality

Betweenness Centrality determines the extent to which a particular vertex/node lies on the shortest path between another vertex/node in a social network. This measure is able to show how important vertices/nodes are in relation to one another by calculating how information flows through them.

Closeness Centrality

Closeness Centrality is defined as how many steps it takes for a vertex/node to reach all other vertices/nodes in a network. It is basically linked to the distances between people and is related to the information spread within a social network.

Davies Commission

An independent Commission set up by UK Government in 2012, and chaired by Sir Howard Davies, with the remit of recommending ways to increase airport capacity in the South East.

Degree Centrality

Degree Centrality is the measure of how many edges/ties a vertex/node has within a social network.

Density

Density is related to the level of edges/ties amongst vertices/nodes in a social network graph. It aims to measure the extent to which all vertices/nodes are connected to one another.

Direct Action

Direct action has a multitude of meanings and is notoriously difficult to describe. But generally, it is a strategy employed by social movements that includes confrontation and disruption for the means of achieving a particular social or political objective. These actions can be both violent and non-violent.

Edge

An edge is NodeXL's definition of a tie. It is the connection between two vertices/nodes.

Ego

An ego is the vertex/node at the centre of their own network. Typically, ego networks refer to the central vertex/node as the ego and the surrounding vertices/nodes as alters.

Egocentric

An egocentric network is a personal network which comprises alters that are known by the ego.

Eigenvector Centrality

Eigenvector Centrality measures vertices/nodes influence and is based on the connections between alters to determine importance, as having important friends provides a stronger signal of importance.

Facebook

A social media platform launched in 2004 by Mark Zuckerberg.

Node

A node is the definition of an individual point on a social network graph which is a representation of an individual or group.

NodeXL

A social network analysis visualisation tool which possesses the capability to extract social media data.

Page Rank

Page Rank is a variant of Eigenvector Centrality and determines importance. NodeXL utilises this metric in social media networks.

Reachability

Reachability refers to the extent to which an actor is in contact with other actors either directly through its own connections or through those of its neighbours.

Reciprocity

Reciprocity is the idea of mutual exchange of ideas, information and interaction between people.

Social Media

Social media is a group of internet based applications that enable communication amongst individuals and groups.

Social Network

A social network is a network of social interactions and personal relationships.

Tie

A tie is a connection between one or more people/groups.

Twitonomy

Twitonomy is a paid data extraction tool which extracts Twitter data into a Microsoft Excel spreadsheet.

Twitter

A social media platform launched in 2006 by Jack Dorsey, Noah Glass, Biz Stone and Evan Williams.

Vertex

A vertex is NodeXL's definition of a node. Much like an actor, it is representation of people or groups.

Glossary of Acronyms

ANT	-	Actor Network Theory
API	-	Application Programming Interface
ARIMA	-	Autoregressive Integrated Moving Average Model
BACAN	-	British Association for the Control of Aircraft Noise
CCF	-	Cross Correlation Function
DfT	-	Department for Transport
DoT	-	Department of Transport
EF	-	Earth First
EMO	-	Environmental Movement Organisation
ENGO	-	Environmental Non-Governmental Organisation
FoE	-	Friends of the Earth
GJM	-	Global Justice Movement
HACAN	-	Heathrow Association for the Control of Aircraft Noise
ICTs	-	Information Communication Technologies
KACAN	-	Kew Association for the Control of Aircraft Noise
LAANC	-	Local Authorities Aircraft Noise Council
LADACAN	-	Luton and District Association for the Control of Aircraft Noise
LANPA	-	Langley/Nuthampstead Preservation Association
LULU	-	Locally Unwanted Land Use
NGO	-	Non-Governmental Organisation
NIABY	-	Not in Anyone's Back Yard

NIMBY	-	Not in My Back Yard
NoTRAG	-	No Third Runway Action Group
NVDA	-	Non-Violent Direct Action
NWEEHPA	-	North West Essex and East Hertfordshire Preservation Association
POT	-	Political Opportunity Theory
RMT	-	Resource Mobilisation Theory
RSPB	-	Royal Society for the Protection of Birds
SMO	-	Social Movement Organisation
SMT	-	Social Movement Theory
SNA	-	Social Network Analysis
SNS	-	Social Networking Sites
SSE	-	Stop Stansted Expansion
TDA	-	Twyford Down Association
WARA	-	Wing Airport Resistance Association
WWF	-	World Wildlife Fund for Nature
YARA	-	Yardley Airport Resistance Association

Chapter 1

Introduction

Community opposition to the siting of infrastructure developments have often been centred around the environmental effects of construction (Budd, 2007) and operation, as debates surrounding fracking (Jones, 2013; Shankleman, 2014; Randall, 2015), wind farms (Bell et al, 2005; Jones and Eiser, 2010; Valentine, 2014), power stations (Eiser et al, 1995, Venables et al, 2009), new housing developments (Moseley, 2000; Tallon, 2013), road construction (North, 1998; Doherty, 1999; Wall, 1999a), high speed rail (Rootes, 2003; Massey, 2012; Cloke, 2014) and airports (Buchanan, 1981; Griggs et al, 1998; Griggs and Howarth, 2000) have shown. Historically, proposals for improving and increasing airport capacity have been the subject of national political debate (Nulman, 2015).

Citizen protests and mobilisations over the construction, operation and extension of airports is not a new phenomenon (Griggs et al, 1998). The increase in passenger numbers from 10,393 in 1922 to 29,312 in 1929 in the UK (Goldsmith, 2012) led to government concern about the noise impact – ‘not that it might affect people’s health or happiness, but that they might complain about it’ (ibid: 158). This led to ‘civil aviation legislation in the UK protecting aviation from anyone wishing to take an action for nuisance resulting from aircraft noise’ (Johnson 2003: 213). It was during the 1920s and 1930s when individual complaints against airport noise began (Budd et al, 2013). In 1924, Croydon Aerodrome was at the forefront of complaints by local residents regarding noise and low-flying aircraft (Hudson, 1984). In 1930, the Yorkshire Post and Leeds Intelligencer reported that a proportion of residents in neighbourhoods of aerodromes in Yorkshire complained of aircraft noise. By 1958 aircraft noise pollution was such that the British Government imposed noise restrictions on take-off and night flights as well as introducing strict arrival and departure routes (Buchanan, 1981; Budd et al, 2013). The formation of more formalised anti-airport noise groups resulted after the introduction of jet powered aircraft in the UK as air transport movements and noise increased (Buchanan, 1981).

The result of increased noise led to the creation of The Local Authorities Aircraft Noise Council (LAANC) in 1958 which ‘appears to have been the first group in Britain to have raised the problem [of noise] in a systematic and thoughtful way’ (ibid: 88). In 1966, and with the concern of aircraft noise becoming more widespread, a national anti-airport noise group, known as BACAN (British Association for the Control of Aircraft Noise) was formed (Buchanan, 1981; Budd et al, 2013) and ‘under BACAN’s umbrella a number of other local associations were formed including KACAN (Kew Association for the Control of Aircraft Noise) and LADACAN (Luton and District Association for the Control of Aircraft Noise), for example’ (Buchanan 1981: 88). KACAN became HACAN (Heathrow Association for the Control of Aircraft Noise) in the early 1970’s which successfully campaigned for ‘the introduction of alternating use of runways, and changes in night flight quotas’ (ibid: 89). By the late-1980s to early-1990s, UK environmental protest then progressed to incorporate direct action repertoires and this was the major reason for a new cycle of environmental protest (Doherty et al, 2000) in an attempt to broaden the issue of environmental change.

Traditionally, this human dislike of change has been articulated by letter writing, petitioning and leafleting. In recent years, campaigning has become mediated by new information communication technologies (ICTs) which have enabled new forms of protest to emerge. One of the most significant developments has been the introduction and widespread uptake of social media (Tucker et al, 2016).

There are different definitions for the existence of social media (Van Looy, 2015). Kaplan and Haenlein (2010) limit social media to the introduction of Web 2.0, which is a stage in the development of the internet characterised by the change from web pages to more fluid forms of content; specifically social media. A more accurate definition of social media can be found in the work of Code (2013: 39) who states that social media is:

“a group of Internet-based applications that enable communication amongst individuals and groups, the creation and exchange of participative user-generated content, and the expression of individual and collective agency.”

The evolution of social media applications can be traced back, according to Morrison (2015), Allen (2012) and Scholz (2008), to before the creation of Facebook in 2004. In fact, ‘social media has become a ubiquitous part of daily life, the origins of which date to the 1970s’ (Morrison 2015: 1). Social media arguably began with the first chat room “Compuserve” in 1980 before online portals and online news appeared in 1984 (ibid). Blogs began to be

utilised from 1990, wiki technology was created in 1995 and Google launched in 1999 (Allen, 2012). But it was from 2001 when a constant stream of social innovation appeared: starting with Wikipedia, MySpace and Facebook in 2004, Youtube in 2005, Twitter in 2006 and Instagram in 2010 (Morrison, 2015).

Social media has also evolved alongside traditional media channels but there are distinct differences between the two. Traditional media, according to Hausman (2014: 1), relies heavily on a one way interactional paradigm ‘that does not create engagement or work toward promoting word of mouth.’ Social media, on the other hand, is a two way communication system which ‘create[s] word of mouth advertising’ (ibid 2014: 2) and encourages extensive sharing of information to increase the message reach and provide instant communication between people. The goal of social media content, unlike traditional media, is to generate a response from a user (Meckler, 2010). However, Veglis (2014) explains that there is a shift from traditional media to social media in the ways that people are kept informed because social media enables people to network with one another.

Since 2010, social media has become increasingly utilised as a tool in the communication of the environmental movement, with groups using Twitter and Facebook to publicise information, raise awareness and interact with others (Poell, 2013; Earl et al, 2013; Sandoval, 2013) and organise physical protest at various locations; since protest instruction can be disseminated instantaneously and for very little monetary cost.

1.1 The Research Problem

One of the key elements of democracy, according to Diamond and Morlino (2004) is the active element of people to participate in politics and civic life. Campaign groups form when large numbers of people collectively feel strongly about a certain issue (Baggott, 1995) and campaign against certain projects when they feel that they are denied democracy (Goldstone, 2011) or are marginalised from the mainstream population (Shoveller and Nathoo, 2002).

Protest was articulated by letter writing, petitioning and leafleting but the advent of the internet, and more recently social media, has become a very important resource for protesters (Ronzhyn, 2014) and has increased the campaigning opportunities for those organising protest (Cammaerts, 2015). This has led to the rapid proliferation of campaign groups and the

creation of new forms of activism and participatory politics which have been multiplied and transformed (DeLuca et al, 2012). Moreover, there are those existing campaign groups which have been campaigning for a number of years, before social media was seen as a tool to protest and social media's rapid growth has opened up new opportunities (Monshipouri and Mokhtari, 2016) for these existing groups but has also created challenges (Farrington et al, 2014). Thus the incorporation of social media into their existing campaigns and the associated challenges and opportunities will be the problem under investigation in this research. This thesis also responds, in part, to Jensen (2016) who recommends assessing how not-for-profit organisations are incorporating social media into their communicative repertoires.

1.2 Research Aim and Objectives

The aim of this thesis is:

“To explore the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK.”

Five objectives are employed to address this aim:

1. To investigate the role of social media within popular protest.
2. To identify an appropriate theoretical underpinning to the research.
3. To analyse the social media pages of three anti-airport expansion groups.
4. To examine the challenges and opportunities existing groups face when incorporating social media into their campaigns.
5. To make recommendations for practice and areas for future research.

It is important to mention that the research questions are developed out of Social Media and Protest Movements (Chapter 3) and The Theoretical Approach (Chapter 4) and are thus illustrated in Research Design and Methods (Chapter 5 (Figure 5.1)).

1.3 Thesis Structure

Following this introductory chapter, the thesis is structured into nine further chapters:

Chapter Two: Airport Development in the South East and Community Response

This chapter provides the historical context to airport developments in London and the south east and the community responses to it. It also presents the findings of the Davies Commission report.

Chapter Three: Social Media and Protest Movements

The chapter examines the development of the environmental movement and direct action as a means of protest. It also provides a detailed account of the evolution of social media and its use by campaign groups.

Chapter Four: The Theoretical Approach

The theoretical approach utilised as the underpinning to the thesis is introduced. The chapter details origins and historical development of social network theory, discusses how degrees of centrality can be calculated, and presents its applications to social media.

Chapter Five: Research Design and Methods

The chosen research paradigm is discussed and the research questions are presented in this chapter. It also provides a justification for choosing the campaign groups and the methods used in the thesis are described in detail.

Chapter Six: Findings: Social Network Analysis

The findings of the social media data are presented and social network analysis, using Node XL, is used to uncover frequencies of interaction, interaction patterns and positions within each network which determines how social media is used using the centrality measures discussed in Chapter Four.

Chapter Seven: Findings: Time Series Analysis

The chapter discusses the findings of the time series, cross correlation and intervention analysis.

*Chapter Eight: Findings: “What’s depressing about social media is it’s very ephemeral.”
The Views of Social Media by Campaigners*

Semi-structured interviews are derived from the key findings of the other methods to determine the extent of incorporation of social media and the issues arising from it.

Chapter Nine: Social Media and Campaigning – Incorporation, Utilisation and Issues

The chapter details key issues identified in the previous three chapters and how this either confirms or refutes the literature in Chapter Three. It also advances the understanding of the research area through the analysis of the data.

Chapter Ten: Conclusions and Recommendations

This draws together the findings and discussion, uncovers the incorporation of social media into existing campaigns, the challenges and opportunities this brings and highlights key areas for future research. The limitations of the study and the informing of future social media practice are also discussed.

The next chapter relates to the research context and provides the historical context to airport developments in London and the south east and the community responses to them.

Chapter 2

A Background to Airport Development in the South East and Community Response

2.1 Introduction

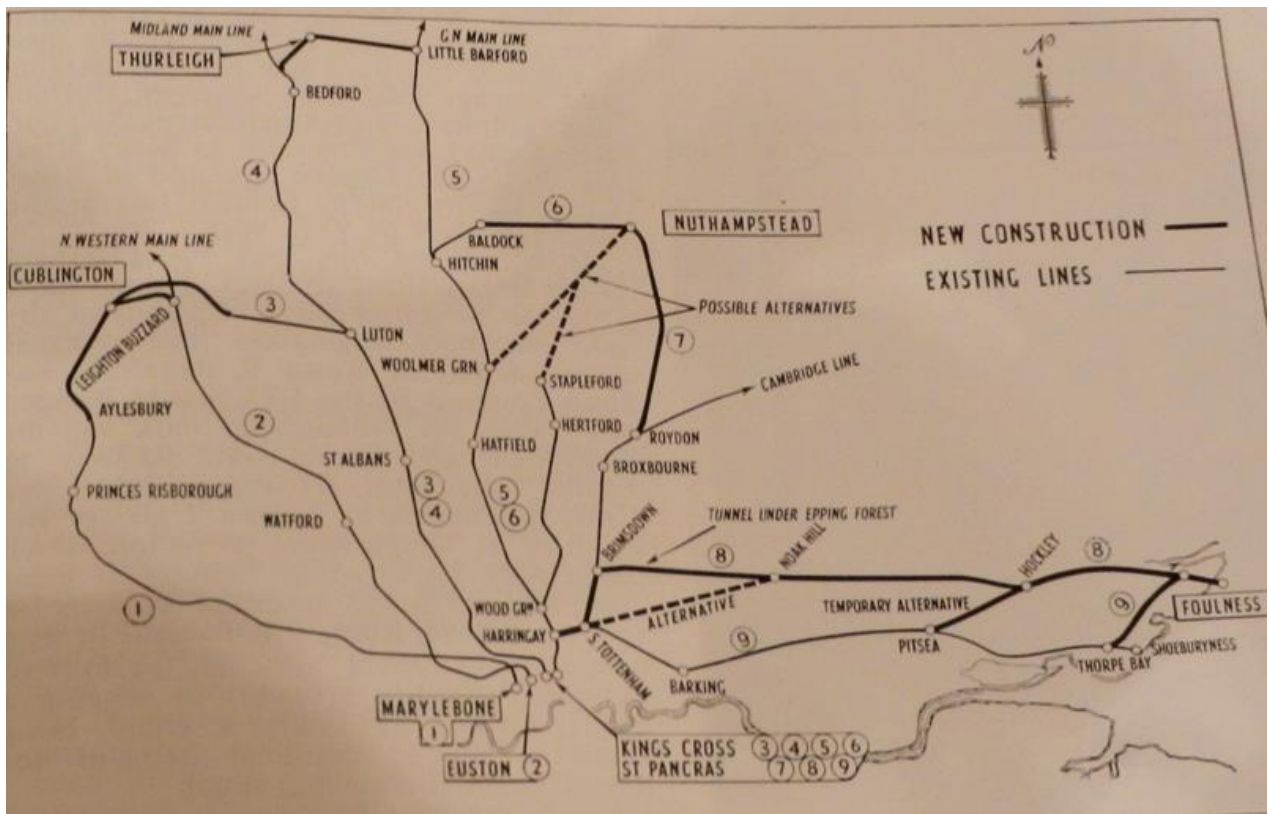
This chapter presents a chronology of selected responses to airport development by community organisations and campaign groups over the past sixty years to contextualise this research and highlight campaigns associated with the anti-airport expansion movement in the south east. The national debate regarding increasing capacity is focused in this region owing to the importance of Heathrow to the UK economy and the high profile protests against it. UK airport protest, since the creation of the first aerodrome in London in the 1920s, appeared as local community responses but increasingly, direct action emerged, in the mid 1990s, to make the campaigns against airport expansion more high profile. Since the creation of Facebook and Twitter some ten years ago, the incorporation of social media into campaigns has been able to empower all campaign groups irrespective of protesting focus (Coxall, 2015). As a result, social media has enabled numerous anti-airport expansion groups, campaigning against the expansion and operation of Heathrow airport, to do new things. Additionally, there are currently, at the time of writing, fourteen campaigns which were created in 2014 or later, with three campaigns active before social media was utilised for widespread protest (which is seen as from the start of the Arab Spring uprisings in 2011 (Tufekci and Wilson, 2012)).

This chapter begins with the resistance to the first major announcement of increasing airport capacity in the form of a third London airport (Section 2.2). Section 2.3 presents the campaign against the expansion of Stansted airport whilst section 2.4 highlights the campaign against the expansion of Heathrow airport. The chapter then explores the implications of the Davies Commission report (Section 2.5) and provides a brief overview of the shortlisted options to increase capacity in the south east. This is important because of its potential in shaping future airport capacity and the high profile opposition the plans engendered.

The next sections provide a chronology of the development of protest repertoires within the airport expansion movement; beginning in the 1970s with local community responses to the Third London Airport decision, the first major post-war Commission implemented to address increasing airport capacity (Goulden and Dingwall, 2012).

2.2 Resistance to the Third London Airport

Croydon opened as the first major aerodrome within London in the 1920s. However it could not handle growing volumes of commercial flights and was constrained by suburban development (Hall, 1980). The closure of Croydon led to the development of London airport (now Heathrow), which was the first major airport in London and began civilian operation in 1946. Passenger numbers quickly increased from 63,000 in 1946 to 796,000 in 1951 (Heathrow, 2015). Shortly afterwards, Gatwick was then designated as London's second airport in 1950 and closed soon after in 1956 to undergo a two year renovation and was reopened in 1958 (Gatwick, 2016). Then, in 1968, a commission was announced on the development of a third London airport chaired by Lord Justice Roskill. It was set up to 'enquire into the timing of the need for a four-runway airport to cater for the growth of traffic at existing airports serving the London area, to consider the various alternative sites, and to recommend which site should be selected' (Helsey and Codd 2014: 23). It was assumed that Stansted would be London's third airport (McKie, 1973) but a campaign against it led to political rebellion. As a result Stansted was not placed on Roskill's shortlist but four other sites including Cublington in Buckinghamshire, Nuthampstead in Hertfordshire, Thurleigh in Bedfordshire and Foulness, a coastal site in Essex were selected (Helsey and Codd, 2014). Figure 2.1 shows a map of the location of all shortlisted sites.



Roskill, 1971

Figure 2.1: Shortlisted sites

In 1971 the final decision was reached; to develop a site at Cublington in Buckinghamshire. This caused widespread resistance from local community groups in the villages around the proposed site. The residents of Stewkley 'very quickly formed an anti-airport committee and were able to organise a march on the very day that the Commission's shortlist was officially published' (Buchanan 1981: 93). Protest committees were quickly set up in other villages and a coalition was formed called the Wing Airport Resistance Association (WARA) which recruited over 65,000 members (ibid).¹ The campaign had a 'carefully nurtured relationship with the press with the aim to publicise Cublington, at least once a week in *The Times*, *The Daily Telegraph* and *The Guardian*' (ibid). Despite Roskill's recommendations, the Conservative Government led by Edward Heath rejected the Cublington site in favour of developing Maplin Sands (Foulness). This was the most expensive option (ibid). However, in 1974, the new Labour Government abandoned the plans due to cost, the need to reduce public spending, high fuel costs and the fact that London's existing runway capacity was more than capable of dealing with increasing passenger numbers until 1990 (Needham, 2014).

¹ Buchanan was a part of the Roskill Commission and disagreed with the report's findings. He consequently produced a minority report which recommended a site at Foulness.

However, on 19th May 1979, 'there came the shock announcement that the Government had six sites under consideration for a third London airport' (Buchanan 1981: 94). The Stansted site appeared on the shortlist after being previously dismissed by the Roskill Commission. The site at Cublington had re-surfaced under the name of Hoggeston and WARA reformed. By June 1978 a public meeting had been held which attracted 3,500 people and fundraising began in the form of donations, sponsored walks, barn dances, coffee mornings and Christmas card sales. By the end of 1978 WARA membership stood at 74,000 (ibid). Yardley Chase was another chosen site; close to the previous site of Thurleigh in Bedfordshire. A public meeting was held on 8 June 1978 and 150 people were present, the outcome was the formation of the Yardley Airport Resistance Association (YARA). A petition of 35,000 signatures was presented to the Prime Minister and when it transpired that the Government was unlikely to recommend Yardley Chase; the campaign dwindled (ibid). The former site at Nuthampstead also re-appeared under the name of Langley; The Nuthampstead Preservation Association was reformed as the Langley/Nuthampstead Preservation Association (LANPA) and 500 people attended a public meeting on 20th June 1979. There was no vigorous campaign but instead the tactic was to 'wait and watch until it became plain that the site was in imminent danger, when the real effort would be made' (ibid: 96).

Stansted was chosen out of the six shortlisted sites for development in 1979. Work commenced on resurfacing the runway in August 1979 which involved the conversion of an existing military base into a completely new site (Woodley, 2011). In 1985 the Government gave its consent for a passenger throughput of up to fifteen million passengers a year (ibid). Stansted opened in 1991 and was initially a white elephant because of its underutilisation, profit loss, the fact that airlines favoured other airports (Pageot, 2013) and concerns, dating back to 1985, that it would not be commercially viable. Starkie (2003: 1) explains that its large-scale expansion was a mistake but the 'project went ahead in spite of the absence of clear market demand for the scale of capacity that was provided for.' It continued to operate and attracted low-cost carriers in the mid 1990s after European deregulation (Nilsson, 2009). Additionally, there was a further significant moment in airport development at the turn of the Century which involved the publication of the Future of Air Transport White Paper in 2003 and ultimately led to two high profile campaigns.

2.3 Stop the Stansted Expansion (SSE) Campaign

The broader environmental and social issues were central to the Future of Air Transport White Paper in 2003 which set out a framework for the future development of airport capacity within the UK until the early 2030's but did not officially authorise any development (DfT, 2003). It also affirmed the Government's belief that Britain's economy was dependent upon air travel for exports, tourism and inward investment and in order to cope with demand airport capacity needed to be increased. During the consultation leading to the 2003 White Paper, and beyond, SSE participated in joint actions with other local campaigns (Griggs and Howarth, 2008). It also endorsed the problems associated with expansion of airports within the south east of England. This was part of the broader, general consensus and reflected contemporary discourse at the time; particularly due to environmental and climate change concern. As a result, SSE 'rejected a narrow localized campaign in favour of a more populist politics that did not seek to displace the development of runways onto other inland sites' (ibid: 134), it did however promote the case for the development of an offshore airport which stood in opposition to the strategies set by Airport Watch who 'rejected increased airport capacity anywhere in the UK in favour of demand management' (ibid). The overall populist ideologies of the leadership of the SSE 'were primarily confined to the delimited sphere of the local communities surrounding Stansted Airport,' as a result wider social and environmental concerns were 'persistently brought back to the confines of the local region' (ibid: 133). The successful judicial review to include the expansion of Gatwick into the consultation process of the 2003 White Paper 'betrayed the dynamics of a particular rather than universal struggle' (ibid: 135). The SSE campaigners successfully argued that a planning agreement in place between the British Airports Association (BAA) and West Sussex County Council, to not expand Gatwick before 2019, could not prohibit the consideration for a new runway (ibid).

When the White Paper was published in 2003, North West Essex and East Hertfordshire Preservation Association (NWEHPA) led a new campaign and linked with Friends of the Earth (FoE) and other environmental groups to launch Stop Stansted Expansion (SSE) (ibid). The campaign was able to call upon various community activists and included 'a former parliamentary commissioner, an emeritus professor of clinical virology and a 'legendary' libel lawyer' (ibid: 131). Within the first few months of the campaign, over two thousand people had attended eight public meetings, had campaigned outside of the Department for Transport (DfT) and produced 26,000 posters, 5,000 car stickers and 1000 t-shirts (SSE, 2002).

However the SSE leadership 'warned against direct action, advocating instead an extensive non-partisan communications and lobbying campaign,' they acknowledged some activists may dig tunnels but they argued that democratic processes were key and would be used until the end of the campaign (Griggs and Howarth, 2008). They accused the Department for Transport (DfT) of 'being overwhelmed by representations from BAA and the aviation industry and having completely ignored the voice of the people' (ibid: 133), which led to a frontier between the local communities and BAA that was characterised as 'a privileged monopoly that exploited its position to employ bullying tactics against local residents' (ibid: 133).

2.4 Heathrow Airport and HACAN Clearskies

The Future of Air Transport White Paper did not just cause protest at Stansted, Heathrow was also proposed for expansion in the form of a third runway and sixth terminal, but concerns were raised over noise and air pollution (DfT, 2003). It was chosen because of its status as a hub airport (which relies upon a large number of transfer passengers to increase destination choice) and its importance to the regional and national economy (it employs in excess of eighty thousand people with over half living within the local vicinity) as approximately three hundred firms (Optimal Economics, 2011) are reliant on Heathrow including hotels, catering and security. Heathrow also provides access to nearly every major city in the world and there is a strong relationship between Heathrow and the financial services industry (Guinness, 2011). However, the publication of the White Paper and the recommendation to expand Heathrow led to a wave of anti-Heathrow expansion protests. HACAN Clearskies created and led campaigns, in various forms, against the operation and proposed expansion of Heathrow airport since the 1970's.

HACAN (Heathrow Association for the Control of Aircraft Noise) initially started campaigning as KACAN (Kew Association for the Control of Aircraft Noise) in the late 1960s. In the early 1970s, it changed its name to HACAN (HACAN, 2006). In 1999 HACAN amalgamated with Clearskies to become HACAN Clearskies. Clearskies chair was John Stewart, a surface transport advisor with an established background in community action and anti-roads campaigning who was previously chair of the anti-roads pressure groups, Alarm London and Alarm UK (Griggs and Howarth, 2004). HACAN opposed the fourth and fifth

terminals at Heathrow. The campaigns were unsuccessful and the failure to prevent terminal five led to the resignation of Dermot Cox (the then chair of HACAN) and the appointment of John Stewart (ibid). John Stewart's background in anti-road and community action brought new ideas into the HACAN Clearskies organisation; including greater community action and media campaigns (ibid). HACAN Clearskies now claims to be the largest voluntary organisation in Europe dedicated to campaign for those who suffer due to aircraft flight paths (HACAN, 2006). Its membership has expanded over time to include other areas within West and South London and twelve community groups have been established that support community action. The following year, in 2000, John Stewart created Airport Watch, the national umbrella organisation which brings together other local airport protest groups as well as national environmental lobbying groups such as CPRE, FoE and Transport 2000 in a coalition to oppose airport expansion. It also campaigns for a demand management approach to aviation and for keeping aviation emissions within strict UK targets (Airport Watch, 2013).

During the protests against the construction of terminal five in the early part of the 21st Century, HACAN Clearskies held together fragile networks of short term interests. The way it did this was through Airport Watch and also the introduction of 'a host of new strategies and tactics designed to mount a global challenge on the entire concept and rationale of airport expansion' (Griggs and Howarth 2004: 190). Both HACAN Clearskies and Airport Watch have 'widened the boundaries of the identity set of those affected by airport expansion; joined up the struggle against expansion to wider social struggles; and made populist appeals to forge a wide social coalition.' The attempted unification and diversification of the campaign has meant that the 'campaign against airport expansion is equally the campaign of others' (ibid: 194).

Moreover, HACAN Clearskies has been shown to engage in a transformative campaign (ibid) by being able to regenerate itself and broaden its constituency as a result of the failure of the Terminal Five campaign and the change in leadership towards a new direction of community action and coalition with other localised protest groups. The Climate Action Camp in 2007 provided an example. This brought together residents and environmental protesters in a field near Heathrow airport with the aim to raise awareness of the contribution of aviation to increasing carbon emissions and to oppose the third runway. 'It thus stands in marked contrast to other airport protests in the United Kingdom where, as in the case of the Campaign Against the Second Runway at Manchester Airport, defeat brought disappointment, failing

mobilisation and ultimately collapse [of the campaign group]' (ibid: 182). This was evident during the protests against the proposed third runway at Heathrow from 2003 - 2010 where HACAN Clearskies linked with other community groups such as NoTRAG (No Third Runway Action Group), direct action campaigns such as Plane Stupid, local authorities, MPs and high profile celebrities (Griggs and Howarth, 2014). Similarly, this coalition between activists, groups and residents led to the climate action camp close to Heathrow airport in 2007 which aimed to raise awareness about climate change and the expansion of Heathrow (ibid). This is a part of a new politics of aviation protest in that 'local anti-airport campaigns have diversified their strategies and coupled flying to issues such as tackling climate change, advancing alternative forms of sustainable transport, challenging the limits of government decision-making, and addressing global justice' (Budd et al 2013: 9), ultimately caused by 'multiple crises facing the aviation industry in the second decade of the 21st Century' (ibid). Additionally, many of the campaign actions, during several years of campaigning, were 'directed toward attracting public attention, first at the local level and then jumping scale to the national level' (Nulman 2015: 132) and there have been developments within the anti-airport expansion movement as groups now reject airport expansion at any site, rather than purely in their own vicinity (Budd et al, 2013). During the Conservative campaign for the general election in 2010, the party attracted younger voters by framing the third runway as an environmental and climate change issue and pledged to make a 'U-turn on the issue' (Nulman 2015: 132) if they were to be elected. Their subsequent victory in May 2010 led to an immediate rejection of a new third runway at Heathrow and highlighted that the well publicised environmental campaign influenced this policy (ibid).

As a result, the media was the primary means to 'attract attention, increase the salience of the issue, and affect public opinion on the third runway,' (ibid: 132). Whilst this well publicised campaign was ultimately framed as "environmental" and "climate change" within media circles, the contemporary campaigns against the Davies Commission reports, both interim and full, has prompted a shift of dissemination and interaction through the realm of new information communication technologies such as Twitter and Facebook. This has enabled campaign groups to take control of their own information networks choosing who they share their campaigns with. The next section details the shortlisted expansion options by the Davies Commission to provide a background to show what is being campaigned against; particularly at Heathrow.

2.5 The Davies Commission

The independent Davies Commission, headed by Sir Howard Davies, a former chairman of the Financial Services Authority, began in November 2012 and was a response to the growing political pressure to expand one of London's airports by recommending an airport capacity expansion option to the Government. Initially an interim report was published on 17th December 2013 which provided the Commission with three recommendations and included two options from Heathrow and one from Gatwick.

The initial option at Heathrow involves the construction of a new runway to the northwest of the existing northern runway at a cost of £17 billion, adding 250,000 flights a year and the creation of 70,000 jobs. The implementation of a new runway, Irvine et al (2015) argues, could increase Heathrow's capacity by up to 57.6%. This option should include banning of night flights between 11.30pm and 06.00am, no increase to current noise levels, compensation, from the airport, to those losing their homes at full market value plus 25% and the proviso that no further expansion would take place (Airports Commission, 2015). There would also be a cost to the local community with 783 homes having to be destroyed (Topham, 2015).

The second option at Heathrow involves lengthening the existing northern runway to accommodate both arriving and departing traffic. This lengthens the northern runway to 3,000 metres. A runway of this length means that it could effectively operate as two runways, independent of one another with a 650 metre safety area in between. It would essentially provide the same capacity as two runways at an operating capacity of 700,000 air transport movements a year through a mixed mode operation (Airports Commission, 2015).

The final option proposes a second runway at Gatwick airport for a new runway to the south of the existing runway with the construction of a new terminal. Both runways would allow for mixed mode operation and increase capacity to 560,000 air transport movements. The restrictive covenant placed upon Gatwick to halt the development of a second runway ceases in 2019. So if the expansion was granted by Government, it could only begin after this date (ibid).

The option currently favoured by the Davies Commission in the final report, published in July 2015, is to construct a new runway to the northwest of the existing northern runway at Heathrow airport. As a result, Topham and Vaughan (2013: 2) suggest that campaigners are

preparing for imminent action and are ‘dusting off the D locks.’ Moreover, since 2014 there has been a significant growth in the number of active anti-Heathrow airport campaigns created by social media, fourteen in total. As a result, the Commission’s recommendations caused widespread discontent amongst anti-airport expansion groups and in October 2015 a mass rally was organised by numerous anti-Heathrow expansion campaigners; primarily through social media channels (Watkinson, 2015). Griggs and Howarth (2014: 300) argue that there are growing interactions between campaigners at Heathrow and those in Europe, particularly at Notre-Dame-des-Landes. This can be explained by the ‘Europeanization of aviation policies’ which is driven by ‘increasing social networking between activists, which is often aided and abetted by the tools of social media.’

2.6 Summary

This chapter provides an understanding of airport development and responses to it. The resistance to the third London airport was the first major Governmental Commission (Roskill Commission) which focused upon airport capacity and the construction of a further airport for London. It also created a network of community responses against airport construction and expansion at the various sites and despite localised attempts, the Government ultimately chose to develop Stansted as London’s third airport, after initially proposing Cublington. The Future of Air Transport White Paper published in 2003 detailed the need to expand six airports in the UK.

Additionally, the White Paper led to further protests at Heathrow airport where expansion was focused on various issues: economics, social displacement, environmental and climate change. Protest became more high-profile under the guidance of HACAN Clearskies and John Stewart in 1999. But there became an increasing link between HACAN Clearskies and other anti-airport expansion groups, under Airport Watch, as new strategies linking airport expansion against a wide variety of issues transformed the campaign in light of defeat (particularly after the Terminal Five campaign). Furthermore, the change in Government in May 2010 provided protest groups with a sense of victory, but only temporarily, as the issue of airport capacity was once again on the political agenda after the announcement of the Davies Commission in 2012. The Commission shortlisted several sites but ultimately favoured the plan for a new runway to the north west of Heathrow.

The publication of the interim report led to an increase in the number of Heathrow related campaign groups created on social media from 2014 and the full report in July 2015 also caused an increase in protest and articulation on social media. This advent of social media has become an important tool for both existing and newer types of campaign groups and is being increasingly used to articulate their campaigns. Whilst this chapter has provided a context to the development of airports in the south east and high profile protests against them, the next chapter will review more in depth literature about the environmental movement (which the anti-airport expansion campaign frames itself alongside). This is important because it shows how protest has developed and increasingly changed overtime, how social media, as a new method to articulate protest, performs an increased role in activism and the issues this brings.

Chapter 3

Social Media and Protest Movements

3.1 Introduction

This chapter places a deeper focus upon the incorporation of social media as a contemporary protesting tool which is important because social media is shaping communication patterns, the speed and quality of information dissemination and enabling campaign groups to take control of their own news broadcasting networks. Social media is seen as a ‘solution to the limitation of the internet in interactive communication’ (Demirhan, 2014a: 6) because of its ability to promote instantaneous two-way dialogue, increase interaction possibilities between groups, individuals and organisations (ibid) and also create new social networks. Additionally social media enables campaign groups to build a presence online ‘without any form of technical knowledge’ (Coxall 2015: 564).

Protest groups in contemporary society are associated with championing and campaigning against social, political, economic and environmental issues (Demirhan, 2014b). Within the last ten years since the advent of Twitter and Facebook, social media has become an important tool for protest movements to communicate, organise and disseminate their campaign. These have created issues surrounding alleged leaderlessness (Bennett and Segerberg, 2012) and unstructured campaigns (Castells, 2012; Earl and Kimport, 2011). This chapter reviews the literature associated with the development of social media and its application within protest campaigns. The purpose of this chapter is to address Objective 1, which is to “investigate the role of social media within popular protest” and ultimately identify the research gap which this thesis seeks to address.

In order to present the wide-ranging literature relating to this subject, this chapter is separated into nine sub-sections. Section 3.2 focuses on the development of the environmental movement, the campaign groups it has created and the direction protest went in with specific reference to Section 3.3, which discusses two transport related campaigns, as an example of direct action. Section 3.4 discusses the rise of social media within activism and what this has

meant for users. Section 3.5 discusses the role of social media and its uses as both an inward and outward means. Section 3.6 explores the creation of new protest spaces developed as a result of the increased use of social media within protest. Section 3.7 highlights the advantages and disadvantages of campaign groups which are created on social media and Section 3.8 compares the organisation and structures of traditional and contemporary campaign groups. Section 3.9 provides summarising remarks to the chapter.

After reviewing the literature it became apparent that there is currently little research which examines both the challenges and opportunities enabled by social media, particularly when it is incorporated into traditional protest campaign repertoires which were created before the advent of social media.

3.2 The Development of the UK Environmental Movement

The environmental movement has become a significant component of environmental politics in most industrialised nations. 'There are around 200 national organisations and between 4 and 5 million members in the UK' (Carter 2007: 144) which have manifested in two distinct waves: the first wave has its origins, according to Rootes (2008), in the conservation and public health campaigns of the nineteenth century. Conservation societies grew with the National Trust and Royal Society for the Protection of Birds (RSPB) among them. But organisations were not just concerned with the preservation of wildlife, a number of organisations, Rootes explains, were established with human well-being and the built environment in mind and as a result, the first national environmental conservation society, The Commons Preservation Society, 'was established in 1865 to protect public access to open land, principally so that an increasingly urbanised population might find recreation in ready access to nature.' (ibid: 33). The second wave, according to Carter (2007), was a modern wave of environmentalism which took place from the 1960's onwards and saw the number of groups and organisations explode in number with Friends of the Earth (FoE) and Greenpeace being the most notable.

This increase in environmental groups was noticed in the 1990's as environmental concerns became incorporated into political agendas and groups began campaigning to raise awareness of anthropogenic climate change and pressure governments into taking action.

3.2.1 Environmental Groups and the Environmental Movement

The Environmental Non-Governmental Organisations (ENGOS), according to Binder and Neumayer (2005), can have a significant indirect impact on environmental quality but they neither have the authority nor the financial capability to restore quality on anything but a local level. However, the strategies used which can have an indirect impact on environmental decision making can take the form of several types of activity:

- Informal, formal and discreet lobbying.
- Collecting and sending letters or petitions from the public.
- Producing scientific research and reports.
- Taking legal action.
- Organising demonstrations/marches.
- Staging media stunts.
- Disseminating information.
- Boycotting consumer goods.
- Engaging in non-violent and violent forms of direct action.

Adapted from Binder and Neumayer (2005: 529)

On the other hand, Cox and Schwarze (2015) explain that environmental groups lack direct channels for proposing their demands to government decision makers and have often utilised these activities (shown above) to attract attention from the media. Nevertheless, the growth in ENGOS has been unprecedented and there is little doubt, according to Carter (2007: 131), 'that environmental groups have been the most effective force for progressive environmental change.' Their campaigning repertoire ultimately focuses on the dissemination of information and the lobbying of politicians and key decision makers (ibid). The explosion in growth has largely been attributed to the increasingly valuable tool the internet has become as it enables greater communication and activism for environmentalists (Pickerill, 2003). It is through the media, according to Binder and Neumayer (2005: 532), 'that ENGO activities make policymakers more aware of public opinion on the environmental issue,' and the information relayed to the public can increase participation in the organisations ethos and can convey its message whilst coalitions are built across geographical borders (Doyle, 2009).

By the mid 1990's, Rawcliffe (1998: 78) notes that many large ENGOS, such as Greenpeace and FoE, appeared to be increasingly motivated by self-interest and 'their activities were

curtailed by increasingly cumbersome budgets, and that they were, in consequence, ignoring grassroots issues and local groups.' Moreover, there are cases where the organisation and coalition of, particularly environmental groups, can ignore grassroots issues. Saunders (2007) highlights the Twyford Down protest camps in 1992 where FoE withdrew from campaigning against the M3 motorway extension when faced with a court injunction. Another example relates to the East London River Crossing Road Campaign in 2001. Conversely, organisations such as Greenpeace, as Eden (2004) suggests, work hard to control their image, operating as a company and marketing itself as a brand. As a result of this Saunders' (2007) findings, through questionnaires and interviews with national and local campaign group members, demonstrate that the larger environmental movement organisations carefully choose which local campaign to affiliate with based upon 'popular and winnable issues' (ibid:744). Her extensive qualitative method approaches found that national EMOs tend to have a stronger affiliation with other national groups with local campaigning groups having stronger ties with other local groups especially where local issues are concerned. Saunders then counter-balances her argument by suggesting that national ENGOs are more likely to provide information to regional and local groups than they are to receive information back from them as a local organisations remit and financial capabilities are small. These findings reject Vettes et al (1993) and Wolsink's (2000) argument that NIMBY style campaigners are only concerned about issues within their vicinity and acknowledges the NIABY effect (Not In Anyone's Back Yard) (Kemp, 1992).

At a similar time, the grassroots environmental movement, according to Carter (2007), was deemed the saviour of the environmental movement and became revitalised in the UK and USA 'very often as a direct response to the perceived failings of the institutionalised mainstream environmental movement.' The term "grassroots" can be indentified into three broad categories:

1. Radical social movements such as Earth First!
2. Small local groups campaigning against a specific locally unwanted land use (LULU)
3. Broad coalitions of groups, such as the UK anti-road protesters, which may contain groups from both the other categories.

Adapted from Carter (2007: 155).

The first category of grassroots environmental movements subsumes 'the most radical strand of the grassroots movement.' (ibid: 155) and many were set up by activists in response to the disillusionment faced with mainstream environmental organisations. The most radical group was Earth First! the founders of which were 'deep ecologists committed to confrontational direct action' (ibid: 155-156) and often used illegal tactics to portray their message (including monkey wrenching² and sabotage). The second category, which most groups fall into (Carter, 2007), are based in a local community and are usually formed by residents as a not in my back yard (NIMBY) response to a locally unwanted land use (LULU), such as a mobile phone mast, a new road or waste incinerator. Typically, these groups rely heavily on voluntary action, subscription and fundraising and some employ indirect action tactics to publicise their case such as lobbying, signing petitions or publicising their case through posters, flyers, banners and the media (ibid). However, conventional methods of protest can prove fruitless prompting 'frustrated and increasingly politicised activists to adopt more confrontational, unconventional tactics, such as demonstrations, sit-ins and blockades' (ibid: 157). The third category refers to the limitations recognised by environmental groups in working in isolation and they have consequently forged relationships with other grassroots groups. The most recognisable example of this is this anti-roads movement which was involved 'in a series of linked struggles against the building of new roads as part of the conservative government's massive construction programme, starting in 1992 with opposition to the M3 motorway extension at Twyford Down' (ibid: 159). The coalition of some 250-300 anti-road protest groups was organised under two umbrella organisations: Road Alert and Alarm UK. (The anti-roads protest will be discussed in section 3.3.2).

The increase in environmental groups in the UK has brought both opportunities and challenges to link with other groups nationally and locally. The next section discusses the interaction patterns of these groups before the introduction of social media, particularly those environmental groups based in the south east of England.

² Monkey wrenching is defined as a means of stopping environmental activity by destroying or damaging the equipment involved in the activity (see Bevington, 2009).

3.2.2 Interaction Patterns of Environmental Campaign Groups

An environmental group's (also known as Environmental Non-Governmental Organisations (ENGO)) relationship with its supporters is imperative as a large proportion of their funds come from public subscription; either via cheque or direct debit. As a result 'national ENGOs may choose to focus on issues or campaigning styles that maximise public sympathy and enhance, or at least protect, their budgets.' (Saunders 2007: 743). This can mean that maintaining a public image can often take priority over the campaigning itself. Similarly, Rawcliffe (1998: 212) notes that many large ENGOs, such as Greenpeace and FoE, appear to be increasingly motivated by 'self-interest and their activities curtailed by increasingly cumbersome budgets, and that they were, in consequence, ignoring grassroots issues and local groups.'

Saunders (2008) suggests that ENGOs have a tendency to affiliate with other national environmental groups ignoring grassroots movements and form collaborative relationships with them. A sentiment shared by Lamb (1996) who explained that in the early 1990's, Friends of the Earth (FoE) upset numerous grassroots activists when faced with an injunction, it withdrew from campaigning at Twyford Down rather than risk collapse within the organisation. FoE further deepened the rift between itself and direct action campaigners when FoE claimed credit for the East London River Crossing road campaign, 'a victory more plausibly claimed by EF! (Earth First!), the Wildlife Trusts and local campaigners' (Saunders 2007: 743). Moreover, Greenpeace was described by Dale (1996: 5) as an organisation which has lost touch with the grassroots and has become 'sluggish and cumbersome' which has decreased its effectiveness; as it has increased in size. Therefore, according to Saunders (2007: 744) 'in their quest to improve their bank balances and public reputation, ENGOs carefully craft a favourable public image and focus upon popular and winnable issues.' This point corroborates Weston (1989) who explained that the two main factors in shaping FoE's decision making on campaign issues are availability of funding and winnability.

Saunders (2007) research on relationships between environmental groups shows that national ENGOs have more links with other national groups than with regional and local groups. Her research also shows that regional groups are brokers and providers of information rather than collaborators with national groups (Saunders, 2008). The information was based on the fact that within collaborative networks 'there are over 50 linked pairs of national organisations, but national group ties with regional and local groups number 17 pairs at most' (ibid: 745).

Her research demonstrates that there is a greater tendency for national groups to collaborate with one another at the expense of working with regional and local organisations. However, national ENGOs are more likely to provide information to regional and local groups than they are to receive information back from them as local organisations' remit and financial capabilities are small (Saunders, 2007), which have previously restricted grassroots movements campaigning (Saunders, 2008). Moreover local campaign groups have strong ties with other localities that are experiencing similar problems and these collectively have a vast knowledge on pressing local issues (ibid). Furthermore, Goodwin and Jasper (2015: 156) explains that social movements, such as these, may be dependent on one another, directed by one organisation but having other 'revolutionary movements.' These may be autonomous, aware of others with little coordination or requirement for them.

Diani and Donati (1999: 22) point out that the 1990's have seen the creation of new participatory protest groups with the proliferation of grassroots organisations which 'testifies to the unease that the growing institutionalisation of major environmental actors has generated in peripheral sectors of the environmental movement.' Similarly, Statham and Szerszinski (1995) explain that national groups such as the WWF and RSPB allow local, grassroots groups to become involved in their national activities and enable them to have a degree of autonomy in their own initiatives whilst Greenpeace limit them to fundraising (Diani and Donati, 1999). Furthermore de-Shalit (2001) states that tension between national and local environmental groups stems from an underestimation of local campaigns and the greater power of national organisations and their ability to influence decision makers. But Rootes (1999: 5) suggests that local groups play a 'discovery role,' promoting the issue to gain national attention and once 'an issue is securely on the national agenda, the baton of protest passes to the bigger battalions of better resourced environmental movements organisations' (ibid). As a result, national environmental groups interact with a network of other national and local environmental groups' offline (ibid). Nevertheless, national environmental organisations such as FoE possess local groups who are well-organised and networked within the local community which actually reduces the reliance on the national group (Saunders, 2007). Saunders (ibid: 746) uses the example of the 'long and sustained campaigns against expansion of Heathrow Airport,' to show the link between organisations and the brokerage role played by Nic Ferriday, an activist of West London's FoE group.

As the environmental movement developed in the mid 1990's and groups began to link their campaigns with similar others, there began a wave of direct action as a result of the increasing influence the internet had on the dissemination of information and mobilisation of people.

3.2.3 The Direct Action Movement

Virginia Woolf, 'one of the most prominent modernist literary figures of the twentieth century,' whilst 'giving a lecture to Cambridge undergraduates' (Coudert 1996: 4), observed that "On or about December 1910 human character changed, relations between masters and servants, husbands and wives, parents and children shifted and when human relations change there is at the same time a change in religion, conduct, politics and literature" (Woolf, 1924). She was writing at a time where there were rapid increases in industrial and social change and previously recognised ideals were being challenged. Just like the Suffragette Movement in the late nineteenth and early twentieth century led to the right for women to vote, which was a factor in the changing of society described by Virginia Woolf, Jordan (2002) argues that since then, a new form of society emerged towards the end of the twentieth century; one that can be possibly dated to the fall of the Berlin Wall.

The Suffragette Movement is probably one of the earliest examples of direct action in twentieth century Britain, sabotage, hunger striking and in some cases violence were the main forms of action used. It is these forms of direct action that are still being used by protesters over one hundred years later. What can be interpreted from Jordan's (2002) argument is that the information age has led to dynamism within the direct action movement since the 1990s. Direct action protests have been more extensive and frequent with the globalisation of the internet allowing direct action groups to disseminate their ideas quickly, cheaply and to a much wider audience than the conventional media (Doherty et al, 2003). Wall (1999b) argues that the time-space compression enabled by globalisation has meant that direct action groups have adopted new technologies for protest which would not have been possible ten or twenty years ago. Lattimer (2000), much like Doherty et al (2003), explains that the internet has become the single most important tool for campaign groups and has brought about revolutionary advances to all aspects of campaigning. This technological age has been hailed as the most significant advancement since the industrial revolution (ibid) with the internet

able to provide different sources of protest for the direct action movement; from online petitions to newsletters.

The term direct action, according to Carter (2005: 1), denotes essentially non-violent methods of 'non-cooperation, obstruction or defiance,' and is quite often used by groups and individuals with no clear political stance. It is seen as a means for people to pressurise governments and/or business corporations - whether multinational or national. The forms of non-violent resistance are powerful acts according to Scalmer (2013) as traditional communicative acts such as demonstrations, petitions and marches have provided noticeable forms of collective action. As well as forms of non-violent resistance, these can also be termed non-violent direct action strategies. The purpose of these acts, Harrison and Dye (2008) argue, is to highlight the existence of injustices.

It is the variations within the non-violent direct action movement which prompted Sharp (1973), in the second book of a three volume series on the politics of non-violent action, to suggest and devise three types of non-violent direct action: 1. non-violent protest and persuasion; 2. non-cooperation and; 3. non-violent intervention. The first form is concerned with letter writing, lobbying and marches with the aim of garnering support. The second form is concerned with strikes and boycotts and the third type is concerned with sit-ins, hunger strikes and the acceptance of imprisonment which can directly interrupt activity. There are numerous examples of Sharp's (1973) first type of non-violent direct action. Burningham (1998) found this within the construction of a new road between Havant and Chichester, after conducting interviews and postal surveys, the findings suggest that the main persuasion tactic used was the lobbying of local MPs in the hope that political channels could be opened. Similarly, Griggs and Howarth (2008) with reference to the Stop Stansted Expansion (SSE) campaign found that the group's chair, Norman Mead, mobilised residents whilst advocating against violent direct action. Griggs and Howarth (2008) reaffirm Sharp's (1973) first form when they demonstrate that the campaign lobbied locally elected representatives in the form of letter writing. Sharp's (1973) third paradigm of non-violent direct action is witnessed in Griggs et al (1998) investigation into the protests behind the second runway at Manchester. Carter (2005: 37) argues that Sharp's (1973) three forms do not 'give enough emphasis to the structural forces that determine human behaviour' and can miss the forms of violent direct action which have brought about change.

Camino de Villa (2008), analysing the resistance against the potential for a new Mexican airport near Mexico City in 2001, found that farmers affected by the proposal formed a social movement despite the government offering compensation over the loss of land. Initially the farmers actions matched Sharp's (1973) first form of non-violent direct action and organised meetings with representatives from the government, however, the protests seemingly bypassed Sharp's (1973) other forms as the farmers organised a further stage of violent direct action whereby members of the police and civil service were kidnapped and held hostage. The governmental judicial process favoured the farmers and the new airport plans were cancelled which 'translated into the victory of the social movement' (ibid: 33).

However, Doherty et al (2000) interpret direct action, with regards to the British environmental movement, as a way in which protesters engage in forms of action not only to change government policy or to shift public opinion through the media, 'but to change environmental conditions around them directly' (ibid: 1). 'Direct action is almost always illegal and involves situations where participants may or may not be prepared to accept arrest' (ibid). Activists are 'quite often engaging in symbolism rather than expecting to achieve their goal immediately. The symbolic and dramatic aspects of direct action are important because they draw public attention to the issues and potentially become part of a wider political debate and political process' (Carter 2005: 3). Symbolic forms of protest such as rallies and marches are designed to make the public aware of certain issues with the aim of garnering support and commitment to a cause.

The 1990s saw substantial changes in the nature of the British environmental movement. Doherty et al (2000) explains that after a decade of professionalism from environmental organisations, the environmental movement suddenly seemed to take a radical turn. The swing in radicalism is seen as a response 'to perceived failures or limitations of the reformist strategies adopted by mainstream groups' (ibid: 1). The direct action movement has been described as 'not merely rejecting parliamentary politics but seeks to repoliticise civil society' (Doherty et al 2003: 669), it is almost a re-democratisation of contemporary society with the aim of giving power back to the communities. It also aims to create 'more, financial or physical' pressure (ibid: 670) on governments' and is not seen as a 'last resort when other methods have failed but the preferred way of doing things' (Wall 1999a: 192).

Earth First! (EF!) UK was one of the first of a new wave of direct action groups. It was created by two students, Jake Burbridge and Jason Torrance in 1991 (Wall 1999b: 82) and its

first campaign was a blockade of Dungeness nuclear power station in coalition with the peace and anti-nuclear power movements. This occurred in December 1991, when 150-200 people attempted to prevent a ship (the M.V. Singa Wilstream), filled with rainforest timber from Sarawak, Borneo, from docking at Tilbury, on the Thames Estuary. Sea Shepherd, the Greenpeace splinter group, supplied the power boats used in this action and some Earth First! members used rubber dinghies to impede the ship's approach to the dock. Other individuals, supported by FoE participated in a demonstration at the docks. The collective actions of the protest groups failed to stop the ship from docking but it was seen as a basis to build upon for non-violent direct action (NVDA) and in generating increased media attention (Doherty et al, 2000; Wall, 1999a; 1999b).

Direct action is seen as a last resort when contemporary measures fail and can garner increased media attention as a result of people's actions in attempting to halt change. But it has also been framed against other campaigns; particularly within the transport movement. The incorporation of direct action tactics have been specifically utilised within campaigns against road and airport expansion.

3.3 The Transport Movement, Direct Action and Climate Change

The transport movement as a particular part of the environmental movement witnessed widespread direct action protest during the 1990s and early 2000s as the Conservative Government announced the 'Roads to Prosperity' programme to develop the UK road network in 1992 and the Labour Government announced its decision to expand Heathrow airport as a result of the Future of Air Transport White Paper in 2003. These expansion projects were two of the most high profile direct action campaigns focused upon by transport campaign groups. Their protests were not just framed against noise pollution and loss of property but against broader issues associated with climate change.

3.3.1 The Twyford Down Association, an Anti-Road Campaign

In 1992, the anti-road campaigns became a dominant part of British environmentalism. Whilst local groups and activists campaigned against the car in general, there was a growing consensus building when the Conservative government in the UK announced its 'Roads to

Prosperity' programme - its plan to deliver major investment to the British road network - that the protest should shift to campaigning against road building. The government's announcement faced heavy criticism from the environmental pressure groups - and Twyford Down was the launching ground for the anti-road protests in the 1990s (Doherty, 1999; Wall, 1999a; Plows, 2006). St. Catherine's or Twyford Down in Hampshire, near the city of Winchester, had been at the centre of controversy regarding the construction of the M3 motorway link since the 1970s when local campaigners disrupted a public inquiry and 'frustrated plans for the M3 link for some years' (Wall 1999a: 65). The second phase of direct action, this time against the construction of the motorway, began before the 1992 General Election. On 18th February 1992, EF! activists along with supporters from the Twyford Down Association (TDA) 'carried out the first direct action on the planned route' (ibid: 66): occupying two Victorian bridges which were due for demolition. According to Wall (1999a), the TDA members distracted the police whilst the EF! activists occupied the bridge. The first anti-road protest camp was established at Twyford by FoE with members chaining themselves across a threatened water meadow but it was soon disbanded as FoE received an injunction from the Department of Transport (DoT) and the fear of paying huge legal costs lead them to consider other methods (ibid: 67-68). The camp was established again in 1992 but the occupants were once again evicted, and by 1993 the camp was re-established once more by six EF! activists. The TDA was dissolved citing reasons of exhausting legal channels and the Friends of Twyford Down was set up by members who felt not enough had been done previously (ibid: 72). The protests continued on a daily basis throughout 1993 costing contractors approximately £2 million. 'In July Tarmac brought an injunction against seventy-six activists, threatening them with imprisonment if they entered the work area and making them liable for the claimed £2 million. This was widely thought to have been aimed at local, often middle-aged, protestors who could be made bankrupt and lose their homes.' (ibid: 72). However, two days after the injunction, 600 activists broke into the site which resulted in several imprisonments and a considerable media presence. Protest dwindled in 1994 and as a result the construction of the M3 motorway still pressed ahead as planned rendering the activists direct action attempts unsuccessful.

The protests received major attention in the media 'and helped to shift the agenda towards criticism of the priority given to roads in transport policy' (Doherty 1999: 276). As stated previously, the occupation of the site at Twyford Down was the first direct action protest against road building and provided a catalyst and spring-board for other direct action

movements to follow. 'Newcastle (1993), Wanstead (1993), Bath (1994), Blackburn (1994-5), Glasgow (1994-5), Leytonstone (1994) in London, Thanet in Kent (1995), Fairmile in Devon (1995-7), Ashton-under-Lyne in Manchester (1995-7) and Newbury in Berkshire (1995-6)' (ibid) were all examples of movements that took place in the shadow of Twyford Down. In all of the campaigns, including Twyford Down, local resident's affiliation, and their assimilation of ideas, with direct action protestors proved vital in the protests longevity and legacy. This is an example of how legal avenues taken by residents coupled with the confrontational approach by direct action protestors, and the campaigning over similar interests, can have beneficial implications in publicising the issue, through the mass media, nationally.

3.3.2 Plane Stupid and the Camp for Climate Action, Anti-Airport Expansion Campaigns

It is only recently that grassroots networks within the UK have specifically focused upon the climate change issue which 'point towards important changes in the environmental, and now climate, movement' (Doyle 2009: 109). The Camp for Climate Change and Plane Stupid are based upon direct action networks such as Earth First! and according to Doyle (2009: 109), they seek to give a greater role to the individual as part of 'a collective action against climate change.' In relation to the climate change agenda, the grassroots movement has emerged as local campaign groups have become embroiled in a debate over the lack of autonomy given to them by their national campaign (Greenpeace, WWF) counterparts. However, what unites each campaign group, national or local, is the way each 'prioritise climate change as their main campaign issue' (ibid). Plane Stupid was founded in 2005 by Joss Garman, Richard George and Graham Thompson and focuses upon the aviation industry as a prime producer of harmful greenhouse gas emissions which cause climate change. It has three aims:

- To end short-haul flights and airport expansion.
- Stop aviation advertising.
- Creation of sustainable jobs and transport.

Adapted from Plane Stupid (2012).

Since its formation, initially to oppose an aviation industry conference in 2005, the direct action group has temporarily disrupted easyJet and BAA's headquarters, disrupted private jets at London City and Edinburgh airports, campaigned on the roofs of the House of Commons and Scottish Parliament (see Figure 3.1), supported the Camp for Climate Change at Heathrow airport in August 2007, worked with local residents to protect their homes from bulldozers and thrown green custard over former Labour spin doctor Peter Mandelson (ibid).



BBC (2008)

Figure 3.1: Plane Stupid protesters on the roof of the House of Commons (2008)

The Plane Stupid network, according to Doyle (2009: 109), is composed of 10 local Plane Stupid groups, other local anti-expansion groups along with two FoE groups. 'Whilst the focus is upon local and national direct action within the UK, the target is the global aviation industry, and the network's online presence extends their campaign message beyond the national context' (ibid).

Similarly, The Camp for Climate Action started in August 2007, when 600 people gathered at the UK's biggest single source of carbon dioxide, Drax coal-fired power station in West

Yorkshire to protest against, and hopefully with the aim to start, a social movement to tackle climate change (Camp for Climate Action, 2009) which was then followed by arguably its most high profile action; a camp metres away from Heathrow airport. Over 2,000 people joined the camp. 'We chose Heathrow as we wanted to help local residents stop Heathrow's owner BAA from building a third runway' (ibid: 1). The camps are intended as 'a platform to inspire individuals to adopt these ways of living in their local communities' (Doyle 2009: 110). Both Plane Stupid and the Camp for Climate Action use forms of direct action but their online activities are 'reserved for activist networking rather than lobbying governments' (ibid: 115). The Camp for Climate Action, Doyle (2009) argues, offers the most radical form of activism, it focuses on empowering individuals whilst stressing the importance of collective action to foster a sustainable society with the aim of taking responsibility in averting climate change (ibid). As Meyer (2007) explains, a coalition is needed of different groups from different sectors which work independently and together in order to build a climate change movement that takes into account political actions but also the ideologies of individuals and collective action. There are also certain environmental cases such as open cast coal mining and airport noise which are 'now being framed in terms of climate change. And we are arguably just at the beginning of this process: in the future, we can inevitably expect more and more cases to be framed using climate change arguments.' (Hilson 2010: 1).

The direct action movement has formed a key part in contemporary British environmentalism. More recently, the collective actions of people have progressed with the incorporation of various protesting tools on social media as these possess the ability for groups to organise themselves and others very quickly with little monetary cost. This has seen groups mobilise forming new repertoires of direct action, whether violent or non-violent.

3.4 The Rise of Social Media in Activism

The rise of the internet, in the 1990's, did not necessarily replace traditional repertoires (Friedland and Rogerson, 2009), but instead provided a forum to avoid barriers to protest. It revolutionised the way in which activists campaigned because 'it could reach more people, more rapidly, and more cheaply than other forms of communication' (Hertzberg 2001: 25). On the other hand, Van Laer and Van Aelst (2010: 1160) describe a 'classical problem' which relates to unequal internet access between members of society. Notwithstanding Earl

and Kimport (2011) who argue that the internet is generating new forms of activism with Castells (2012) contending the internet has become an autonomous space which can lead to the mobilisation of face-to-face networks. More recently, social media, particularly the emergence of Facebook and latterly Twitter, has altered ‘communication via the internet into something much more real time with greater possibility for visual connection’ (Friedland and Rogerson, 2009). It has enabled groups to link together allowing information to flow within and between networks (Gonzalez-Bailon and Wang, 2016), has increased reach and the speed of communication and mobilisation (Poell and Van Dijck, 2015) and can mobilise large numbers of people quickly (Fuchs, 2015). The emergence of these social networks, according to Ahangama (2014) has enhanced communication and the potential for protest.

Since the incorporation of the internet into repertoires of protest there has been a further transformation in the ways in which societies articulate their campaigns against specific issues. This has been associated with an emergence of new information and communication technologies (Garcia et al, 2013). The advent of social media, in particular Twitter and Facebook, enables the expression of societal thoughts and opinions and ‘it is people’s usage of technology – not technology itself – that can change social process’ (Earl and Kimport 2011: 14). This led to the term ‘network society’ (Castells 2004: 3) which is defined as a social structure consisting of networks fuelled by information communication technologies (Garcia et al, 2013). A network is described as a formal structure of actors (Monge and Contractor, 2003) with a social network being a set of actors and the relationships between them (Wasserman and Faust, 1994).

The expansion of social media can be specifically attributed to changes in information availability and the organisation and mobilisation of individuals (Nutter-Smith, 2014). The potential of Twitter and Facebook for protest was initially realised as a result of the Moldovan uprisings in 2009. Despite its failings as a revolution, it drew attention to the use of Twitter and Facebook for mass protest organisation and dissemination (York, 2014). A series of high profile protests, organised on social media, followed beginning with the G20 protests in London, Pittsburgh and Toronto (Poell, 2013; Bennett and Segerberg, 2011) to the Arab Spring opposition to dictatorial regimes in Egypt and Tunisia (Tufekci and Wilson, 2012; Stepanova, 2011). This has constituted to ‘a new phase in the development of alternative communication’ (Poell and Van Dijck 2015: 527).

Twitter in particular, has long been associated with providing a global voice for protestors and campaigners with Theocharis (2012) suggesting its potential for far-reaching transformation both politically and socially enabling people to mobilise and disseminate information quicker (Theocharis et al, 2013). This has been witnessed in the Middle East, particularly in Egypt, where the fall of President Hosni Mubarak was attributed to social media providing sources of information, mostly out of state control thus influencing how individuals made decisions about participating in protests (Tufekci and Wilson, 2012). On the other hand, Shirky (2011: 38), highlights that although authoritarian states have closed down communication networks it can create a 'short term risk of alerting the population at large to political conflict' which was the case when the Bahrainian government banned Google Earth (ibid).

Traditionally, activists have tried to access larger audiences through mass media networks and have typically struggled for 'public visibility by the mass media' (Rucht 2004: 27). Similarly, Cottle (2008: 867) explains that campaign groups, irrespective of size, seek out media attention for the wider dissemination of their campaign and politics, from local to global, is 'informed by the cultural-situatedness of people and their preparedness to engage in protests and demonstrations about concerns and issues that are both close to home and mediated from distant places.' However, the rise of social media has 'unquestionably increased the opportunities for social movements to challenge the monopoly of power held by mass media. It has provided movements with alternative means for mobilization, communication and representation' (McCurdy 2013: 59). It has accelerated participation in public discourse and the vast reach of social media communication means that protest campaigns are able to 'directly communicate with very large publics' (Poell and Van Dijck 2015: 528). Additionally, social media is able to provide instantaneous updates regarding protest events (Papacharissi and de Fatima Oliveira, 2011). This was particularly noticed in the Occupy protests in Toronto as social media networks enabled continuous forms of activism, before, during and after protests (Earl et al, 2013; Poell, 2013). Research by Poell (2013: 8) highlighted that this was because of the different uses between social network sites during the protests. Twitter enhanced and quickly disseminated people's account of the protest, Youtube was primarily a source of material which other people were posting although a few videos received a hundred thousand views and 'can be considered as the most prominent social media reports of the protests.'

The use of Facebook played an important role in the planning stages of protest rather than 'sharing breaking news' (ibid: 10). Non-governmental organisation (NGO) websites provided an out link to the G20 Toronto Facebook page and more than '80% of the websites referenced the Facebook group' (ibid). In addition to this, Mercea (2013) researched the use of Facebook by the Social Movement Organisations (SMOs) of Climate Camp and Occupy and found that the former SMO embraced Facebook as a communicative tool as the overarching message was networked through friends of friends. It also led to the mobilisation of a 'cohort of non-activists previously inaccessible in a similar manner with activist media including emails' (ibid: 1315). The latter SMO used Facebook to upload photographs and incorporated a chat application for comments although in contrast to Climate Camp's use of Facebook, Occupy DH's 'audience had the distinct possibility to have a real-time input in camp affairs' (ibid: 1318). Thus, these Information Communication Technologies (ICTs) are 'changing the ways in which activists communicate, collaborate, and demonstrate,' (Bachmann and Harlow 2014: 727) with Chadwick (2007) suggesting that before social media the internet was regarded as un-dynamic and fragmented. Moreover, even 'sceptics of the potential of ICTs to fundamentally alter power relations in society acknowledge the opportunities for disadvantaged groups to self-represent themselves, communicate independently and organise transnationally' (Cammaerts 2015: 2). This illustrates that social media can be utilised in different ways and for different means.

3.5 The Role of Social Media

The ability to campaign online, as with more traditional protest spaces, 'can be more active or more passive' (Cardoso 2006: 447). This is witnessed by two important and complementary roles of social media within activism which serve as 'both a networking agent and window on the protest space' (Bennett and Segerberg 2013: 95). Cammaerts (2015) separates these into inward and outward roles. Inward actions refer to coordination, networking, internal debate and information exchange and although social media lowers the costs of participation, it 'does not lead to higher overall levels of political participation' (ibid: 5). Furthermore if social media is utilised for informative purposes, face to face trust building is still important. A further function is that inward actions on social media increase the ability for campaign groups to link up with others both nationally and globally, 'potentially leading to movement spill over' (ibid 2015: 5). On the other hand, outward roles facilitate mobilisation and direct

action offline and strategies of recruitment. As with inward actions, lowering the cost of mobilisation is a key feature but also outward roles increase the efficiency of mobilisation and communication, ‘enabling on-the-spot or in-real-time communicative practices’ (ibid 2015: 6).

The following sections discuss the roles of social media in more detail, beginning with the inward role of social media as means of consuming and producing information (Section 3.6.1) and through a coordinated approach to the social media platforms of Twitter and Facebook (Section 3.6.1.1). Section 3.6.2 then discusses the outward actions of mobilisation and direct action.

3.5.1 Social Media as an Inward Action

Social media’s incorporation into protest group’s campaign strategies has not purely taken the form of protest organisation and creation. It has provided protest groups ‘with an opportunity to organize their supporters, connect to more and potentially more diverse individuals and information streams, exchange resources, and create common action strategies’ (Theocharis 2013: 40). Moreover it has also enabled the rapid proliferation of published media articles by individuals and groups as they become citizen journalists (Murthy, 2011). The internet and social media have thus assisted in the ‘speed[ing] up [of] the news cycle, and improved the informational resources available to investigative journalists and investigative citizens alike’ (Howard 2011: 86). This has led to a growing body of research which illustrates social media’s role in a media production approach, disseminating information across social networks. This has largely been born out of, according to Poell and Borra (2011: 705), the mainstream media not providing a balanced account of social protest because of its perception as being illegitimate. Moreover, the reporting of protest by the mainstream media has been ‘extensively criticized for focusing too much on the spectacle and the occasional violence that accompanies protest activities, and for not paying sufficient attention to the reasons for protest’ (ibid).

This has created a ‘microphone for the masses’ as Murthy (2011: 779) states and individuals are now becoming journalists in their own right as they both produce and consume news and are able to take control of their own news networks (ibid). Cox and Pezzullo (2016) term this citizen journalism which plays an important role in producing news stories in order to redraw

the balance between the public and media. Likewise, Gruzd et al (2011) suggest that Twitter's function, in particular, acts as an information neighbourhood although it is unclear, on Twitter in particular, as to how many tweets are read, 'the fact of the matter is that people are sending tweets and consider it to be meaningful to them' (Murthy 2011: 781). Citizens are breaking news stories through Twitter because the traditional media is 'hard-pressed to have people on the ground picking up stories this quickly' (ibid: 783). Moreover, Pelaprat and Brown (2012) suggest that those users on social media sites, such as Twitter and Facebook, seek reciprocal actions to encounter and engage. Therefore having reciprocal relationships with others can increase the likelihood of engagement (see Section 3.4.2). However, whilst it is useful for communicating immediate stories, it does not 'displace the usefulness of traditional news media and length-unrestricted blogs in the realm of new media to cover in-depth of longer-running issues and matters' (Murthy 2011: 784).

Chadwick (2007: 297) suggested that the internet, and more recently social media, is creating 'new opportunities for political organizations to diversify their repertoires.' This has involved greater numbers of people becoming involved in consuming and producing digital content (Chadwick, 2012) and it is 'a reasonable hypothesis that hugely popular social network environments such as Facebook encourage more by-product learning about politics than do static web pages' (ibid: 47). Facebook also acts as a one-way channel of communication to 'transmit their policies and ideas' (Parmelee and Bichard 2013: 205). More specifically, Twitter is playing a major role in the integration of new and old media, by 'reconfiguring intra elite communication among journalists and politicians, as well as occasionally integrating non elite members of the public into news-making assemblages.' (Chadwick 2012: 50). This integration, as Lovejoy and Saxton (2012) explain, enables social media to share information on a large-scale which can often formulate the building blocks for more complex functions; such as mobilisation. Moreover, it has enabled targeted communication by disseminating information to a number of individuals, groups and larger organisations. Targeted communication can 'include efforts to recruit supporters to join an interest group or campaign, raise money and resources, and/or mobilize political action' (Harvey 2014: 860).

More specifically, another aspect of inward action on the role of social media is the coordination and relationship between Twitter and Facebook. Both social media platforms, despite being utilised for different means, are networking agents and are able to complement one another during protest, as the section below illustrates.

3.5.1.1 Coordination and Relationship between Twitter and Facebook

There is growing research into the use of Facebook and Twitter as a coordinated approach for campaigning and both have been extensively used against autocratic regimes. The 2011 student demonstrations in Chile collectively used Facebook and Twitter in their campaign. Valenzuela et al (2014: 2058) examined the relationship between using Twitter and Facebook for the street protests. Their research found that regularly using both Facebook and Twitter ‘increased by approximately 8% to 11% the probability of attending street protests.’ This significantly increased the likelihood of protesting and it is when both platforms are used to complement one another that they are most effective. Similarly, in the Middle East uprisings a combination of Facebook and Twitter were used extensively in the mobilisation of protesters and although revolutions existed long before social media; it still played an important role (Papacharissi & de Fatima Oliveira, 2011; Tufekci & Wilson, 2012). Moreover, Kravets (2011) points out that Twitter and Facebook have aided the Middle East protests as over 80,000 people confirmed via Facebook that they would protest. Its effectiveness led the Egyptian government to try and block access to both Facebook and Twitter.

Additionally the combination of Facebook and Twitter has been used to assess participation rates in Romania and the UK (Mercea, 2012; Theocharis, 2012) and mobilising voters in both North and South America (Bennett and Segerberg, 2012; Harlow and Harp, 2012). Likewise, Tierney (2013: 9) states that campaign groups utilise social media ‘where the free press is limited or non-existent’ as an ‘effective method to organize groups in order to redress political inequalities and injustices.’ Gerbaudo (2012) also supports the position that the relationship between social media platforms harnesses widespread collective action. Using the 15M movement in Spain as an example, Gerbaudo (2012: 100) explains that the protests were characterised by the intense use of Facebook and Twitter. The collaborative nature meant that ‘Facebook pages and Twitter feeds constructed loose collective identities characterised by an appeal to normality aiming to intercept prospective users regardless of their political and cultural affiliations.’ However, Barbera and Metzger (2013) illustrate that although social media was involved in the Ukrainian protests, it was Facebook which was used significantly more than Twitter. Despite the fact that there was a division in the purpose of each social media platform – Facebook creating content for domestic audiences and Twitter for an international audience – the differences arguably helped the mobilisation of at least 300,000 people (Grytsenko and Walker, 2013). Notwithstanding, Bastos et al (2015)

show the causality between Facebook and Twitter communication, during the Occupy movement, as being key to recruit participants and enhance mobilisation.

Nevertheless, there is a school of thought that believes Facebook and Twitter should remain as two separate entities and not be integrated within the protest movement. Lucie-Smith (2015) anecdotally stated that with regards to religion, Facebook can be seen as Catholic and Twitter as Protestant. Although the metaphor could be seen as slight tongue-in-cheek, it has connotations for the differences between Twitter and Facebook. Lucie-Smith (2015: 3) argues that Facebook is far more useful than Twitter as it is based around a network of friends rather than followers – ‘it is this bond of friendship that restrains the worst excesses of Twitter style grandstanding.’ Twitter addresses the crowd whilst Facebook speaks to a community and is more suited to people who want to converse. These networks are demonstrated by a difference in ties; mentioned in Chapter 4. Similarly, the preference for Facebook over Twitter has been researched by Enli and Skogerbo (2013) for the election campaign in Norway and the political uprisings in the Middle East (Preston, 2011).

According to Stepanova (2011: 1) the 2011 Arab Spring protests did not show a collaborative social media campaign for most protesters as it was Facebook which ‘kick started the opposition April 6 Youth Movement and generated tens of thousands of positive responses.’ The Twitter revolutions, often associated with the Middle East protests, are therefore by Stepanova’s (2011) findings, farfetched as the number of Twitter users in Egypt and Tunisia ‘numbered just a few thousand’ (ibid: 4). Preston (2011: 1) furthers Stepanova’s (2011) argument by highlighting that once the Facebook page was created, it became the largest dissident page in Egypt attracting over 473,000 likes and has ‘helped spread the word about the demonstrations.’ Overall, Twitter was simply not as established as Facebook in the Middle East – Facebook usage in Tunisia, for example, grew exponentially from 30,000 in 2008 to 800,000 in 2009 and by the end of 2011 it had reach approximately two million (Rosen, 2011). Even though Youtube and other social media tools played a part, ‘Facebook was on a plane of its own – the GPS for this revolution’ (ibid: 3) – ultimately it was the platform which guided the protests (ibid). Notwithstanding Theocharis (2012: 173) who argued that during the UK student protests, although Facebook played a role in the demonstrations, it was Twitter that ‘acquired more prominence and exposure in the major media outlets.’ Similarly, Beaumont (2009: 2) found that Twitter was the social media tool which played the most important role in the mobilisation of people at the G20 Summit protests in London. It enabled conversation between people a week before the protest and

provided a powerful means to portray what was happening on the day. Twitter's strength is 'in its ability to turn a simple message into a threaded and easy-to-follow conversation' (ibid).

Furthering the information dissemination potential of social media is its second role, outward action, which facilitates mobilisation and communication between people. It also enables protest to be undertaken on the street through the spreading of information and the linking of Twitter and Facebook.

3.5.2 Social Media as an Outward Action

Mobilising people to partake in protest has often been aided by the news coverage of a particular event which is seen as important for the mobilisation and recruitment of new members (Corbett, 2006). These forms of news media include: newspapers, magazines, radio, television and the internet (ibid) and the ways in which news media portray protest can have an effect on the perception of the event as 'most people consider the mass media to be one of the most credible sources of information' (ibid: 215). Additionally, protest 'makes for good news coverage. Protests are flashy, exciting, dangerous, and photogenic' (Boulding 2014: 189) and are able to help bridge the gap between the public and policymakers (Melucci, 1996). Moreover, for democracy to work, 'it is essential that active engaged citizens demand accountability and responsiveness' (Boulding 2014: 189). 'Current thinking is that news media do indeed have effects on people – influencing their awareness, attitudes, and at times even their behaviours' (Corbett 2006: 216). However for grassroots groups, in particular, little is known about their use of news media as they typically utilise underground channels of communication within their own social networks (Gamson and Wolfsfeld, 1993; Anderson, 2001). Although for contemporary protest, social media is having an impact on the mobilisation of people and is able to improve coordination between people (Roth and Di Bella, 2015) by improving information, interaction and communication possibilities (Bennett and Segerberg, 2011). This relationship and the interaction between people and the social networks they possess can be investigated using social network theory which provides the means to assess structures and communication within and between groups of people, or through individuals themselves. Social media exhibits a contemporary way to utilise social network theory as protests and campaigns provide a way for people to join together thus

altering communicative power between people (Lester and Cottle, 2015); something which has not been radically achieved via the internet (Gavin and Marshall, 2011).

Social media has enabled activists, supporters and members of the public to be instantly kept up-to-date (Smith, 2014) and has become a means of reporting real-time event happenings (Davis and Davis, 2012) to a large audience of people (Tierney, 2013). News that would usually receive little attention can be highlighted through social media and followed through to its resolution (Thaler et al, 2012). Twitter and Facebook, in particular, are able to generate international attention and so are of interest to activists when campaigning (Smith, 2014). Similarly, for journalists who were reporting on the revolutions in the Middle East, Beaumont (2011) argues that social media played a role in the uprisings by acting as a medium that carries and shapes messages which led to the revolutions spreading virally across the region. On the other hand it has enabled individuals, in their own right, to instantly report on specific events in time which Murthy (2011) terms as citizen journalists. In fact, the real-time reporting of events satisfies a need for instant information until the issue is able to be covered in more detail by professional journalists (Veglis, 2012). Furthermore, social media as an accessible platform to gather, communicate and interact has created a means to publicise a message whilst concurrently observing the ‘participation of others’ (Tierney 2013: 10). Thus these ubiquitous forms of instant protest communication ‘far outstretch the reporting capabilities of mainstream media and can be of strategic importance to activists’ (Poell and Van Dijck 2015: 530). Conversely, the reporting of such events can lead to a particular focus placed on violence and the spectacle rather than the bigger picture (Poell and Van Dijck, 2015); although activist reporting can not only counterbalance mainstream reporting but highlight other issues which may have been neglected (Poell and Van Dijck, 2015). Nevertheless, Small (2011: 873) explains that because of social media’s means of breaking news in real-time, allowing anyone with access to the internet to break a story and share accounts with others globally, it is a ‘democratic media because it allows for democratic activism.’

It is the combination of global popularity and weak ties³ which ‘creates an opportunity for people to make links that transcend distances and national borders’ (Takhteyev et al 2012: 74). The Iranian, Egyptian and Tunisian protests show that although demonstrations may have been organised and coordinated within regions; the world was informed about these

³ The concept of weak ties will be explained in Chapter 4, Section 4.4.

protests (Rainie and Wellman, 2012). Additionally, what Demirhan (2014a) and Bennett and Segerberg (2012: 286) describe as new information and communication technologies (ICTs), have played a significant role in the development of social and political movements because they provide ‘communication, information, and interaction possibilities.’

These may have been examples of the way social media can lead to political and social change but many unstable states faced political uncertainty which enabled the spread of dissent against oppressive regimes. The freedom of speech which social media allowed, particularly in the case of the Egyptian revolutions, and the fact that the Egyptian government were not reactive, led to it garnering more support amongst the Egyptian people (Shu, 2011). Both El Tantawy (2011) and Kamel (2014) support the position that social media was an invaluable vehicle which contributed to the organisation of the protests that helped to speed-up the mobilisation of people. The real-time, virtually instantaneous protests were due, in part, to the varied role of social media:

‘While Facebook was used to exchange excessive audiovisual content, write-ups and in the formulation of discussion groups; Twitter was used for logistical purposes on where to meet, what to avoid and how to deal with tear gas among other uses’ (Kamel 2014: 3).

It is possible that social media can indirectly bring about political change through increased political participation. The effects of social media are often discussed in terms of anarchistic protest tactics and radicalism but it can have positive effects on political change in terms of increasing political awareness and participation, often transcending social media users. The personalisation of social media has led to the rise of ‘large-scale, rapidly forming political participation aimed at a variety of targets, from more traditional parties or candidates, to direct engagement with corporations, brands, and transnational policy forums’ (Bennett 2012: 21). Moreover and with regards to political participation in the Netherlands, Effing et al (2011) studied Twitter, Facebook, Youtube and Hyves (the largest social network site in the Netherlands) and indicated that although social media did not influence voting behaviour in local elections it increased significantly during national elections. It was due, they point out, to certain politicians having a higher social media engagement strategy – they consequently received more votes than those who did not use social media.

Social media has thus become a voice for activism and provides ‘opportunities for otherwise powerless individuals to coordinate’ their concerns (Powell 2012: 88). This usage to engage societies has many benefits ‘including the strengthening of democracy’ (Musa 2014: 151).

Overall, the accelerated use of social media for uprisings and protest ‘would appear that, currently, participation in social activism has increased as compared to previously used methods’ (Powell 2012: 88). However, despite its increase, Hoffman and Kornweitz (2011) argue that social media has become a new way for people to get involved but is not an incentive for involvement. In other words, social media is a new protesting repertoire but not a condition for protest and has led to new protest spaces being developed.

3.6 The Creation of New Protest Spaces

The notion of space is part of ‘the social structures that protest is influenced by and also shapes’ (Della Porta et al 2013: 27). It also includes repertoires of contention and is ‘integral to the attribution of threats and opportunities’ (Martin and Miller 2003: 145). Della Porta et al (2013) explains that social movements are structured by the space where they develop, and this can sometimes be the site of contention, other times the object itself and ‘usually both the site and the object of contentious politics’ (Auyero 2006: 567). In fact, protest uses and produces space by incorporating both a physical place and a physical expression, for example barricading and petitioning – or as Routledge (1996: 517) explains: ‘it constitutes the geographical ground upon which conflict takes place and its representational space with which to understand and interpret collective action.’ And so a protest space, according to Jin Woo (2009: 107) is often symbolic spaces such as ‘city halls, legislative buildings, politicians’ offices, or public plazas and commercial centers’ and the purpose of this being to connect their issues with a wider audience to garner support. Moreover it also takes into account the means to protest, both offline and online, and it is this which has developed significantly over the past decade.

Traditional offline tactics such as petitioning, leafleting and letter writing possess the potential ‘to facilitate broader, more inclusive forms of participation by increasing the number and types of participation opportunities (e.g. blogs, forums, electronic petitions, public comments), distributing those opportunities across space and time, increasing overall access to information, and linking individuals and groups’ (Minion and Kinsella 2009: 260). But the rise of new information communication technologies (ICTs) has additionally provided the ‘capacity for a newly available democratic space for participation and production and hence, by association, the dispersing of power’ (Johnston 2016: 82). These

online spaces have been added to existing ones on the ground (ibid) and users who use social networking sites become imprinted into local and global spaces with their thoughts and ideas shifting as ‘they continuously engage in the digital dialectical communication with people from different cultural, economic, and political backgrounds’ (Limbu 2014: 141).

On the other hand, as Tierney (2013: 85) argues, whilst social media is potentially open and accessible to everyone, ‘social media sites require registration, thereby limiting conversation to fellow members’ and there are those individuals who do not use social media for reasons including reluctance, lack of internet connection or not being able to understand how it works (Lipschultz, 2015) and so they rely upon other online and offline repertoires to receive information. Nevertheless, social media has formulated a new model of protest which is based upon communication within a virtual online space and a spatial model of mass demonstrations offline (Al Sayyad and Guvenc, 2013). It is this model where online involvement can shape offline events to amplify their message (Skoric et al, 2011; Enjolras et al, 2013; Fuchs, 2015; Steinert-Threlkeld et al, 2015) but social media cannot be viewed as being a communication tool in isolation as there are other means available to campaigners (Della Porta, 2013). Put simply, social media as a protest space is part of a broader protesting environment, contributing something to existing, more traditional repertoires. So, whilst it has created a further space for people to interact and share information with others online, campaign groups typically still possess offline methods such as leafleting, flyering and letter writing in their repertoires; particularly those campaigns created before the internet age. Therefore, content should not just be created for social media platforms (Albarran, 2016) but also repackaged and disseminated to an audience which may exist offline (Harvey, 2014). The extent to which groups link their offline and online platforms is important as it also aids the mobilisation of people in offline spaces, as the section below discusses.

3.6.1 Integration between Offline and Online Protest Spaces

The link between offline and online repertoires is a growing body of research providing findings that one cannot exist without the other and the importance of integration for wider campaign dissemination by reaching different audiences (Bachmann, 2014). More recently, the use of the internet and particularly social media as tools for activism have shifted ‘to a strategy of combining offline and online activism, especially when focussing on a campaign that they perceive as crucially important’ (Rucht 2013: 261). Moreover, Van Laer and Van

Aelst (2010: 1148) distinguish between the more traditional and newer forms of collective action by categorising them as 'internet based' and 'internet supported.' Internet based only exists because of the internet and internet supported refers to traditional forms of communication that have 'become easier to organize and coordinate' due to the internet. Although Van Laer and Van Aelst (2010: 1164) contend that digital activism will not, 'and probably never will, be able to replace traditional forms of activism and face-to-face communication.' Similarly, Bachmann (2014: 728) suggests that activism does not have to separately remain either offline or online instead, 'the more individuals engage in offline activities, the more likely they are to also participate in online activities.' This ultimately casts doubt 'on the assumption that online actions are less valuable' (ibid: 728). On the contrary, Harlow and Harp (2012: 204 - 205) point out the differences between online and offline approaches to activism. Online repertoires encompass the internet and all forms of social networking sites (SNS) such as Twitter, Facebook and Youtube whereas offline activism refers to 'signing a petition, participating in a rally/demonstration, participating in civil disobedience, attending a community meeting or, contacting a public official.' Their findings support the position that digital tools are enhancing traditional offline tactics and social media tools such as Facebook and Twitter 'are becoming institutionalized as useful tactics in activists' digital repertoire' (ibid: 210). Moreover, Harlow (2011: 238) provides evidence, in the form of a Guatemalan justice movement, to argue that the online mobilisation of a Facebook page helped to 'create a sense of community which moved offline to the streets of Guatemala.' Harlow's (2011: 238) findings show that Facebook was used to post comments and 'mobilize the online and offline movement, organize protests, showcase photos of protests, and actively show their support for the movement.' This illustrates the link between online and offline activism.

On the other hand, Della Porta and Mosca (2009) analysed the use of websites (261) of the Global Justice Movement (GJM) and demonstrate a clear distinction between offline and online activism. The websites are used to spread information, mobilise offline and increase transparency whereas the internet's use for mobilising online is limited. 'This is quite a surprising result, as we expected Social Movement Organisations (SMOs) to be more concerned with using their websites to reduce inequalities among users and engaging them in online mobilizations' (ibid: 786). Additionally, Van Laer (2010: 347) researched nine different protest demonstrations in Belgium and like Della Porta and Mosca (2009) there is a significant difference in online and offline activists in terms of 'socio-demographic and

political backgrounds, formal network and organizational embeddedness, and to some extent motivational aspects;’ with online activists less likely to protest alone. Similarly, the internet ‘seems to be used by people who are linked or even strongly linked to an organization’ (ibid: 358). Therefore, Van Laer (2010: 359) suggests that the internet is not used by organisations to connect with people outside of the organisation. In other words, online activism stays within the boundaries of “online,” whilst activists who take to the streets using informal (offline) tactics are ‘less likely to have learned about the upcoming demonstration via the Internet.’ Moreover, Juris (2012) states that the wave of social media has not replaced traditional forms of mobilisation but rather helped to diffuse new ideas into activism.

Conversely, Vissers et al (2012) preliminarily discuss how social media is not yet properly understood regarding how effective it is for mobilisation. In order to address this research problem they undertook a study in Belgium conducting experiments over four months on one hundred and nine participants. Some were exposed to face to face information and others to internet information. Their findings support the position that mobilisation is medium specific in that face to face mobilisation does not affect online participation and internet mobilisation did not shape offline participation - suggesting that both online and offline mobilisations are separate entities. On the contrary, according to Campbell and Kwak (2011), the internet and social media plays a vital role in political discourse and enables online participation to be moved offline. Also, discussion online is complemented by other sources of information. Additionally, the ‘evidence is now clear that the online political participation leads to more participation offline, particularly as the modern distinctions between online and offline communication has become increasingly blurred’ (Barry 2016: 40). This is demonstrated by UK Uncut, a grassroots movement highlighting alternatives to austerity, which ‘blurred’ (Olcese 2015: 279) their preference between offline and online forms of activism. Social media was used to ‘inform the network of supporters about offline and online actions, to allow ideas of offline actions to emerge and be discussed, to collect feedback about online and offline actions, and to widen the debate by gaining coverage in traditional media’ (ibid). This notion is further supported by Kavada (2010: 102) who states that although offline social movements can have a complicated 'relationship with digital technologies,' they can use online tools for a variety of reasons including 'mobilization, coordination, and community building' (ibid). Overall, these new protest spaces enabled by social media create new communication opportunities and the potential for users to interact with many others, affecting social relationships. The sociological concept of reciprocity is becoming an

important part of mutual exchange between people on social media (Pelaprat and Brown, 2012). The next section discusses this social behaviour in relation to new protest spaces on social media.

3.6.2 The Concept of Reciprocity

Pelaprat and Brown (2012) explain that reciprocity, in the form of social interaction, is important in understanding online social behaviour with Twitter providing ways for users to seek reciprocal actions to engage with. Similarly, high reciprocity between users on Twitter has been measured in Java et al (2007). These reciprocal actions are typically measured by assessing following and followed (follower) relationships. Pelaprat and Brown (2012) also suggest that the popularity of both Twitter and Facebook has meant that people tweet and post to call for a response that seeks reciprocity and people seek reciprocal actions to encounter and engage. Furthermore, Bhargava (2012) explains that reciprocity is an important social behavioural principle which drives what people do and when asymmetry is present it can lead to feelings of discontent and selfishness.

On the other hand, Hansen et al (2011: 36) contend that whilst Twitter may exhibit reciprocity between some users, the information diffusion between them through mentions, retweets and replies 'tends to expand far beyond the circle of reciprocity, and proliferate among followers with whom no reciprocal relations are entertained' and there 'is no technical requirement for reciprocity' (Soboleva et al 2015: 2). Whilst Kwak et al (2010) suggests that those users who demonstrate reciprocity tend to be geographically close, Xiong et al (2011: 141) highlights low reciprocity levels on Twitter due to the fact that 'top users with large number of followers in Twitter are mostly celebrities and mass media, but most of them do not follow their followers back.' Therefore, in terms of friendship, Facebook exhibits more reciprocal ties because users have to accept friend requests whilst Twitter demonstrates the potential for more asymmetry because user A can follow user B but user B does not have to follow user A back (Kwak et al, 2010).

Although, Lomborg (2014: 109) argues that reciprocity is important on Twitter, in particular, as it 'identifies norms of mutuality and reciprocation of interest as being pivotal to the interactional patterns and practices characteristic of the genre.' So, mutual interests are important for interactional purposes and encourage interaction between people. This means

that by ‘reciprocating attention, participants in the cluster recognize each other’s membership, and reinforce symmetrical relations as normative within the cluster’ (ibid). However, reciprocity may occur less in a total mass of followers and more in a network of relevant others, rather than occurring mostly in geographically close users, as Kwak et al (2010) suggests. Despite this, Huberman et al (2009) found that despite users following and being followed by large numbers of others, their interactive engagement is limited to a few users and built on reciprocal attention. As a result, Twitter exhibits reciprocity through interactions such as mentions, retweets and replies which seem to form a small part of an individual’s total network (Lomborg, 2014). But overall, these new protest spaces have created an extensive network of newer, contemporary campaign groups.

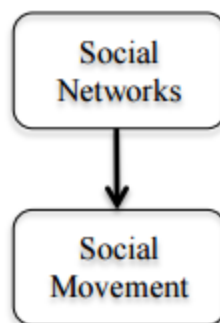
3.7 Campaign Groups and Social Media

The rapid growth of social network sites has enabled people to connect with each other more easily and interact with much larger audiences. As a result, the numbers of campaign groups have increased since social media began to be recognised as a protesting repertoire and it has been able to provide them with an asserting voice against development projects (Theaker, 2011). However debates have continued regarding whether the advent of new information communication technologies creates positive or negative issues with regards to social interaction (Totterdell et al, 2008).

3.7.1 Benefits of Social Media

The connection and interaction between people, that social media provides, have altered the protesting landscape by allowing individuals to link with others on a much larger scale (Shirky, 2011). Similarly, according to Tsatsou (2016), the democratising potential of social media allows decision-makers to get closer to individuals and creates a more level playing field through ‘opening the gates’ (ibid: 95) to smaller groups. Additionally, it has also enabled campaign groups to connect with groups, with connections being made both nationally and globally, transcending and globalising communication flows. Lopes (2014) explains that Twitter and Facebook are able to reach millions of people from across the world as events are happening and this mobilising potential is a lot quicker than through traditional

media outlets. This ability to connect is partly due to the globalisation of social media and the facilitation of weak ties between people (Gladwell, 2010). These are the strength of relationships between people and are defined as an individual's acquaintances where limited interaction takes place. As a result, social networks, particularly on social media, are constructed of many weak ties providing a source of information (Granovetter, 1973). Moreover, they are able to link different communities of people together from across the world. However, as Gladwell (2010) argues, whilst weak ties are beneficial in spreading information through and between social networks on social media, they are only beneficial for increasing participation and lessen the level of motivation. In other words, social media, through weak ties, can increase people's participation in action but it is the strong ties between people (in the form of friends, family, those interacted with most) that helps people to persevere. For Gladwell, social movement's offline need to be built on strong ties between people. Notwithstanding Swain (2010) who argues that tie strength possesses different roles on various social levels. On the macro level, within larger social networks, weak ties matter because of the information flows between users and on a micro level stronger ties are important because of closer friendship ties. The study of weak ties is a branch of social network theory and used to analyse the inner workings of social networks (Figure 3.2).



Adapted from Lopes (2014)

Figure 3.2: Social Networks and Social Movement

Social networks enabled by social media have the ability to cause social movements (Lopes, 2014). But weak ties are related to the characteristics of social networks (Sousa, 2012) and are the precursor to mobilisation within social movements. On the other hand, that is not to

suggest that all weak ties within social networks lead to mobilisation. Instead weak ties can be used to share common interest, inform people about causes, disseminate information, articulate dislike and raise awareness (Preece and Maloney-Krichmar, 2003).

In addition to providing a platform to voice concerns, 'social media offer great potential for mobilising people for participation in social movements' (Kumar 2016: 261). Bauer (2015) explains that mobilisation and activism shaped by the internet and more recently social media, is increasing. 'With over two billion users worldwide (2010), the internet has become a large transport infrastructure like the open seas, which has the potential to mobilise people, if they ever perceive their space at risk' (ibid: 129). The internet and social media have not altered the fact that mobilisation occurs, but has altered that 'individuals play by a different set of rules' (Lopes 2014: 10). A point contended by Bennett and Segerberg (2012: 14) who suggest that 'the widespread adoption of digital media may be shifting the burden of mobilization from organizations to individuals.' But social media has also empowered individuals, amplified their voices and makes it easier for people to mobilise their social networks (Bridger, 2009). It has been particularly used as a political tool to protest against autocratic regimes and governmental policy (Chan and Lee, 2015; Martens-Edwards, 2015; Poell, 2015; Poell and Van Dijck, 2015; Mekouar, 2016). Although, during the Occupy protests in 2011, which took place in over 80 cities worldwide mobilising millions of people against social and economic inequality, Fuchs (2015) explains that activists utilise a multiple media approach to mobilisation and communication which includes phones, email, face-to-face as well as Twitter and Facebook . Mobilisation 'in face-to-face communication tends to positively influence other forms of mobilisation communication such as social media use for spreading the word about protest events' (ibid: 354). Fuchs concluded that activists used both offline and online repertoires, digital and non-digital and their activities created 'occupied squares as public spheres and that organised themselves and voice political demands offline and online and as a combination of both' (ibid).

Social media is also used to quickly disseminate a message which is another of its benefits. Eltantawy and Wiest (2011) explain that this speed and interactivity was previously lacking in traditional types of mobilisation which generally included leafleting, posters and faxes. On the other hand, Nissen (2015) explains that whilst one of the advantages of social media is its speed in spreading information, it is difficult to monitor and track all connections, content and behaviour in a network. Conversely, White et al (2013: 425) explain that the speed of social media is a given, and is particularly of great importance to those users playing a game

of ‘cat and mouse with the authorities.’ Similarly, during the Arab Spring movement which saw countries in North Africa topple their respective governments, social media, particularly Twitter and Facebook, provided rapid organisation not only to unite the protesters but they also demonstrated the ‘means for disseminating important safety information during the mobilizations, such as the counter-actions of police, and served as an outlet for seeking help when in danger, reducing response times and increasing personal safety’ (Smith 2014: 77). Likewise, the Against Corruption Together movement in India in 2011 saw the speed of social media for information dissemination become a key asset. After launching a campaign online, through the internet and social media, the ‘number of voters increased from 0.4 million to 1.2 million in just three days with almost 14,000 votes being added every hour’ (Kumar 2016: 266).

3.7.2 Limitations of Social Media

Social media is often put on a pedestal by protesters and campaign groups but it is ‘neither a panacea for the world’s problems nor a substitute for real-world activism’ (O’Connor 2012: 242) and it is not the only form of communication being utilised in struggles either. In fact, Grossman (2009: 1) argues that Twitter’s communication strengths may also be its weaknesses. Whilst Twitter may be efficient in spreading information virtually instantaneously across the world; it is often chaotic and subjective. Moreover, because information can come from anyone, it is ‘totally unverifiable’ (ibid). Similarly, Shearlaw (2016: 1) contends that certainly for the protests against the autocratic government in Egypt, the uprisings did not happen because of social media. Instead ‘the platforms provided opportunities for organisation and protest that traditional methods couldn’t’ (ibid). Despite social media being of good use to the protesters, ‘it is not an alternative for physical expressions of freedoms in the public space’ (ibid: 2) and as the spirit of change in Egypt proved infectious for other North African countries, Facebook and Twitter should ‘first and foremost be regarded as instruments of communication and not as a genuine driving force of protest’ (Wank and Winter 2003: 223). Simply put, they facilitate the operation of movements rather than completely shape them. However, what social media has done is create opportunities for the formation of newer, more contemporary protest groups and helped to mobilise large numbers of individuals who recruit based on ‘personal contacts and online social networks’ (Anduiza et al 2014: 750). Nevertheless, Cuconato and Waechter

(2012) provide a further example of youth political participation in Europe and North Africa and how young people utilise social media to rebel against certain regimes. Once again, and as with many social movements, social media was ‘just a tool and not the driving force – the driving force is the youth being fed up with their life circumstances and the governments responsible for these circumstances’ (ibid: 152).

Additionally, social media networks are often not as deep as more traditional networks meaning they do not provide foundations for movements because of their instantaneous nature and speed of mobilisation (Gladwell, 2010). Similarly, Martens-Edwards (2015) explain that social media does not provide a deep level of conversation when mobilising around a particular issue. It enables organisation to an extent but it is not a deep level of organisation. Lovink (2016: 80) also suggests that revolts on social media often travel ‘at the speed of light’ through social networks, however these quick interactions ‘do not consolidate into long-lasting action’ (ibid). This is because social media is argued not to produce ‘sufficient social capital and deep community ties necessary for sustained social movement activism’ (Smith 2014: 72). Also, the replacement of face-to-face, real world communication can reduce ‘the solidarity and consensus building that is critical to social movements’ (Dewey et al 2012: 10). These forms of low cost activism enable flexible networks that people can easily opt in and out of and as a result do not produce deep political activism ‘needed to achieve social change’ (Land et al 2012: 16). Rather a combination of strong and weak ties online and strong ties offline ‘may help provide both broad mobilization and deep participation’ (ibid).

The problem with many campaign groups, according to Klemanski et al (2016), particularly when operating social media pages is that only a select few individuals may be involved in the dissemination of the social media profiles. Social media communication is a part of a broader campaign strategy which can include ‘walking door to door [and dropping literature], making telephone calls, working at campaign headquarters (e.g. working with computer lists, sending press releases, organizing fund-raisers), managing Internet (and social media) communications, recruiting volunteers and helping organize and participate in events’ (ibid: 80). Moreover, recruiting enough volunteers, particularly where a campaign is specialist, to assist within a campaign group can also be a problem. Wollenberg (2008) suggests that the perception of volunteering being ‘geeky’ has turned potential recruits away from helping causes they may be otherwise interested in.

The ephemeral nature of social media can be viewed as both an advantage and disadvantage. Chin (2014) explains that ephemeral social networks are those small social networks where interaction takes place during a specific activity at a specific event or location. The connections are often spontaneous and temporary. Kilduff and Tsai (2003) suggest that ephemerality is seen in weak ties between users, as networks are in a constant state of flux, adapting to different situations and events and they can only be considered 'as weak ties by being ephemeral' (Muller 2006: 85). Additionally, ephemeral social networks, Chin (2014: 28) argues, can bridge the gap between offline and online, as they 'provide a permanent trace of your activities, who you met, and any social interactions, from which you can then interact with those people offline after the event.' However, ephemeral social networks prevent strong and close relationships between users being built as they are often more fleeting (Chayko, 2016). A further problem is social media's instantaneous nature and the fact that social media profiles are ephemeral. This means that much information is in the moment and may be irrelevant tomorrow (Solomon, 2011).

3.8 Traditional and Contemporary Campaign Groups

Campaign groups, causes and movements which involve focus on a single issue can be termed protest politics, protest groups or protest movements (Lowes, 2006). Such 'movements are characterized by a focus on the tactic of protest, in the hope that a groundswell of support and public opinion will help realize their goal' (ibid: 197). Global activism has its roots in traditional forms of protest with traditional campaign groups utilising traditional forms of non-violent direct action through demonstrations, boycotts, petitions (Diaz-Romero, 2014), street marches, sit-ins as well as barricading (Shepard, 2011). Although during the 1990's repertoires of direct action began to take the form of illegal non-violent direct action such as obstruction and disruption (Coxall, 2013). More recently, the advent of social media has led to a new form of protest (Dagi, 2016), the creation of newer campaign groups (Diaz-Romero, 2014) and has reinvented social activism (Gladwell, 2010). Campaign groups now possess the ability, through social media, to mobilise quicker, disseminate information to a larger audience and reduce coordination costs (Diaz-Romero, 2014). Social media has not just increased the number of campaign groups but it has increased the opportunity for groups to protest (Kostiuchenko, 2014), providing they have access to the internet (Lopes, 2014). Additionally, Heywood (2015) explains that the

incorporation of new media has strengthened campaign groups in a number of ways such as: 1) Demonstrations becoming easier to organise and more effective helping to generate a generation of non-hierarchical and decentralised groups and 2) different organisation of traditional and contemporary campaign groups, possessing different group structures which is explained in the next section.

3.8.1 Organisation of Campaign Groups

Social media has become crucial in providing new information about protest and increasingly, large numbers of people learn about contemporary protest through social media (Dagaev et al, 2015). This also brings with it new forms of single and multi-issue campaign groups who campaign for various causes and as such there are different structures which exist within them ranging from one man activists through anarchistic groups who are loosely bound together to one-off single issue campaign groups to traditional, well-funded non-governmental organisations (NGOs). They can also vary in scale from local, grassroots campaigns to ones with a regional or national focus campaigning for days, months or even years at a time (Coxall, 2015). The organisation of campaign groups can have a significant effect on ‘social ties and identities that participants create in the course of engagement’ (Corrigall-Brown 2012: 62).

For more traditional campaign groups, their organisation and structure is primarily based around a hierarchical system (Coxall, 2015), although degrees of hierarchy vary from very hierarchical to very egalitarian (Corrigall-Brown, 2012). Steers (1977) found that in larger, more hierarchical organisations, individuals were less likely to participate over time and in smaller/less hierarchical groups, they would have more of an impact. On the other hand, Tilly (1978) emphasised the importance of an organisational structure whilst Gamson (1990) found that those groups with a centralised, unified organisation were more successful than those who did not. Large NGOs typically have a very formal structure based upon appointed or elected directors who have responsibility for different areas of the group’s activities. These structures ‘are best suited to permanent NGOs with a formal legal status, employing large numbers of full-time staff and volunteers. For many small, single-issue protest groups such a structure is much too top heavy and inflexible’ (Coxall 2015: 314). Similarly, intense interaction within protest groups does not typically occur within hierarchical organisations (ibid), instead those less hierarchical groups ‘with high levels of interaction tend to create

bonds of solidarity by enmeshing members in a set of overlapping and interlocking relationships' (ibid: 63). These groups tend to take the form of a team structured approach (Coxall, 2015) whereby the organisational model is based on a management approach. 'A management team acts as facilitators to the group to make suggestions and to execute the decisions of the group' (ibid: 315). These groups have regular structured meetings with their membership base to vote on objectives, strategies and plans. The management board then coordinates the implementation of these actions. A team structure such as this 'works well in volunteer-based protest groups where individuals may have to manage several different tasks or areas of responsibility' (ibid: 316).

With regards to campaign groups on social media, Anderson (2014) acknowledges that there are considerable differences in their structural formation. 'Some are more formal and hierarchical than others, whereas others are more informal with loose, fluid formations. Also they shift over time and employ different organisational repertoires at different points' (ibid: 33). White (2013) furthers this by explaining that digital media is the twenty first century town square, a place where environmental organisations can get their message out and voice their opinion. He also contends that 'digital campaigning is not going to cause revolutionary change. A tweet is not going to influence the wavering or uninterested citizen. The bonds of Facebook are not so strong that a like or shared infographic will cause someone to stop denying climate change' (ibid: 2). Instead what this shows is that online activity can lead to offline mobilisation as previously the 'main barrier to becoming an activist was knowledge' (ibid) and social media has the ability to provide knowledge on large scales.

Technological change has also 'attracted most attention of late, as it has influenced the organizational structure of social movements as well as their tactics' (Della Porta and Diani 2006: 155). Della Porta and Diani contend that campaign groups and organisations were required to be highly organised in distributing their message before the internet but now, a 'lightweight one' (ibid) is able to attract attention. However, for larger environmental organisations such as Greenpeace, new communicative tools have simply expanded their capacity to act and in some cases they have brought about a coalition of activists with looser organisational structures (ibid) which offer short-term engagement, are characterised by multiple identities and help inform groups (Della Porta, 2015). The contemporary nature of online protest has now been incorporated into the realms of social media because of its ability to reach wider audiences and possessing lower associated costs than more traditional methods

(Hara and Huang, 2011). Social networks are now changing the way people 'are connected in important, if not revolutionary, ways' (Tremayne 2014: 112).

The organisation of social media, as Segerberg and Bennett (2011: 200) describe, can play different roles for different protesting ecologies. They specifically focused on Twitter and explained that it possesses two complementary aspects: as a 'networking agent' and as a 'window on the protest space.' The former being associated with Twitter's role as an organisation and interaction mechanism with the latter a view on real time actions of protesting events from personal and media related perspectives. These new information communication technologies (ICTs) have helped to support collective movements. This collective action refers to high levels of organisation and the collective identity between people consisting of 'agreed upon definition of membership, boundaries, and activities for the group' (Larana et al 1994: 15). However, Benkler (2006) and Bennett and Segerberg (2012) argue that when speaking about networks enabled by ICTs, they can often resemble forms of collective action but they do not possess the same formal organisation. Instead, a logic of connective action is more applicable. This is based on the 'formative element of sharing,' (Bennett and Segerberg 2012: 760) the premise that content can be shared widely across social networks, compressing boundaries. Thus in these networks 'are applications of communication technologies that contribute an organizational principle that is different from notions of collective action based on the core assumptions about the role of resources, networks, and collective identity' (ibid).

Therefore, the organisational structure of those groups who utilise social media in their campaigns has led to academics describing it as loose (Gladwell, 2010), leaderless (Castells, 2012) and unstructured (Earl and Kimport, 2011). Nevertheless, the advent of social media has proved to be a useful tool in the repertoires of protest groups. Gladwell (2010) argues that social media activism is ineffective because of its communication being inherently loose and non-hierarchical and this also limits effective organisation and problem solving. Additionally, it makes it difficult to understand who has authority to start or stop a campaign and who has the final say on how a community expresses itself (Drescher, 2011). On the other hand, Khamis and Vaughn (2015: 302) highlight that one of the key features of the Middle East uprisings was that the protests possessed a loose structure and a lack of identifiable leaders.⁴

⁴ Interestingly, although Nedd Ludd was cited as the identifiable leader of the "Luddites," he was a mythical character who did not exist and followers carried out protest on technological change in his name. Theoretically, any Luddite could be Nedd Ludd at any given moment (see Binfield, 2016).

This was the strength of the campaign and ‘made it very difficult for the regime to break.’ Moreover, a fluid and leaderless network enabled by groups who use social media to protest in situ means that they ‘thrive in the digital and physical networks of contemporary social movements’ (Western 2014: 673). Furthermore, Alkhouja (2014: 28) contends that it was the loose structure in the Arab Spring protests that was the main part in their success and social media was effective ‘towards the imploding of regimes.’

On the other hand, Gerbaudo (2012: 135) refutes the position that social media networks promotes leaderless protest organisation. He explained that there are key individuals who have had pivotal roles in the process of mobilisation on Twitter and Facebook. These ‘social media activists have deeply shaped the actions of social movements throughout the phases of both initiation and sustainment’ although the label of leaders may be refused, ‘the communicative and organisational work they conduct through Facebook and Twitter amounts to a form of leadership, as a relatively centralised influence’ (ibid). Moreover, Clemens (2009) suggests that organised and coordinated networks make success more likely and Dunbar et al (2015) highlights that online communities possess very similar structural characteristics to their offline networks. Similarly, Smith (2016: 1630) argues that less attention is placed upon social media influencing organisational leadership but structured networks matter because leaders are able to act as leaders without formal authority and are increasingly ‘emergent and organic’ rather than being appointed. Gerbaudo (2012: 135) terms this a ‘softer form of leadership’ as it does not represent the end of organisation but rather more ‘liquid forms of organising’ with the communicators of a specific campaign ‘become also automatically its organisers and leaders’ (ibid). Likewise, Dagaev et al (2015: 25) study the extent of protests being leaderless conversely and this illustrates that although social media allows people to announce their preferences at a lower cost, ‘the same number of people would be led to the streets by greater number of leaders. This creates the wrong perception of leaderless nature of the protests.’

3.9 Summary

This chapter has identified the development of social media and the protest movement in order to address the first objective to “investigate the role of social media within popular protest.” Protest groups have used the most contemporary forms of communication available

to them in order to broadcast their campaigns from leafleting and the internet, especially websites and discussion forums, to the most recent platforms of Facebook and Twitter. This enables them not to just interact more widely with others and promote their campaign, but to gain more knowledge and constantly keep up to date with information from news media, the public and other protest groups. It is clear from the literature that the utilisation of social media within protest movements is complex and poses different questions for campaign groups. This chapter has also detailed the numerous components of the rise of social media in contemporary activism, which has created new protest spaces and different forms of participation, as well as creating issues for campaign groups with regards to its utilisation.

Moreover, it shows that the increasing influence social media, especially Twitter and Facebook, is having on protest events organised by groups from the view of the events themselves; which are usually short-lived and transient. Additionally, it has explained that social media has provided a new democratic space for participation and can be used for different means of mobilisation across different spheres and utilised in tandem with other protest repertoires. Moreover, there has been a rapid uptake of social media by newly created campaigns and new forms of social media are creating new forms of protest. However there are still more traditional campaign groups who have campaigned for many years that were created before social media was viewed as a tool for protest. Therefore, the challenges and opportunities of incorporating social media into these existing protest campaigns remains an under researched area which may have highly significant implications as to how these groups operate.

Chapter 4

The Theoretical Approach

4.1 Introduction

The purpose of this chapter is to detail the theoretical underpinning of this research. The theoretical approach has been selected as a result of the findings of the literature review which explored how social media has been used by people or as part of a broader campaign group, how they mobilise in reaction to particular events and how they organise themselves in comparison to more traditional campaign groups. This chapter employs a theory related to the interaction and engagement flows of individuals; social network theory (Moreno and Jennings, 1938; Barnes, 1954).

There is an ongoing debate involving numerous social network theorists (Kilduff and Tsai, 2003; Scott, 2000; Degenne and Forse, 1999; Bandyopadhyay et al, 2011) regarding whether the study of social networks is a collection of methods or if it represents ‘a distinctive theoretical perspective’ (Kilduff and Tsai 2003: 35). For ‘many people, the social network field is a collection of methods, providing algorithms for operationalizing a range of important concepts such as centrality, structural equivalence, cliques and so on’ (ibid). It is both Kilduff and Tsai (2003) and Scott (2000) who argue that social network theory constitutes a set of methods. However, others argue that social network theory actually forms ‘a theory of structures’ (Degenne and Forse 1999: 12). In particular, Pryke (2012: 79), who suggests that ‘it was not until the 1960s that SNA methodology developed into a coherent theory,’ although Bandyopadhyay et al (2011) contend that social network theory has both theoretical and methodological implications.

Section 4.2 provides an overview of theoretical approaches which could be used to study personal relationships and the justification for selecting social network theory. Section 4.3 highlights the network types and the centrality measures used in social network theory and explains how they are calculated. Section 4.4 provides a detailed description of Granovetter’s (1973) study on the ‘strength of weak ties,’ which was a ground-breaking piece of work in

the development of social network theory. This is then applied to social media in Section 4.5 and a chapter summary and conclusion is provided in Section 4.6.

4.2 Theoretical Approaches to the Analysis of Social Media

There are many approaches to the study of group and individual interactions within social movements. This section highlights certain influential theories in the study of social movements and collective action (according to Fagan, 2004 and Haenfler, 2006) and presents the theory utilised in this research (in Section 4.2.1).

Social Movement Theory (SMT) forms part of a broader social theory with the central issue investigating how movements transform into order and can be traced back to the early works of Karl Marx and Emile Durkheim in the early to mid twentieth Century. Fagan (2004) explains that early social movement theorists (before the late 1960s, when environmental movements began to expand in number) viewed social movements as disorganised and having little access to policymakers (Saunders, 2013) and protest was viewed by the general population as a weakness and unhealthy sign of democracy. But as social movement theory developed there was recognition that non-institutional ‘protest activity can be rational and contribute to democracy’ (ibid: 23). Additionally, they possessed the capacity to ‘reclaim the normative standards betrayed by the systematic decoupling of politics and economic exchange as executed in the modern state and in capitalism’ (Eder 2015: 35).

Resource Mobilisation Theory (RMT) overlapped considerably with SMT and was developed in response to its perceived weaknesses (Saunders, 2013). It shifted away from the collective behaviour approaches on the irrational and emphasised organisational structures and tangible resources required for social movements to succeed (Bahati-Kuumba, 2001). This theory counters the assumption that protest is a psychologically driven response to disorganisation and argues that it is an extension of society’s decision making processes, engaging ‘social groups that lack access to the normal channels for political expression’ (ibid: 53). However, RMT exaggerates the importance of elites within protest movements and minimises the role of the masses (Buechler, 2016). Additionally, RMT highlighted structure and organisation over spontaneity which occurred within protest networks.

Haenfler (2006: 61) contends that rather than focusing on a group's internal resources, such as money (which RMT does), Political Opportunity Theory (POT) emphasises the significance 'of resources external to the group' (ibid). This theory is related to both SMT and RMT and began to gain attention in the 1980s. It argued that social movements arise by political opportunity: people join social movements in response to such opportunities (ibid). Rather than focusing on money or power within a group's internal resources, as RMT did, POT focuses on 'the significance of resources external to the group' (ibid). On the other hand, Kendall (2011: 615) argues that social movement organisations may not be 'always completely distinct from, or external to, the existing political system.'

All three of these movements gained attention from the 1960s and dominated discussion about social movements (Haenfler, 2006). However, they fell under increasing scrutiny by social theorists. Whilst they were useful in explaining 'more organized movements' they were less useful when 'applied to diffuse movements' (ibid: 61); which social media creates. Moreover, theories such as RMT struggled to take into account interactions between actors. The development of a newer social movement theory brought attention to expressive forms of action and how movements are able to construct an ideology and the connections between 'the individual and collective identity' (ibid: 62). However, this new form of social movement theory only studied 'conventional social movement networks' (ibid) and does not explain those unstructured networks created on social media. Moreover, these theories are only concerned with the mobilisation of protest and not the inner workings of the campaign groups themselves. Therefore, the following theoretical approaches take this limitation into account and are presented because of their ability to investigate relationships within group networks.

Actor Network Theory (ANT) is an approach which attempts to capture the 'complexity of the social world by uncovering relations among human and nonhuman actors' (Bosco 2010: 8). It is also called the 'sociology of associations: the focus is always on the connections among disparate things rather than on the similarities or regularities that may appear to be grouping actors together' (ibid). One of the main criticisms of ANT comes from Social Network Theory (SNT) which 'begins by trying to understand the forms and varieties of social structure, actor network theory's problematic is an investigation of the nature of power in society, the way actions, beliefs and opinions are formed and developed' (Cavanagh 2007: 32). Law (1999: 4) explains that there are two main aspects to actor network theory: 'semiotics of materiality' or 'relational materiality.' These aspects are the idea that 'the

relationality of signs is to be lifted from the realm of semiotics (how a meaning is created and communicated) and extended to the analysis of material forms, such as common everyday objects' (Gane and Beer 2008: 27).

The criticism aimed at actor network theory is derived from its principle of 'generalized symmetry, which treats both human and non-human objects alike' (Geisler and Wickramasinghe 2009: 50). On the other hand, social network theory treats all human actors the same by providing ways to investigate their interaction patterns. Moreover social network theorists believe that individual people are fundamentally different from nonhuman actors and ANT removed people from their pivotal role (Collins and Yearley, 1992). A further limitation of ANT, according to Gad and Bruun Jensen (2010) is that focus is placed upon stronger actors who aim to create strong networks and its apparent obliviousness towards other ways in which networks could develop (through weak ties). This can be reflected by the fact that those who exercise power in stronger networks often have humans at the centre of it which contends the actor network theory position that power is a function of networks rather than the actors themselves (Whittle and Spicer, 2008). However, Social Network Theory (SNT) provided a means to analyse the relationships between actors.

4.2.1 Social Network Theory

The theoretical approach to social network theory and much of its terminology was, according to Lee (2009: 7), borrowed 'directly from graph theory to address questions of status, influence, cohesiveness, social roles and identities in social networks.' The diagram below shows its progression.

Graph theory → Network theory → Social network theory

Adapted from Paar-Jakli (2014: 18)

Graph theory emerged as a theory in its own right and 'can be considered a relatively young science as it took root only during the last decade of the 19th Century' (Paar-Jakli 2014: 18). Network theory provides a number of techniques for analysing graphs and applying it means using graph theory for visual representation. Kumar (2013: 2) also suggests that network

theory ‘concerns itself with the formulation and solution of problems that have a network structure; such structure is usually captured in a graph.’ This indicates that network theory is actually a part of graph theory and ‘network analysis in general, and social network theory particularly, makes use of the mathematical tools and concepts developed with graph theory’ (Paar-Jakli 2014: 18). Wasserman and Faust (1994: 93) also describe that graph theory has not just been used in network theory but has ‘become useful in social network theory.’

Social network theory shaped the direction of Granovetter’s (1973) work on the strength of weak ties. These ties were found to be prevalent in social networks and were related to people finding jobs. Furthermore, social network theory has seen somewhat of a revival in the internet age (Gane and Beer, 2008) with the ‘growth of the internet as a communication medium has increased the opportunities for data collection of social network data’ (Neustadtl et al 2002: 199). The advent of social media has provided a new realm with which to extract interaction patterns. This is the natural progression as a result of social network research and the internet, or as Howison et al (2011: 767) illustrates ‘there is an exciting natural match between social network theory methods and the growth of data sources produced by social interactions via information technologies, from online communities to corporate information systems.’

Therefore, this thesis adopts the selection of social network theory discussed in this section as attention is placed upon the interactions and relationships between users as well as certain measures to provide an account of the happenings within a network. Appendix A provides a context to the historical development of social network theory.

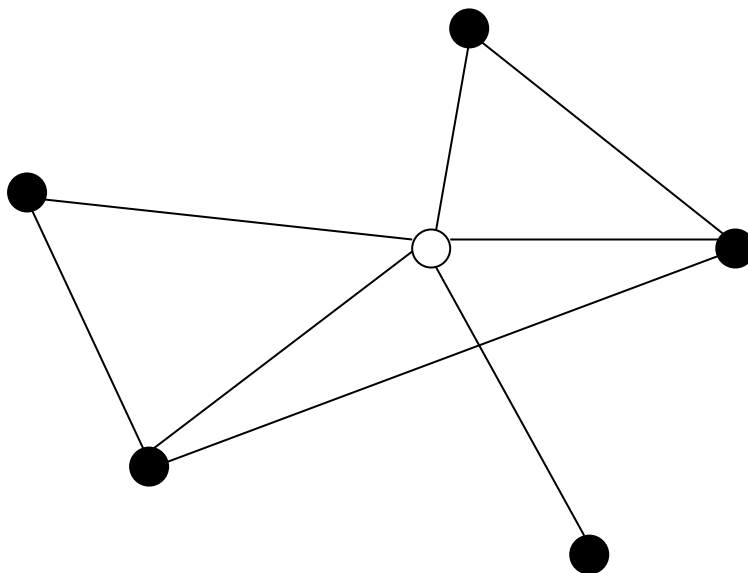
4.3 Network Types and Centrality Measures

These measures are applicable to social networks and the study of the interactions and relationships within and between them. An interpersonal network (which is the interaction between people) is constructed from two different types of action: 1) Communications (which is related to the transfer of information between individuals); and 2) instrumental/purposive which is the transfer of ‘material goods/services between people’ (Mitchell 1969: 36-39). Mitchell also suggested that these interpersonal networks can be analysed through concepts which describe interaction quality (Scott, 2013). The concepts, proposed by Mitchell (1969: 24 - 29), were ‘reciprocity, intensity and durability.’ Reciprocity is concerned with

relationships between people and whether these are ‘returned’ (ibid: 25). Intensity involves the strength of relationships. This is either by the strength of the commitment or multiplexity of the relationship. Multi-stranded relationships are more intense because they are spread over a large area and involve more people. Finally durability determines length of relationships. Relationships which are constantly activated are highly durable whilst those which are not are highly transient.

Mitchell (1969) added a ‘further set of concepts to describe the texture of social networks’ (Scott 2013: 34). These concepts were derived from graph theory and translated into sociology (Scott, 2013). Firstly density, which measures the extent to which all connections are present. This is also described as ‘connectedness’ and secondly reachability, which assesses how easy it is for a person to reach all others.

The origins of network types date back to the works of Alfred Radcliffe-Brown (Henning et al, 2012). The two types of networks are: ego-centric and global/whole networks. Egocentric networks are those which are focused on the connections of a certain node (a node being an individual person or group) and their immediate contacts (known as alters) (Newman, 2010) (see Figure 4.1).



Adapted from Newman (2010)

Figure 4.1: Ego-Centred Network – An Ego and Five Alters

It is composed of the ego and its immediate contacts, ties are ‘measured between ego and alters, as well as between the alters’ (Prell 2012: 119). Hanneman and Riddle (2011) similarly describe that a one-step neighbourhood (ego network) is constructed of ego and ‘all nodes to whom ego has a direct connection.’ It also includes ‘all of the ties among all of the actors to whom ego has a connection’ (ibid: 357).

Global networks or whole networks, focus on all nodes rather than specific nodes.

‘Researchers using whole network data frequently analyse more than one relation, sometimes collapsing relations into a single network’ (Marin and Wellman 2011: 19). It was Karinthy (1929) who initially speculated that anyone in the world could be connected to any other person through a chain of no more than five other people. The study of whole networks and egocentric networks are often distinguished from one another. But Marsden (2005) contends that they are related and interrelated. Global/whole networks contain egocentric networks for each node within the global network. The difficulty in the analysis of global networks is concerned with defining network boundaries (Holton, 2008). This is partly due to global networks cutting across boundaries and thus ‘network members may often be located in different places, or be highly mobile’ (Holton 2008: 50). In addition to network types, there are centrality measures which are metrics that highlight the position of an individual(s) within a network. These are betweenness, closeness, degree and eigenvector centrality.

4.3.1 Betweenness Centrality

Betweenness centrality measures the ‘unique role in understanding how information, influence, and even diseases flow within networks’ (Cherven 2015: 195). As a concept, Scott (2013: 86) explains betweenness centrality as the way of ‘measuring the extent to which a particular point lies between the various other points in a graph.’ This measure ‘shows an individual’s position within a network in terms of his/her capacity to make connections with other pairs or groups in the network’ (Bilecen 2014: 139). Betweenness centrality identifies brokers or gatekeepers, whereas other centrality measures are largely concerned with direct connections and/or ‘proximity to others with many connections’ (Cherven 2015: 195). What betweenness does is ‘measure how important an individual node is for others traversing the network. Specifically, this measure tells us how often a given node lies on the shortest path between two other nodes’ (ibid). Those networks with a high betweenness centrality ‘signify networks where some individuals have a central role in the social lives of the egos because

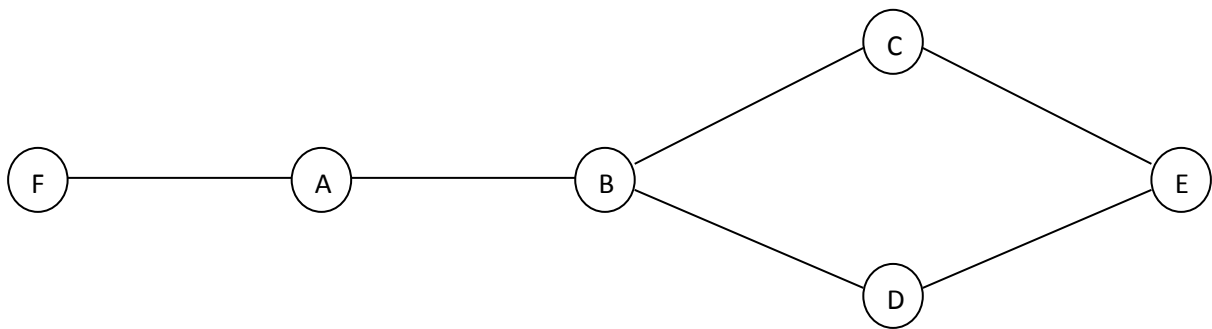
they, like the ego, have relationships with different subgroups' (Bilecen 2014: 139). These actors with a high betweenness centrality have structural advantages as they can promote or limit interaction between other actors with whom they connect (Freeman, 1979).

Betweenness centrality of node (i) is calculated as:

$$C_B (i) = \sum_{s \neq t \neq i} \frac{\sigma_{st}(i)}{\sigma_{st}}$$

Takemoto and Oosawa (2012: 48).

Where $\sigma_{st}(i)$ and σ_{st} are the number of shortest paths between nodes s and t, 'on which node i is located, and the number of shortest paths between nodes s and t. For normalization, the betweenness centrality is finally divided by the maximum value' Takemoto and Oosawa (2012: 48). In network terms, betweenness centrality can be illustrated as in Figure 4.2.



Adapted from Network Analyzer (2013)

Figure 4.2: Betweenness Centrality

In Figure 4.2, node B possesses the highest betweenness centrality which highlights it lies on the shortest path between two other vertices (Hansen et al, 2010) and is thus between most other vertices in the network. It thus reflects the amount of control a node exerts over all others.

4.3.2 Closeness Centrality

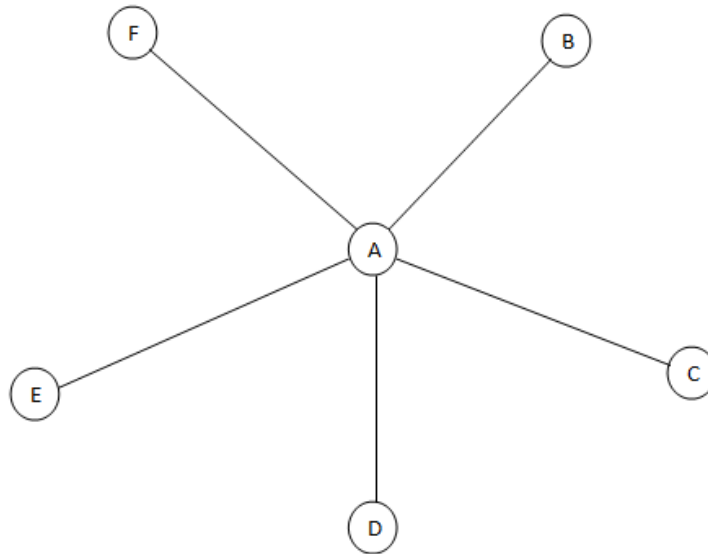
Closeness centrality is a measure of how many steps ‘on average it takes for an individual node to reach every other node in the network’ (Chin and Chignell 2010: 84; Neal 2013: 78) and is related to the small-world problem regarding the distance between people. Both de Nooy et al (2011) and Barash and Golder (2011) contend that higher closeness centrality scores indicate a more central position, or ‘larger distances yield lower closeness centrality scores’ (de Nooy et al 2011: 146). In this instance, the ‘closer a vertex is to all other vertices, the easier information may reach it and the higher its centrality’ (de Nooy et al 2011: 146). Whereas Cherven (2015: 203) suggests that ‘higher values indicate more distant levels of proximity’ – this is because the measure is inversed (ibid). Therefore, nodes which have fewer direct connections have higher closeness measurements whereas ‘those in the center of the graph can more easily travel to all other nodes in the network’ (ibid) which Cherven (2015) would describe as those with lower closeness centrality scores. Individuals which possess a high closeness centrality can be seen as ‘good information spreaders, since they can propagate information throughout the network most quickly’ (ibid).

The closeness centrality $C_c(n)$ of a particular node (n) is calculated as:

$$C_c(n) = 1/avg(L(n, m))$$

Pandia and Bihari (2014: 187)

In this instance, $L(n, m)$ is the ‘length of the shortest path between two nodes n and m ’ (Pandia and Bihari 2014: 187). The closeness centrality value of each node is between 0 and 1 and is a useful measure of influence and determines ‘how fast information spreads from a given node to other reachable node(s) in the network’ (ibid). In network terms, closeness centrality can be defined as:



Adapted from Mascolo (2012: 20)

Figure 4.3: Closeness Centrality

In Figure 4.3, node A possesses the highest closeness centrality which according to de Nooy et al (2011), Barash and Golder (2011) and Burger et al (2014) means that it is a good information spreader, is quick at disseminating information throughout the network and wants to be in the ‘middle of things’ (Mascolo 2012: 17).

4.3.3 Eigenvector Centrality

Eigenvector centrality is a measure of a node’s influence in a network. Degree centrality focuses on the network as a whole (Bonacich, 2007) and is based on connections with an individuals’ number of neighbours. Whereas in eigenvector centrality the ‘node is dependent on eigenvector centrality of neighbours node’ (Pandia and Bihari 2014: 188) and focuses on the connections between neighbours and highlights that ‘having more important friends provides a stronger signal’ (Zafarani et al 2014: 53). The basic assumption of eigenvector centrality is that ‘you (a node) are more central if you have more contacts – as in degree centrality – and especially if your contacts are more central, that is, if they have many central contacts’ (de Nooy et al 2011: 153). Connecting to more users does not mean that a user is important (as is the case with degree centrality) but it matters who a user knows. If a user knows an influential user, it is more likely to exert influence through them (ibid). If a

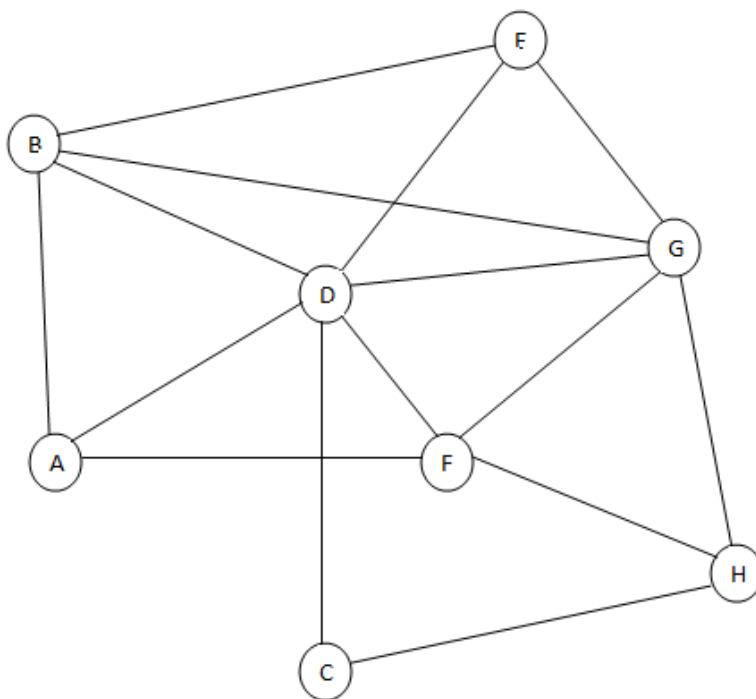
particular node has a high eigenvector centrality, it is connected to those who also have a high eigenvector centrality (Pandia and Bihari, 2014).

The eigenvector centrality (e) of a particular node (i) is calculated as:

$$e_i = \lambda \sum_j x_{ij} e_j$$

Borgatti et al (2013: 168); Prell (2012: 102)

Prell (2012) contends that ‘ e ’ is the largest eigenvector centrality score of the adjacency matrix (which is a means of representing which vertices are adjacent to which other vertices) and λ ‘represents the array of eigenvalues in the matrix’ (ibid: 102). In network terms, eigenvector centrality can be illustrated as (Figure 4.4):



Adapted from Iyer (2014)

Figure 4.4: Eigenvector Centrality

In Figure 4.4, it is node D which possesses the highest eigenvector centrality. According to Pandia and Bihari (2014) the eigenvector centrality of node D is high because it has a large number of connections to others who have a large number of connections themselves. It is not just a measure of popularity (Borgatti et al, 2013) but influence, as node D is able to exert influence through the users it is connected to.

4.3.4 Degree Centrality

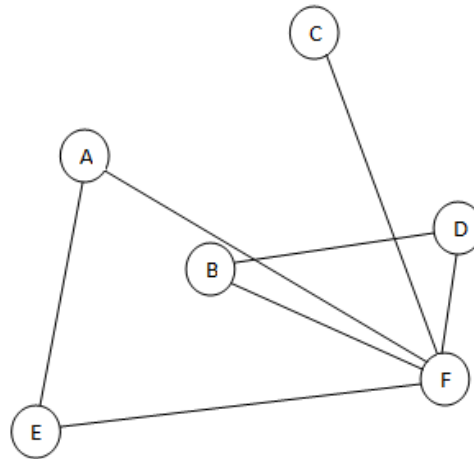
Degree centrality is a measure of the number of immediate ties an actor has in a network (Prell, 2012). It is seen as the simplest form of centrality (Prell, 2012; Takemoto and Oosawa, 2012; Pandia and Bihari, 2014; Ziegler, 2012) and is measured by counting the number of alters ‘adjacent to ego, ignoring both the direction and value of the tie’ (Prell 2012: 97). Ziegler (2012) and Scott (2013) describe two different types of degree centrality: absolute and relative. Absolute degree centrality refers to the connections of a particular node to other nodes and relative degree centrality measures the number of nodes that a particular node is connected to ‘as opposed to the overall number of nodes in the social network’ (Ziegler 2012: 32). Degree centrality can also be broken down further into in-degree and out-degree but this only applies to directed networks. In-degree is the direction of ties towards a particular node and out-degree is the direction of ties away from a particular node. There is no direction of ties in undirected networks as direction is irrelevant, it is the connections between people that matter. Degree centrality does not consider ‘whether or not an actor is seen as influential or popular [but] in a communication network, an actor with high degree centrality is one who can be considered to be a major channel for information in that particular network’ (Prell 2012: 97).

The degree centrality (C_D) of a particular node (i) is thus calculated as:

$$C_D (i) = \frac{k_i}{N-1}$$

Takemoto and Oosawa (2012)

Where (C_d) is degree centrality and (i) is a particular node, k_i is the degree of the node and finally N is the overall network size (total number of nodes) (Takemoto and Oosawa, 2012). In network terms, degree centrality can be defined as:



Adapted from Hanneman and Riddle (2005)

Figure 4.5: Degree Centrality

In Figure 4.5, it is node F which possesses the highest degree centrality as it has the most ties to the other nodes in the network. Hanneman and Riddle (2005) explain that nodes, such as node F, who have more ties, may be in an advantageous position in the network. They are less dependent on other individuals and are important in both spreading and receiving information.

In the 1970s, there was a significant development in the study of social network theory which specifically investigated the interactions within networks and the tie strength between them. The next section discusses this means of assessing network structures called the ‘strength of weak ties’ by Granovetter (1973). Additionally, whilst these centrality measures may originate from social network theory, they are relevant to the study and analysis of social networks produced by social media. Therefore, Granovetter’s work is applied in context to the study of social media and also uncovers the different connections found within networks, with specific reference to weak ties.

4.4 Granovetter's (1973) Study on the 'Strength of Weak Ties'

In 1973, sociologist Mark Granovetter wrote a paper for the *American Journal of Sociology* entitled 'The Strength of Weak Ties.' In it he proposed that small-scale interaction can be translated 'into large-scale patterns, and that these, in turn, feed back into small groups' (Granovetter 1973: 1360). The branch of sociometry, Granovetter argued, had been virtually non-existent in the field of sociology as it had only been applied to social psychology. It did not possess the theory or sampling techniques to be applied to larger group structures.

When analysing ego networks, Granovetter contends that the network could be divided up into 'strong and non-bridging weak ties on the one hand, and that of bridging weak ties on the other' (ibid). In the first instance, the ties are usually people who know one another and have few contacts tied to the ego. In the 'weak sector' (ibid), ego contacts are not tied to one another, but 'they will be tied to individuals not tied to ego' (ibid). The indirect contact between people is undertaken through these weak ties. Granovetter found that a number of jobs were sought through weak ties with the general characteristic of tie strength being related to the 'amount of time, the emotional intensity, the intimacy, and the reciprocal services which characterize the tie' (ibid: 1361). Also, these ties are of 'importance not only in ego's manipulation of networks, but also in that they are the channels through which ideas, influences, or information socially distant from ego may reach him' (ibid). Additionally, Granovetter (1973: 1376) explained that weak ties are more 'likely to link members of different small groups than are strong ones, which tend to be concentrated within particular groups.'

Ten years after his original study, Granovetter revisited the strength of weak ties and highlighted three pieces of empirical research. Langlois (1977) studied a sample of men and women in a branch of the Quebec provincial Government. Langlois found that 42.7% of the 2,553 individuals found their jobs through personal contacts (also see Granovetter 1983: 205). He concluded that weak ties amongst individuals were those which resulted in a new job but this differed by occupation. Additionally, Ericksen and Yancey (1980) studied a sample consisting of 1,780 working adults living in an area in Philadelphia in 1975. In this instance, a strong tie was a friend or relative who helped a person find their current job. A weak tie was the same process but through an acquaintance. Similarly Lin et al (1981) assessed weak and strong ties in relation to occupational status attainment for men of employable age in New York. Weak ties were associated by the respondents as acquaintances

whereas strong ties were seen as close friends or family. They concluded that weak ties possess a strong association with higher occupational achievement as they connect the respondent to someone well placed in the inner occupational structure. Granovetter (1983: 208) suggests that the studies ‘clarify the circumstances under which weak ties provide unusual advantage.’ These weak ties are more likely to be bridges than those strong ties. The bridges are links between communities. This would mean, then, following the definitions by Granovetter (1983: 208) and the other author’s that those utilising the weak ties most are those whose ‘weak ties do connect to social circles different from one’s own.’ Granovetter’s updated paper argued that weak ties in bridges act as functions between networks.

Granovetter’s study on the strength of weak ties, although conducted over forty years ago, has contemporary applications when investigating social media and the relationships and ties between people in social networks. It is therefore applied to the study of social media, as the next section details.

4.5 Application to Social Media

The centrality measures mentioned in Section 4.3 are useful for uncovering the position of users within networks but it is degree centrality which can be utilised to uncover tie strength, a key metric of measuring this is through interaction frequency according to Granovetter (1973). It is therefore useful for the analysis of social networks on social media in order to establish the prevalence of weak ties.

Lankshear and Knobel (2011) describe the work of Granovetter (1973; 1983) as being a key, powerful and influential idea in the development of social network theory. It is this area of social network theory, more specifically, which can be extended to online networks such as Facebook and Twitter. Hoffman (2015) described that this work by Granovetter marked a turning point in social network theory and led to him pioneering the development of the subject. The way Granovetter furthered social network theory was through the proposal of the strength of weaker ties. Here, weak ties are those ties linking individuals belonging to different communities whilst strong ties are those individuals connected in the same community (De Meo et al, 2014). This may be the reason why weak ties ‘have been recently proved to be very effective in the diffusion of information’ (ibid: 2). Their overall conclusions highlight the connection between their definition of weak ties and Granovetter’s

(1973) original definition (De Meo et al, 2014). Also, Gilbert and Karahalios (2011) relate the tie strength indicators along with several from other authors including communication reciprocity (Friedkin, 1980), possessing at least one mutual friend (Shi and Adamic, 2007), recency of communication (Lin and Dayton, 1978) and interaction frequency (Granovetter, 1973).

The two general conceptualisations of tie strength according to Granovetter (1973) is the duration of the tie and how often it is exercised. The duration signals the ‘amount of time that has elapsed since the tie was first established’ (Doh et al 2010: 694). The tie frequency refers to how many times contact is made with another user (ibid). The definition of strong and weak ties by Brown (2011) implies that those users whom each group interact with the most on Twitter would be classed as strong and those whom they interact with the least would be weak ties. Similarly Henning et al (2012) explain that weak ties are where limited interaction occurs by typically one-off contacts. Likewise, the work of Easley and Kleinberg (2010), Marlow et al (2009) and Huberman et al (2009) shows that stronger ties can be calculated as having at least two interactions with another user and weak ties a single interaction. Therefore, strong ties require investment of time and effort whilst weak ties are not necessarily maintained continuously which is why they accumulate in such large numbers (Easley and Kleinberg, 2010).

Brown (2011) also highlights the implementation of Granovetter’s work in social networking sites and explains that strong and weak ties should be thought about in the following way (Table 4.1):

<u>Strong Ties</u>	<u>Weak Ties</u>
1. Someone you know well.	A more tenuous relationship.
2. You’ve probably got their number on your phone.	Once a year, you may send them a Birthday or Christmas message.
3. You interact with them on social networking sites.	They are surprised to hear from you.
4. There is a good two way conversation.	You have different tastes and don’t interact much.

Adapted from Brown (2011)

Table 4.1: Strong Ties vs. Weak Ties

Like Granovetter (1973), Brown (2011) contends that weak ties bring circles of networks into contact with one another, which can strengthen friendships and create new bonds between different circles. On the other hand, Gladwell (2010) argues, with regards to the Arab Spring and Occupy Wall Street movements, social media develops weak social ties as opposed to strong ties. These weak ties ultimately result in connections which are rarely sustained or lead to successful offline action. However, Tufekci (2010) argues that within a social network, weak and strong ties complement one another. Rather than weak ties not being very impactful, Tufekci suggests an individual could form weak ties to a person they do not know and this may allow both individuals to access new information. Furthermore, these weak ties are an essential pool of connections which could become an individual's strong ties.

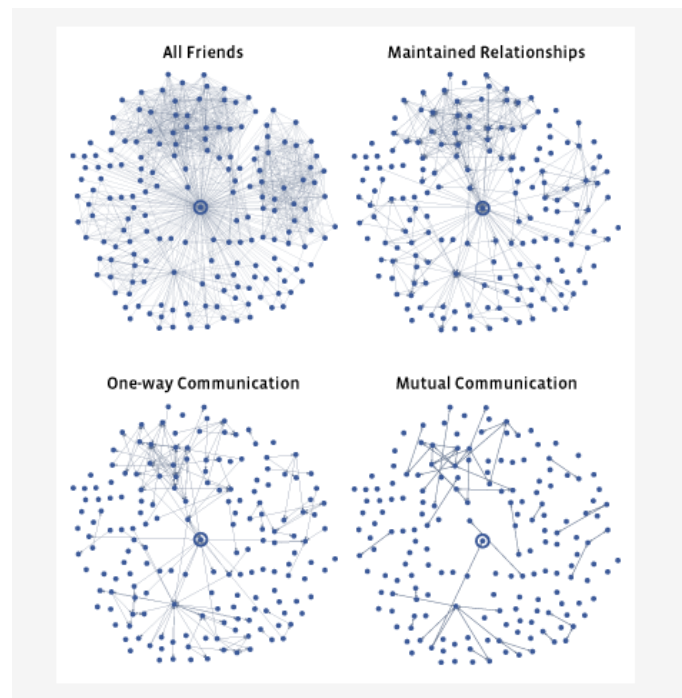
Furthermore, Tsvetovat and Kouznetsov (2011: 14) suggest that the power of social media lies in its 'ability to maintain and amplify weak ties.' They define weak ties as those connections between individuals that require 'little or no emotional attachment' (ibid) and little or no time and energy to maintain but yet 'are extremely powerful' (ibid). With regards to Twitter, it helps to minimise the 'time and cost of maintenance of a large number of weak ties' (ibid: 15) – and increasing the reach of the weak ties. The one-sided follow relationships which Twitter possesses enable communication which can 'quickly turn ordinary people into celebrities' (ibid). Similarly, Gladwell (2010) explains that social media is actually built around weak ties. Twitter provides a platform for interaction between people who have sometimes never met. Additionally Facebook is a way of managing friends and acquaintances and keeping in contact with those who lack other means of communication. The ways in which social media forums operate with the importance of weak ties is a 'wonderful thing' (ibid: 2). It is actually 'our acquaintances – not our friends – which are our greatest source of new information and ideas' (ibid: 3).

Easley and Kleinberg (2010) assess tie strength on both Facebook and Twitter. For Facebook, Easley and Kleinberg refer to Marlow et al (2009) work on Facebook relationships (see Figure 4.6). They defined three categories regarding friendship links over a one-month period:

1. Reciprocal (mutual) connection – If a user both sends and receives messages from another user during the observation period.
2. One-way communication – If a user sends one or more messages to another user (whether or not these messages are reciprocated).

3. Maintained relationship – If a user ‘followed information’ (whether or not a communication took place) – this means either clicking on content on the Facebook news feed or visiting a friend’s profile more than once.

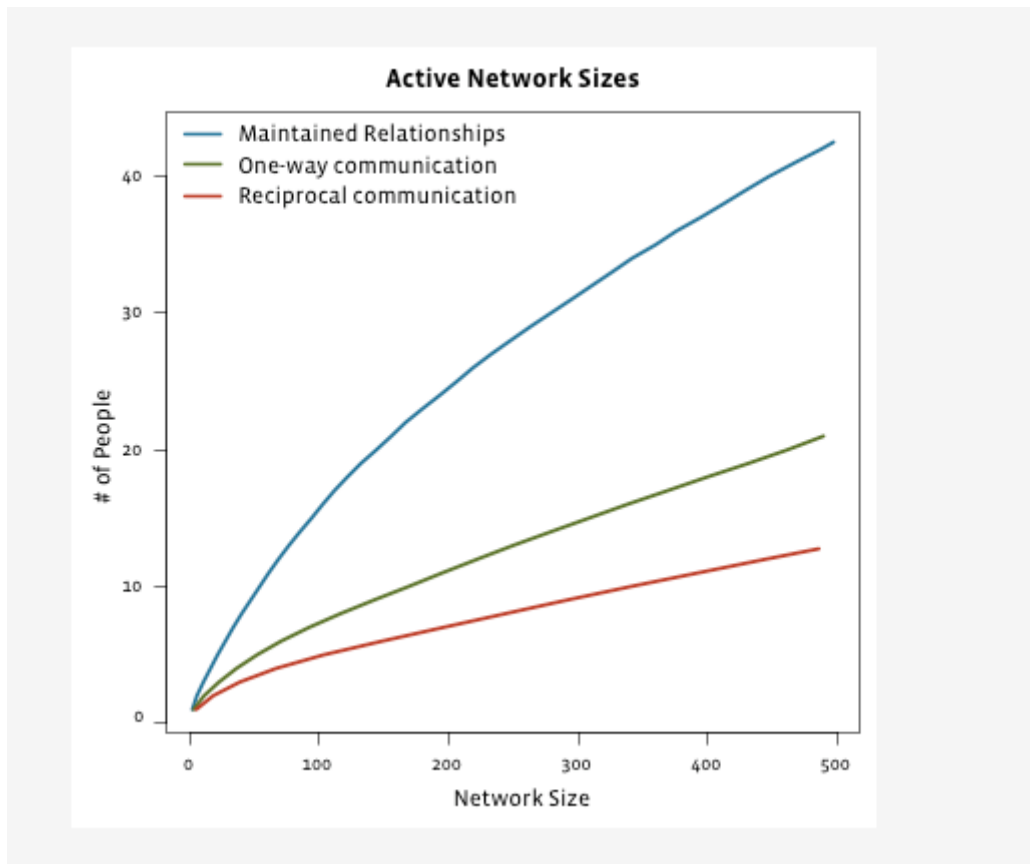
Adapted from Easley and Kleinberg (2010) and Marlow et al (2009)



Adapted from Easley and Kleinberg (2010: 61)

Figure 4.6: Communication Patterns in Facebook Networks

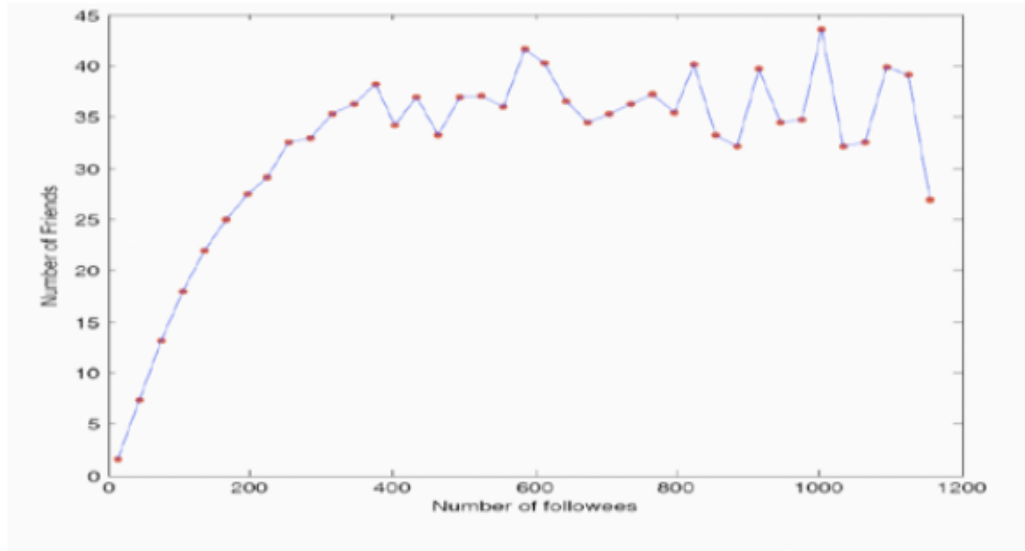
The diagrams are a sample of a user’s Facebook network. The image in the top left of Figure 4.6 shows the user’s friends and all of the links between friends. The other three pictures ‘show how the set of links becomes sparser once we consider only maintained relationships, one-way communication, or reciprocal communication’ (ibid). Figure 4.7 shows various relationships as a function of overall network size.



Adapted from Easley and Kleinberg (2010) and Marlow et al (2009)

Figure 4.7: Network Sizes

Easley and Kleinberg (2010) explain that interesting conclusions can be drawn from the graph. Firstly, even for those users who possess a large number of friends in their network the ‘number with whom they actually communicate is generally between 10 and 20 and the number they follow even passively (by reading about them) is under 50’ (ibid: 63). This shows, as Granovetter (1973) suggested, that there will be a number of people who are actively communicated with (strong ties) and there are those casual acquaintances that are very occasionally communicated with (weak ties). Easley and Kleinberg (2010) explain that for Twitter, weak ties are those which specify a user as merely following another user’s messages and strong ties are formed between those users who direct messages specifically at others. Easley and Kleinberg (2010) point to Huberman et al (2009) on the inner workings of Twitter. They produced a graph (see Figure 4.8) which shows the total number of strong ties for a particular user defined as at least two messages directed at another user during their study period.



Adapted from Easley and Kleinberg (2010: 63)

Figure 4.8: Total Number of a User’s Strong Ties

Figure 4.8 demonstrates ‘how the number of strong ties varies as a function of the number of followers. As we saw for Facebook, even for users who maintain very large numbers of weak ties online, the number of strong ties remains relatively modest’ (ibid). Easley and Kleinberg (2010: 64) contend that there is a relative scarcity of strong ties in Facebook and Twitter. Strong ties require continuous maintenance of time and effort and even ‘people who devote a lot of their energy to building strong ties will eventually reach a limit’ they can develop by interacting with another user frequently (Grabowicz et al, 2013). Whereas weak ties are maintained by milder constraints as they do not require the same investment as stronger ties – and so it is ‘easier for someone to accumulate them in large numbers’ (ibid: 64) and, as with latent ties, are more effective at spreading information (ibid).

Latent ties are those ties that are ‘technically possible but not yet activated socially’ (Haythornthwaite 2005: 137). They can only be activated (converted from latent ties to weak ties) ‘by some sort of social interaction between members’ (ibid). These ties occur when new communication infrastructures become available which allow individuals to make contact; such as the internet, telephone lines, and social media which support latent ties. Ellison et al (2011: 137) defines them as a relationship between two individuals which has not been socially activated and these individuals may have an awareness of one another or have even met briefly. Such connectivity connects those which are unconnected and the ‘latent tie structure has to be established by an authority beyond the individuals affected.’ In this case,

‘internet-based social support fits this profile’ (ibid). This is done by individuals who possess a particular interest, posting information and initiating discussion (Haythornthwaite, 2005).

Furthermore, Heckscher (2015) relates latent ties to social media. Heckscher (2015) acknowledges it has been often assumed that the important ties are the active ones but there are ties which can be activated when needed. On social media, those individuals with ‘good latent tie networks can be more effective than those who just use active connections; there are even preliminary indications that when you ask for help, people you haven’t spoken to in years respond more quickly and enthusiastically than those you see every day’ (ibid: 121). This theoretically means that because of the large numbers of people who use social media, there are thus a considerable number of latent tie opportunities.

Information communication technologies are valuable for latent tie opportunities because ‘they represent a low-involvement, low-effort channel to maintain these bonds’ (Tuten and Solomon 2015: 126). Although Zhang and Gearhart (2014) suggests that social media is primarily utilised to seek further information about people which users have some offline connection with. This means that with social networks on social media, particularly those follower/following networks and those within a page or group on Facebook, users are likely to have encountered most of the users within it. Moreover, Ellison et al (2011) contend that those people learning more about another user are activating latent ties and so on social media people learn about what others have to say through following (on Twitter) or by joining a Facebook group or page. It is only when they interact which is when these latent ties are converted into weak ties (Heckscher, 2015). Therefore ‘there is great potential for social media in the democratic process’ (Zhang and Gearhart 2014: 1140).

4.6 Summary

The theoretical approach to social network theory has been discussed in this chapter in order to address the second objective: “to identify an appropriate theoretical underpinning to the research.” It shows that there are different centrality measures which are applied to social networks to determine different factors. Betweenness centrality assesses certain gatekeepers or brokers in a network which determines information flow and the importance of a user in being a point of contact between all others. Closeness centrality illustrates how close a user is to all others in the network and how many steps it would take for information to reach all

others. Eigenvector centrality measures how influential a node is within a network and degree centrality highlights how connected a person is to others. These centrality measures are able to be utilised to measure interaction and relationships between users within anti-airport expansion group's social networks on social media and uncover how social media is utilised. The analysis of this is presented in Chapter 6.

The implementation of social network theory is associated with the aim of this research in a number of ways. Firstly, it provides a structure to explore how social media is utilised. This is undertaken through analysing interaction patterns with others, the relationship between social media platforms and how these groups respond to a particular event in time associated to their campaign against airport expansion. Secondly, it can assess the challenges and opportunities incorporating social media means for existing protest campaigns by studying people within groups through different centrality measures as well as utilising other methods to provide a different way to show other facets of social media use within a group setting. Thirdly, it lends itself to the study of weak ties as social media is constructed of numerous users who form tenuous links with others and open up other social networks to disseminate information through.

Furthermore, a research paradigm is required which shapes how the research is conducted and how the results are interpreted. In this instance, social network theory informs the methods used to (for example NodeXL and Twitonomy which inform social network analysis, time series, cross correlation and intervention analysis and semi-structured interviews) analyse social media data to ultimately explore the challenges and opportunities of incorporating social media into existing protest campaigns.

Chapter 5

Research Design and Methods

5.1 Introduction

In the previous chapters, a literature review was conducted which led to the development of the research gap and the identification of an appropriate theoretical underpinning of social network theory. The purpose of this chapter is to detail the research design and show how this addresses the aim, objectives and research questions.

This chapter is divided into eleven sections. The research paradigm is discussed in Section 5.2. Section 5.3 details the aim, objectives and research questions for this research. Section 5.4 describes the research design and mixed methods, with specific reference to the case study. Section 5.5 details the selection of the anti-airport expansion groups at Heathrow. Section 5.6 illustrates the justification of using Twitter and Facebook and Section 5.7 highlights the ways in which the data was imported. The subsequent sections provide the rationale behind the choice of methods used in this research, which includes Social Network Analysis (Section 5.8), Time Series Analysis (Section 5.9) and Semi-Structured Interviews (Section 5.10). A chapter summary is presented in Section 5.11.

5.2 Research Paradigm

A research paradigm, according to Bryman (1988: 4), is a ‘cluster of beliefs which for scientists in a particular discipline influence what should be studied, how research should be done, and how results should be interpreted.’ The research paradigm thus frames and guides research questions, the methods to be applied and how knowledge is identified (Greene and Caracelli, 1997).

Johnson and Onwuegbuzie (2004: 14) argue that quantitative researchers articulate ‘assumptions that are consistent with what is commonly called a positivist philosophy.’ Quantitative purists maintain that ‘social science inquiry should be objective [and] social

observations should be treated as entities in much the same way that physical scientists treat physical phenomena’ (ibid). Conversely, qualitative researchers (also known as constructivists or interpretivists) ‘reject what they call positivism. They argue for the superiority of constructivism, relativism and interpretivism’ (ibid). There is also a pragmatist paradigm operating between the two and has strong associations with mixed method research. This approach emphasises pragmatism which ‘opens the door to perform multiple methods with different perspectives and with different assumptions’ (Mukherjee 2016: 45).

Guba and Lincoln (2005) provide a more simplified explanation of the research dichotomies adding axiology into their definitions:

Ontology	“What is the nature of reality?”
Epistemology	“What is the nature of knowledge?” “What is the relationship between knower and would-be-known?”
Axiology	“What is the nature of ethics?”
Methodology	“How can the knower go about obtaining the desired knowledge and understandings?”

Table 5.1: Research Dichotomies

An explanation of each of the research dichotomies can be seen in the work of Guba and Lincoln (1994); Tashakkori and Teddlie (1998); Johnson and Onwuegbuzie (2004); and Dudovskiy (2015). Alternatively, a summary can be found in Appendix B.

Given the richness and complexity of social media data, a pragmatist research paradigm has been employed and appropriate data collection methods selected in order to address the aim: “to explore the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK.” This is not because of an inability to decide between the advantages and disadvantages of numerous alternatives; but rather this approach has sought to understand the variety of social media data by applying elements of more than one investigative approach. Moreover, pragmatism naturally lends itself to mixed methods research (Cameron, 2011) and it is possible to transform from qualitative to a quantitative approach or vice versa (Mukherjee,

2016); thus empirical research into social media data contributes to the contextual decision to use a mixed methods design (see Section 5.4). For example social network analysis (SNA), according to Onwuegbuzie and Hitchcock (2015: 290) is regarded as a quantitative technique but qualitative data can enhance SNA; ‘interview data can be collected whereby clarifying questions are asked while the network data are being collected.’

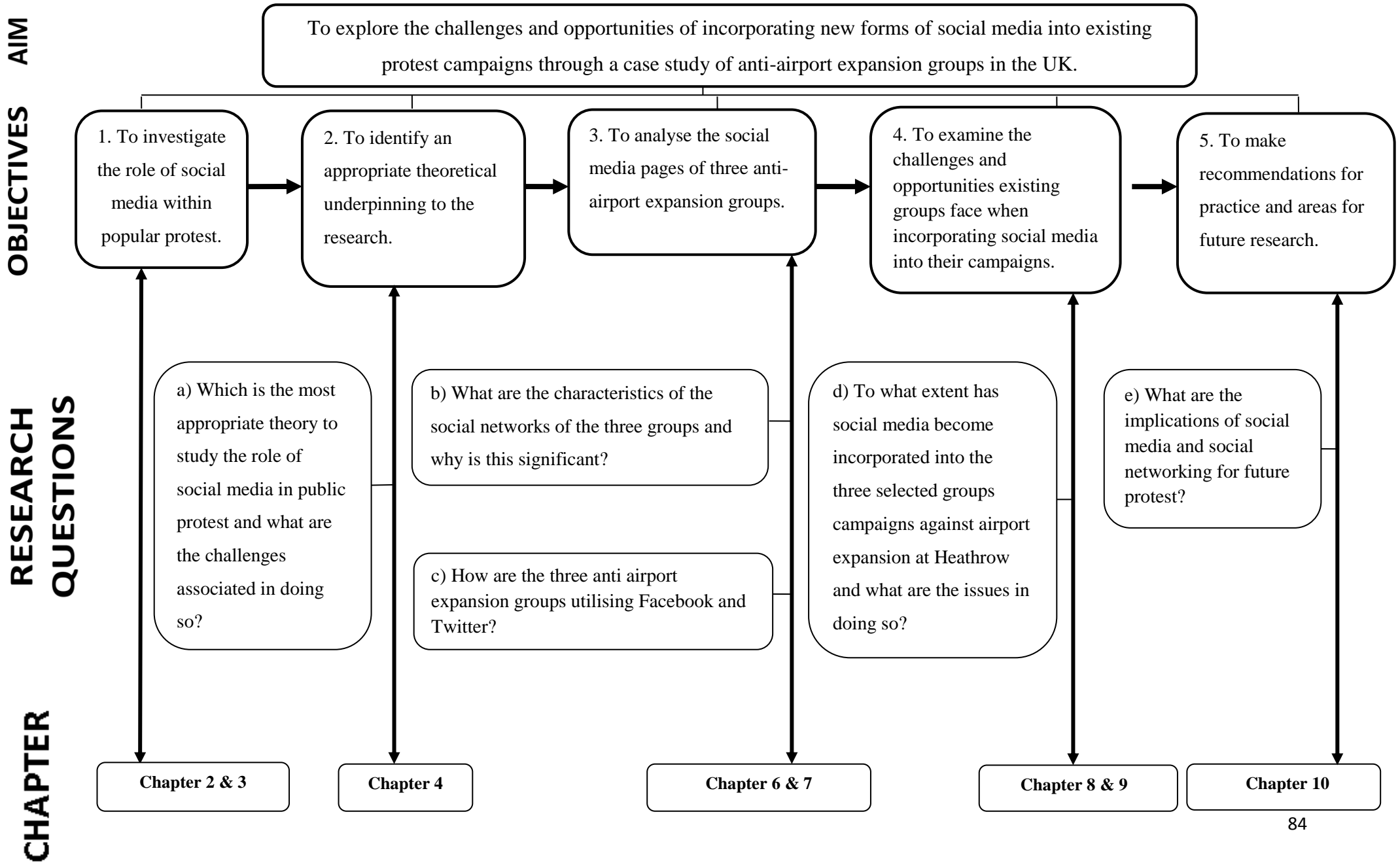
5.3 Aim, Objectives and Research Questions

The aim, objectives and research questions are discussed in this section. The aim of this research is:

“To explore the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK.”

The research aim, as shown in Figure 5.1, is achieved through five objectives, each of which is associated with a series of research questions which arise from the literature.

Figure 5.1: The Research Agenda



Objective 1 investigates the development of the UK environmental movement, the interaction patterns between environmental groups and the increase of direct action; using two transport campaigns as exemplars. It also investigates the rise of social media within activism, its ability to create newer protest spaces and the issues this can bring for those campaigns created on social media. The review of literature undertaken in Chapter three has identified limits to knowledge and the subsequent research gap.

Objective 2 identifies social network theory, its key characteristics and the centrality measures used in this thesis. It also identifies how the strength of weak and latent ties can be applied to a study of social media relationships.

Objective 3 analyses the extraction of Twitter and Facebook data from two sources: Node XL and Twitonomy. It was fulfilled using a combination of methods. Social network analysis, time series analysis and semi-structured interviews all provide an in-depth analysis of challenges and opportunities existing protest campaigns face when incorporating social media into their campaigns against airport expansion.

Objective 4 examines these challenges and opportunities related to the incorporation of social media into existing campaigns. This is examined because of social media's impact on creating new protest campaigns and its increased utilisation into their campaigning repertoires by existing protest groups.

From the research questions and objectives, objective 5 informs social media campaigns and seeks to provide recommendations. The findings from the analysis and discussion provide recommendations to protest groups regarding their social media operation and propose areas for further research.

The next section describes the research design used in this thesis.

5.4 Research Design and Mixed Methods

There is a common misperception that research design and research methods are terms which can be used interchangeably. Research design refers to 'the way an investigator applies a logical structure to his or her research project. The function of this step in the research process is to make sure that the data gathered are sufficient and appropriate for answering the research questions completely and unambiguously' (McNabb 2010: 40). The research

methods are associated ‘with different kinds of research design’ (Bryman 2012: 45). Bryman (2012: 45) uses the example of a case study, which is often mistakenly described as a research method, when in fact it is part of a research design as ‘a research method or research methods are needed to collect data.’

The single-case study design, in particular a representative or typical case, is applied to the study of anti-airport expansion groups at Heathrow airport. The issues groups are campaigning against are ‘everyday or commonplace’ (Yin 2013: 48). Additionally, the case study of Heathrow is used as it represents an area of high profile protesting campaigns against the construction of new runway capacity. Moreover, campaign groups have created new protest spaces and now utilise different online platforms to articulate their protest.

Mixed methods research employs both qualitative and quantitative techniques. The former is typically seen as the 'how' and 'why' of understanding human behaviour through approaches such as ethnography (studying everyday life and practice) and phenomenology (empirical observations of phenomena) and is mostly used within the social sciences (Denzin and Lincoln, 2011). The latter refers to the empirical investigation of social phenomena and the identification of facts and causal relationships through statistical, mathematical and/or computational techniques (Given, 2008). The pragmatic research paradigm demonstrates an ability to incorporate mixed methods into the research methodology (Guba and Lincoln, 2005; Mertens, 2010). Given the use of social media, the case study of anti-airport expansion groups at Heathrow and proposed research questions, this research utilised a triangulated mixed method design (Creswell et al, 2003). An understanding of how social media is used by anti-airport expansion campaigns, in terms of examining the challenges and opportunities of incorporating social media by existing campaign groups, was developed by extrapolating and investigating empirical data from social media networks. A triangulation design is used when ‘a researcher wants to [...] validate or expand quantitative results with qualitative data’ (Creswell and Plano-Clark 2011: 62). Thus, a mixed method approach was chosen for this research because of the benefit in having methodological techniques which inform and benefit one another. This approach enabled the initial extraction and visualisation of social media data using social network analysis which was followed by time series modelling. These findings were then used to determine the interview questions. Therefore, an advantage of utilising a mixed method approach enables the understanding of the problem under investigation by providing an in-depth ‘picture of the topic of the research’ (Robson 2002: 167) which can reduce limitations associated with each method ‘while building on their

strengths [...] and is particularly valuable in real world settings because of the complex nature of the phenomena' (ibid).

Each method is sequential as initially social network analysis enables the extraction of a proportion of social media data and the visualisation of networks to uncover patterns and organisational structures before this daily data can be modelled using time series analysis which produces a model based on the observed data points. Once the ARIMA model of the time series is produced, it is then modelled onto the time series again to assess the impact of a specific intervention in order to uncover whether this led to a change in the time series. But there is also data which cannot be explained by the time series (residuals), these are reduced to white noise and thus require further analysis. Therefore, cross correlation uses these data points to determine the relationship between both social media platforms. The decision to conduct semi-structured interviews after undertaking quantitative analysis on each group's social media pages was to enable more specific questions, about the social media data, to be asked; which would have been difficult to formulate without an analysis of the social media pages. Also, this additional detailed information obtained through interviews with the social media coordinators of each of the three groups was undertaken as the reasons behind implementing and operating social media campaigns could not be sought through quantitative data alone.

Having described the mixed methods approach that have been utilised in this thesis, the next section discusses the research methods implemented to address the aim, objectives and research questions. Firstly, the extraction of social media data is described. Secondly the extracted data is used within the social network analysis and time series analysis. Thirdly the findings of this stage of the research subsequently inform the questions for the interviews.

5.5 Anti-Airport Expansion Groups

There are seventeen anti-airport expansion groups who campaign against the expansion at Heathrow airport (Airport Watch, 2016); fourteen of which were created on social media from 2014 onwards. Of these seventeen, Airport Watch, HACAN Clearskies and Transition Heathrow have been chosen because they were the existing protest campaigns, created before social media was used for widespread activism. They are also active at different spatial scales, possess different structures and are different sizes. Airport Watch is the national anti-

airport expansion umbrella organisation but unlike other national groups such as Plane Stupid, which use direct action, Airport Watch acts as a link between other national environmental bodies, conservation groups, anti-noise campaigns and direct action groups, HACAN Clearskies is a regional campaign group associated with noise, disturbance and expansion and Transition Heathrow is a grassroots, local group which is embedded into community life and seeks to strengthen community relationships, promote resilience and encourage sustainable living. They are three of the most recognisable groups in anti-Heathrow campaigning circles in terms of mobilising people and publicising the campaign against airport expansion. They have also been using social media, as a part of their campaigns, for many years. They also exhibit a degree of permanence (Airport Watch since 2000, HACAN Clearskies (originally as KACAN) since the late 1960s and Transition Heathrow since 2007). This is in contrast to transient anti-airport expansion groups such as NoTRAG (No Third Runway Action Group) who ceased campaigning after the general election in May 2010. Therefore, the Twitter and Facebook pages of Airport Watch, HACAN Clearskies and Transition Heathrow will be examined in order to answer the third objective: “to analyse the social media pages of three anti-airport expansion groups” and subsequent research questions. Table 5.2 provides the justification for selecting each individual expansion group.

Table 5.2: Justification for including each anti-airport expansion group

<p style="text-align: center;"><u>Airport Watch</u> (Formed 2000)</p>	<p style="text-align: center;"><u>HACAN Clearskies</u> (Formed as KACAN in late 1960s)</p>	<p style="text-align: center;"><u>Transition Heathrow</u> (Formed 2007)</p>
<ul style="list-style-type: none"> • Existing protest campaign. • Conventional campaign group. • Provides a structure to campaign groups so that they reject airport expansion everywhere (Saunders, 2013). • A voice against airport expansion nationally. • Recognised by Government and Davies Commission. • Helped to create a groundswell of opinion by mobilising residents, politicians and celebrities against airport expansion. • National – focuses on aviation growth and expansion. 	<ul style="list-style-type: none"> • Existing protest campaign. • Operates a ‘middle ground’ between conventional and direct action. • High profile campaign. • Long-term campaign against airport expansion. • Publicises the campaign against airport expansion to large audiences; particularly using the media and now through social media. • Well recognised by politicians and stakeholders. • Regional – focuses on impacts in London and south east predominantly. 	<ul style="list-style-type: none"> • Existing protest campaign. • More revolutionary (squatting on land in Sipson) using direct action. • Ability to unite a community against airport expansion. • Provides a different means, from the other groups, to communicate the message against airport expansion. • Also provides a different tactic to conventional groups. • Visible face of the local community – raises awareness of issues. • Local/Grassroots – focuses on the villages around Heathrow. • Links with local government.

Airport Watch was formed as an umbrella organisation in 2000. It not only campaigns against airport expansion but also advocates a ‘demand management approach to aviation, keeping aviation emissions within UK national targets’ (Airport Watch 2016: 1). Airport Watch links with other groups to build a coalition of individuals and organisations who are not just environment focused but also campaign for ‘social justice and quality of life’ (ibid). Its supporters and members include: Aviation Environment Federation, Friends of the Earth, Greenpeace, the Campaign to Protect Rural England, WWF UK, the Campaign for Better Transport, the Woodland Trust, the World Development Movement, Action Aid, the National Trust and the Royal Society for the Protection of Birds (RSPB).

The Kew Association for the Control of Aircraft Noise (KACAN) was formed in the late 1960s to campaign against noise pollution from Heathrow airport over Kew and by the mid 1970’s changed its name to HACAN to incorporate other communities. It later joined with the pressure group Clearskies, in 2004, and was renamed HACAN Clearskies (HACAN, 2014). It is a campaigning organisation which opposes airport expansion and lobbies on behalf of local residents for a reduction in aircraft noise for communities under the flight paths. HACAN is comprised of a committee of sixteen people who organise the campaign and decision making activities (HACAN, 2016).

Transition Heathrow was formed in 2007 and is a part of a broader Transition network (transition networks exist all over the western world). It is a grassroots, local action group which works to build resilience between Heathrow communities to enable them to better cope with economic and environmental crises. It promotes community and establishes ‘replicable structures of organisation, which could provide a model for future non-hierarchical, consensus-based communities’ (Transition Heathrow 2016: 1). It also incorporates a long-term opposition to the expansion of Heathrow airport into a wider sustainability and environmental awareness campaign. Transition Heathrow, in 2010, began occupying a piece of land in Sipson which it called ‘Grow Heathrow.’ Grow Heathrow aims to promote sustainable living and community integration with numerous activists living on site throughout the year.

All three groups have been active in campaigning against the expansion of Heathrow airport for a number of years prior to social media’s advent within protest circles. They also post on both Twitter and Facebook social media accounts to disseminate their campaign to large audiences both nationally and internationally. Moreover, utilising these three anti-airport

expansion groups at Heathrow corroborates the aim (Section 1.2). Similarly all three groups created social media accounts after the previous third runway was dismissed by the new Conservative-led coalition Government in May 2010. More recently, they have increased their presence on social media in response to the creation of the Davies Commission and their associated reports. It is these existing group's Facebook and Twitter data which are extracted using different extrapolation tools. The justification for extracting just Twitter and Facebook pages for each of the three groups is detailed in the next section.

5.6 Justification for Using Twitter and Facebook

For the purposes of this thesis, Twitter and Facebook information for Airport Watch, HACAN Clearskies and Transition Heathrow will be extracted. Such textual data is more permanent and more structured than other forms of social media such as video and image data (Jolley, 2013). Youtube, in particular, is a source of unstructured data (Wang et al, 2015) which makes it particularly difficult to assess interactions between people as the data is problematic to index and analyse (ibid). Both Twitter and Facebook provide textual data which details where a message has come from and where it is being directed to. There is also a distinction between the different platforms on Facebook: namely groups and pages.

Both NodeXL and Twitonomy are social network analysis tools used to extract social media data directly from Facebook and Twitter respectively. Whilst NodeXL enables the visualisation of the social media data in the form of social network graphs, Twitonomy only extracts data from Twitter but does not have the strict data limits which limit the operation of NodeXL.

5.7 Data Extraction – NodeXL and Twitonomy

Gephi (Bastian et al, 2009; Bruns, 2012), Graphviz (Ellson et al, 2002; Ellson et al, 2004), R (Ihaka and Gentleman, 1996), Ucinet (Johnson, 1987; Borgatti and Everett, 1993) and NodeXL (Ahn et al, 2011; Sharma et al, 2011) are the software tools most commonly used to analyse social networks. Most require computer programming experience and can be difficult to learn (McFarland et al, 2010), whilst others merely mine data from different sources without visualising the results. Older social network analysis packages such as Ucinet do not

possess the capability to extract social media data whilst other tools either extract data or visualise it. NodeXL provides a means of bridging this gap between the capabilities of various tools – it allows a user to obtain various forms of social media data and provides a means to then visualise it. This software package, unlike others, does not require extensive computer programming training and is relatively straight-forward to use (Hansen et al, 2010). Nevertheless, a period of training was required to familiarise oneself with the software (ibid). Unlike other social network analysis tools, NodeXL is an open-source package which is available as a plug-in for Microsoft Excel 2007 and 2010. It produces social network graphs which are relatively easy to interpret whilst integrating other ‘features, not only aimed at data collection, but data storage, analysis (sic) and visualisation’ (Smith 2013: 89).

Social media data for a user’s Twitter page and their Facebook page or group can be extracted using NodeXL. The simplicity in how it is done is one of the software’s defining features. For Twitter, entering the user’s username prefixed by an ‘@’ symbol or their unique identification number is done through the ‘Import’ feature (Figure 5.2).

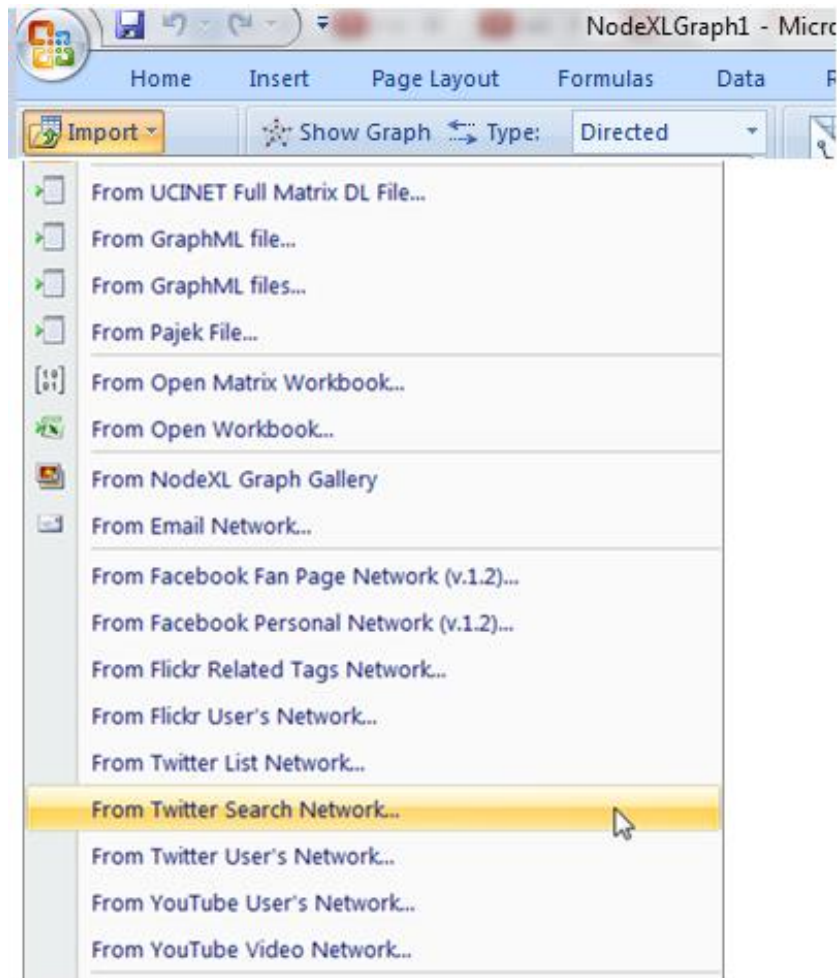


Figure 5.2: Import Feature in NodeXL

However, Twitter places restrictions on the amount of information which can be obtained. Only the most recent 1,500 tweets or the last seven days of tweets can be extracted. This is because of the Twitter Search API (Application Programming Interface) which provides access to users' timelines and user information – this applies to third party applications such as NodeXL. They are in place to prevent the site becoming overloaded with data requests (Figure 5.3).

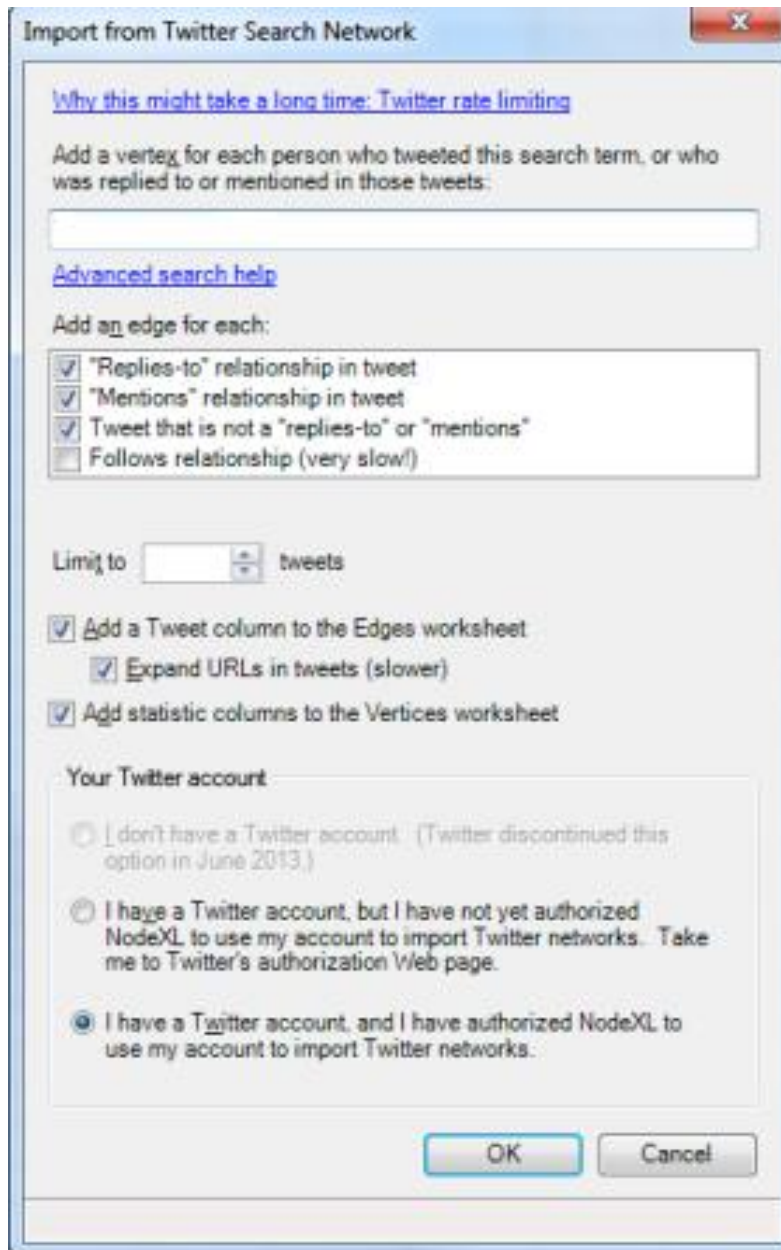


Figure 5.3: Data Importer for Twitter Networks

Additionally NodeXL is limited to the number of information requests per fifteen minutes it can make to Twitter. The software is restricted to gathering information about fifteen users in the fifteen minute window before NodeXL has to pause and wait a further fifteen minutes to elapse before requesting more data. This is problematic if the network being analysed is large or very dynamic with lots of active users. Twitter can also refuse further requests for data regardless of how long NodeXL has been waiting (Capone, 2013). In this instance where limited amounts of data are available, other data extraction packages were researched – from these the tool Twitonomy was selected to obtain Twitter data. It is an independent analytics tool not affiliated with Twitter. It ‘allows users to search for the Twitter history of accounts

by entering a Twitter handle into a search box' (Francalanci and Hussain 2015: 185). It does not possess the same restrictions on obtainable data so a larger quantity could be extracted. The data was categorised into three distinct categories: mentions, retweets and replies to.

The structure of two of these sub-categories was adopted from NodeXL's definition. The mentions sub-category is one of the two forms of connection which involve a direct message between users. A mentions connection is a link between two users (or vertices) that is formed when a user 'creates a tweet that contains the name of another user' (PewResearchCenter 2014: 6), prefixed by an '@' symbol. Barash and Golder (2011) contend that reply and mention tweets are better indicators of social ties than follower/following networks as the frequency of interaction between two users can be traced. There is a natural distinction between reply and mention tweets. Reply tweets, always prefixed by an '@' symbol at the very start of a tweet, are 'for' someone and mention tweets, where the '@' symbol and the user's username appear anywhere within a tweet, are tweets 'about' someone (ibid) – reply tweets are ultimately a subset of mentions, 'all @replies are @mentions, but not all @mentions are @replies' (ibid: 147). A reply network is a way of measuring how strong social ties are, it is ultimately the frequency of interaction between people which determines its strength.

A study by Cosley et al (2007) found that even though people may have large numbers of followers, the proportion of those which they interact with on a regular basis remains small. There is also some confusion as to how NodeXL identifies a mention as currently it extracts mentions from all forms of twitter interaction whether it be through tweets themselves or retweets. This method is inaccurate as it does not distinguish between the messages that the groups tweet and retweet. Instead NodeXL groups mentions together even though a certain user may have been mentioned in a tweet which one of the groups then retweeted. For this reason, and because of a lack of a retweet edge (an edge is a tie in NodeXL terms), two distinct edges have been created from the data obtained by Twitonomy: retweet edges and mention edges. The new retweet edge thus extracts all retweets from each of the three selected groups. A retweet is a 'viral aspect of Twitter as a social media tool, spreading messages across multiple networks and groups on Twitter' (Van Fossen 2011: 54) – the more retweets a tweet receives, the further the message is spread. Retweets are recognised by the letters 'RT' at the beginning of a tweet with the username of the original tweet appearing after the 'RT' letters. For example, 'RT @username' would mean that '@username' posted a tweet which was then retweeted. The new mention edge is different to the current edge which

NodeXL creates. Here, a user’s username, prefixed by an ‘@’ symbol, appears anywhere within an original tweet and not within a retweet. Therefore from the Twitter profiles of the selected groups taken by Twitonomy, all of the ‘new’ status updates which the package categorises are grouped together (these are those which the groups tweet) and then analysed to see if they contain a mention of another user. If the tweets contain a mention then the user’s username is extracted and placed into NodeXL - also if different users are mentioned within one tweet then all of their usernames are extracted. These can then be visualised in graph form (see Section 5.8.1).

There are still restrictions which limit the number of obtainable tweets but this number is over double which is possible through NodeXL. The last 3,200 tweets is the most Twitonomy can extract – what this means is that the data for HACAN Clearskies (John Stewart) and Transition Heathrow’s network was exported from when they first started to use Twitter (as they had not yet posted 3,200 times). Data from Airport Watch’s user network, on the other hand, was only available from April 2013 as anything before this date fell outside of the 3,200 tweet limit and could not be extracted. Table 5.3 shows the differences between NodeXL and Twitonomy.

<u>NodeXL</u>	<u>Twitonomy</u>
<ul style="list-style-type: none"> • Lack of accessible data over a longer time frame (only a week or first 1,500 tweets). 	<ul style="list-style-type: none"> • Extraction of a longer period – last 3,200 tweets.
<ul style="list-style-type: none"> • Provides visualisation tools. 	<ul style="list-style-type: none"> • Merely an analytics software package.
<ul style="list-style-type: none"> • Able to obtain the number of followers. 	<ul style="list-style-type: none"> • This is the only analytic which Twitonomy could not extract.
<ul style="list-style-type: none"> • Can also extract other forms of social media data (namely Facebook). 	<ul style="list-style-type: none"> • Can only be used for Twitter.
<ul style="list-style-type: none"> • Does not extract retweets. 	<ul style="list-style-type: none"> • Provides analytics for every form of Twitter interaction.

Table 5.3: Differences between NodeXL and Twitonomy

These platforms are used in a complimentary approach. The limitations of one platform are eliminated through the benefits of the other and vice versa. So, NodeXL’s inability to extract more data is offset by Twitonomy’s ability to extract 3,200 tweets. Also, one of the forms of Twitter interaction is the ‘retweet’ function. Therefore Twitonomy is used to incorporate these ties into NodeXL.

5.7.1 Extracting Facebook Data

Facebook does not possess the same restrictions on data mining and the process of extracting Facebook information is less complex. NodeXL is used to collect the data for all three of the selected groups’ Facebook pages and groups and the Facebook graphs for each group not only demonstrate connections between the creators of each Facebook group but also map the interactions between individuals in the group. Through the ‘Import’ feature in NodeXL (Figure 5.3), the group name is typed into the ‘name’ box and boxes ticked which represent a user-user Facebook network (Figure 5.4).

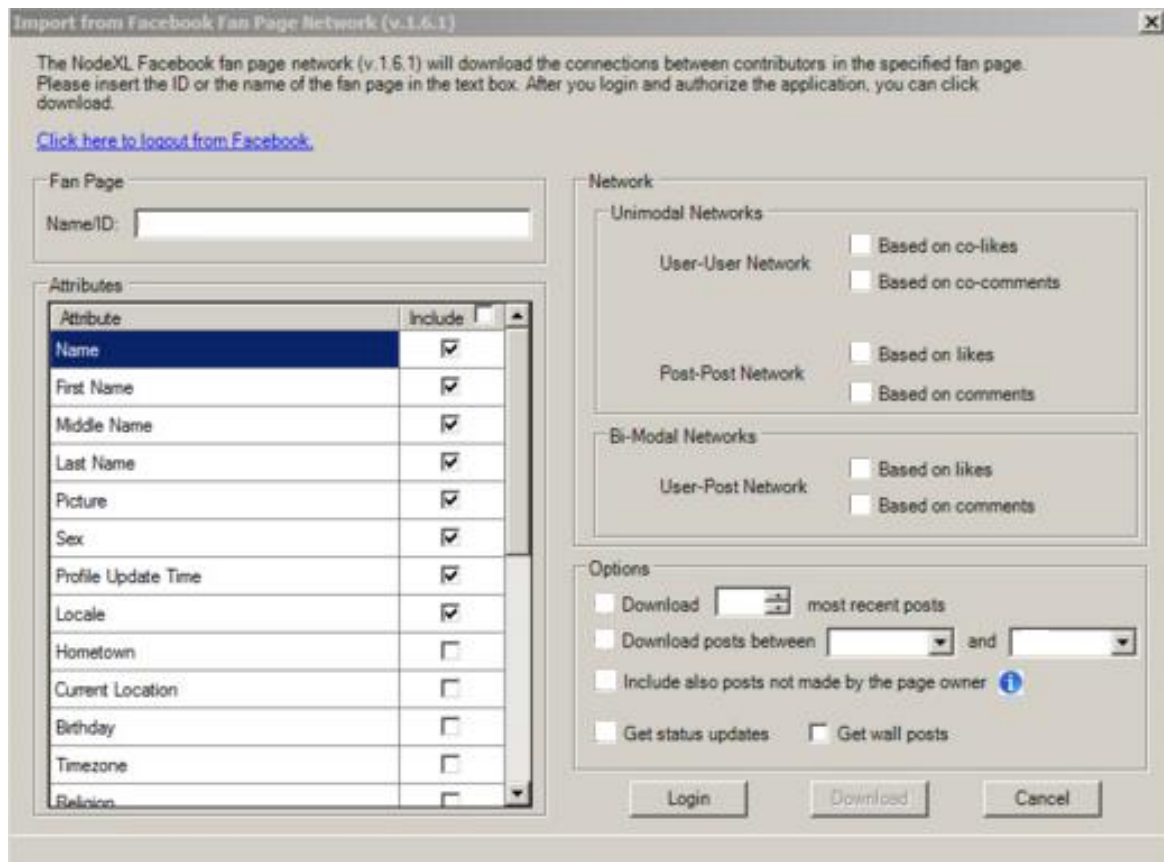


Figure 5.4: Data Importer for Facebook Networks

The user-user network illustrates the interaction between people (users) and is the only network type which focuses on connections between people which appear as vertices (a vertex is a node in NodeXL terms). These connections take the form of users who mutually like (a like is a way to acknowledge a Facebook comment) or comment (a comment is a way to leave a person's thoughts on a status or Facebook post) on the same post in the group. The post-post network (a post is a type of message, it is either a comment, picture or other form of media) places posts themselves as vertices with the link between them if they share commenters or likers. Unlike the user-user network, the post-post network does not visualise users. The third network type is the user-post network (this is the interaction between a person and a type of message) which creates a network where both users and posts appear as vertices whereby there is an edge between them if a user has commented on or liked the post. For the three selected groups a user-user network approach will be employed as it places focus upon users and their interactions.

The date range option feature, in NodeXL (Figure 5.4), allows posts from the three groups to be downloaded from when they first started using Facebook to the end date of 14th February 2014. The edges between all vertices in the network consist of three different types: an edge is created between the vertices if two users have liked and/or commented on the same post, those who have liked and/or commented on a post (the edge being to the posts' author), and between those who have liked and/or commented on a particular comment and its author. These edges demonstrate interaction between group members – but it is important to highlight that NodeXL will only extract those users which either: post an update in the group/fan page and who like or comment (or both) on a post or comment. Basically, a group itself can have many likes or people join it but NodeXL only visualises those who interact with the group/fan page or with each other within the confines of the Facebook group/fan page. But there are differences between Facebook groups and pages which are explained below.

5.7.2 Facebook Groups vs. Pages

The three selected groups: Airport Watch, HACAN Clearskies and Transition Heathrow have all created either groups or cause pages. Both HACAN Clearskies and Transition Heathrow have Facebook groups, the former possessing 270 members at the time of data extraction (15th February 2014) and the latter having 1,070 members. The dates when each group was

established also varies – HACAN Clearskies in October 2011 and Transition Heathrow in January 2010. Both created a public group whereby any Facebook user can join and post status updates, like posts and comment on what people have said. Despite the groups showing many users who have joined, NodeXL only downloads and visualises the people who interact with the group and each other through creating edges between users if they comment and/or like a post and comment and/or like a comment – a vertex is also created if a user posts on the group wall but does not receive any likes or comments on it. Airport Watch is the only one of the three groups which has a cause page. This can ultimately spread awareness of the campaigns’ values to a larger number of people (Facebook, 2008). Instead of ‘joining’ a cause, a Facebook user can like and follow it. The differences between groups and pages are shown in Table 5.4.

Facebook Groups	Vs.	Facebook Pages
Collection of people who share mutual interests.		Organisation/individual organise themselves into communities of action which support various issues and/or campaigns.
Designed to share information, advice and offer opinion.		Raise awareness of a particular agenda.
Organisation of events.		Recruit new supporters and launch fundraising campaigns.
Public, closed or secret.		Effective organising tool available to non profit groups.
Collate smaller communities where smaller scale communication occurs.		Favour larger national NGO’s where large scale interaction takes place.

Table 5.4: Differences between Facebook Groups and Pages

Facebook categorises its causes and fan networks into a generic ‘page’ category whilst keeping groups separate. As a result, NodeXL only possesses two import options: via fan page and via group. For Airport Watch, its cause page can be downloaded through the fan page option as the fan page feature covers the generic ‘page’ category.

In order to analyse the social media data extracted from these packages, an explanation of methods utilised in this research is presented in the following three sections. Social network analysis is the first method to be illustrated.

5.8 Social Network Analysis

Social Network Analysis (SNA) provides an effective means of investigating the inner structures of particular social networks. It has been successfully used in numerous branches of academia from medicine to physics, sociology to geography and information science to terrorism studies (Carrington and Scott, 2011). But the evolution of social media use in recent years, through Twitter and Facebook, particularly ‘lend themselves naturally to further exploration via social network analysis’ (Hambrick 2013: 287). There are also studies which demonstrate the use of social network analysis for Twitter (Ediger et al, 2010; Huberman et al, 2009; Kwak et al, 2010) and Facebook (Nazir et al, 2008; Ugander et al, 2011).

Social networking sites provide researchers with detailed information regarding patterns of interactions through different message types and ties with others within group structures. It is the most effective method when researching the perceived structures in online social networks. NodeXL’s variety of functions makes it an appropriate tool to extract and visualise numerous forms of social media data. NodeXL also categorises tweets and posts which then enables the network to be visualised. This is described in the next section.

5.8.1 The Visualisation of Network Graphs

NodeXL has various layout options which assist in visualising the network graphs. Firstly, the Fruchterman-Reingold algorithm is quick, easy to interpret and does not require substantial computer memory. The vertices behave, as Fruchterman and Reingold (1991) analogise, like atomic particles which exert attractive and repulsive forces on one another which in turn reduces movement. Each time the ‘refresh graph’ option is pressed in NodeXL the graph alters slightly and the default number of iterations per layout is set at ten. This means that the graph undergoes ten alterations per refresh to try and reach a state of equilibrium whereby the graph does not alter its layout after refreshing. This is desirable because it means a graph can be interpreted on numerous occasions without the layout

changing which could potentially affect results. In order to reach an equilibrium state quicker, Barash and Golder (2011) recommend that the default iterations per layout metric is changed from ten to one hundred and therefore, this recommendation will be applied to every graph created in NodeXL. In most of the graphs, for Twitter, once they reach the equilibrium state, those vertices which are interacted with the most appear towards the centre of the network.

It is not as simple for the following/follower networks as interactions are not visualised, instead it highlights whether or not the relationship between the central user and surrounding vertices is symmetrical (reciprocal) or asymmetrical (one-directional). NodeXL thus places all vertices which exhibit a reciprocal relationship with the central user into an inner circle, closer to the centre, and places vertices with an asymmetric relationship into an outer circle. It is also slightly different for the Facebook networks as these do not exhibit the sociometric star networks noticed within the Twitter graphs (which demonstrates the interactions of just the central user to other users) and thus clearly show those who are interacted with more towards the centre instead. This is because they map the interactions between every user in the group the graphs are different to those seen in the Twitter networks. The Harel-Koren network graph is the second visualisation algorithm which NodeXL uses. It is primarily used in the generation of large networks as visualisation is quick and efficient (Golbeck, 2013); although it does require a fast computer. Harel and Koren (2001: 193) devised a new algorithm a decade after Fruchterman and Reingold's paper (1991) which was designed for 'speed and simplicity.' Both graph types are very similar but in order to create and analyse the networks of all three of the selected groups, the Fruchterman-Reingold layout will be used as it creates a graph which is easy to interpret and does not require substantial computer memory. The visualised networks are distinguished into various network types, which is the subject of the next section.

5.8.2 Network Features

The Twitter and Facebook profiles for each of the three selected groups possess different network types. An egocentric-type network includes the visualisation of a particular individual and sociocentric for the study of a group network. The egocentric network, which is related to Twitter, focuses on the interactions of a particular individual at the centre of its own network. It is, according to Newman (2010), a network which surrounds one particular person. The individual is called the ego and their friends, followers, or who they interact with

are called alters (Barash and Golder, 2011). As the ego is at the centre of the network, the focus is placed upon it to look at its relationship with others in the network as a whole. Within the egocentric network certain ties are reciprocal – ego follows alter and alter follows ego (the group interacts with a user and the user interacts with the group). There are also one-off (asymmetrical) ties where either group interacts with user or user interacts with group.

There are various levels of networks which demonstrate the number of connections within a network. A 1.5 level network is the connections between alters (Golbeck, 2013). This takes the form of closed triads which are an indicator of ties within a social network and assesses whether there are ties between two alters. A level 1.0 network only shows ties between the ego and its surrounding alters (Ackland, 2013). This enables a complete view of the connections both to and from the ego in order to analyse the ego's interaction patterns and thus places sole focus on the ego rather than the alters. However, this level of network does not highlight social networks in their entirety and as a result, the ego can be seen as the most important user when this simply is not a true reflection of the actual happenings in its network. It is important to highlight that the Twitter networks for the three selected groups only show the 1.0 network due to restrictions imposed on third-party extrapolation packages by Twitter. In conjunction with these network types there are two types of edges: directed and undirected. Directed edges have a clear origin and destination and may or 'may not be reciprocated' (ibid: 50) which are represented as individual lines with an arrow head on a graph. Twitter is an example of this as either a user follows a user and that tie is reciprocated or a user follows a user and it is asymmetrical. Undirected edges represent mutual relationships with no origin or destination. Facebook friend networks are undirected as the relationships do not exist 'unless they are reciprocated' (ibid). It is represented as a line without an arrowhead. The other network type, a socio-centric network, focuses on larger groups of people and is closely associated with that of the Facebook network. It studies the relationships of people within a group and the pattern of these interactions (Roberts, 2006). Commonly, socio-centric Facebook friend networks exhibit undirected edge types with current research into online social networks reaffirming this (Ellison et al, 2007; Lewis et al, 2008; Stutzman and Kramer-Duffield, 2010; Ellison et al, 2011).

However, there is little research into Facebook groups and pages which assess interactions between members rather than connections between a specific individual and their friends. This type of network goes against conventional thought that Facebook contains only undirected edges. Whilst this may be true for friendship connections the connections within a

group display the elements of directed networks. It is important to highlight, therefore, that the direction of ties between members of a group are shown to see precisely who interacts with whom. Without this, it would be impossible to demonstrate which user interacted with which other user. The direction of interaction ultimately shows the influence of a particular user and how they are positioned in relation to others in the group.

Social network theory (SNT) lead to the use of NodeXL as a social network analysis tool to both extract (assisted by Twitonomy) and visualise social media data. But it also yields data which can be used in other types of analyses. This shows that the data can be used in different ways, using different methods thus providing a different perspective; all of which formulate an insight into how social media is utilised.

5.9 Time Series Analysis

Time series analysis is used to model the data obtained from the social network analysis. As well as detailing the fluctuations which occur within each group's daily social media data, it produces a model to accurately model the remaining data for the cross correlation and intervention analysis. This model is required to reduce the observed values to residual data points which can then be analysed using cross correlation analysis to assess the extent of the relationship between social media platforms. Additionally, the ARIMA model produced for each time series is then reapplied to the observed values to undertake an intervention analysis which examines the extent of a specific event in time on the time series.

A time series analysis is chosen for the daily social media data because of its ability to track fluctuations and patterns in the data. Once the data series is collected and dates added to the figures to enable the comparison of Twitter and Facebook, the application of time series methods is undertaken. SPSS is used as the statistical package in which the time series is produced and is advantageous because it is able to construct expert time-series models as well as providing statistical algorithms, including ARIMA models which can analyse past trends. An Expert Modeller in SPSS automatically selects the best fitting ARIMA (Autoregressive Integrated Moving Average) model and estimates the best-fitting ARIMA or exponential smoothing model for one or more dependent variable series, thus eliminating the need to identify an appropriate model through the investigation of ACF (Autocorrelation Function) and PACF (Partial Autocorrelation Function) (SPSS, 2007). ARIMA models are selected in

the Expert Modeller section as these are the best models, in terms of understanding the variations in the data, which can be used within a time series. An ARIMA model consists of three parts: AR (p), I (d), MA (q) (Kocurkova, 1999). These describe the random shocks and their relationship with the time series.

The ‘p’ parameter demonstrates the AR (Autoregressive) relationship. An ARIMA (1, 0, 0) model where p=1, d=0 and q=0 is written as:

$$Y_t = \phi_1 Y_{t-1} + a_t$$

(Box-Steffensmeier et al, 2014)

An ARIMA (1, 0, 0) model ‘is one where the current time series observation, Y_t , is composed of a portion of the preceding observation, Y_{t-1} , and a random shock, a_t . A (2, 0, 0) model would therefore be written as:

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + a_t$$

(McDowall et al, 1980; West, 1999)

The parameter ‘p’ ‘thus denotes the number of autoregressive structures in the model (the number of past observations used to predict the current observation, that is)’ (McDowall et al 1980: 16).

The structural parameter ‘d’ indicates ‘that the time series was differenced’ (McDowall et al 1980: 16). Differencing is defined as the subtraction of ‘the first observation of the series from the second observation, the second observation from the third, and so on’ (Zucchini & Nenadic 2011: 12). Therefore an ARIMA (0, 1, 0) model is:

$$Y_t - Y_{t-1} = a_t$$

$$Y_t = Y_{t-1} + a_t$$

(ibid)

The second structural parameter ‘q’ highlights the number of moving average structures. An (0, 0, 1) ARIMA model thus equates to:

$$Y_t = a_t - \theta_1 a_{t-1}$$

(ibid)

Whilst an ARIMA (0, 0, 2) is:

$$Y_t = a_t - \theta_1 a_{t-1} - \theta_2 a_{t-2}$$

(ibid)

When ‘q’ is zero there are no ‘moving average components’ (ibid: 12). When ‘q’ is 1, there is ‘a relationship between the current score and the random shock at lag 1 and the correlation coefficient, θ , represents the magnitude of the relationship’ (ibid). When ‘q’ is 2 ‘there is a relationship between the current score and the random shock at lag 2’ (ibid), and so on. The ARIMA model also produces residual and observed values.

The residuals are saved in the time series modeller section as these are what remain of each data point after the model has been run and explain the series as best as it can. They are the difference between the observed and predicted values. The expert modeller is run to produce various ARIMA models for all three of the selected groups daily Twitter and Facebook data. The observed values are then plotted against time to produce a model which accurately explains the pattern in the data with the residual data points representing what cannot be explained in the model. By producing a model of the time series it explains its variation in terms of its own past behaviour, this means that the residuals are reduced to white noise, are not connected to the time series and are ultimately not explained by the model in terms of its past behaviour. It is the residuals which are used in the cross-correlation, to analyse the relationship between the social media platforms of each group.

5.9.1 Cross-Correlation Analysis

The cross-correlation function (CCF) focuses on the relationship between two time series. It is the residuals which are investigated as these are what cannot be explained by the initial models of the time series data. Significant positive peaks in the cross-correlation function ‘indicate that the input variable variations lead the corresponding variations in the output variable, and significant negative spikes indicate possible feedback from the output to the input variable’ (Yaffee and McGee 2000: 286). As Penn State (2015: 1) describe:

- When one or more x_{t+h} with h negative, are predictors of Y_t it is sometimes said that x leads y .
- When one or more x_{t+h} with h positive, are predictors of Y_t it is sometimes said that x lags y .

The technique possesses several advantages; ‘it is a global measure (using all points in a time series), its statistics are well understood and it is computationally efficient’ (Netoff et al 2006: 266).

5.9.2 Intervention Analysis

The intervention analysis is calculated to determine whether a specific point in time, in this case the publication of the Davies Commission interim report on 17th December 2013 has an impact on the time series. It was used as it is the most significant event in the contemporary debate surrounding expansion in the south east (specifically at the time of undertaking this research).

After models of the time series have been produced for each of the three selected groups, the impact of an intervention at a specific point in time can be analysed to see if an event led to a change in the series. These changes in the ‘mean level of a time series are due to either natural or man-made causes’ (Hipel and McLeod 1994: 653). If the ARIMA model is written as N_t then the whole intervention model may be written as:

$$Y_t = f(I_t) + N_t$$

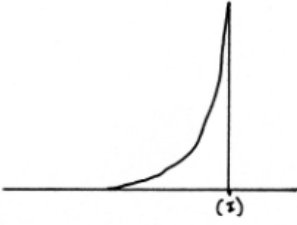
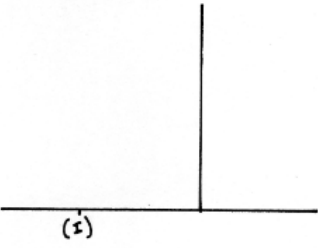
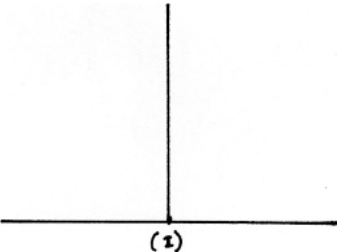
(McDowall et al, 1980)

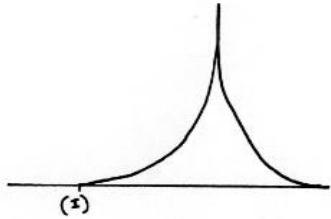
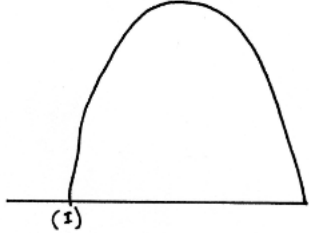
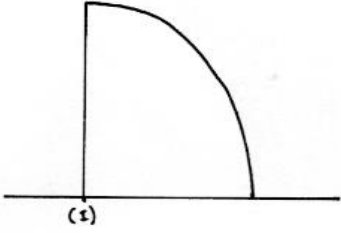
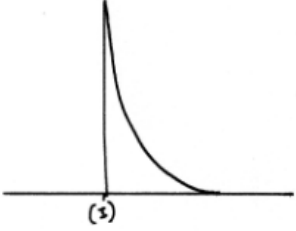
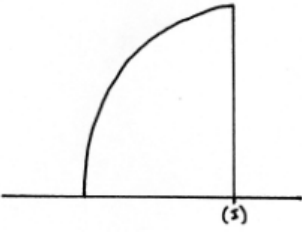
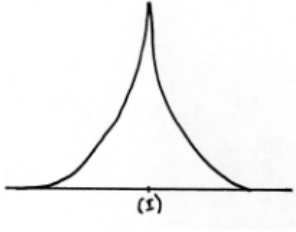
The $f(I_t)$ - ‘function of I_t ’ is the intervention component (McDowall et al, 1980). The N_t component is the ‘null case of the time series’ and the Y_t ‘time series is adequately explained as “noise” by the N_t component’ (ibid: 64). The intervention ‘increases the explanatory power of the model’ (ibid) by a statistically significant level indicated by the t -statistic which focuses on whether the intervention type fits the model through a t value of > 2 . Where $t > 2$ this indicates that the intervention has had a ‘statistically significant’ (Kahn 2006: 102) impact ‘on the time series’ (McDowall et al 1980: 64). As the intervention is an event, it is represented in SPSS as a dummy variable:

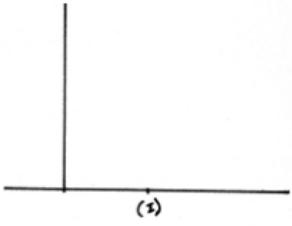
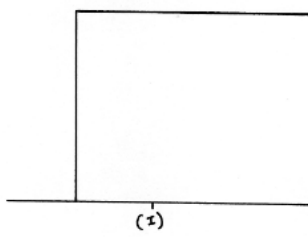
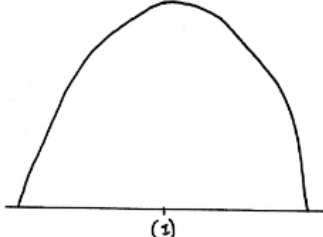
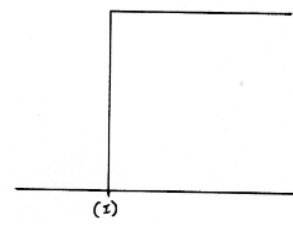
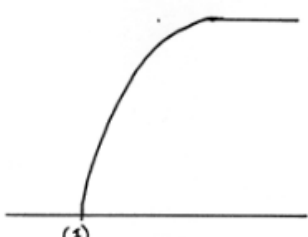
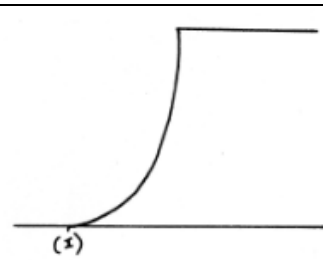
$$I_t = 0 \text{ prior to the event}$$

$$= 1 \text{ thereafter}$$

From this, different functions of the dummy variable exist which enables the investigation of a wide variety of impact types to see which best describe the model and the overall trend in the data. There are 18 different intervention types (see Table 5.5) which have been adapted from McDowall et al (1980). It is important to fit these intervention types as they identify which best fit the time series and thus explain the data. There are some which are statistically more relevant than others and each intervention is fitted to the various time series of each of the three groups. They are then reduced using the fit measures such as RMSE (Root Mean Square Error) (see SPSS, 2012) until one is identified as the best fit.

<u>Intervention Types</u>	<u>Name</u>	<u>Description</u>
	Exponential Instant Week Before.	Exponential growth from the week before the intervention, until the intervention date, then an instant drop to normal levels straight after the intervention date.
	Week Delay Instant.	An instantaneous growth one week after the intervention date and then an instant drop back to normal levels.
	Instant Change.	An instant peak on the day of the intervention which then returns to normal straight after the intervention date.

	<p>Exponential Change 1 Week Later + 1 Further Week.</p>	<p>An exponential growth from the date of the intervention until a peak the week after, and then an exponential decline back to normal levels a further week later.</p>
	<p>Power Change 1 Week Later + 1 Further Week.</p>	<p>A rapid growth from the date of the intervention until a peak the week after, and then a rapid decline back to normal levels a further week later.</p>
	<p>Instant Power Week Delay.</p>	<p>An instant increase on the day of the intervention and then a rapid decline back to normal levels a week after the intervention.</p>
	<p>Instant Exponential Week Later.</p>	<p>An instant increase on the day of the intervention and then an exponential decline back to normal levels a week after the intervention.</p>
	<p>Power Instant Week Before.</p>	<p>Rapid growth from the week before the intervention, until the intervention date, then an instant drop to normal levels straight after the intervention date.</p>
	<p>Exponential Change 1 Week Before + 1 Week After.</p>	<p>An exponential growth which peaks on the day of the intervention and then an exponential decline back to normal levels a week after the intervention date.</p>

 <p>A graph with a vertical y-axis and a horizontal x-axis. A vertical line segment rises from the x-axis at a point marked with a circled 'x'. The line then drops vertically to the x-axis, returning to the baseline.</p>	<p>Week Before Instant Change.</p>	<p>An instant peak a week before the date of the intervention which then returns to normal straight after.</p>
 <p>A graph with a vertical y-axis and a horizontal x-axis. A vertical line segment rises from the x-axis at a point marked with a circled 'x'. The line then continues horizontally at a constant high level.</p>	<p>Week Before Step Change.</p>	<p>An instant increase a week before the intervention date which continues a week after the intervention date.</p>
 <p>A graph with a vertical y-axis and a horizontal x-axis. A smooth, bell-shaped curve starts at the x-axis, rises to a peak at a point marked with a circled 'x', and then falls back to the x-axis.</p>	<p>Power Change 1 Week Before + 1 Week After.</p>	<p>A rapid growth which peaks on the day of the intervention and then a rapid decline back to normal levels a week after the intervention date.</p>
 <p>A graph with a vertical y-axis and a horizontal x-axis. A vertical line segment rises from the x-axis at a point marked with a circled 'x'. The line then continues horizontally at a constant high level.</p>	<p>Step Change.</p>	<p>An instant increase on the intervention date which continues a week after the intervention date.</p>
 <p>A graph with a vertical y-axis and a horizontal x-axis. A curve starts at the x-axis at a point marked with a circled 'x', rises steeply, and then levels off to a horizontal line.</p>	<p>Power Change 1 Week Later (Step).</p>	<p>A rapid increase from the date of the intervention until a week after.</p>
 <p>A graph with a vertical y-axis and a horizontal x-axis. A curve starts at the x-axis at a point marked with a circled 'x', rises exponentially, and then levels off to a horizontal line.</p>	<p>Exponential Change 1 Week Later (Step).</p>	<p>An exponential increase from the date of the intervention until a week after.</p>

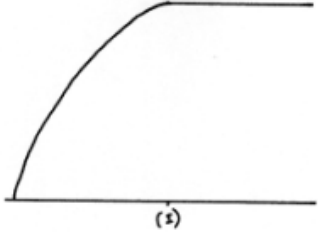
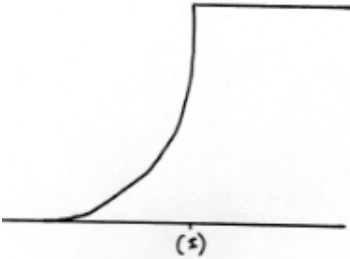
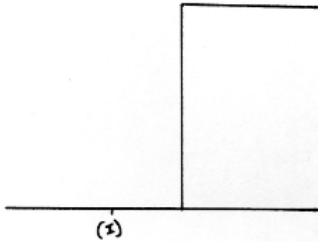
	<p>Power Change 1 Week Before (Step).</p>	<p>A rapid increase from the week before the intervention date which continues until a week after.</p>
	<p>Exponential Change 1 Week Before (Step).</p>	<p>An exponential increase from the week before the intervention date which continues until a week after.</p>
	<p>Week Delay Step Change.</p>	<p>An instant increase the week after the intervention date which continues until the week after.</p>

Table 5.5: Intervention Types

The time series model is calculated using the various intervention types mentioned (Table 5.5) to assess which best fits the data. After its calculation, from these 18 intervention types, one intervention type can be chosen which best fits the change in the time series.

The intervention analysis will assess the impact of a specific intervention, in this instance the impact of the Davies Commission interim report, which was published on 17th December 2013 and detailed shortlisted options to increase airport capacity in the south east, on the number of tweets and posts for each of the three selected groups. This intervention was chosen due to it receiving considerable media attention and reaction from numerous local, regional and national campaign groups.

The time series models the number of tweets and posts up to the intervention (17th December 2013) and the form of this ARIMA model is applied to the whole series plus the intervention component (providing the intervention is significant). In this process each intervention type is examined. This demonstrates whether or not there has been a significant increase in tweets

and posts 1 week before the intervention, on the date of the intervention, or 1 week after the intervention. 1 week before signifies the gradual increase in posts and tweets with a peak on the intervention date, on the date of the intervention illustrates a spike only on the 17th December 2013 and 1 week after shows a peak on the intervention date with a gradual decline in the number of tweets and posts. Expert modeller was used to model the ARIMA p,d,q values being extracted and then used to model the series plus each type of intervention; of which there are 18 for Facebook and Twitter representing all three selected groups (see Table 5.5) to see which best describes the impact of the intervention. These intervention types are then cross-examined with one another to identify the ‘best fit’ (SPSS, 2012).

5.10 Interview Approach

The method behind interviews with key social media personnel for each campaign is covered in this final section. The interview questions are ultimately derived from the key findings of each previous method (explained earlier). The other methods provide an understanding of how social media is used and certain challenges and opportunities that may have arisen when incorporating social media into their protest campaigns. Similarly the interview approach is able to critically uncover the challenges and opportunities of social media by the participants who operate their respective groups’ social media accounts.

5.10.1 Interview Approach and Structure

Semi-structured questions were formulated from the social network analysis, time series, cross-correlation and intervention analysis, meaning there was scope within the interviews to probe interviewees further. It was conducted this way because a comparative analysis could be undertaken between the three anti-airport expansion groups as, ultimately, the aim of structured interviews is for ‘all interviewees to be given exactly the same context of questioning’ (Bryman 2012: 210). Further sub-questioning was required at certain stages of each interview to uncover points of interest and this attempted to overcome the restrictive nature of structured interviews. Although the interview questions used give each respondent exactly the same ‘interview stimulus’ (ibid), they do not specifically follow the closed, fixed structure which is associated with structured interviews. Open-ended questions were asked,

under a semi-structured approach, which encouraged in-depth responses from all participants and produced a rich variety of information (which consequently follows a more unstructured approach). Additionally, the analysis of each interview was undertaken upon completion as a result of the acceptance of each participant to have their interview recorded.

The semi-structured (qualitative) interviews formed the final part of the research process. As mentioned, the questions were formulated out of issues raised from the social network, time series, cross correlation and intervention analysis. Additionally, the aim of the interviews was not just to uncover unanswered questions posed in other methods, but to examine whether certain features of each groups’ anti-airport expansion campaign differed at all from the data collection used in the other methods; which, in turn, would illustrate how familiar they are with their social media campaign.

5.10.2 Interview Participants

Open-ended questions were used to produce in-depth discussion with all three interviewees relating to their social media use. Table 5.6 illustrates the different individuals interviewed in order to obtain their perspective on their social media campaign. The interviews were undertaken between June and July 2015.

Anti-Airport Expansion Group	Individual
Airport Watch	Sarah Clayton
HACAN Clearskies	John Stewart
Transition Heathrow	Ian Westmoreland

Table 5.6: The Campaigns and the Social Media Operators

As detailed in Section 5.5 these three individuals were interviewed because they were identified as the social media coordinators of each group, are existing members of each existing anti-airport expansion group, have been involved in the creation of their respective group’s social media pages and have been involved in the campaign against airport expansion

for a number of years. Whilst each group possesses differing network structures behind the scenes, these three users have been operating their respective social media pages since they were first incorporated into their campaigns. They are therefore able to usefully address objective 4 (see Figure 5.1). Other members of each group were not interviewed as they were either recent employees and did not know their respective social media campaign well enough (for example with HACAN Clearskies) or they are nomadic and frequently move between different local environmental campaigns (for example with Transition Heathrow). Airport Watch only has one person operating its social media campaign. Additionally their campaigns were examined because of their legitimacy within the anti-airport expansion movement.

Initially, John Stewart from HACAN Clearskies was approached in January 2015 and, kindly, suggested that he would contact the other group's social media coordinators. As a result of each group operating a different social media account, interviews were organised with those people individually, to avoid them influencing each others' answers. John Stewart from HACAN Clearskies, Sarah Clayton from Airport Watch and Ian Westmoreland from Transition Heathrow were all asked the same questions in order to compare and contrast answers. The interviews were conducted in what Mackenzie et al (2010: 184) describe as a 'funnel format' with more general questions being asked first before focus was placed on more detailed questions. All interviews were approximately one hour in length. Although questions were developed from the findings of the other methods, certain responses meant that flexibility was required to allow for further exploration.

5.10.3 Recording the Data

A crucial consideration when undertaking qualitative interviews is how the data is going to be recorded (Kervin et al, 2006). Additionally, the interview has to conform to an ethical code of conduct to protect both the interviewer and interviewee. Silverman (2015: 151) argued that the researcher should bring an 'audio-recording device to an interview' whilst Patton (1990) agrees that audio-recording is vital for interviews.

The three interviews were recorded using a digital recorder. Respondents granted consent and the research received approval from the Loughborough University's ethics committee. Each of the three participants was given a participant information sheet which detailed the focus of

the research, what it seeks to address and how the data will be stored (see Appendix C). Each interview was undertaken separately at different locations. The interviews with John Stewart from HACAN Clearskies and Sarah Clayton from Airport Watch were conducted on the same day in the morning and afternoon respectively. The interview with Ian Westmoreland from Transition Heathrow was conducted two weeks later.

5.10.4 The Transcription Process

For this research, a full transcription was made and whilst it can take between five and eight hours to transcribe an hour interview (King and Horrocks, 2010; Aldridge and Levine, 2001), ‘for serious academic research full transcription is necessary’ (Rukwaru 2015: 260).

Recording and transcribing a full interview indicates that the researcher can re-visit and re-code text ‘as more evidence emerges and patterns are detected’ (Gregor and Hart 2005: 56). Additionally, having access to the full interview transcription and the ability to ‘replay the interview at any time is a distinct advantage’ (ibid). Also, as Bryman (2012: 487) suggests, the ability to ‘keep the recorder going’ is vital as valuable material could be lost if recording is stopped after the formal interview. For the three interviews, the audio recording adhered to Bryman’s (2012) suggestion and was only stopped when the post-interview discussion was completed. Moreover from these recordings, the full transcription of all three interviews from audio to a written format took approximately sixteen hours.

For this research, a thematic coding approach was applied to interpret and analyse the qualitative interview data. This involves identifying themes in the data as King and Horrocks (2010) indicate. Once the interviews with the social media coordinators of the three groups were undertaken, the decision was made to manually code/theme the interviews.⁵

5.10.5 Coding the Interview Data

For this research, and to analyse the selected anti-airport expansion groups’ individual interviews, King and Horrocks’ (2010) stages of thematic analysis have been utilised and followed to enable key themes to be identified: 1) Each interview transcript was read several

⁵ This was preferred to Nvivo because it enabled the uncovering of detailed nuances in the data (also see Fernandez, 2004; Gregor and Hart, 2005).

times to gain an understanding of what each person was saying; 2) the key points were written in the margin; 3) the key descriptions from each interview answer were then grouped together according to common themes with the interviews being re-read again; and 4) the overarching themes were identified by using the themes in the research gap highlighted in Chapter 3 which enabled the characterisation of key concepts within the interview responses. These key themes fall within the number prescribed by King and Horrocks (2010). The separation of the data into distinctive themes was relatively straight-forward. This was ultimately born out of the grouping of questions into themes with the respondent's answers falling into these categories seamlessly:

1. The extent of incorporation of social media.
2. What social media adds to their campaign.
3. What are the problems of incorporating social media.
4. What is the future role of social media in their campaign.

All categories are devised to answer objective four (see Figure 5.1) and aim to uncover, from speaking directly with the social media coordinators of each group, the issues of incorporating social media into their protest campaigns. The literature demonstrates that social media has enabled new protest groups to form and has created new ways for them to disseminate their campaign to large audiences. However, what is not known is the extent of existing protest campaigns incorporation of social media. This is important because these campaign groups have been active for a number of years, have formed close relationships with the local communities they campaign on behalf of, have a strong offline presence and are the faces of airport protest around Heathrow. But the development of social media is said to have revolutionised the ways in which people interact, increasing opportunities to those who use it and has changed the ways protesters 'communicate, collaborate and demonstrate' (Bachmann and Harlow 2014: 727). Moreover these new forms of activism have multiplied and transformed the ways in which activists participate in political decision making (DeLuca et al, 2012). Therefore, social media has become integral for those campaign groups who wish to participate in and organise protest (Cammaerts, 2015). Table 5.7 provides a summary of the methods highlighted in this chapter.

Methods	Key Measures
Social Network Analysis	<ul style="list-style-type: none"> • Looks at how social media is used • Utilising NodeXL (for Facebook data and visualisation) and Twitonomy (for Twitter data) • Interactions with ego and surrounding alters to uncover who each group is interacting with • Findings are able to inform interview questioning
Time Series Analysis	<ul style="list-style-type: none"> • Looks at how social media is used • Utilises SPSS for the construction of time series and subsequent ARIMA models • Tracks fluctuations in number of posts and tweets • Analyses relationship between social media platforms • Plots an intervention (Davies Commission interim report) to investigate whether there is a statistically significant change in daily social media data and the extent to which this happens • Findings are able to inform interview questioning
Interviews	<ul style="list-style-type: none"> • Three social media coordinators interviewed • Key themes fall out of interview data • Able to uncover challenges and opportunities of social media incorporation

Table 5.7: Summary of Methods

5.11 Summary

This chapter has detailed the methodology of the research. The pragmatic paradigm has been discussed and how this naturally led to the implementation of a mixed methods research approach and enabled the understanding of the variety of social media data by applying elements of more than one investigative approach. The aim: “to explore the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK” can be addressed by utilising quantitative and qualitative methods which analyse the characteristics of each social

media network. Social network analysis is able to visualise and measure the relationships and interactions between people within each group's social network to uncover patterns, frequency of interaction and their position within the network which can determine their overall importance, influence and power over the control of the spread of information. The social media data from this method is then modelled using SPSS to uncover daily fluctuations in the data. The ARIMA model produced from this is then able to be utilised for the remaining quantitative methods. The cross correlation utilised the residual data points to investigate the relationship between the social media platforms and fourthly intervention analysis which assessed the impact of an identified event in time related to the anti-airport expansion campaign detailed in the Davies Commission interim report on the publication of tweets and posts. The results of all methods posed numerous questions which were answered by conducting semi-structured interviews with the three group's social media coordinators. These three individuals were interviewed because of their role in creating and incorporating social media into their respective group's campaigns and their campaigning longevity against airport expansion at Heathrow.

Chapter 6

Social Network Analysis

6.1 Introduction

Airport Watch (Section 6.2), HACAN Clearskies (Section 6.3) and Transition Heathrow (Section 6.4) have been chosen for analysis because of the reasons identified in Section 5.5. They have adopted new Information Communication Technologies (ICTs) which have been integrated into their campaigns. Twitter and Facebook provide a further platform for each group's campaign as they still possess other forms of online (and to some extent offline) tools within their protest repertoire. This section presents the social media data obtained using both Twitonomy and NodeXL and visualises the data in graph format. This chapter, in part, responds to objective three (see Figure 5.1). Social network analysis is able to uncover the incorporation of social media into these three existing anti-Heathrow airport expansion campaigns by exploring with whom these groups interact and how frequently which gives an indication of network properties (Gruzd and Haythornthwaite, 2011) which includes social media use. Section 6.5 focuses on the number and type of user for each network and analyses the characteristics of each social network on Twitter in order to provide a more in-depth look at how social media is utilised with a view to informing interview questions. A summary and conclusion of the chapter is drawn in Section 6.6.

The following/follower networks, obtained solely by using NodeXL, visualise the asymmetric and reciprocal edges with other users in the network. Those users who possess reciprocal edges fall within a distinct inner circle and those who possess asymmetric (meaning the groups follow another user or vice versa) fall within a larger outer circle. The mention networks, obtained by Twitonomy but visualised through NodeXL, highlight which users each group mentions. Those who appear close towards the central vertex (each particular group) are mentioned most often. The retweet networks show which users each group retweet the most. Again, those who are retweeted most often appear closer to the centre. The replies to networks, obtained by Twitonomy but visualised through NodeXL, demonstrates who each group replies to. Once more, those users who are replied to most

often appear towards the centre. It is important to highlight that given the nature of the 1.0 level Twitter egocentric networks demonstrated in this chapter, all centrality measures naturally point to the fact that each group is the most important and influential in its own network. Therefore, a description of the each centrality measure for the three group's Twitter networks is not provided to ensure meaningful results and avoid repetitiveness. However, because their respective Facebook groups/pages show connections between alters, the centrality measures are introduced to highlight group structure.

Typically, Facebook networks are not directed because users have mutually agreed to be 'friends' with one another, but it is important to discover the direction of ties in these networks to uncover who is interacting with who which ultimately determines individual's positions in the network and their access to information.

A description of each user interacted with in all networks is shown in Appendix D. Airport Watch's social network graphs are first to be presented.

6.2 Airport Watch

The following/follower network graphs (Section 6.2.1) are directed networks showing the direction of edges as users are classified as either following or being followed. The other remaining networks: 1) Mentions (Section 6.2.2); 2) retweets (Section 6.2.3); and 3) replies to (Section 6.2.4), are still directed networks but only asymmetrical. The direction of edges is from the central to the other vertices in the network. The Facebook Page is also highlighted in Section 6.2.5.

6.2.1 'Following/Follower' Network

Airport Watch appears at the centre of the network (Figure 6.1) and is connected to all 2,424 vertices through 2,711 edges some of which are reciprocal meaning that Airport Watch will follow a user with that user following Airport Watch but some edges are not reciprocal which means that a user might follow Airport Watch but Airport Watch might not follow that user or vice versa. On a network level, Airport Watch currently has an in-degree of 1985 and an out-degree of 726 which means that there are 1985 vertices with edges pointing inwards at

Airport Watch (this translates to its followers) and 726 vertices with edges pointing outwards from Airport Watch (this translates to who the group is following).

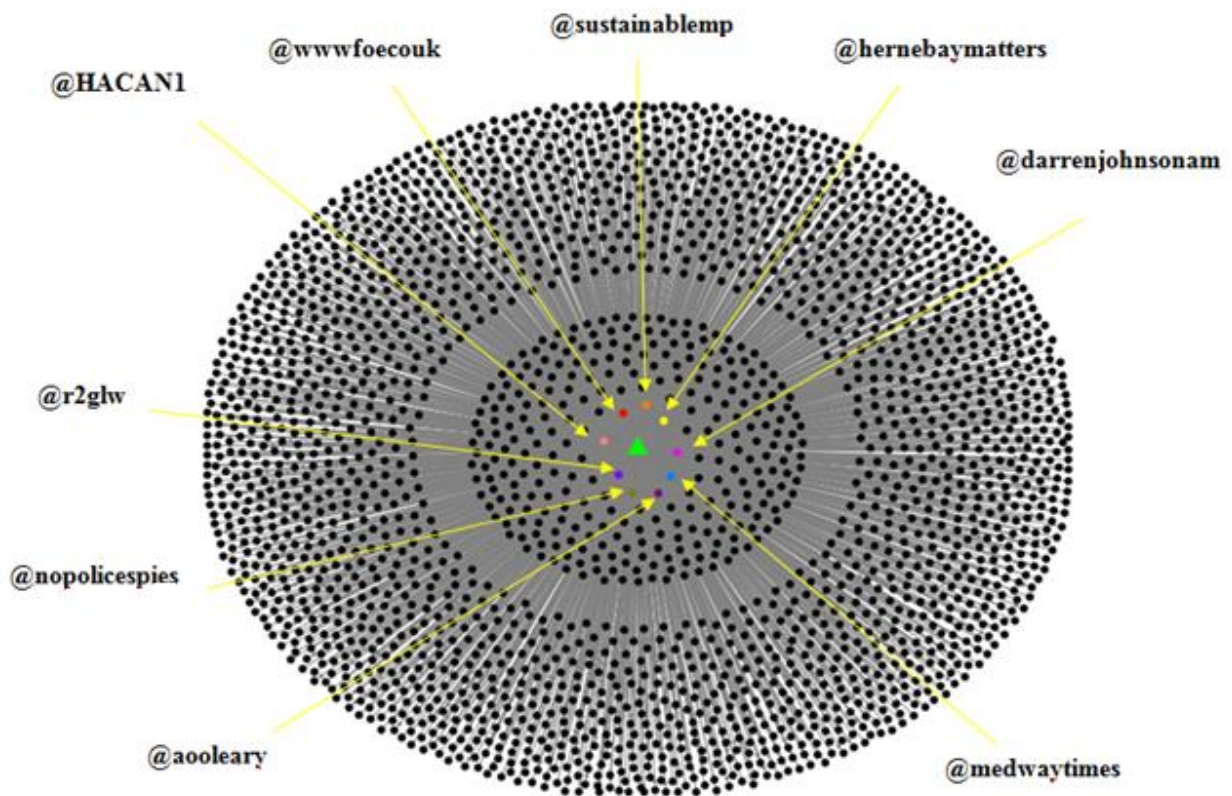


Figure 6.1: Airport Watch's egocentric network denoting closest users

The network graph (see Figure 6.1) shows an inner circle and outer circle. The vertices within the inner circle are closer to Airport Watch, due to the reciprocal edges that exist within this circle (meaning Airport Watch follows a user and that user reciprocates the tie to follow Airport Watch). There are several users close to Airport Watch: @HACAN1 - light pink, @wwwfoecouk - red, @sustainablemp - orange, @hernebaymatters - yellow, @darrenjohnsonam – dark pink, @medwaytimes - blue, @aoleary – dark purple, @nopolicespies – olive green, @r2glw – light purple. It must be highlighted that their position close to the centre of the network is not because they interact more (as interaction is not taken into account in this network), because the Fruchterman-Reingold metric considers edges themselves and not edge types (following/follower). Therefore it makes vertices that

are neighbours attract each other but every vertex repels each other (Fruchterman and Reingold, 1991). The other group being studied, Transition Heathrow appears within the inner circle as there is reciprocity with the follower/following edges. The outer circle comprises all of the vertices who either follow Airport Watch or have Airport Watch follow them. The reciprocal relationships are not surprising given the similarity between the ideology of anti-airport expansion groups; particularly in the south east. There is no reciprocity within the outer circle.

The next network type focuses on who Airport Watch mentions within its Twitter campaign.

6.2.2 'Mentions' Network

Airport Watch appears at the centre of the network and is connected to all surrounding vertices. In total there are 73 vertices within Airport Watch's mention network through a total of 176 edges. Unlike the following/followers network which has either one or two edges to determine whether users follow the ego (Airport Watch) or vice versa, the mentions network exhibits more edges because of more interaction within the network. Out of the 176 edges, 48 are unique edges and these are instances where a 'one-off' mention occurs between user and ego. 128 are duplicate edges; which is where many edges exist between the ego and users and demonstrates greater interaction.

At the core of Airport Watch's mention network, three users appear distinctly closer to the centre than any others (see Figure 6.2).

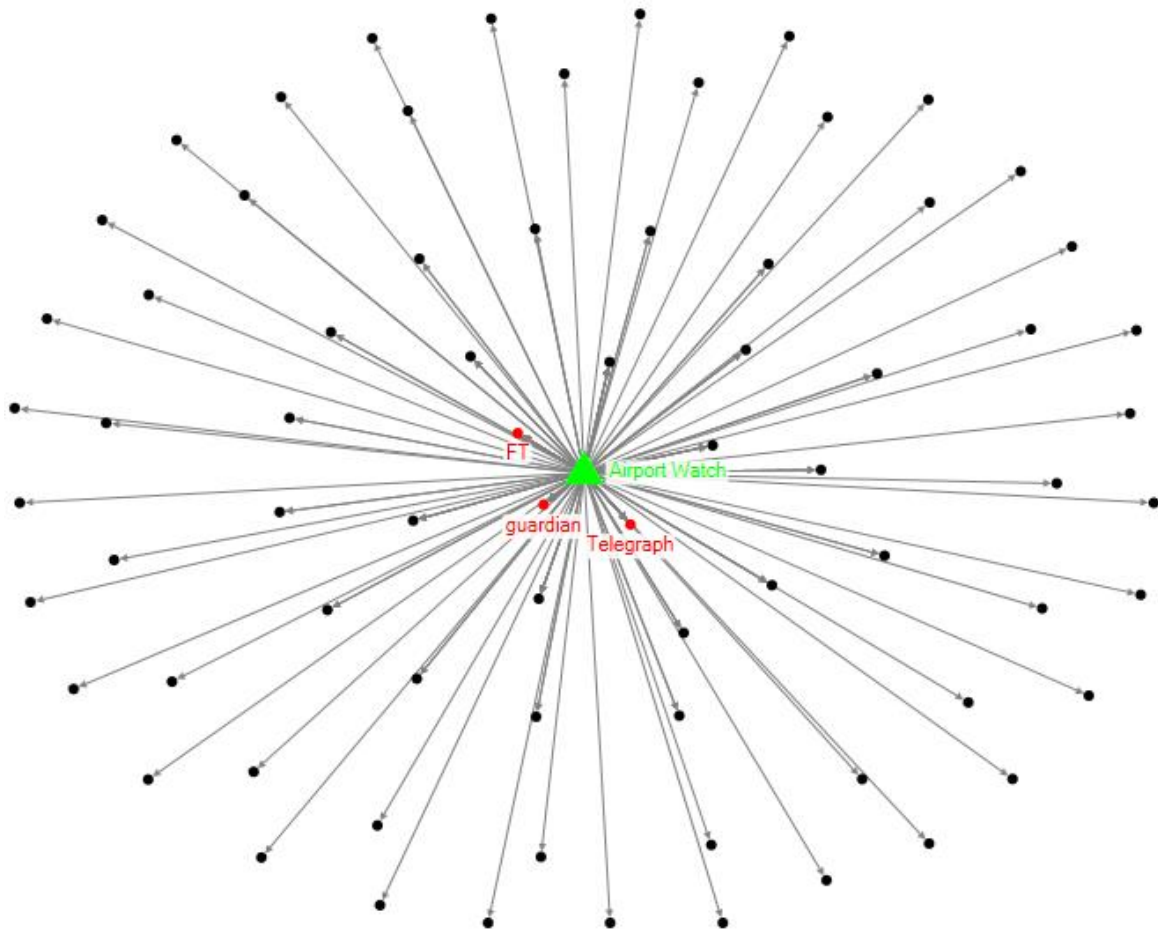


Figure 6.2: Users closest to Airport Watch

@guardian is closest because Airport Watch mentions them more than any other – a total of 33 times between April 2013 and February 2014. Interestingly, two other forms of print news media appear towards the centre of the network - @Telegraph and @FT. @Telegraph is mentioned 17 times and @FT 15 times. Of the vertices away from the centre of the network media platforms are still prominent (Figure 6.3).

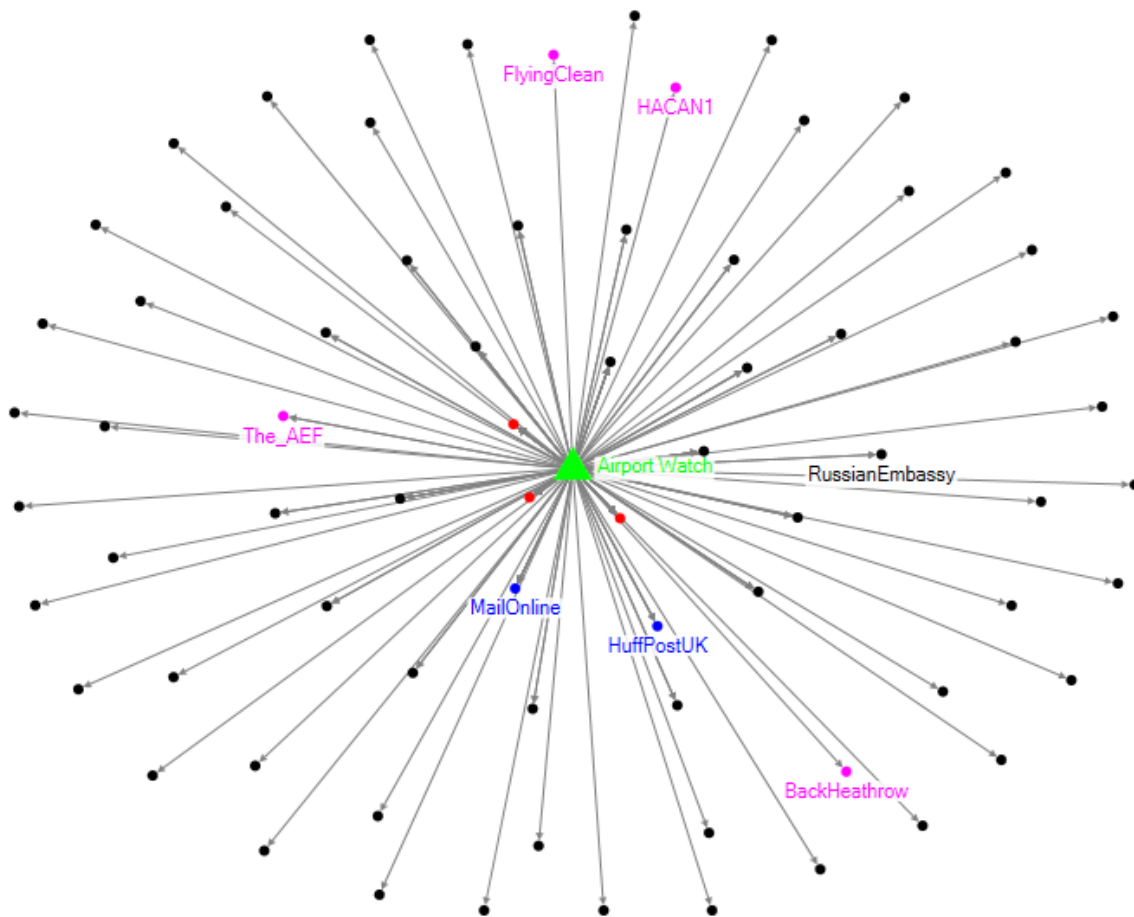


Figure 6.3: Users outside of the centre of the network

@HuffPostUK is mentioned three times and @MailOnline five times. The users which appear on the periphery of the network are the ones which Airport Watch mentions the least often and thus where certain protest groups are positioned (see @BackHeathrow, @FlyingClean, @HACAN1 and @The_AEF). Airport Watch mentions @RussianEmbassy more than the other two selected groups researched in this study (HACAN Clearskies and Transition Heathrow). @HACAN1 is only mentioned once but Transition Heathrow is not mentioned at all.

The retweet network, discussed in the next section, highlights which users Airport Watch retweets.

6.2.3 'Retweet' Network

Airport Watch again appears at the centre of the network. In total there are 156 vertices through 855 edges. If a message was retweeted once by Airport Watch then there would be

156 edges with one from each vertex. However the large number of edges means that Airport Watch retweets numerous users more than once, it can only retweet a message once and therefore a high proportion of edges to a user signifies that numerous messages have been retweeted. 75 are unique edges whereby a single edge occurs between Airport Watch and certain users indicating that Airport Watch only retweets one of a user's tweets. There are 780 duplicate edges meaning many edges exist between certain users and Airport Watch indicating that Airport Watch retweets multiple messages. Unlike Airport Watch's mention network its retweet network shows a contrasting picture, the graph exhibits a small central core of users whom Airport Watch retweets the most. This core contains anti-airport expansion pressure groups (see Figure 6.4).

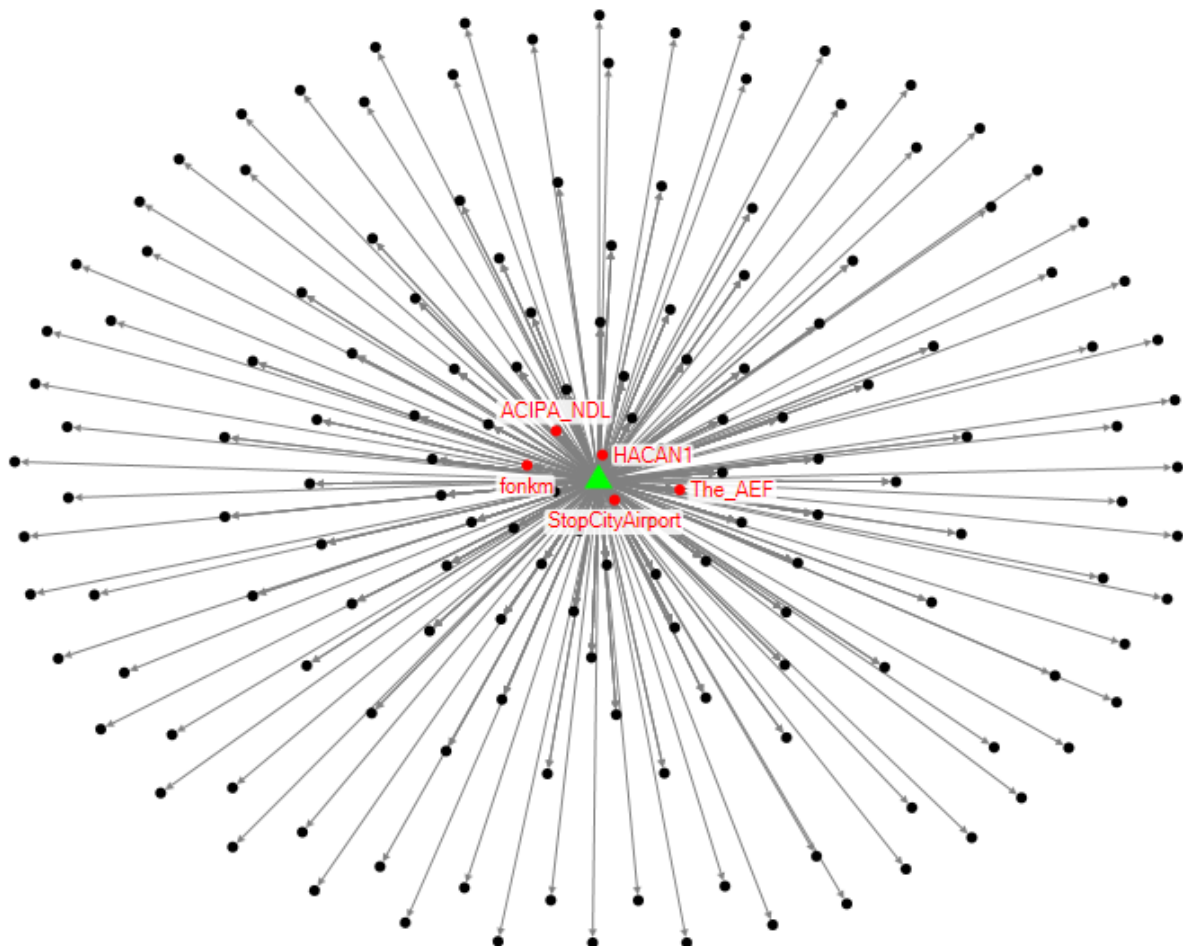


Figure 6.4: Core of anti-airport expansion pressure groups

The anti-Heathrow expansion group @HACAN1 is retweeted 94 times during the period April 2013 – February 2014 with @StopCityAirport being retweeted the most at 102 times.

Other groups include @fonkm – 27 times, @ACIPA_NDL– 24 times and @The_AEF - 21 times. Airport Watch also associates itself with either anti-airport expansion or the environment and climate change individuals (see Figure 6.5).

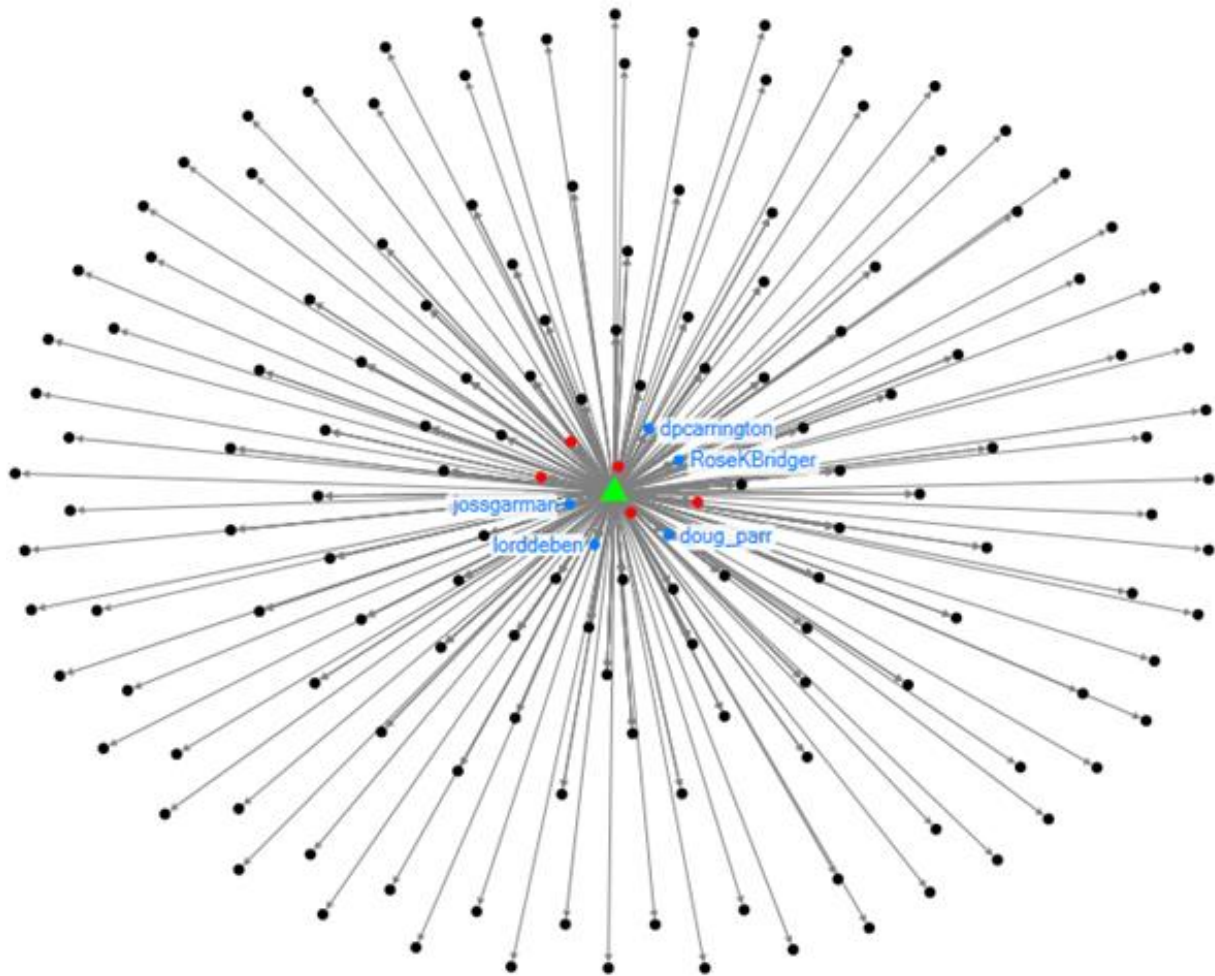


Figure 6.5: Core of close individuals

Within an inner core network, key individuals exist which are retweeted most often @jossгарman – 47 times, @lorddeben – 28 times, @doug_parr – 27 times, @RoseKBridger – 26 times and @dpcarrington – 21 times.

Figure 6.6 highlights which users appear towards the outside of the network. It is these users who are mentioned least often by Airport Watch.

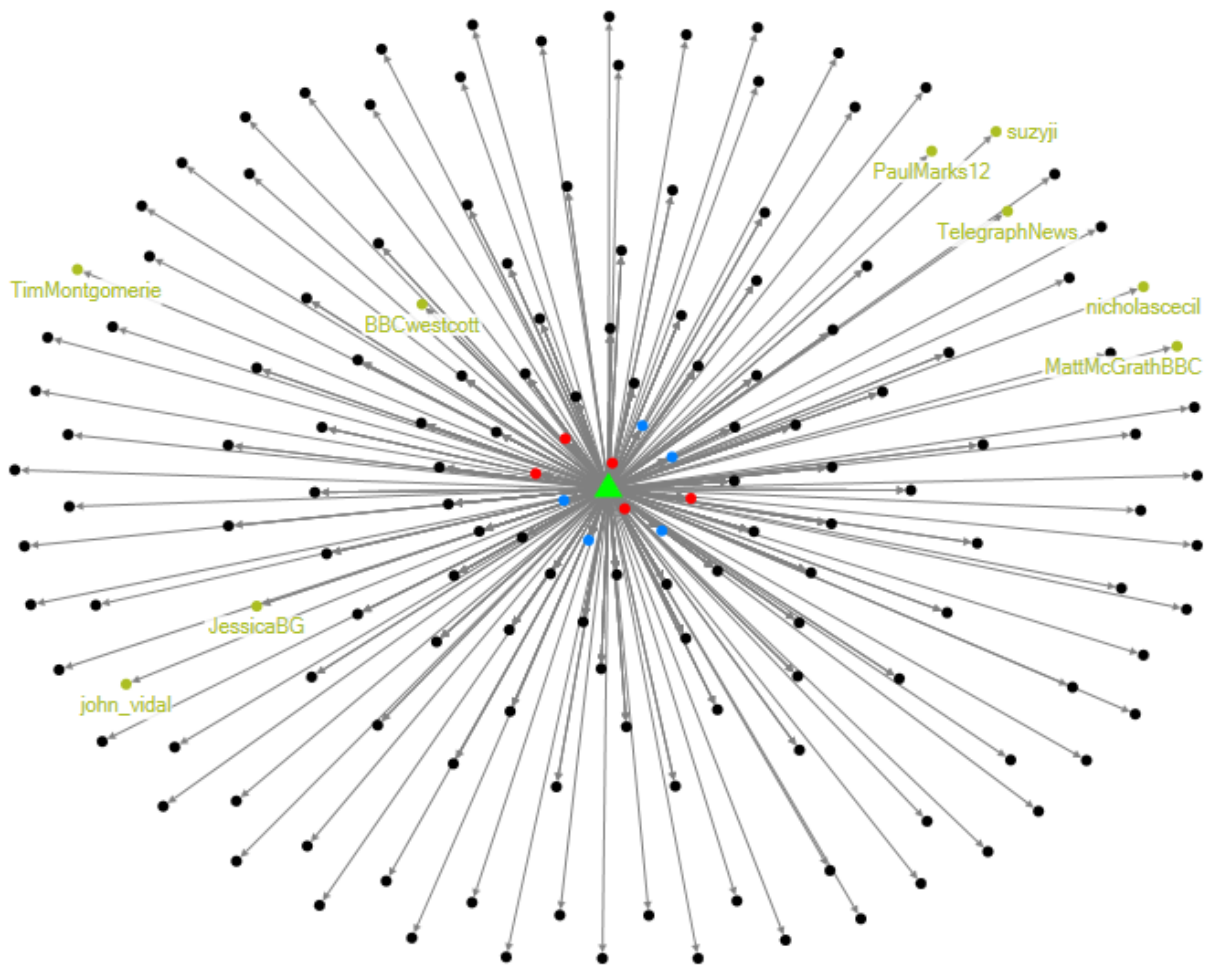


Figure 6.6: Groups and Individuals on the outside of the graph

These users consist of key journalists, which is in stark contrast to its mentions network. These users are all retweeted once, @john_vidal, @MattMcGrathBBC, @nicholascecil, @PaulMarks12, @suzyji, @TelegraphNews and @TimMontgomerie, apart from @JessicaBG who is retweeted twice and @BBCwestcott who is retweeted three times.

The next Twitter network is Airport Watch's replies to network. This highlights all users who Airport Watch replies to.

6.2.4 'Replies to' Network

In Airport Watch's network Airport Watch appears at the centre with 44 vertices surrounding it meaning it replied to 44 different users from April 2013 – February 2014. In total there are 104 edges with Airport Watch replying to certain vertices more than once. 21 edges are unique which means that there is one edge from Airport Watch to 21 individual vertices

where they replied to a tweet only once, the duplicate edge value of 83 highlights that a percentage of vertices are replied to multiple times whether it be numerous replies to the same tweet or different tweets. Unlike the other networks where a very close central group of vertices exist, in the replies to network all vertices are sparsely distributed. There is one user who is close to the centre @keithpp (see Figure 6.7), who is replied to 15 times.

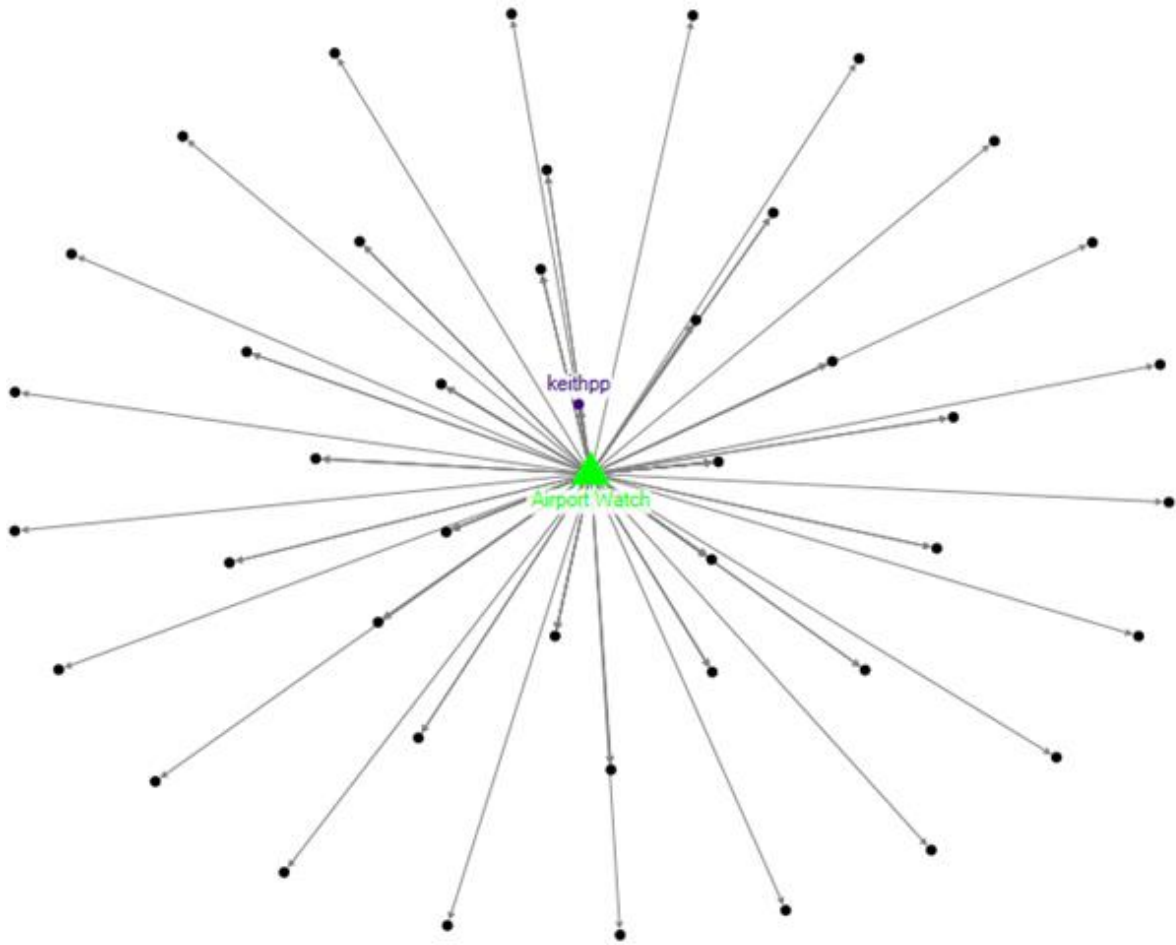


Figure 6.7: Vertex closest to Airport Watch

Additionally there are also those users whom Airport Watch replies to often which have a protesting focus centred around promoting a third runway at Heathrow airport (Figure 6.8).

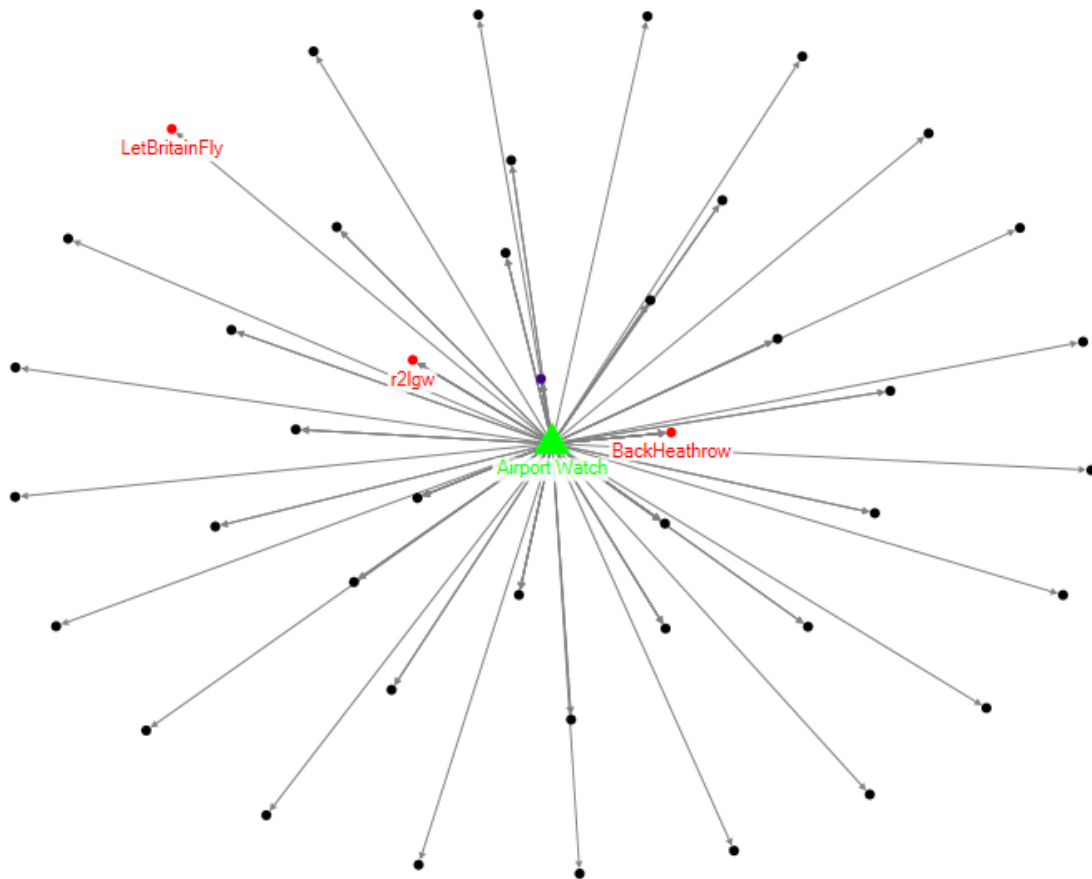


Figure 6.8: Pro-airport expansion groups

These users include: @BackHeathrow which is replied to nine times, @r2lgw is replied to five times and @LetBritainFly is replied to once. This is in comparison to those groups and individuals who are focused on anti-airport expansion (see Figure 6.9).

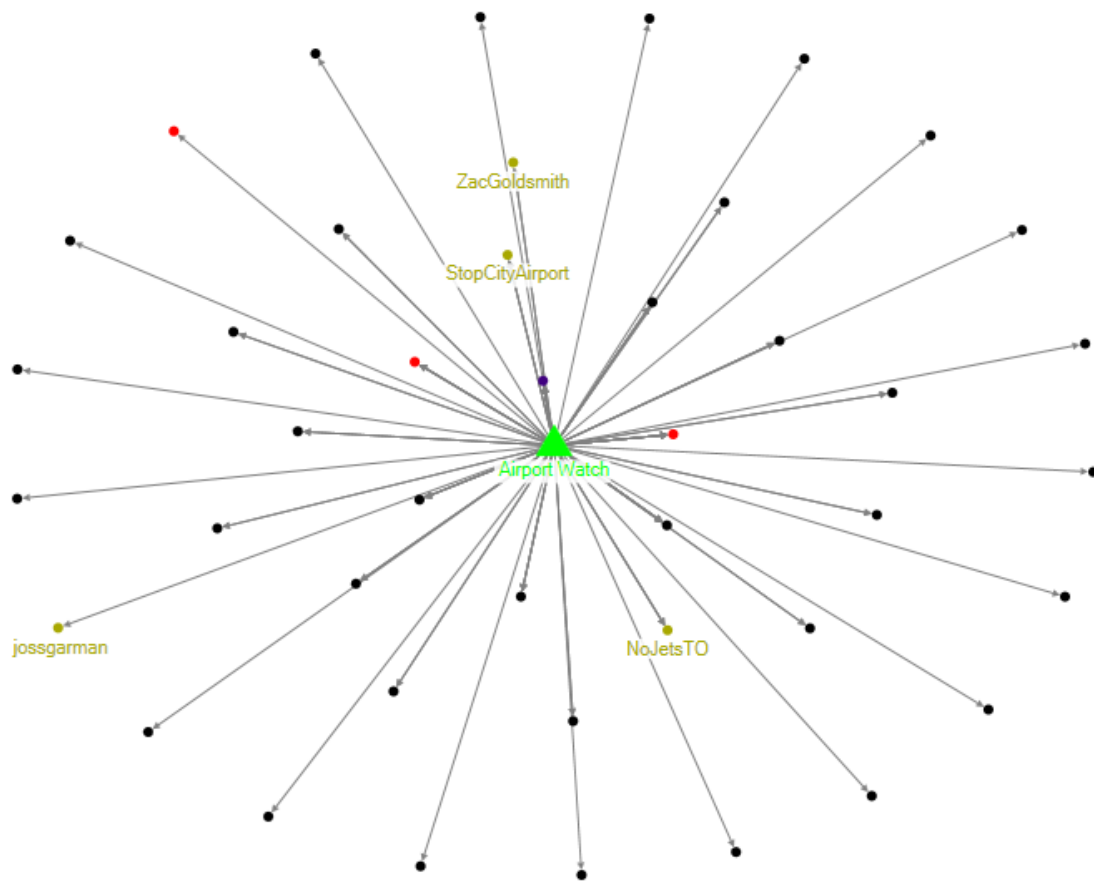


Figure 6.9: Anti-airport expansion groups and key individuals

@NoJetsTO is replied to three times, @StopCityAirport is replied to three times, @ZacGoldsmith is replied to twice and @jossgarman is replied to once.

In conjunction with Twitter networks, Airport Watch also operates a Facebook page. It is the structure of the Facebook page, including centrality measures, which are discussed in the next section.

6.2.5 Facebook Page

Within Airport Watch's cause page Airport Watch appears as a central user, much like its Twitter network. It has an in-degree of 39 which reveals that 39 edges are directed towards Airport Watch and an out-degree of 5 highlighting 5 edges emanating from Airport Watch to other vertices. What this shows is that although Airport Watch is at the centre of the network with more people engaging with it than any other vertex, it does not connect with many other users meaning that it uses the cause page as a way of posting relevant up-to-date information

and relies on its members to generate debate amongst themselves. Other prominent users within Airport Watch's cause page, Francis Voisey and Alex von Berber, have closer in and out degrees – the former has an in-degree of 12 and an out-degree of 8 and the latter an in-degree of 11 and out-degree of 7. What this shows is that the users use the group to stimulate debate – as they seek comments/likes from other users but also comment/like on other users themselves.

The Betweenness Centrality of a particular user is demonstrated through the circles shown in Figure 6.10.

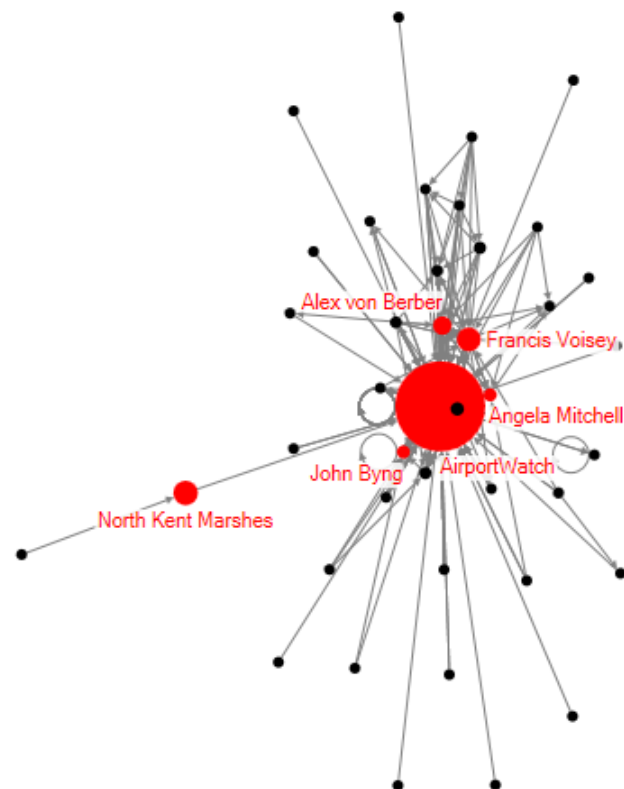


Figure 6.10: Vertex by Betweenness Centrality Score

Airport Watch exhibits a significantly higher Betweenness Centrality than every other participant in the cause page, 1283.2 which is linked to the number of connections it has and its position in the network. The out-degree of five highlights that Airport Watch (in the form of a comment or like) interacts with five other users through five different edges. But the majority of users within the page interact with Airport Watch (in-degree of 39) through commenting and/or liking on a post and/or comment. The high Betweenness Centrality shows that if Airport Watch is removed from either of its networks, then the flow of information within the network would cease and consequently other users would not be able to receive

information. There are also numerous other connections between all other vertices in the network with a total of 289 edges. 75 of these are unique where a one-off interaction exists and 214 are duplicated where two or more edges between users are present. This highlights that a lot of information passes through Airport Watch to every other user in the network; it is at the centre of all information disseminated throughout the page and thus is aware of every happening.

Figure 6.11 shows those users in the network which possess a higher Closeness Centrality when compared to others. A larger circle indicates a higher Closeness Centrality.

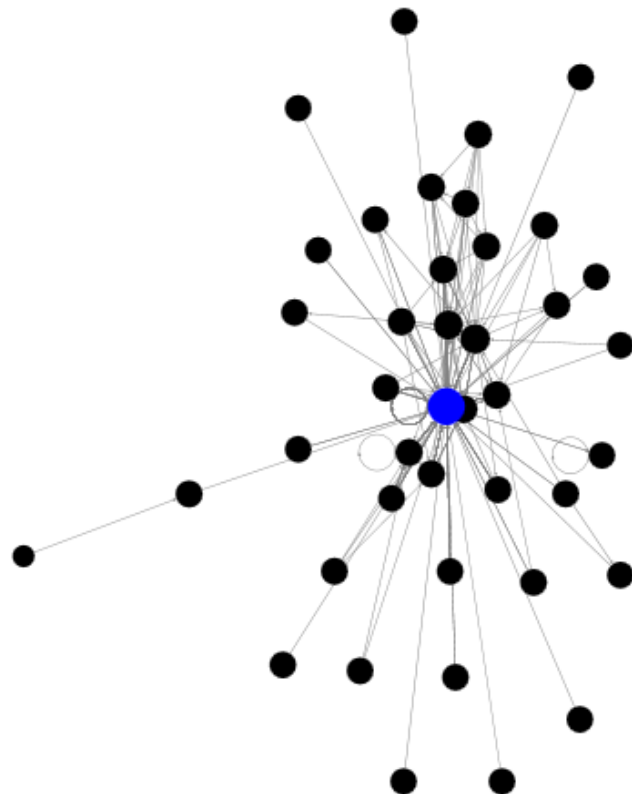


Figure 6.11: Vertex by Closeness Centrality Score

For the Airport Watch page network it is Airport Watch (blue circle) which possesses the highest Closeness Centrality of 0.024 which illustrates that it is the closest user to every other user in the network. Its closeness enables Airport Watch to disseminate information quickly and efficiently between the other users it is connected to and it can reach out to involve other more peripheral users. It also relies on fewer vertices to spread information around the network. The Closeness Centrality measures for other users demonstrate a degree of

uniformity between them and scores range from 0.016 to 0.013. This means they are as close as one another and information requires a similar of steps to reach someone else in the network.

The Eigenvector Centrality measure is a continuation of degree centrality but rather focusing on the size of a user's network which is the number of users directly connected to someone, it is thought to be a more refined version (Borgatti et al, 2013) (see Figure 6.12 for the Airport Watch network Eigenvector Centrality).

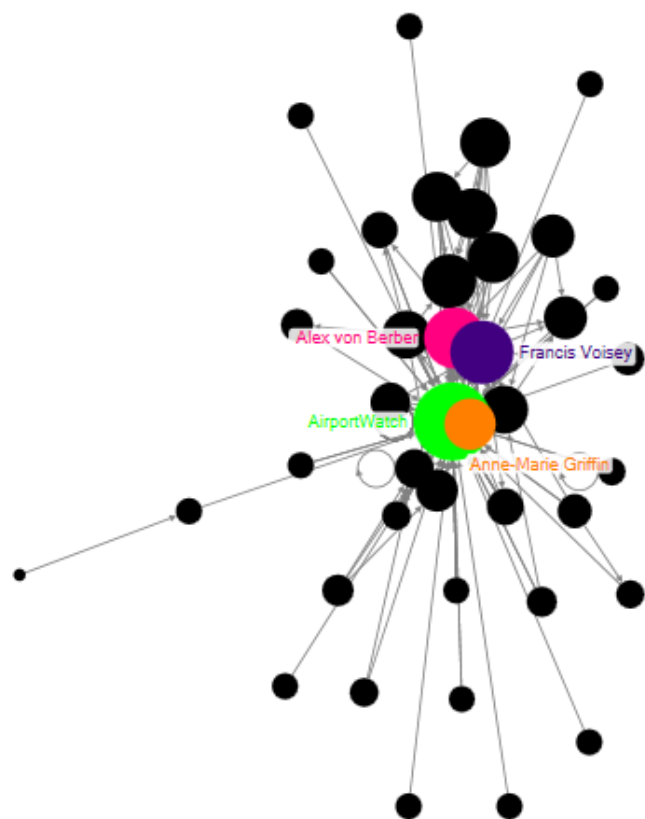


Figure 6.12: Vertex by Eigenvector Centrality Score

Airport Watch possess the highest Eigenvector Centrality out of all users within its Facebook page network (0.101). This relates to the influence of a vertex and focuses on the connections between neighbours. Purely connecting to people does not mean a user is important but if a user has a neighbour who also has a high Eigenvector Centrality it provides a stronger signal of influence and as a result is more likely to exert influence through them. Airport Watch is connected to adjacent users which also have a high eigenvector centrality, for example

Francis Voisey (0.066), Alex von Berber (0.061) and Anne-Marie Griffin (0.043) and exerts the influence it possesses through them.

Airport Watch also has the highest Page Rank measure, 8.55, which highlights its importance. Overall, what the centrality measures show – ultimately Airport Watch’s dominance, is the similarity between both their Twitter and Facebook networks.

The other anti-airport expansion campaign group which is focused on in this research is HACAN Clearskies. This group provides a regional approach to campaigning against Heathrow airport.

6.3 HACAN Clearskies

The networks in this section are: the following/follower network graphs (Section 6.3.1), mentions (Section 6.3.2), retweets (Section 6.3.3), and replies to (Section 6.3.4). The Facebook Group is also highlighted in Section 6.3.5.

The following/follower network graphs (Section 6.3.1) provide a realisation of who HACAN Clearskies is following and who follows HACAN Clearskies.

6.3.1 ‘Following/Follower’ Network

In HACAN Clearskies’ following/follower network there are 1465 vertices in total through 1828 edges, these edges are unique and not duplicated edges as a vertex either follows the central vertex or does not. A duplicate edge would imply that there is the capability to follow another vertex more than once but this is not the case, only one or two edges may exist; one edge if the relationship is asymmetrical and two edges if it is reciprocal. Within the inner circle, through reciprocal edges, what is noticeable is the number of protest groups with either transport or environment ideologies. @AirportWatch, @transheathrow, @planestupid, @GreenpeaceUK, @ClimateRush, @AirportOnTrial, @CleanAirLondon, @fonkm, @HACANEast, @CamdenFoE, @Bham_FoE, @PlatformLondon, @AVJustice, @RoadPeace, @HelicopterNoise and @transenv are all organisations where reciprocity of the following/follower relationship occurs (Figure 6.13).

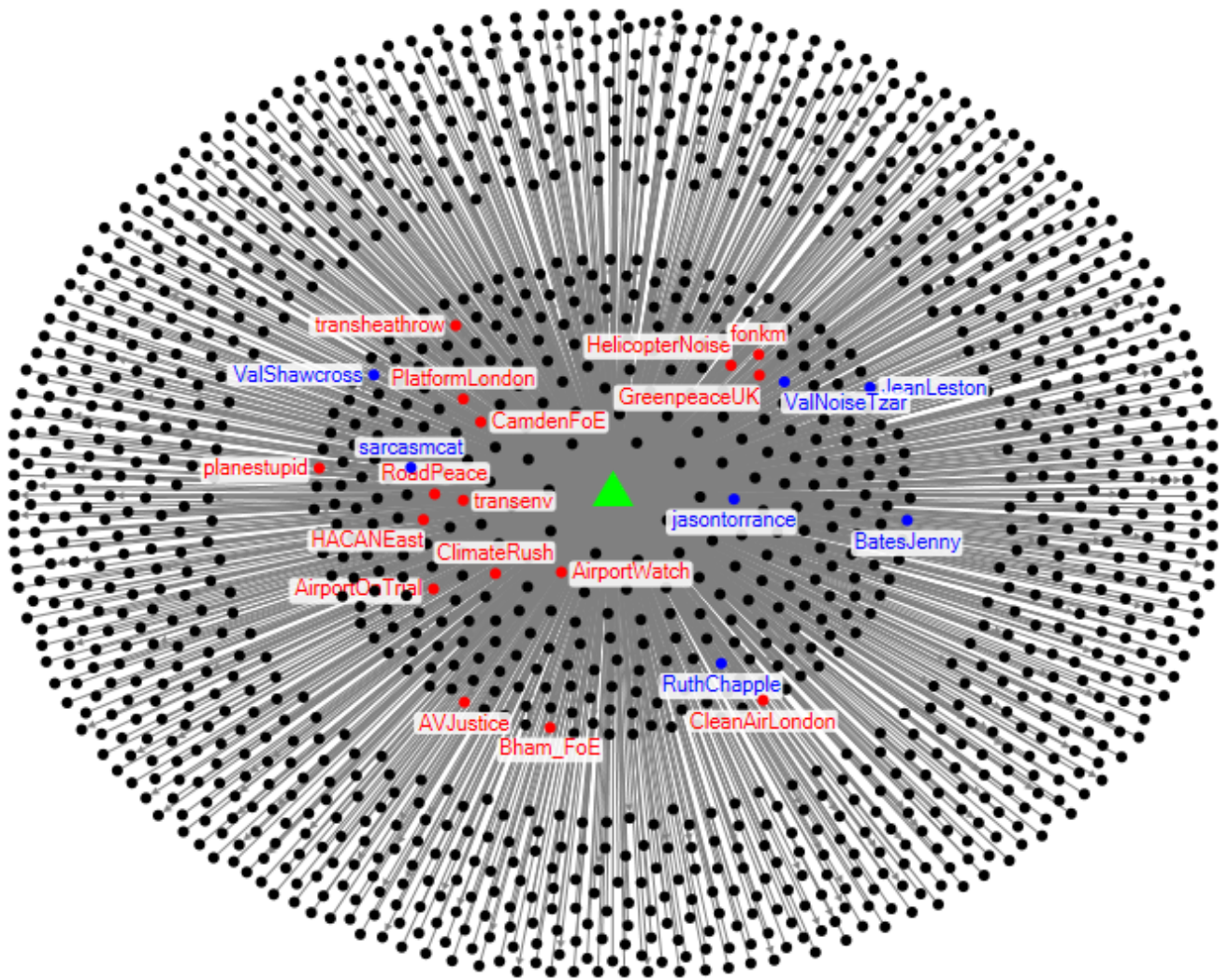


Figure 6.13: Selected Transport and Environment Protest Groups and Individuals

HACAN does, within its inner network, have other followers of interest where a reciprocal edge exists. As well as transport and environmental protest groups, HACAN not only possesses individuals associated with these groups such as @ValNoiseTzar, @sarcasmcat, @jasontrance, @RuthChapple, @JeanLeston, @BatesJenny and @ValShawcross (Figure 6.13), but also has strong ties with various journalists commentating on transport, environment and other political issues (Figure 6.14).

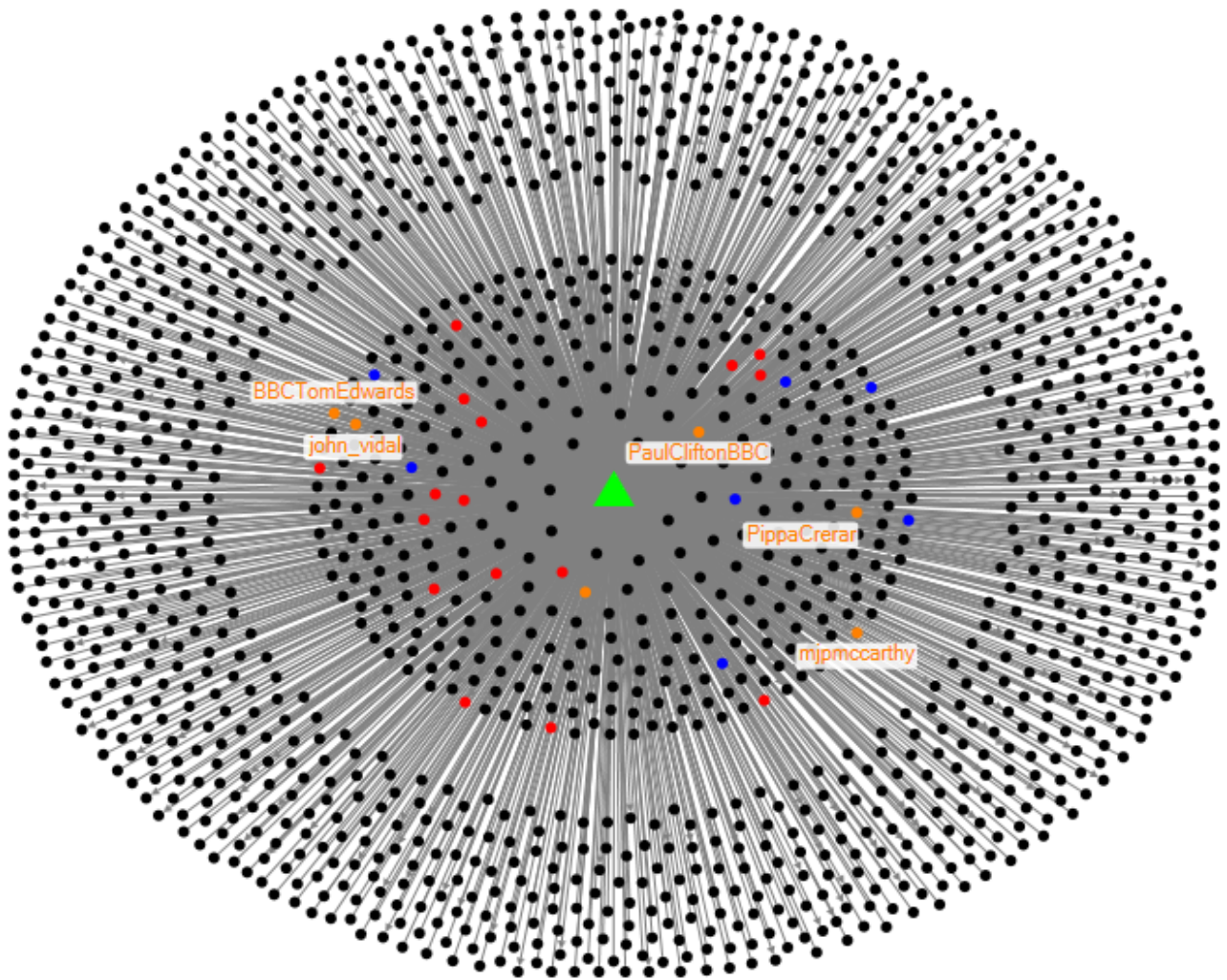


Figure 6.14: Key Journalists

These key journalists with a reciprocal following/follower tie are: @john_vidal, @BBCTomEdwards, @mjpgmccarthy, @PaulCliftonBBC and @PippaCrerar.

HACAN Clearskies' mentions network is presented in the next section. This shows all users who HACAN Clearskies mentioned from when it first started to use Twitter until 14th February 2014.

6.3.2 'Mentions' Network

HACAN appears at the centre of the network with edges from surrounding vertices all connected to it. In total there are 76 vertices in the mentions network, implying that since HACAN joined Twitter it has mentioned, in its own tweets/status updates, 76 different users through a total of 221 edges. 51 edges are unique and indicate where HACAN mentions a

user only once. However the presence of 170 duplicate edges means that certain users are mentioned on multiple occasions. In this network HACAN mentions @guardian the most, 35 times, followed by @addthis, 20 times, and @Telegraph, 15 times (Figure 6.15).

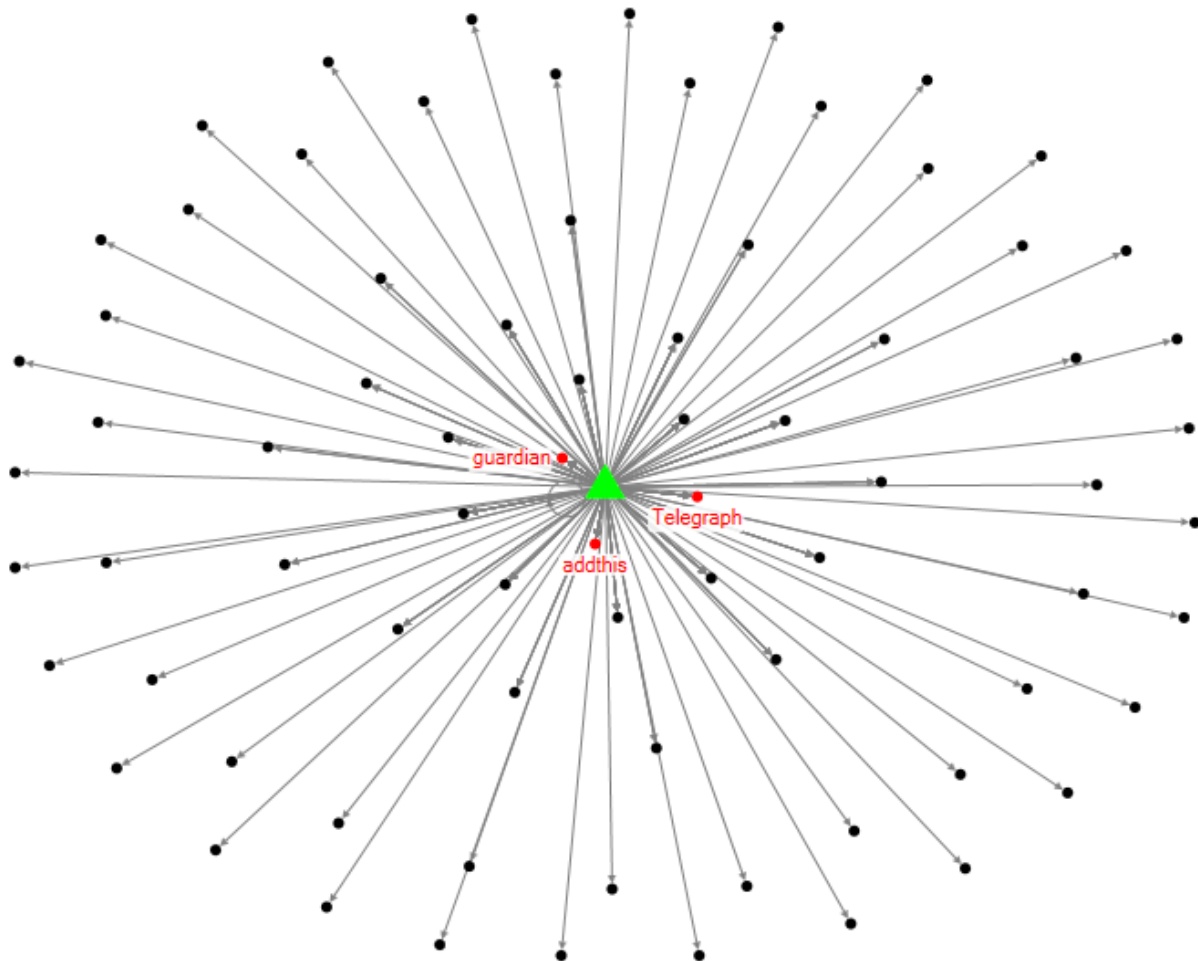


Figure 6.15: Core of Closest Users

In HACAN's mentions network, vertices which are mentioned the most appear towards the centre of the network, and those which are only mentioned once appear in the outer circle. As well as the Guardian and Telegraph newspapers, five other examples of print media are mentioned (Figure 6.16).

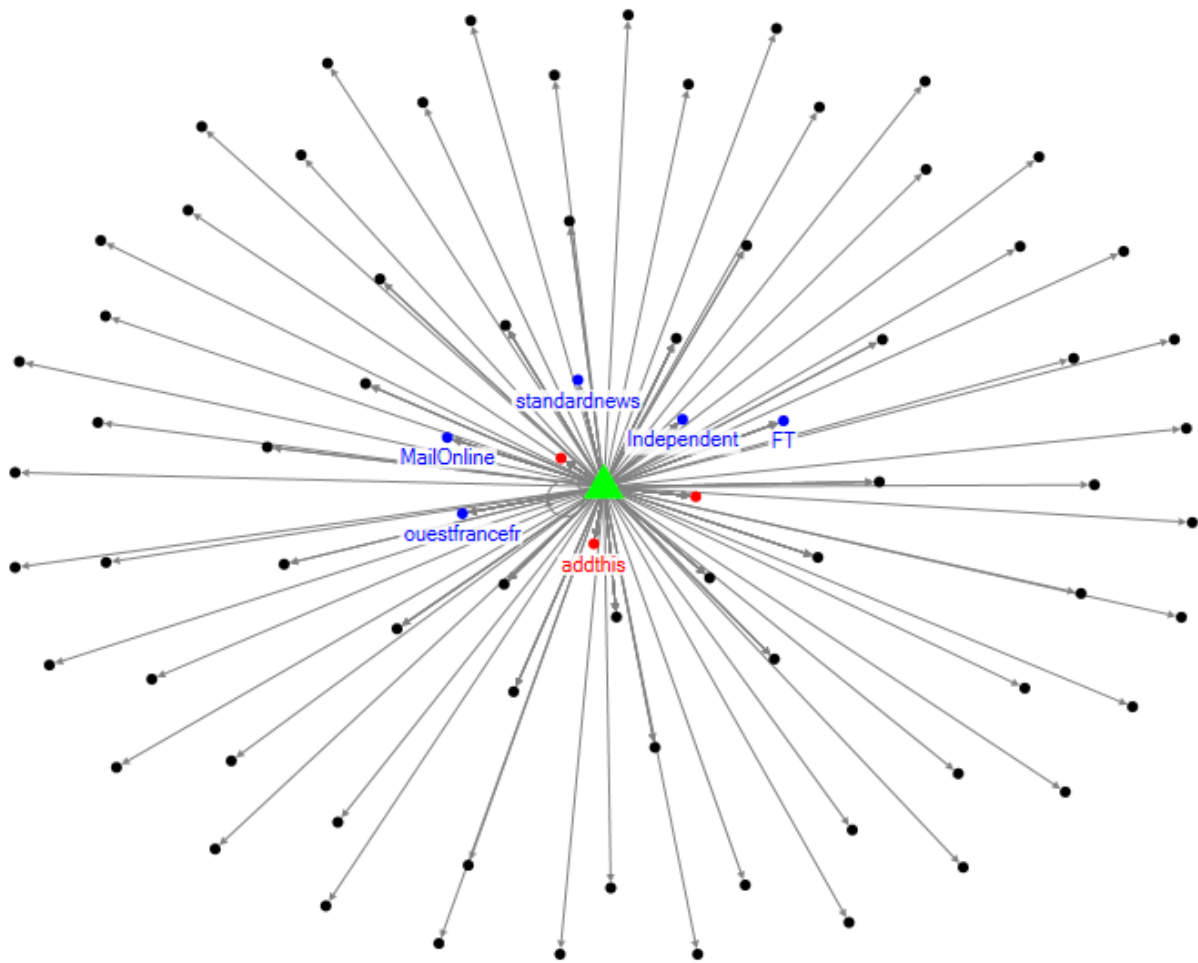


Figure 6.16: Media Users

@Independent is mentioned ten times, @standardnews – eight times, @ouestfrancefr – eight times, @MailOnline – six times, @FT – five times. Unlike Airport Watch which interacts less with other protest groups in their mentions network, HACAN’s network displays a different approach (Figure 6.17).

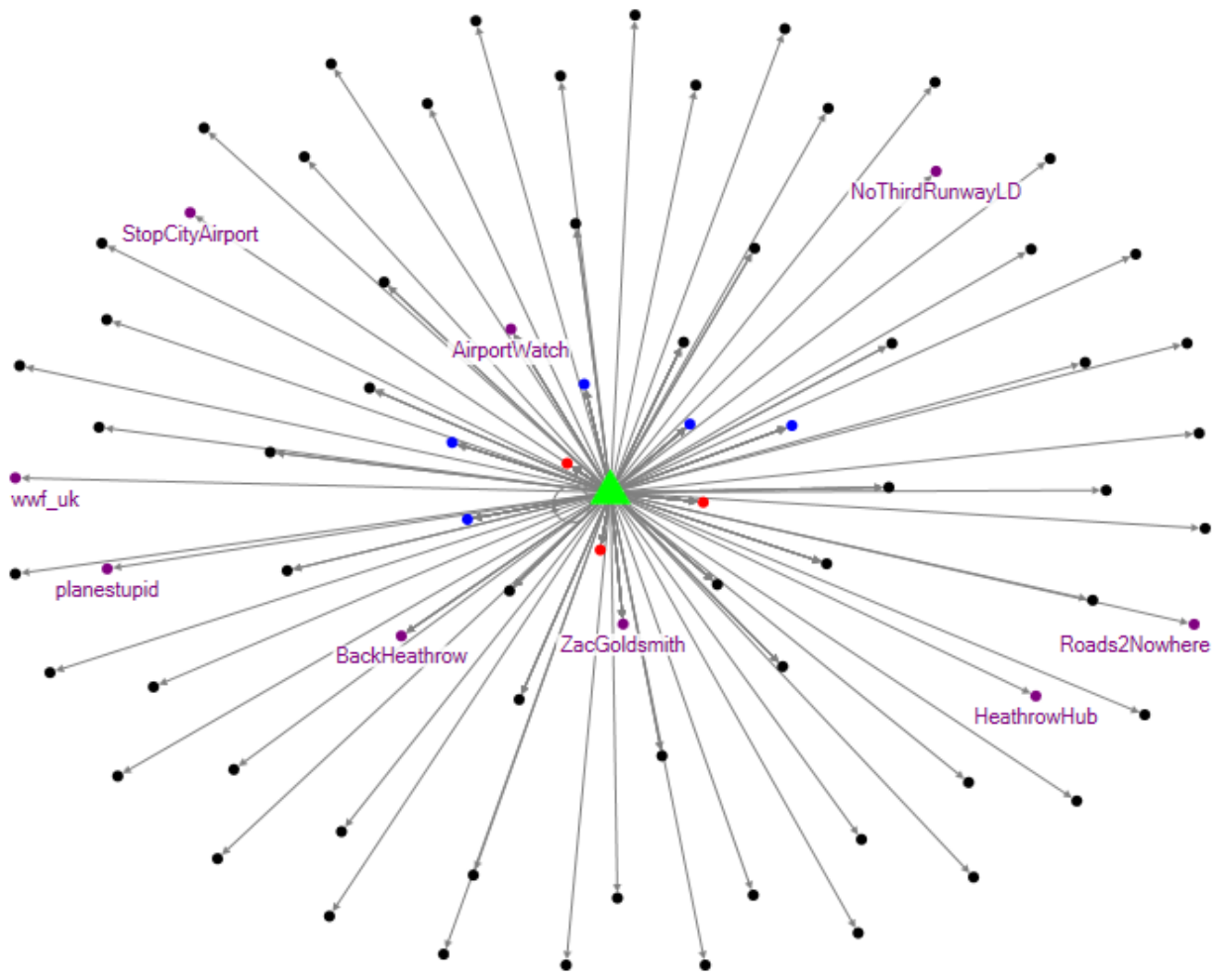


Figure 6.17: Protest Groups

HACAN mentions @ZacGoldsmith – seven times, @AirportWatch - four times, @BackHeathrow – three times, @HeathrowHub – once, @NoThirdRunwayLD – once, @planestupid – once, @Roads2Nowhere – once, @StopCityAirport – once and @wwf_uk – once (Figure 6.17).

HACAN Clearskies’ retweet network shows all users who HACAN Clearskies retweets.

6.3.3 ‘Retweet’ Network

As with all of the Twitter networks for the three selected groups, HACAN appears in the centre of the network with all retweet edges starting with HACAN and connecting to all the other vertices. HACAN has a total of 296 vertices in the network. The 171 unique edges indicate that HACAN retweets 171 vertices only once, leaving 125 vertices which HACAN

retweets multiple times. In fact, 1330 are duplicate edges whereby HACAN retweets the 125 vertices twice or more forming a distinctive structure to the network which has an inner circle where the vertices within it are retweeted on multiple occasions and an outer circle where the vertices within it are retweeted only once since HACAN joined Twitter. The structure of HACAN's retweet graph is similar to that of Airport Watch's although on a much larger scale. For instance HACAN has retweeted approximately double the number of users that Airport Watch has. Data was not available from when Airport Watch first started using Twitter when compared to HACAN and Transition Heathrow. However, regardless of this, a comparable number of tweets for all three selected groups were obtainable and it will be this similar data which will be compared. Figure 6.18 highlights which users HACAN Clearskies retweets most often.

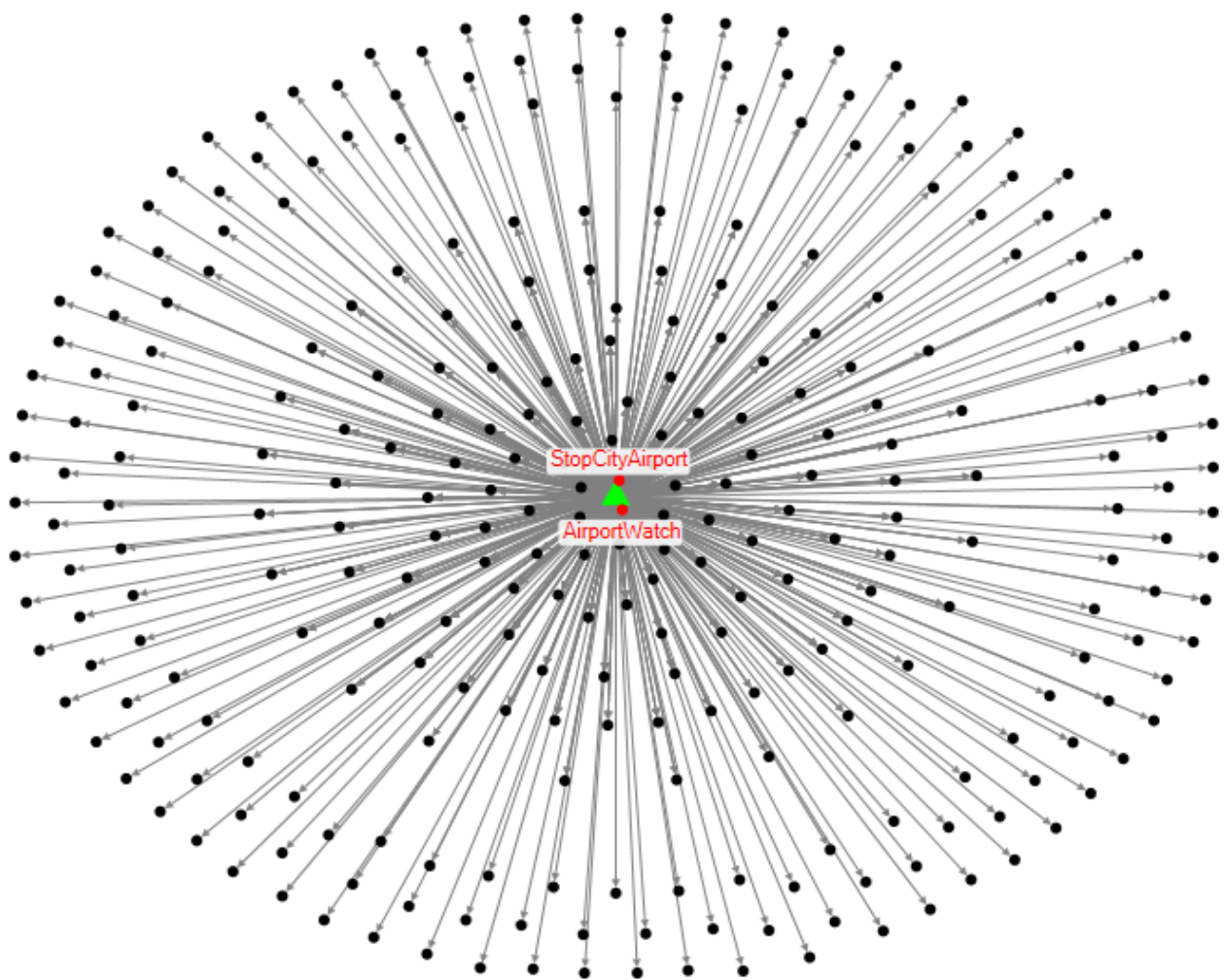


Figure 6.18: Closest Users to the Centre

@AirportWatch – 300 times and @StopCityAiport – 170 times. With retweets being a form of endorsement for what a user has written and considering how many times the two anti-airport expansion groups were retweeted it is not surprising that they appear towards the centre of the network. There are not just other anti-airport expansion groups towards the centre but other environmental pressure groups and prominent individuals (Figure 6.19).

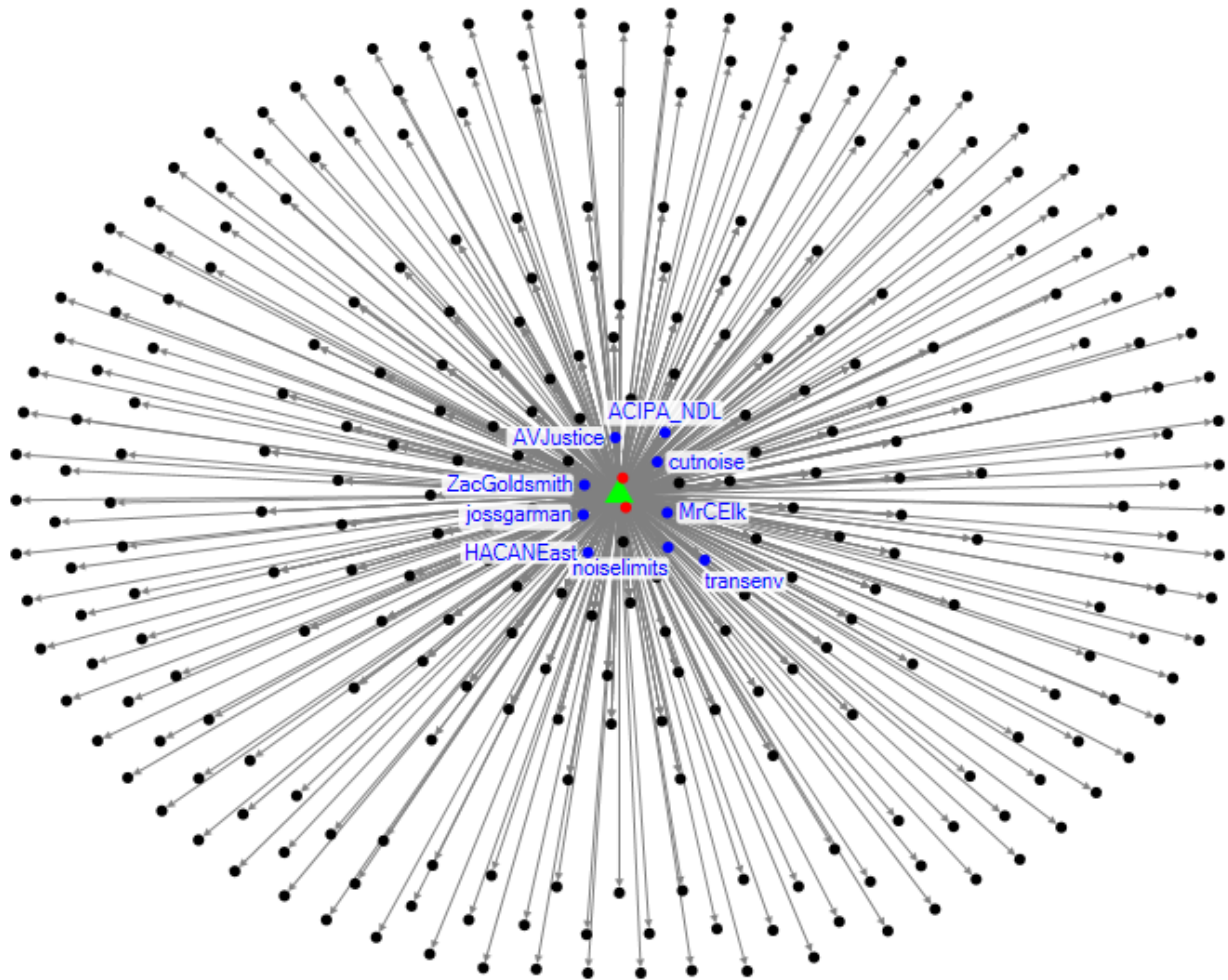


Figure 6.19: Environmental Groups and Individuals

@ZacGoldsmith is retweeted 60 times, @jossгарman – 47 times, @MrCElk – 34 times, @cutnoise – 33 times, @AVJustice – 22 times, @HACANEast – 20 times, @noiselimits – 18 times, @ACIPA_NDL – 17 times and @transenv – 12 times. Moving away from the centre of the network, but remaining within the inner circle, there are a selection of journalists and news correspondents (Figure 6.20).

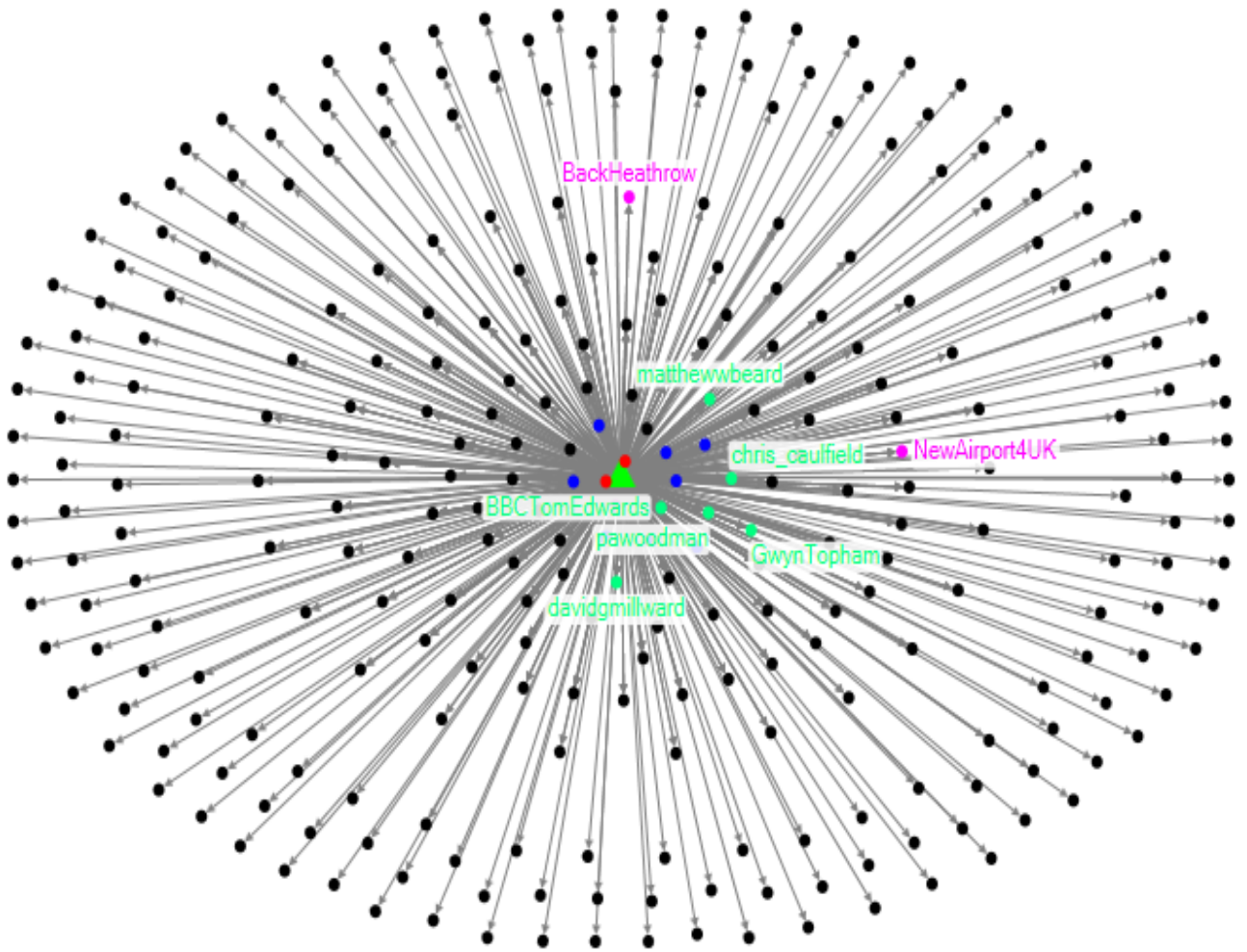


Figure 6.20: Journalists and News Correspondents

@BBCTomEdwards – 31 times, @pawoodman – 15 times, @davidgmillward – nine times, @matthewwbeard – nine times, @GwynTopham – eight times, and @chris_caulfield – six times. @NewAirport4UK is retweeted three times and @BackHeathrow – two times. The outer circle contains all vertices which have only been retweeted once; these clearly are not users which HACAN would envisage as being close to. Rather, the outer circle contains mostly individual users rather than groups/organisations. Some of the individual users are journalists which, unlike the transport correspondents in the inner circle, provide a broader focus (Figure 6.21).

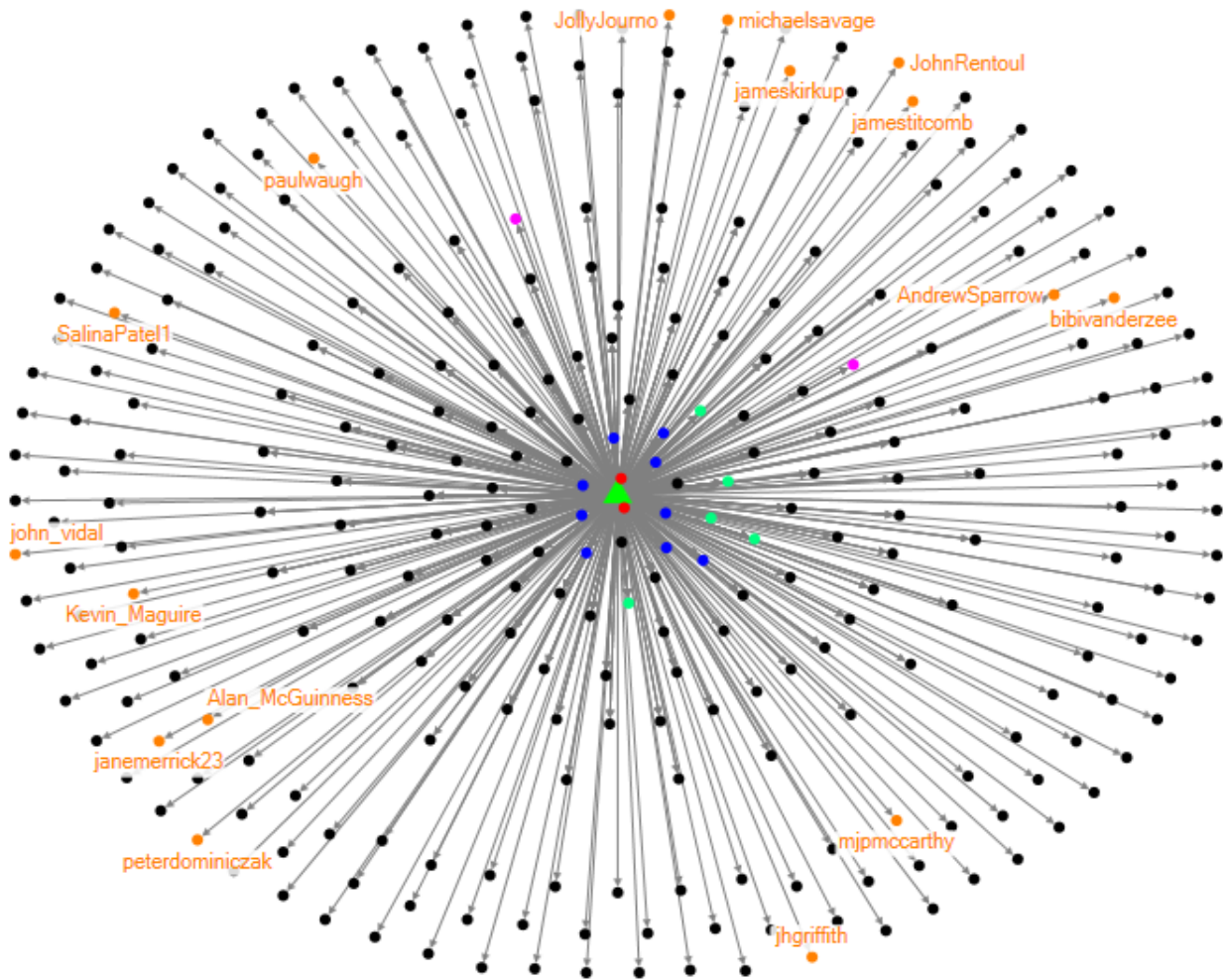


Figure 6.21: Other Journalists

The users that were only retweeted once are: @john_vidal, @JohnRentoul, @JollyJourno, @Alan_McGuinness, @AndrewSparrow, @bibivanderzee, @jameskirkup, @jamestitcomb, @janemerrick23, @jhgriffith, @Kevin_Maguire, @michaelsavage, @mjpgmccarthy, @paulwaugh, @peterdominiczak and @SalinaPatel1. A similar scenario can be seen with MPs (Figure 6.22).

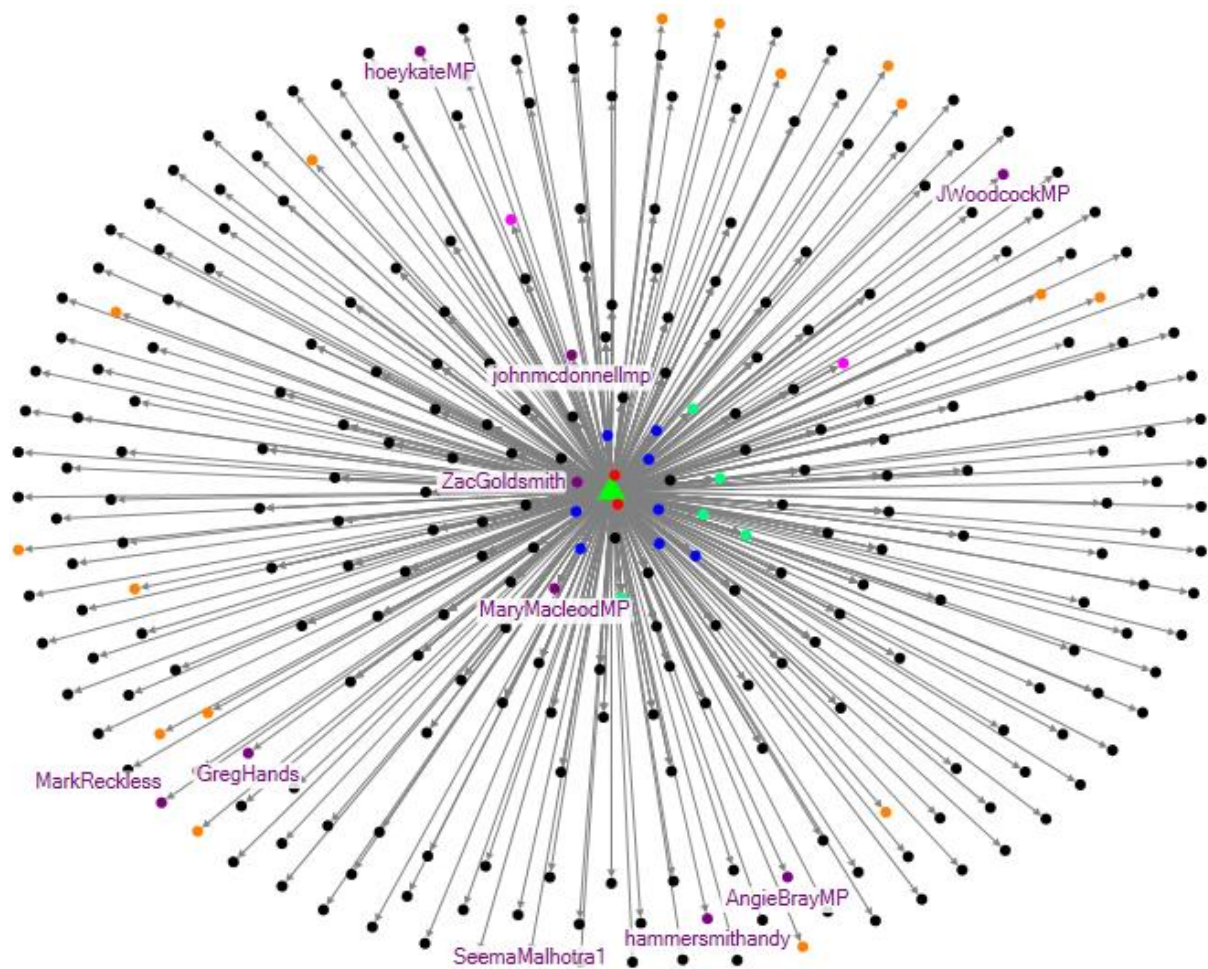


Figure 6.22: Position of MPs

Figure 6.22 shows the contrast between the number of MPs who are retweeted by HACAN Clearskies, these are: @johnmcdonnellmp, @ZacGoldsmith and @MaryMacleodMP are all prominent voices against the expansion of Heathrow airport and thus are placed closer to HACAN as they retweet them more. Whereas @hammersmithandy, @GregHands, @hoeykateMP, @JWoodcockMP, @MarkReckless, @SeemaMalhotra1, @AngieBrayMP are examples of MPs which do not place airport expansion at the heart of their Twitter campaign either because the areas they represent are not directly affected by Heathrow airport or, in the case of Feltham and Heston, they recognise the employment benefits the airport provides (although @SeemaMalhotra1 does want better control of noise pollution) (see Figure 6.22). Whilst HACAN retains a core of groups and users against aviation and airport expansion, there still remain certain anti-airport expansion groups which reside on the outside of the network (see Figure 6.23).

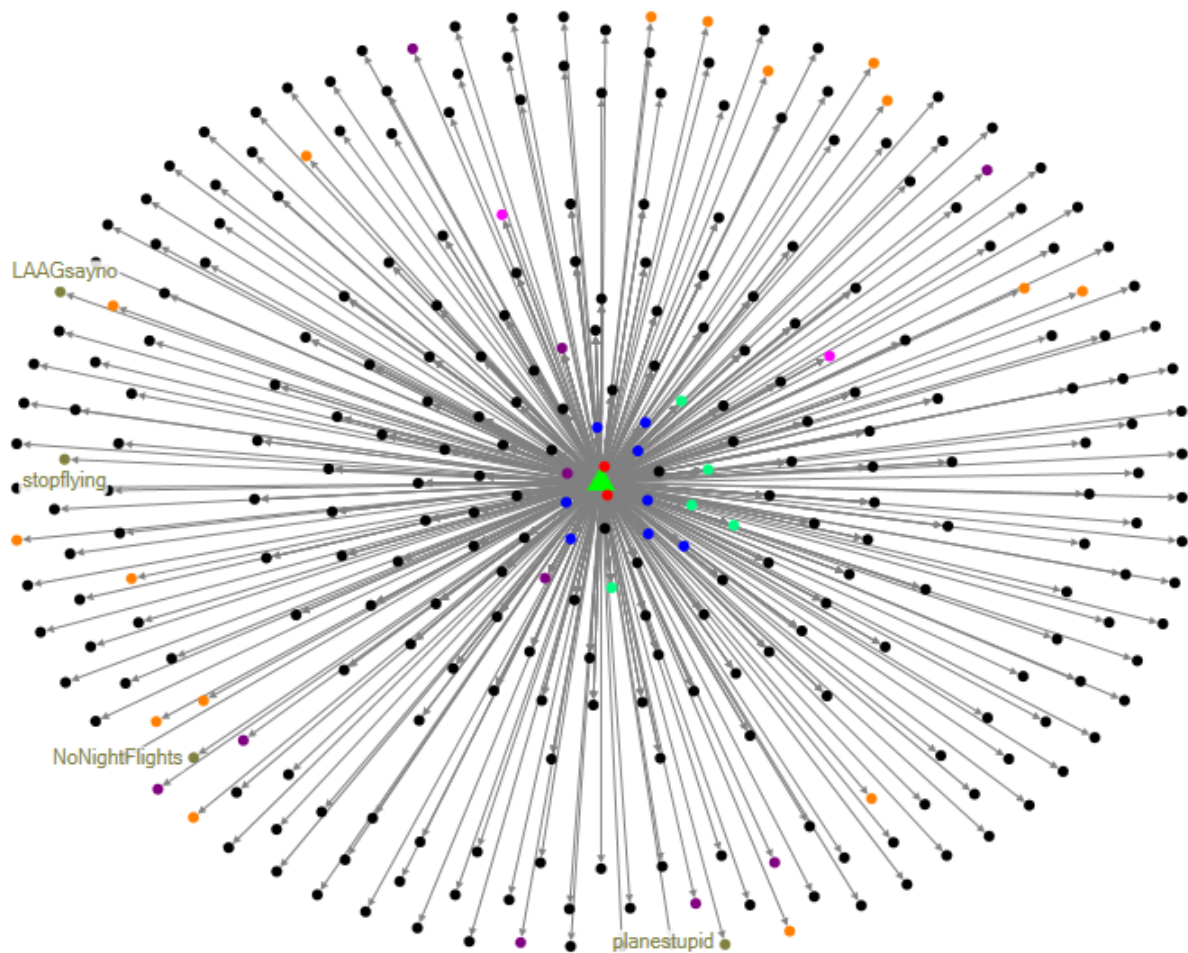


Figure 6.23: Other Selected Anti-Airport Expansion Groups

These groups are: @LAAGsayno, @NoNightFlights, @planestupid and @stopflying. These groups have one thing in common, which is why they appear in the outer circle, they do not tweet much meaning that HACAN is restricted on the number and variety of tweets they can retweet from these groups.

HACAN Clearskies' replies to network shows all users who HACAN Clearskies replies to.

6.3.4 'Replies to' Network

Once again, and as with all Twitter networks for the three selected groups, HACAN appears as an ego at the centre of the network. HACAN, in its replies to network, has a total of 72 vertices all of which it replies to at least once through 47 unique edges but certain vertices are replied to twice or more through 140 duplicate edges totalling 187 edges throughout the network. This graph, unlike all the others, has 19 self-loops which are represented visually as

a circular vertex which emanates from the centre and returns to the same vertex. Figure 6.24 illustrates those users who HACAN Clearskies replies to most often.

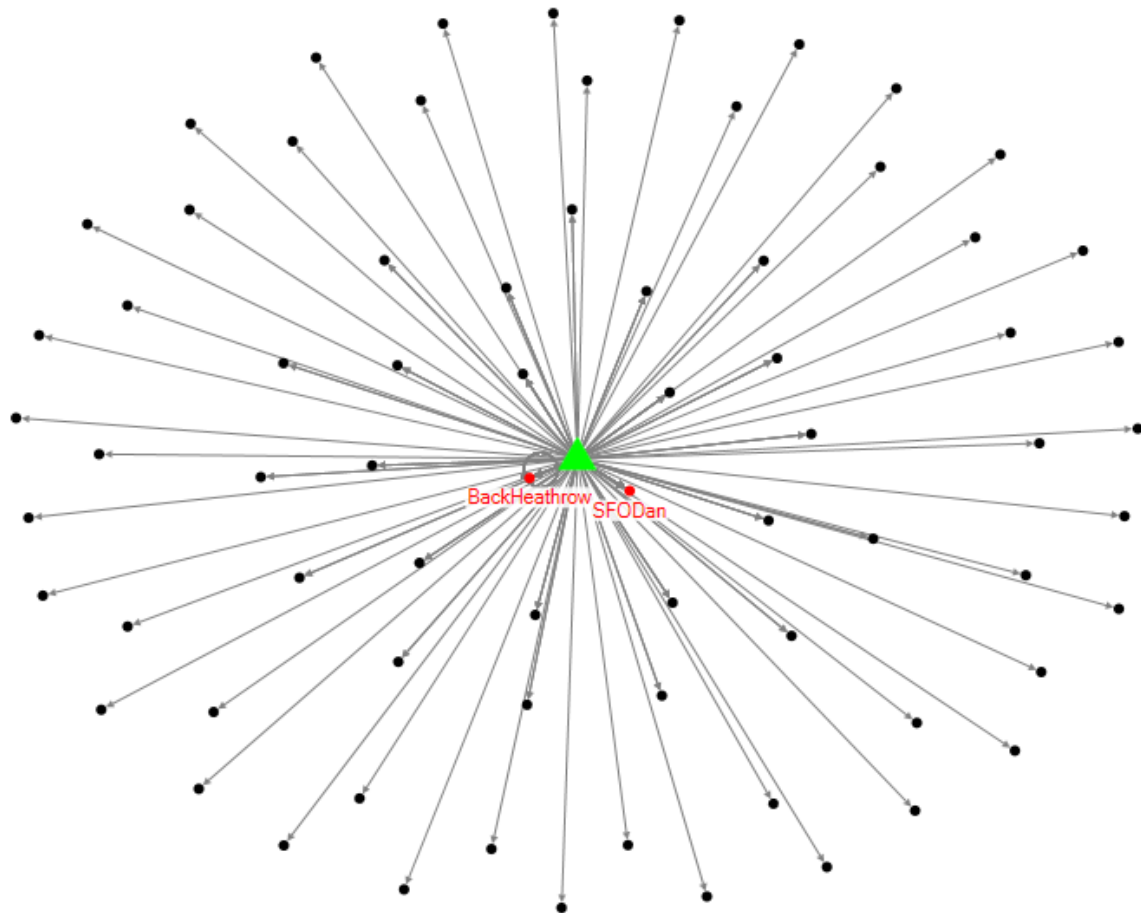


Figure 6.24: Closest users to HACAN

HACAN replies to @BackHeathrow the most – 35 times. There is reciprocity between HACAN and Back Heathrow – they both follow one another. The other user closest to HACAN, @SFODan is replied to 22 times.

There are two other users who also appear close to the centre of HACAN’s replies to network, @jordandias and @xtrand are replied to six times (Figure 6.25).

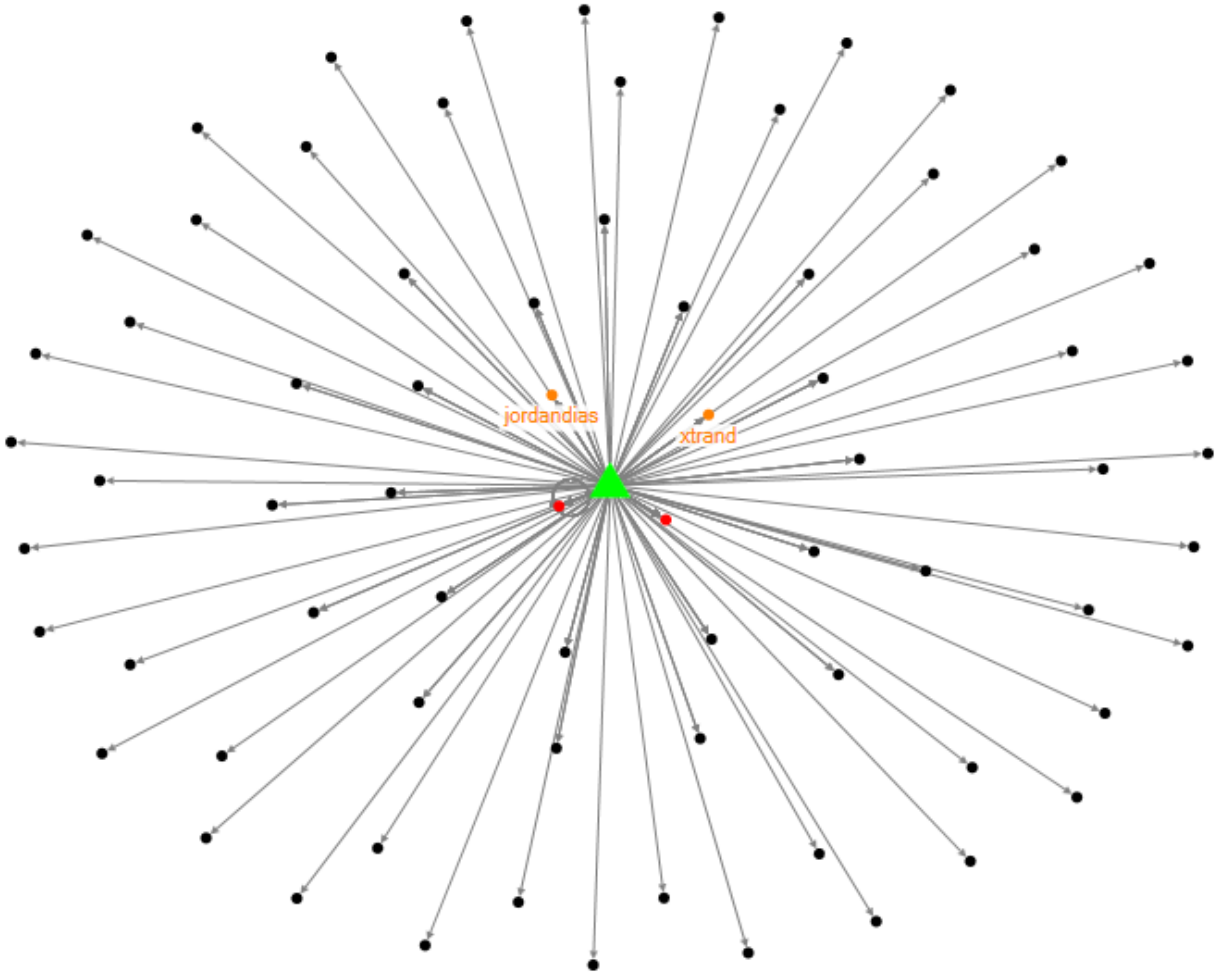


Figure 6.25: Other close users to the centre

There are also notable anti-airport expansion groups and campaigners who HACAN Clearskies replies to (see Figure 6.26).

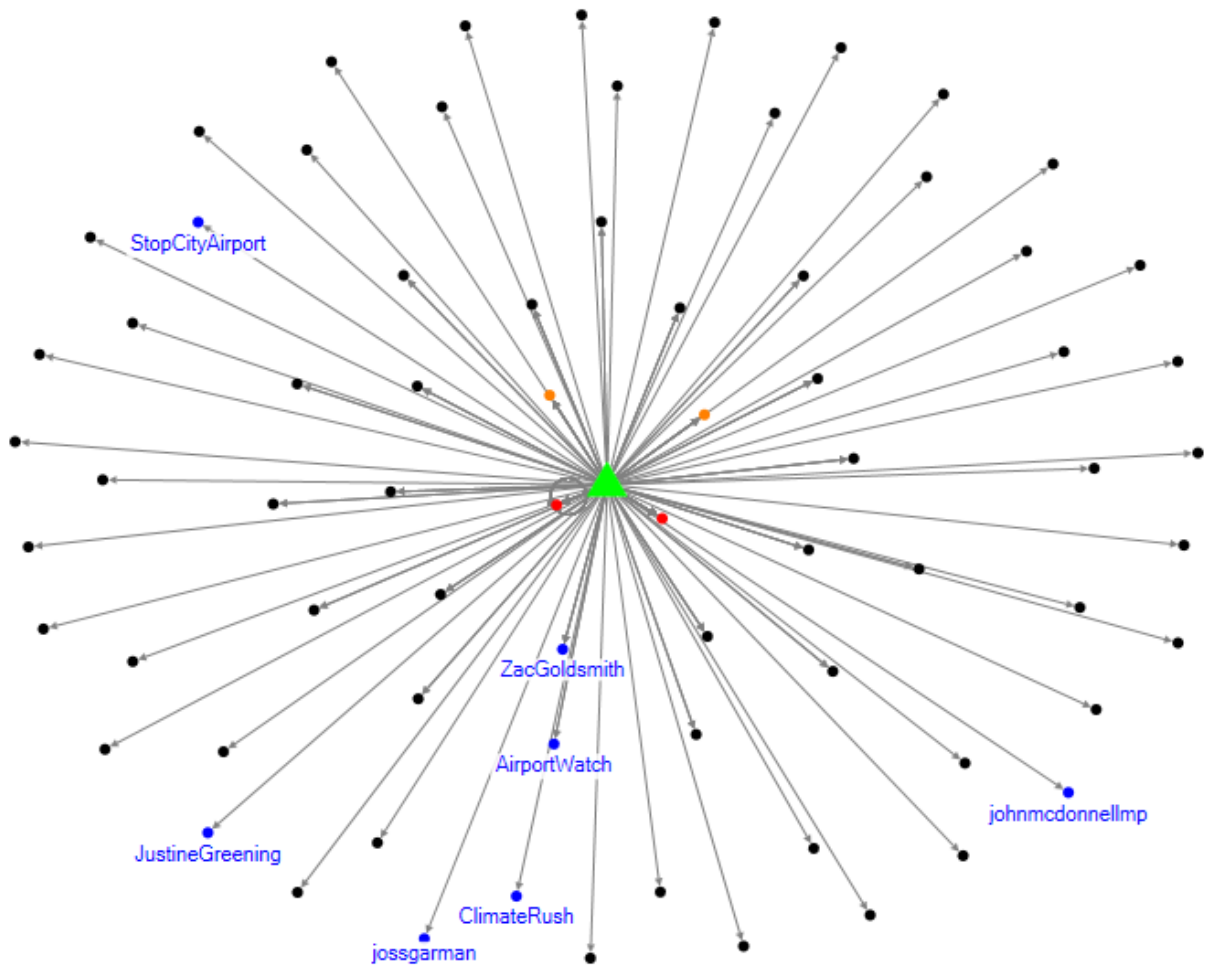


Figure 6.26: Anti-airport expansion groups and key individuals

These are replied to least often which influences their overall position within the network @ZacGoldsmith is replied to three times, @ AirportWatch - twice, @ClimateRush - once, @johnmcdonnellmp - once, @jossgarman - once, @JustineGreening – once and @StopCityAirport - once.

Unlike Airport Watch, HACAN Clearskies operates a Facebook group where frequent interaction with others takes places.

6.3.5 Facebook Group

HACAN Clearskies possesses the same means of communicating with Facebook users as Transition Heathrow through creating a group rather than a page like Airport Watch. A Facebook group enables greater interaction between members. Although HACAN Clearskies possesses the lowest number of users (n=270) in a group setting, it contains the highest

number of interacting users (n=105 or 39%). Through these 105 different vertices are 6,310 edges, the highest number of interactions out of any of the other two campaign groups combined. Multiple interactions between the users exist, with 5,665 edges being duplicated whereas 645 edges are unique where a one off interaction occurs. What this demonstrates is that although there may be frequent and a high volume of interaction, it is only confined to 105 different users. This indicates that 165 users, despite being in the group and receiving notifications of all posts (not comments or likes), do not interact with other members in the group at all.

Within the group, along with its 6,310 edges, there exists 1,047 self-loops meaning different users post comments within their own post either as an addition to their post or as a follow up comment to someone else's comment on their post.

The Betweenness Centrality shows that John Stewart is behind four other users in terms of its communication paths between other nodes (Figure 6.27).

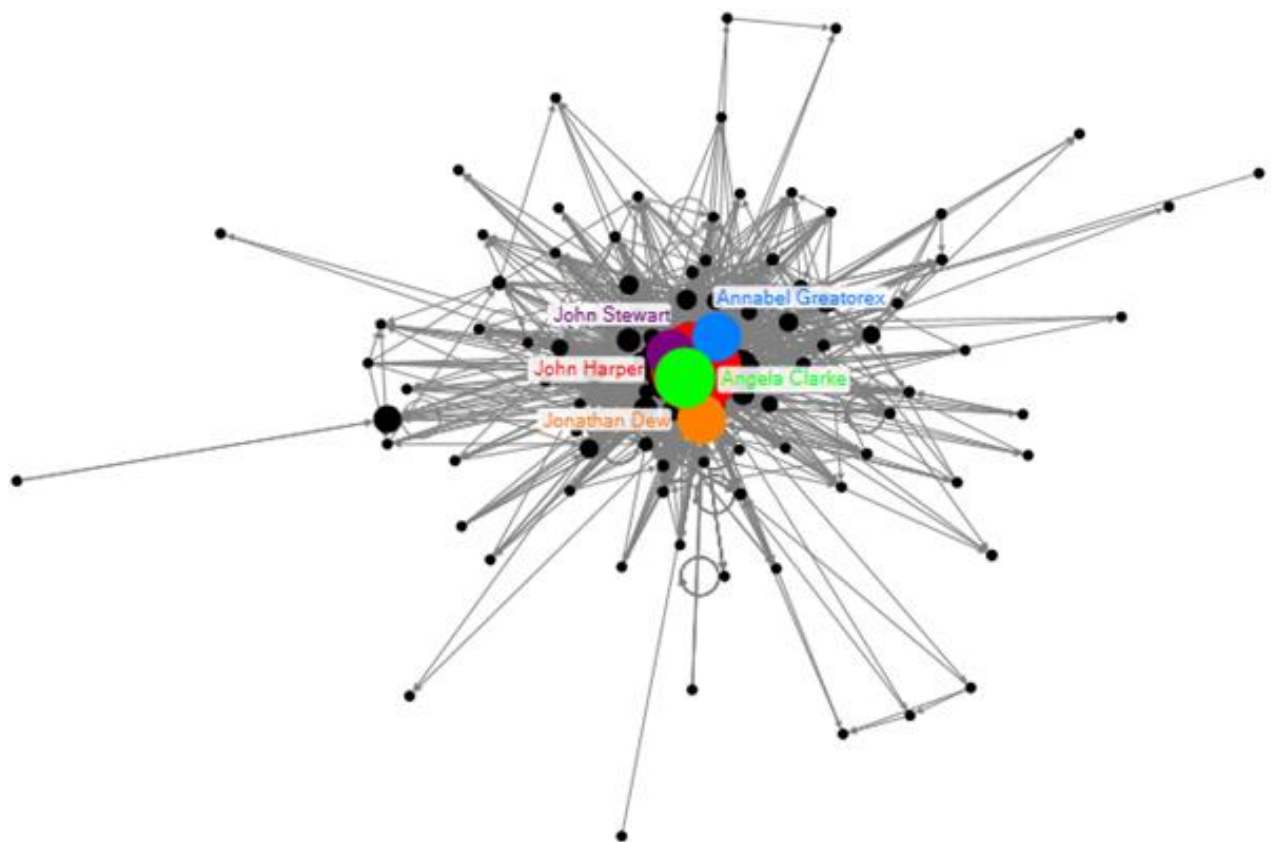


Figure 6.27: Vertex by Betweenness Centrality Score

The Betweenness Centrality scores, shown in brackets for each user are as follows: John Harper (2469.2), Angela Clarke (1075.9), Jonathan Dew (700.7) and Annabel Greatorex (694.8) all have higher Betweenness Centralities than John Stewart (674.1) which demonstrates that they lie on more paths between other vertices – signalling rapid information flow. It is John Harper, who possesses a significantly higher Betweenness Centrality than any of the other users and acts as the main gatekeeper or information broker in the network. Additionally, the users with the highest Closeness Centrality scores are shown in Figure 6.28.

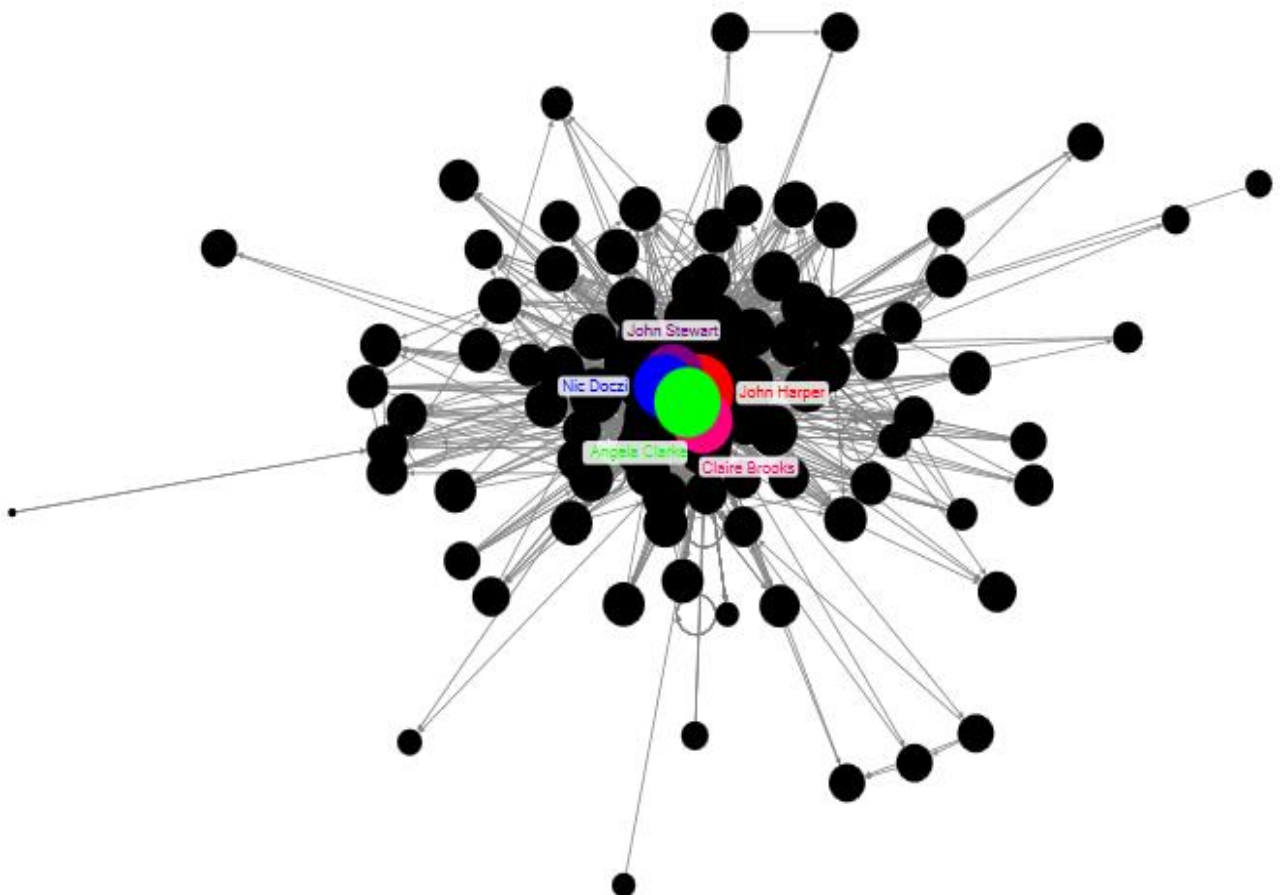


Figure 6.28: Vertex by Closeness Centrality Score

In HACAN Clearskies’ network, it is John Harper who possesses the highest Closeness Centrality of 0.008 meaning it is the closest to every other user in the network. The messages/information he broadcasts possess the furthest reach out of any of the other vertices. He can access more vertices in the network quicker than anyone else and is able to monitor the information flow in order to influence others. The interaction with all others

either directly or indirectly emphasises its overall importance and efficiency in connecting with people. Claire Brooks, Angela Clarke, John Stewart and Nic Doczi all have the second highest Closeness Centrality scores (0.007). These users too are close to other users but not as close as John Harper.

In HACAN Clearskies' Facebook network (see Figure 6.29), both John Harper and Angela Clarke's eigenvector centrality is the highest (0.03) with John Stewart the second highest (0.028) and Claire Brooks and Nic Doczi the joint third highest (0.026).

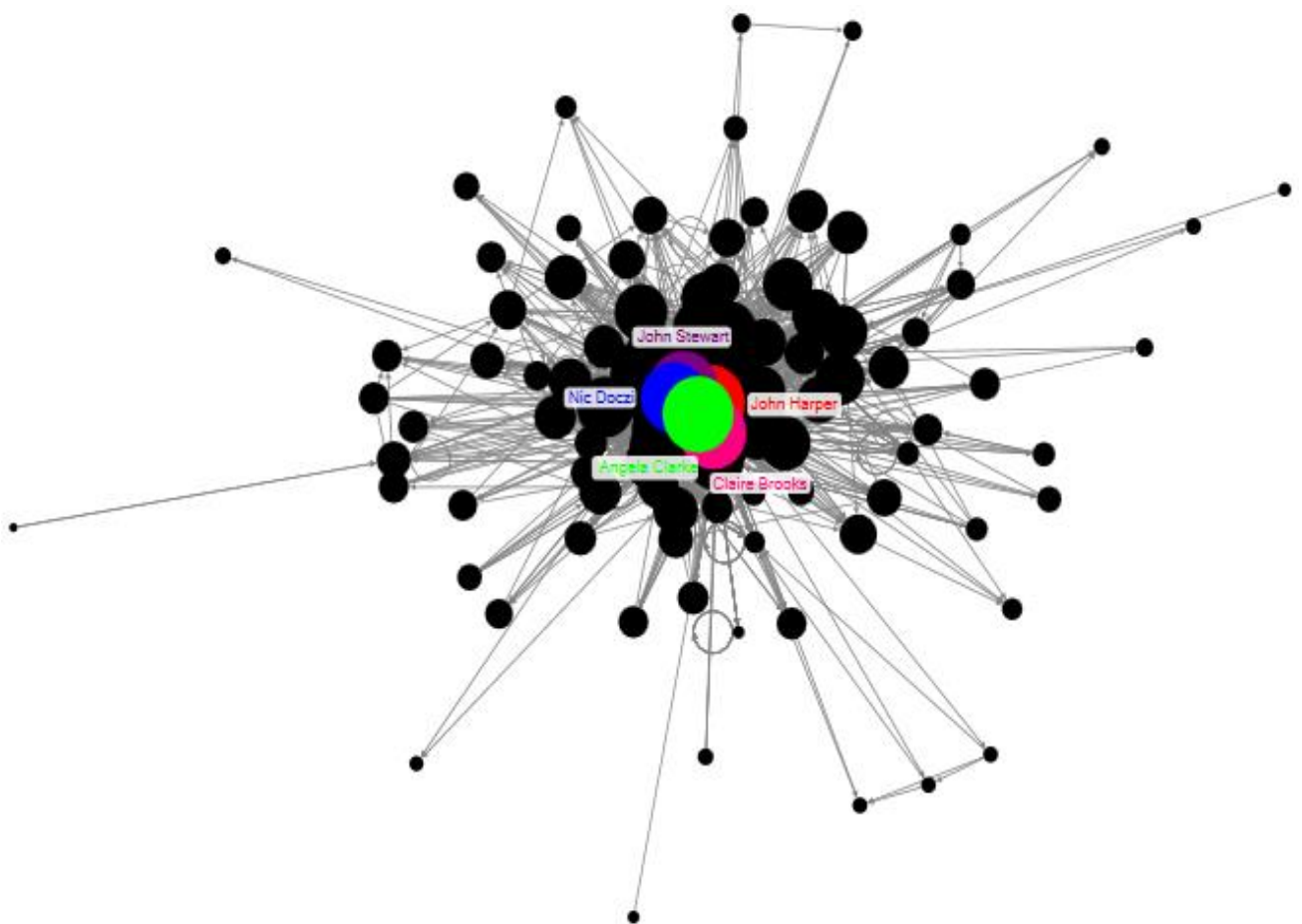


Figure 6.29: Vertex by Eigenvector Centrality Score

This demonstrates that these individuals are the most connected users and they are also connected to other well connected users in part because they are all connected to one another which increases their scores. Overall, and throughout all of the centrality algorithms, John Harper is the most connected user and ultimately he is the user who is the most influential in the network. But in addition to this, the users he is connected to are still important in their

own right as the whole concept of eigenvector centrality depends on a user being connected to other important users. In HACAN Clearskies' Facebook network, John Harper appears as the most popular user (Page Rank score of 4.653), followed by Angela Clarke (3.801) and then John Stewart (3.192). John Stewart, as the creator of the group and chair of HACAN Clearskies, thus does not have overall control within the group and therefore does not solely influence the flow of information within it.

The final group of focus in this research, Transition Heathrow, is highlighted in the next section. They provide a local/grassroots element to campaigning.

6.4 Transition Heathrow

The following/follower network graphs are presented first (Section 6.4.1) whilst the other remaining networks contain: mentions (Section 6.4.2), retweets (Section 6.4.3), and replies to (Section 6.4.4), are still directed networks but only asymmetrical as the direction of edges is from the centre to the other vertices in the network. The Facebook Group is also highlighted in Section 6.4.5.

6.4.1 'Following/Follower' Network

In Transition Heathrow's following/follower network there are 2025 vertices – meaning 2025 individual users. From these 2025 vertices, 2228 edges exist between them and this figure is higher than the vertex count because certain users have more than one edge with the central user which implies reciprocal relationships. Therefore in this network there are 203 vertices which exhibit a reciprocal edge with Transition Heathrow. They follow Transition Heathrow and in turn Transition Heathrow follows them back. Additionally there are 1822 vertices where an asymmetrical edge exists. The vertices follow Transition Heathrow but Transition Heathrow does not follow them back or vice versa. There are no duplicate edges with the network as these look at whether two or more edges exist between two vertices. The following/follower network solely looks at whether edges are reciprocal or not, ultimately there cannot be numerous reciprocal edges between two vertices in a network of this type. The 203 vertices which exhibit a reciprocal edge equates to 10% of the vertices in the network, which means that 90% of vertices have an asymmetrical edge. Within the inner

circle lies a core of key anti-airport expansion groups where reciprocal edges exist between them and Transition Heathrow (Figure 6.30).

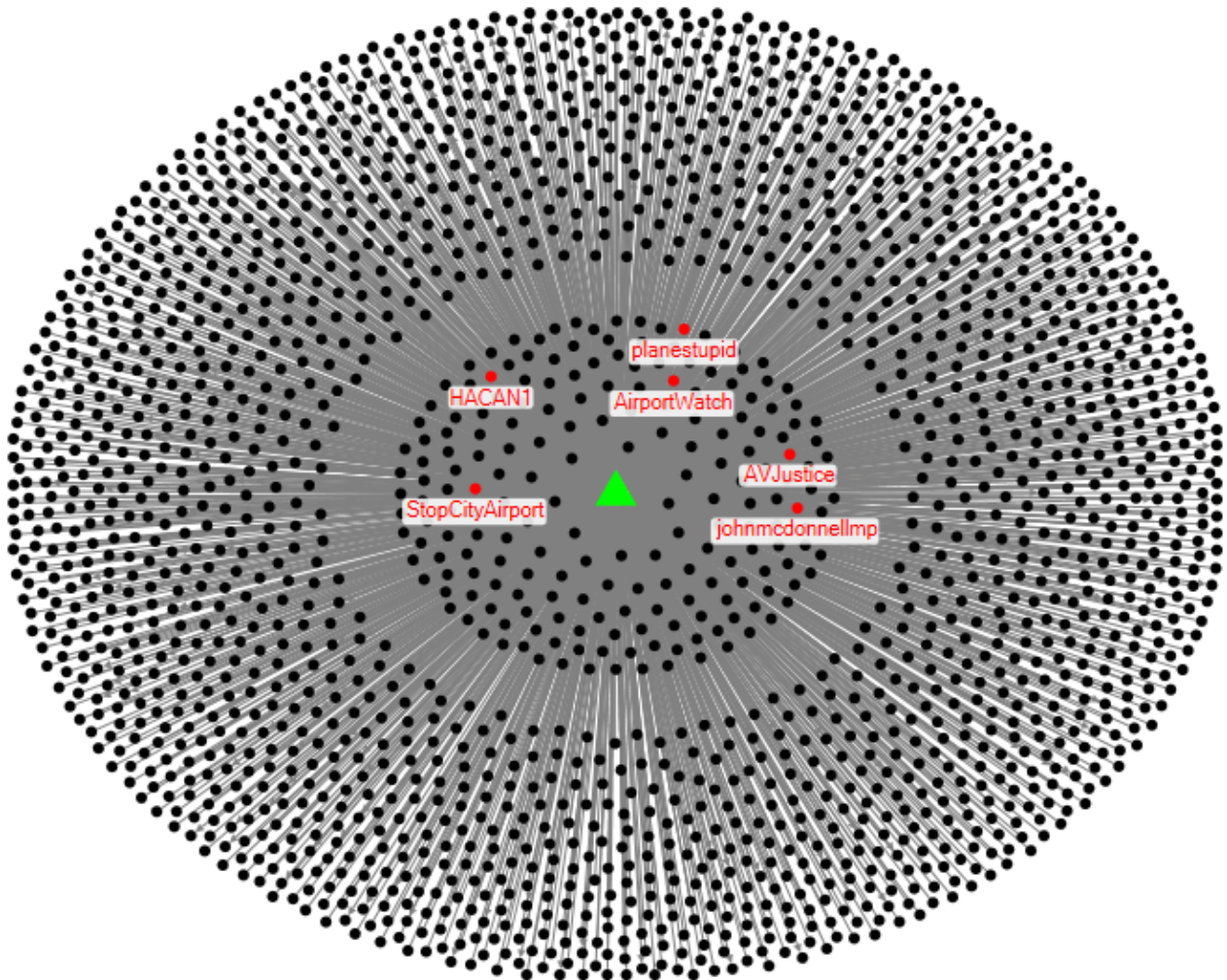


Figure 6.30: Key Anti-Airport Expansion Groups

@HACAN1, @AirportWatch, @StopCityAirport, @AVJustice, @planestupid, @johnmcdonnellmp. However, more so than any of the other two selected groups, Transition Heathrow has a network of reciprocal edges with numerous environmental and climate change groups (Figure 6.31), organisations and campaigns locally, nationally and internationally.

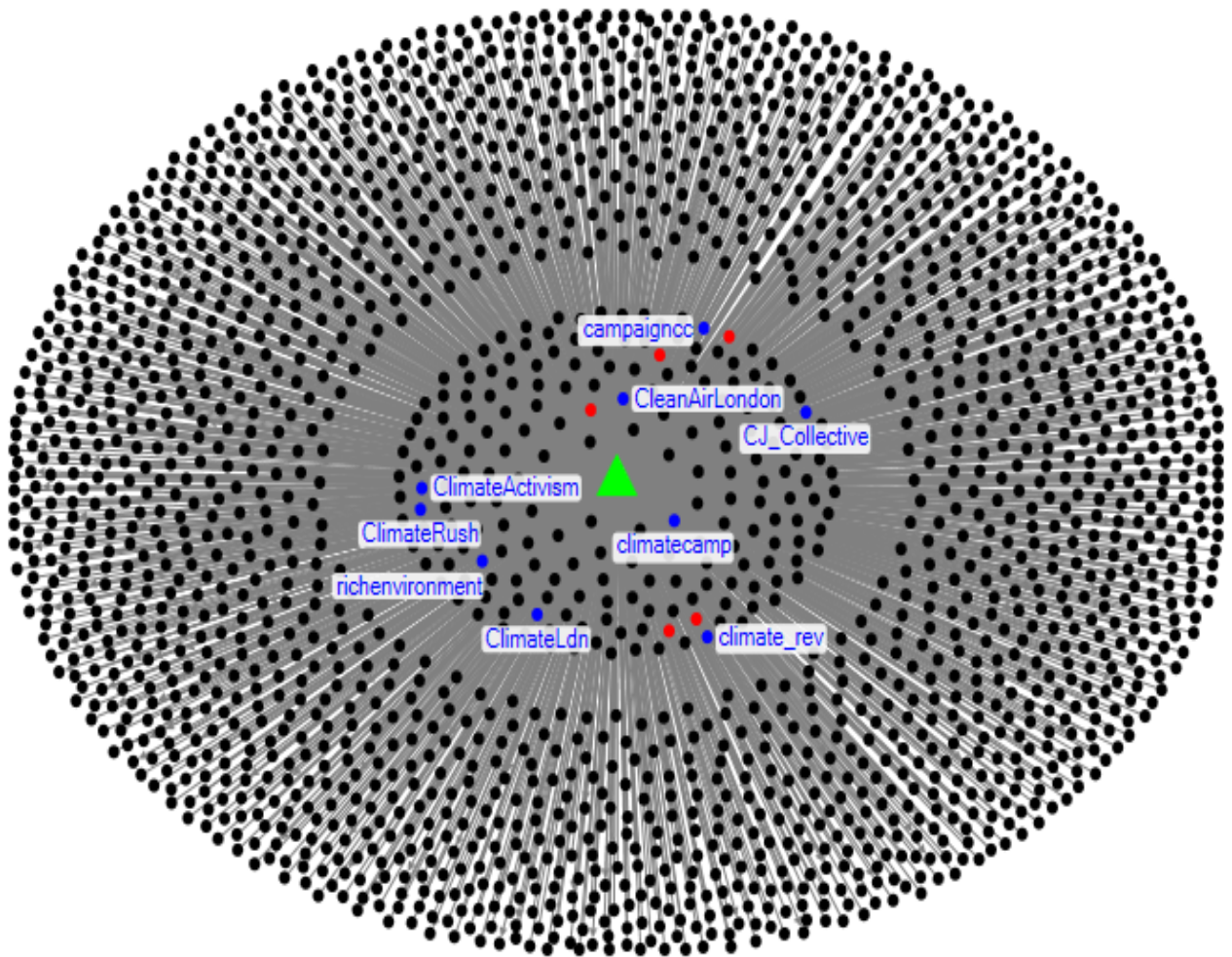


Figure 6.31: Environmental and Climate Change Groups

These include: @climate_rev, @CleanAirLondon, @ClimateLdn, @climatecamp, @ClimateRush, @campaigncc, @richenvironment, @CJ_Collective, @ClimateActivism. There also exist other grassroots groups within Transition Heathrow’s reciprocal inner circle (Figure 6.32).

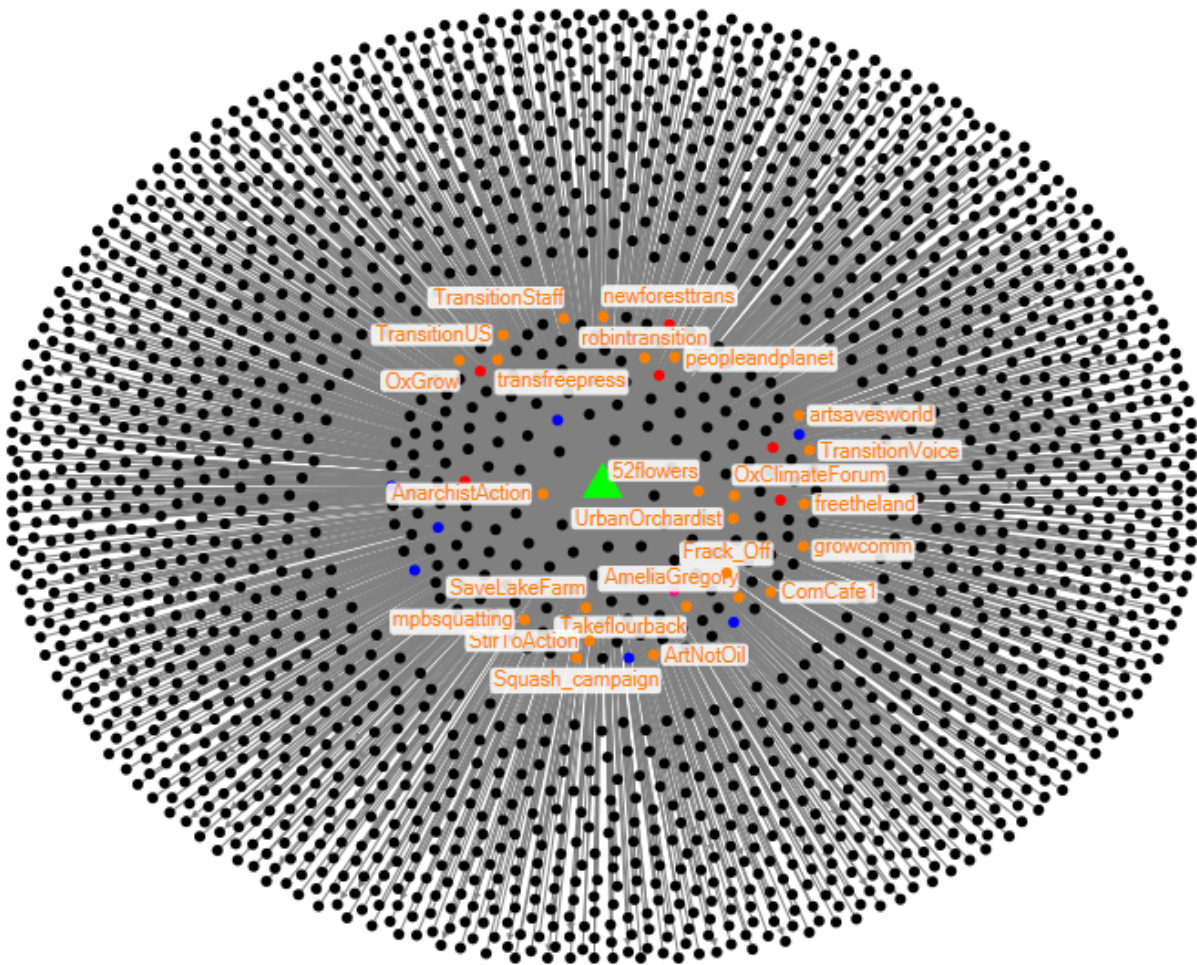


Figure 6.32: Other Grassroots Organisations and Individuals

For example @52Flowers, @mpbsquatting, @robintransition, @StirToAction, @transfreepress, @TransitionUS, @OxGrow, @ArtNotOil, @AmeliaGregory, @artsavesworld, @TransitionVoice, @Squash_campaign, @Takeflourback, @freetheland, @OxClimateForum, @TransitionStaff, @growcomm, @peopleandplanet, @newforesttrans, @ComCafe1 @SaveLakeFarm, @UrbanOrchardist, @AnarchistAction, @Frack_Off are all users where a reciprocal relationship exists between themselves and Transition Heathrow.

Whilst Transition Heathrow has a network of reciprocal relationships with many different individual users associated with different grassroots protesting campaigns it also has countless more asymmetrical edges where either a user follows Transition Heathrow or Transition Heathrow follows a user and it is these edges, which make up 90% of the network, which form the outer circle (Figure 6.33).

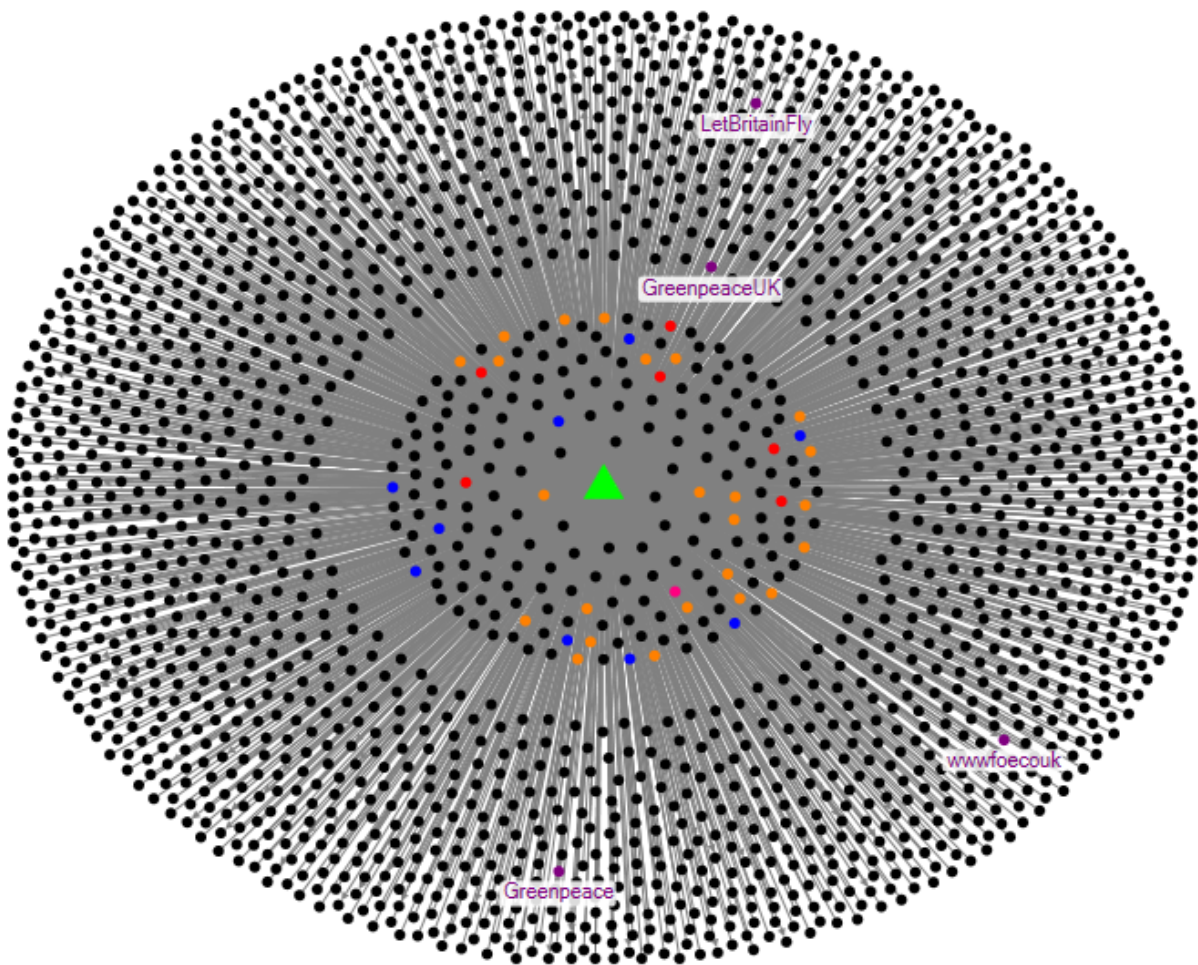


Figure 6.33: Selected Environmental Organisations with asymmetrical edges

There are no anti-airport expansion campaign groups with an asymmetric edge but one pro-expansion group @LetBritainFly which follows Transition Heathrow. Shaw (2011: 67) explains that ‘the majority of people that you follow should be those that you are genuinely interested in hearing from as defined by your areas of interest,’ hence the reason why Transition Heathrow has decided not to follow Let Britain Fly as they are not associated with their ideology.

Transition Heathrow’s mentions network shows all users who Transition Heathrow mentions.

6.4.2 ‘Mentions’ Network

The graph shows two distinct parts: an inner and outer circle. The inner circle consists of two or more edges between Transition Heathrow and the other vertices with the outer circle containing all vertices with only one edge from Transition Heathrow. Six edges show that six

mentions took place, ten edges demonstrates ten mentions and so on. This network can be classed as a type of ego network which looks at the connections between a specific user and others within its network.

Transition Heathrow is connected to every vertex in the network highlighting that none are isolated. In the network as a whole, there are 177 vertices meaning Transition Heathrow mentions 177 different users through a total of 671 edges. Of these edges, 95 are unique where only one edge exists, meaning Transition Heathrow mentions certain users only once this equates to every vertex in the outer circle so 95 unique edges (a one-off connection) are connected to 95 individual vertices. As a percentage the unique edges make up 14% of the total 671 edges but it is 54% of the vertices which contain these connections. There are 576 duplicate edges where two or more connections exist between Transition Heathrow and the surrounding vertices. These edges are to the remaining 82 vertices in the network. As a percentage the duplicate edges make up a total of 86% of the total edges in the network towards the remaining 46% of vertices.

Unlike Airport Watch and HACAN Clearskies' mentions network which show clear patterns of the most mentioned users, Transition Heathrow's network demonstrates a variation between each user (Figure 6.34).

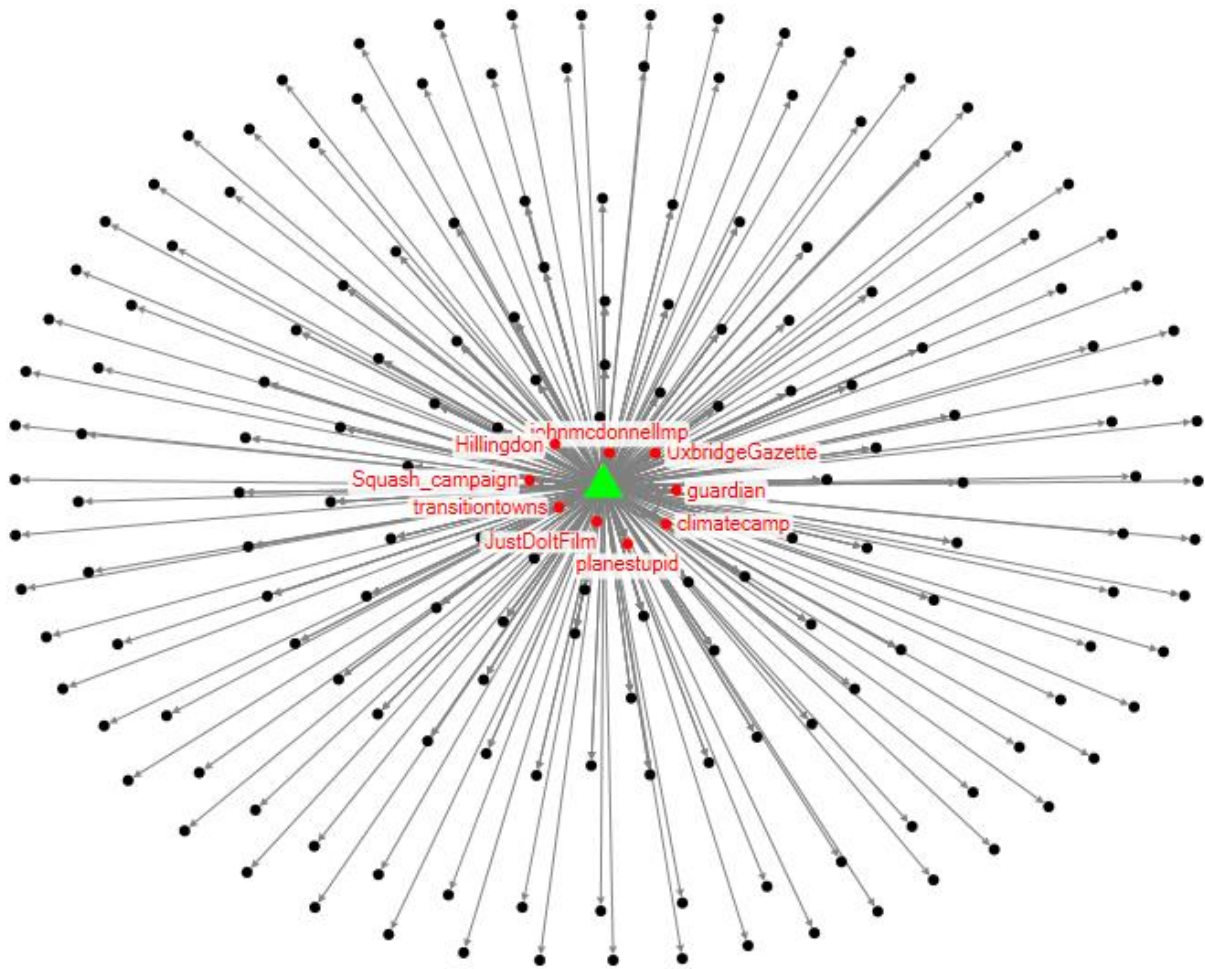


Figure 6.34: Key users within the inner circle

@JustDoltFilm was mentioned the most, 44 times, @johnmcdonnellmp – 41 times, @transitiontowns – 37 times, @UxbridgeGazette - 26 times, @planestupid – 23 times, @Hillingdon – 23 times, @Squash_campaign – 22 times, @guardian – 22 times and @climatecamp – 22 times.

Further away from the centre of the network, but still within the inner circle, it is interesting to highlight just how diverse Transition Heathrow’s network is in terms of the users it mentions (Figure 6.35).

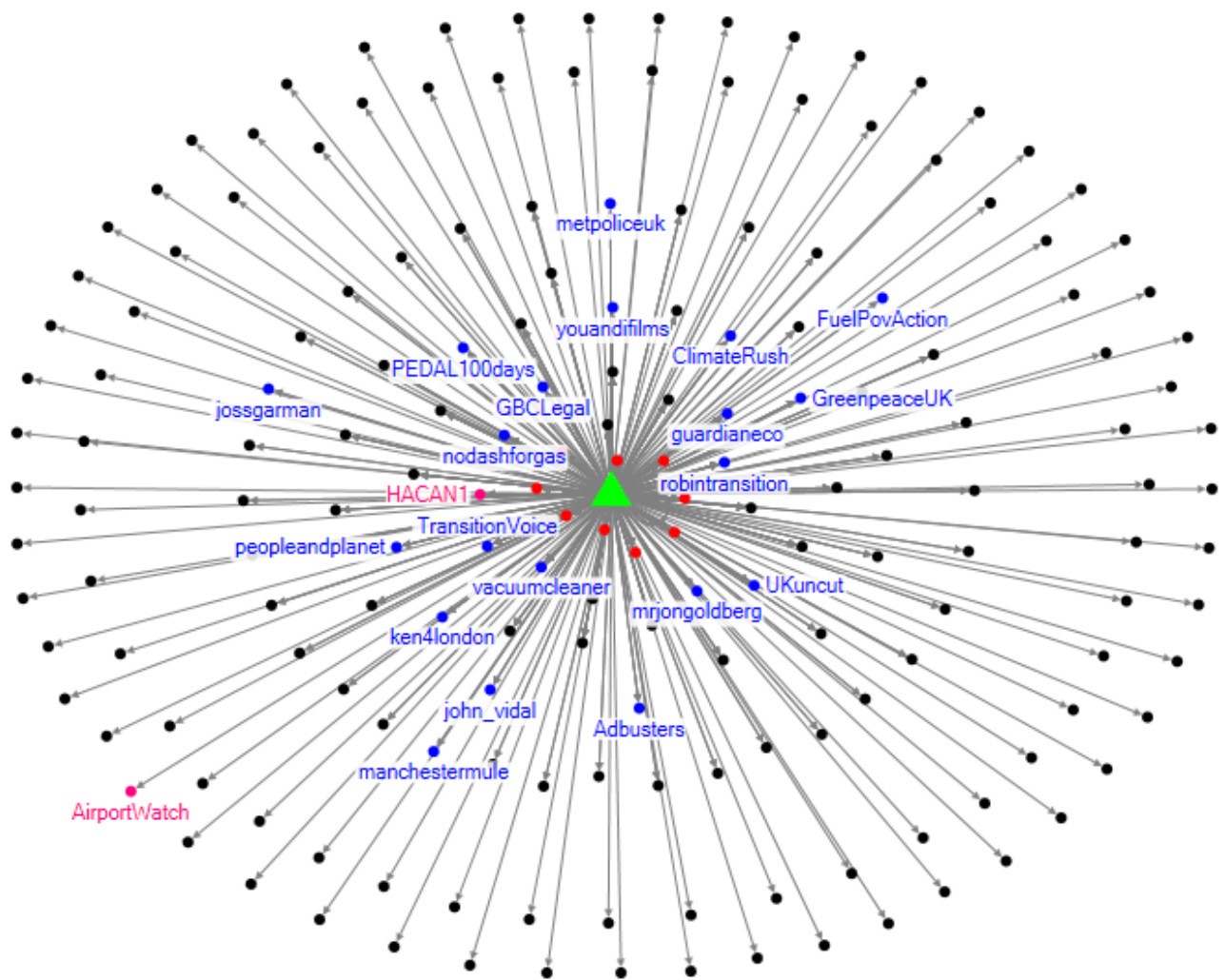


Figure 6.35: The diversity of users in Transition Heathrow's network

@vacuumcleaner is mentioned 12 times, @robintransition – 12 times, @nodashforgas – ten times, @TransitionVoice - nine times, @GBCLegal – eight times, @guardianeco – eight times, @mrjonggoldberg – eight times, @UKuncut – six times, @peopleandplanet – four times, @PEDAL100days – four times, @youandifilms – four times, @ClimateRush – four times, @GreenpeaceUK – four times, @ken4london – four times, @john_vidal – three times, @Adbusters – three times, @jossgarman – twice, @metpoliceuk – twice, @manchestermule – twice and @FuelPovAction – twice. Of the other two anti-airport expansion groups studied in this thesis, @HACAN is mentioned ten times and @AirportWatch is mentioned once (see Figure 6.35).

Towards the outside of the network, within the outer circle, all users are mentioned once and thus have the least interaction with Transition Heathrow (Figure 6.36).

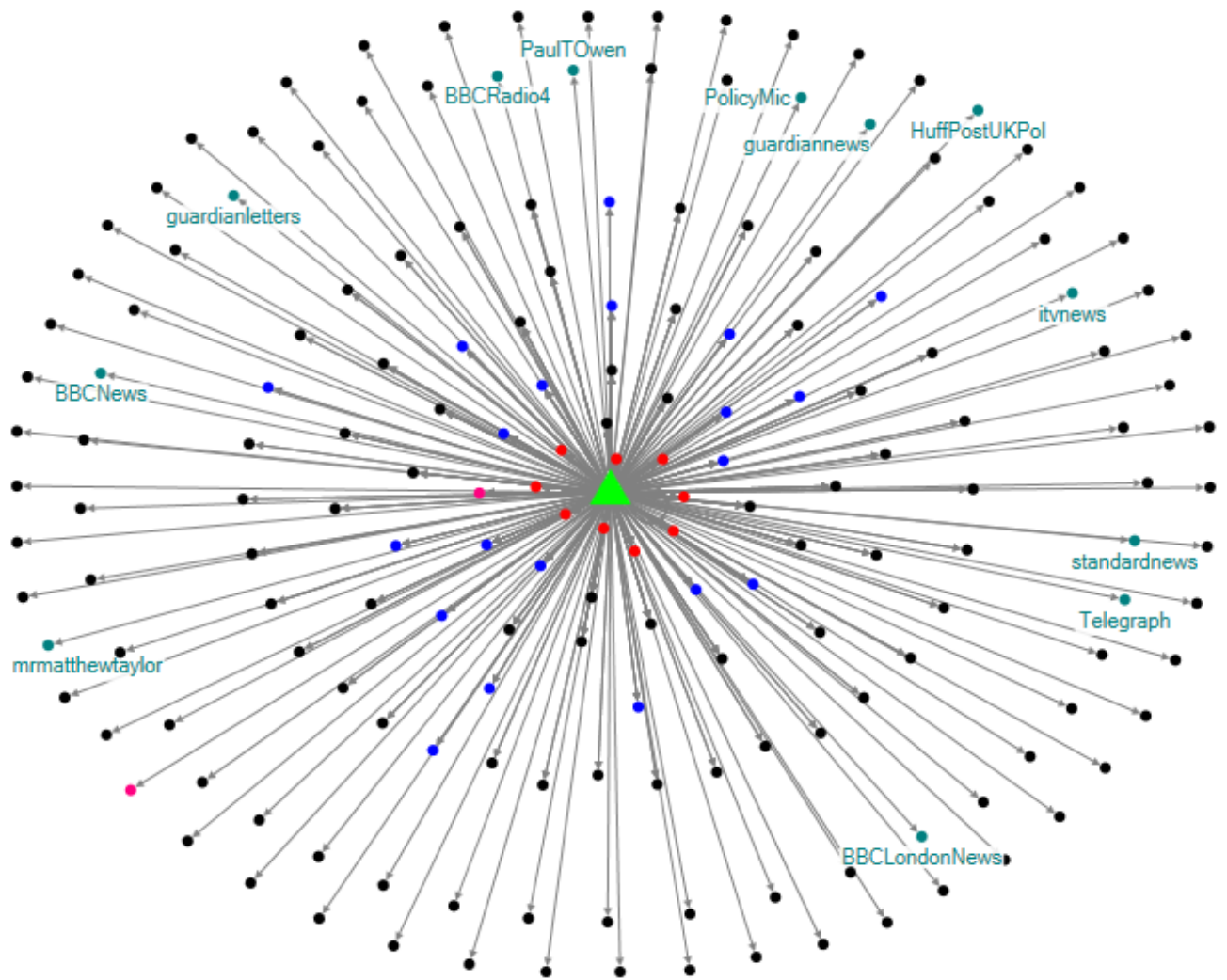


Figure 6.36: Media personnel within the outer circle

Within this network reside the majority of media Twitter pages. For example @guardiannews, @guardianletters, @BBCLondonNews, @BBCNews, @BBCRadio4, @PaulTOwen, @PolicyMic, @HuffPostUKPol, @itvnews, @standardnews, @Telegraph and @mrmatthewtaylor.

The retweet network for Transition Heathrow shows all users who Transition Heathrow retweeted.

6.4.3 'Retweet' Network

Transition Heathrow is the user at the centre of its network with all edges emanating from it, this means that it is purely Transition Heathrow's interactions which are looked at and not

other user's interactions with Transition Heathrow. The network as a whole visualises which users Transition Heathrow retweets. Those it retweets most frequently appear closer to the centre. Overall, there are 285 vertices in the network. This means 285 different users were retweeted by Transition Heathrow from June 2010 – February 2014. From these 285 vertices exist a total of 667 edges from Transition Heathrow to them, 182 of the total edges are classed as unique whereby only one edge is present between Transition Heathrow and certain vertices (27%), but 485 of the total edges are duplicate edges (73%) which means that Transition Heathrow retweets specific vertices twice or more. In fact as percentages, there are 182 unique edges (a one-off connection) which equates to 182 different users in the outer circle of the network. This means that Transition Heathrow is retweeting 64% of users only once which is 27% of the overall edge total. 64% of users contain 27% of connections (edges). The remaining 103 vertices are those which appear within the inner circle in the network. Transition Heathrow is thus retweeting 36% of users twice or more through 73% of the overall edges. 36% of users therefore contain 73% of edges. The closest user, who Transition Heathrow retweets most often, is shown in Figure 6.37.

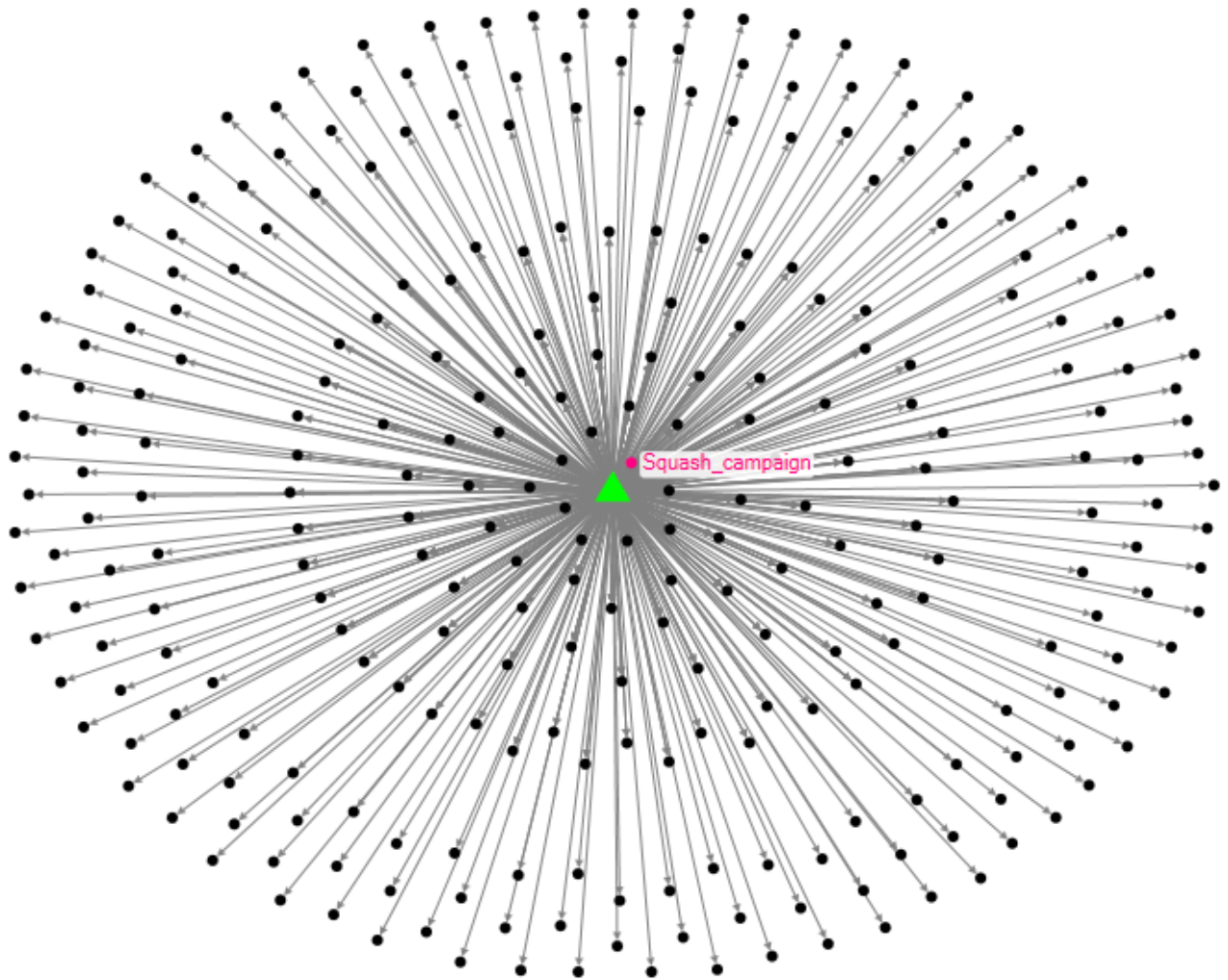


Figure 6.37: Closest user to Transition Heathrow

There are numerous users which appear close to the centre of the network but it is @Squash_campaign which is retweeted the most – 31 times. The next social network graph, Figure 6.38, illustrates other key anti-airport expansion groups and individuals close to Transition Heathrow.

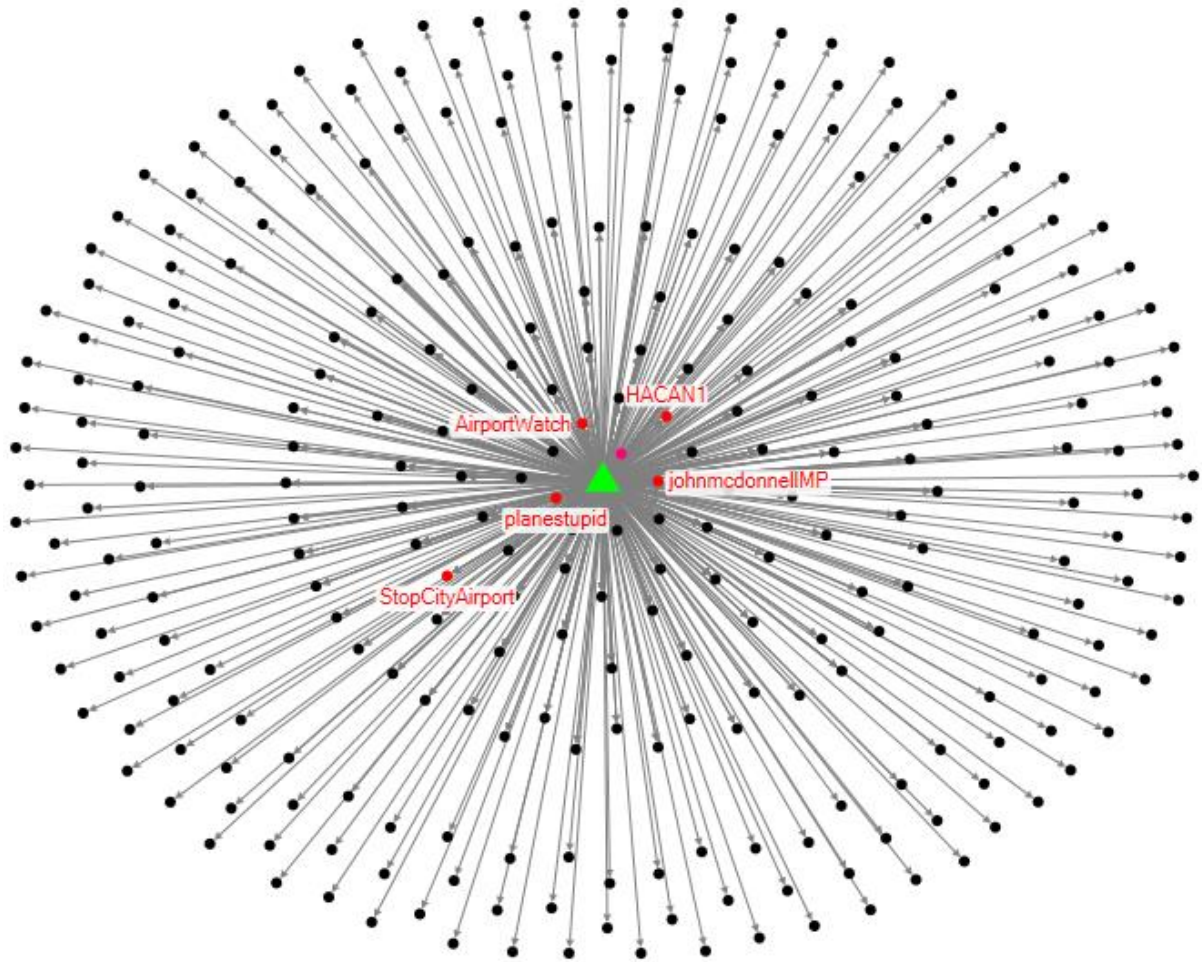


Figure 6.38: Key anti-airport expansion groups and related individuals

These users are: @planestupid who is retweeted 20 times, @johnmcdonnellmp - 19 times, @AirportWatch – 13 times, @HACAN1 – nine times and @StopCityAirport – four times. The other part of the network consists of other grassroots organisations and individuals (Figure 6.39).

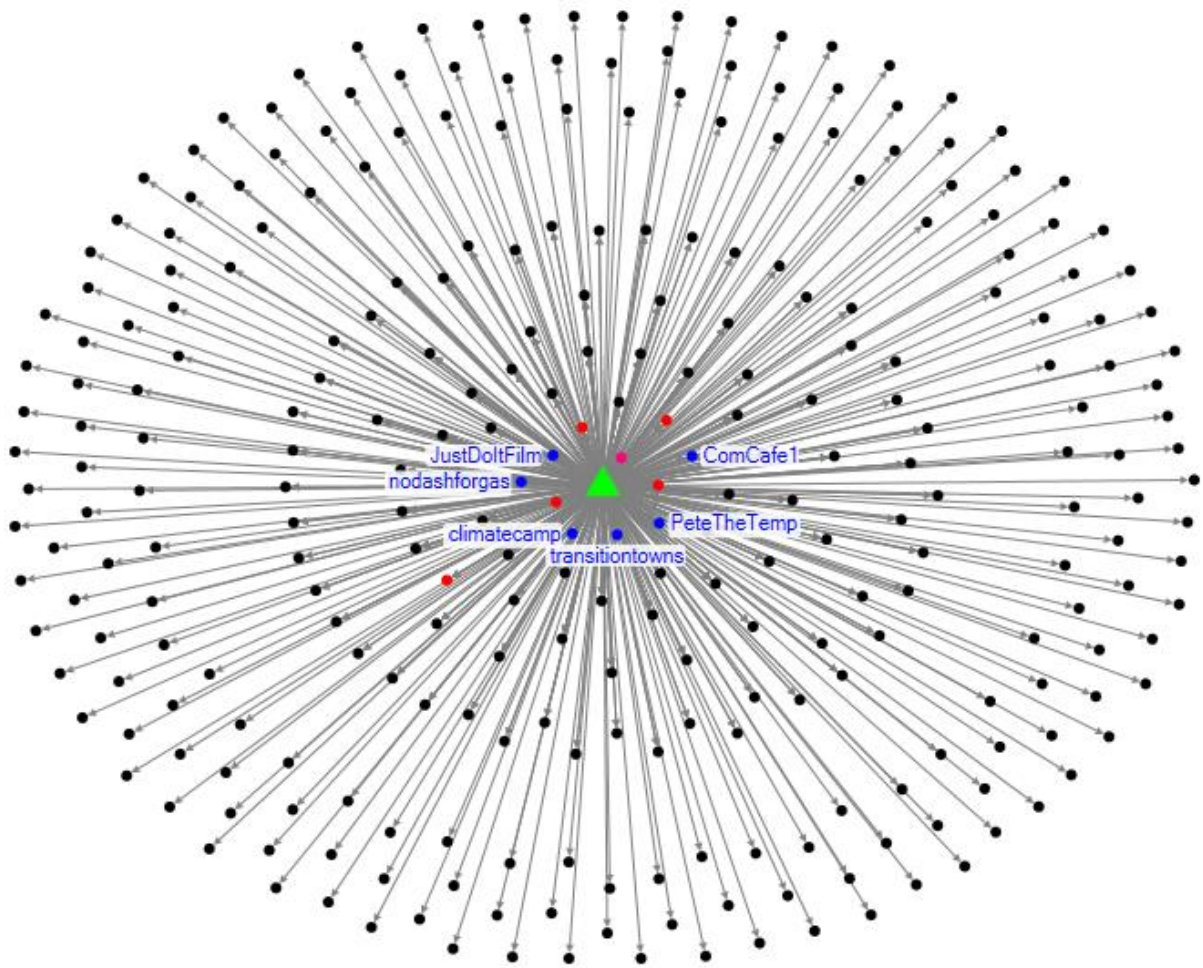


Figure 6.39: Other grassroots groups and individuals

@JustDoItFilm is retweeted 17 times, @transitiontowns – also 17 times, @climatecamp – 16 times, @PeteTheTemp – 14 times, @nodashforgas – 13 times, @ComCafe1 – ten times. Other direct action groups and individuals form a part of the inner circle but are retweeted less than most of the groups mentioned (Figure 6.40).

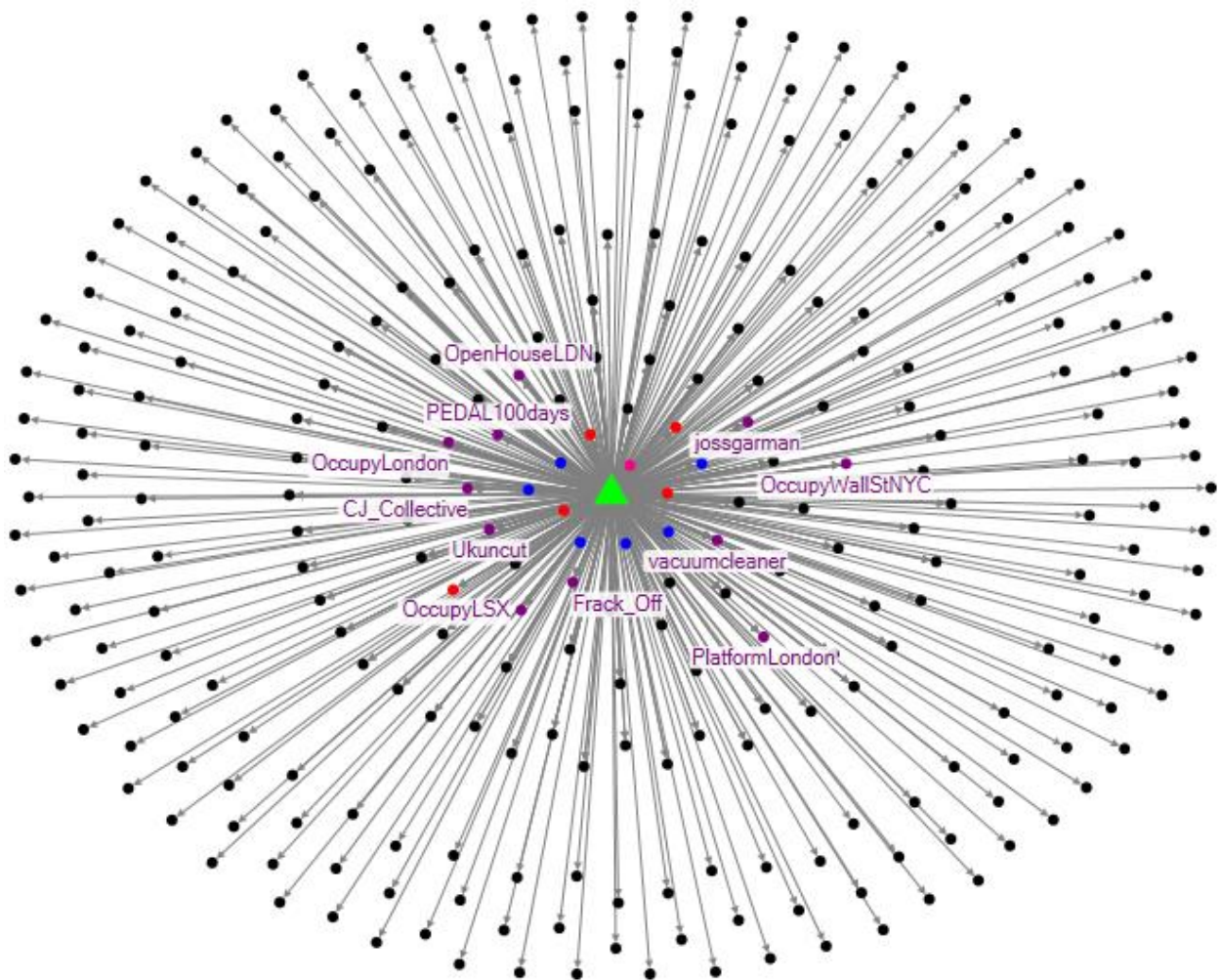


Figure 6.40: Other direct action groups and individuals

@Frack_Off – eight times, @vacuumcleaner – eight times, @UKuncut – seven times, @CJ_Collective – six times, @PEDAL100days – six times, @jossgarman – five times, @OccupyLondon – five times, @OccupyLSX – five times, @OpenHouseLDN – five times, @OccupyWallStNYC – three times and @PlatformLondon – three times.

Within the outer circle of the network, where least interaction occurs, there are several media forums and individuals (Figure 6.41) – much like Transition Heathrow’s mention network, all of whom are mentioned once.

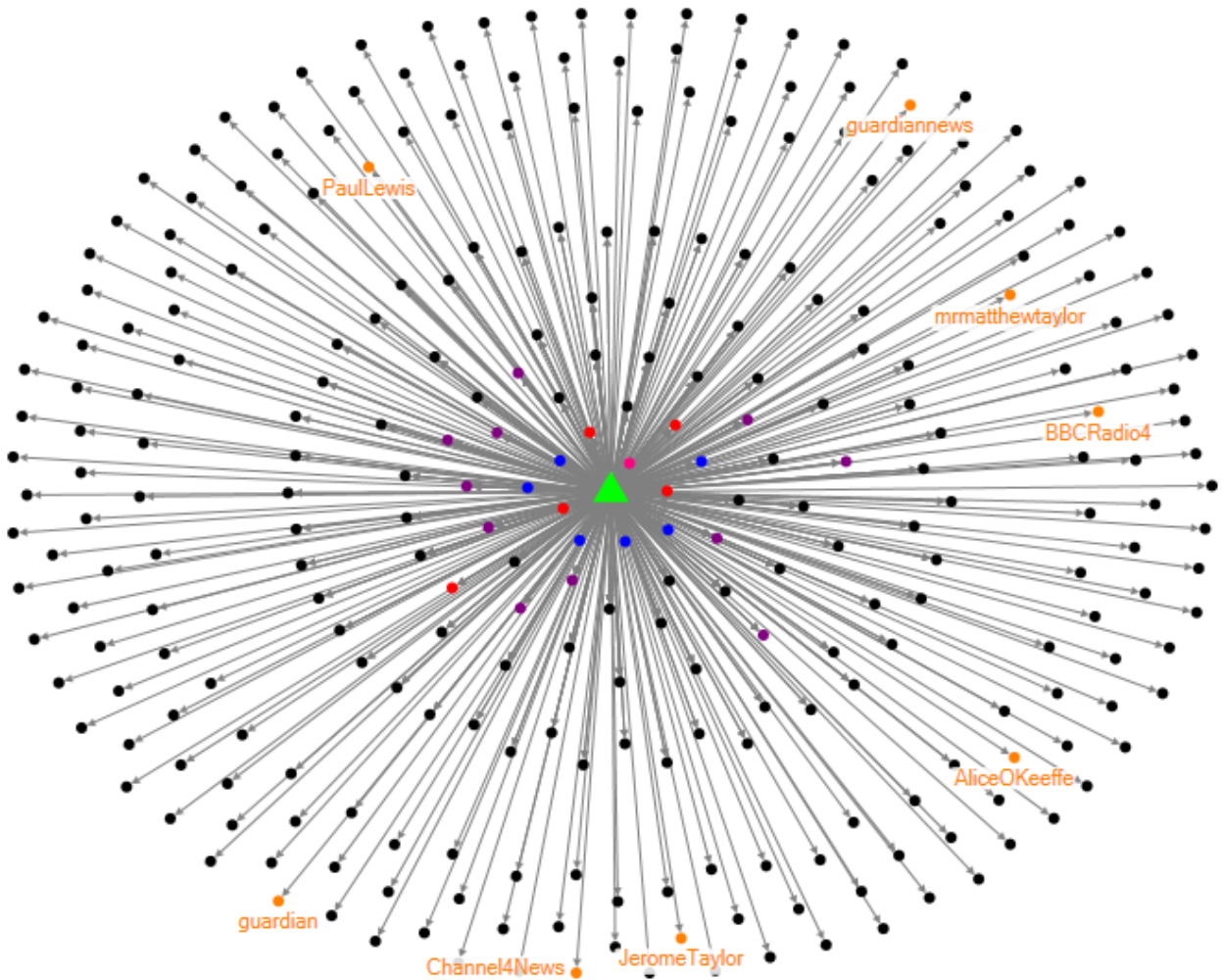


Figure 6.41: Media forums and key media individuals

@BBCRadio4, @AliceOKeeffe, @Channel4News, @guardian, @guardiannews, @JeromeTaylor, @PaulLewis, @mrmatthewtaylor are all examples of media personnel retweeted only once by Transition Heathrow.

Transition Heathrow's replies to network shows all users who Transition Heathrow replies to.

6.4.4 'Replies to' Network

As with all the directed graphs in the Twitter network the selected group (in this case Transition Heathrow) appears in the centre with edges radiating out from it. This shows all of the users which Transition Heathrow interacts with. In total there are 103 vertices in the network meaning 103 different users which Transition Heathrow interacts with. Of these 103 vertices there are 186 edges (186 connections between 103 different users). 75% of these are

unique edges, whereby a one-off interaction occurs and these subsequently connect to 75 different users. This indicates that these users all reside in the outer part of the network where all those that are replied to the least by Transition Heathrow are positioned. This equates to 71% of users are connected by 40% of the total number of edges. There are also 111 edges which are classed as duplicate edges and these are where two or more edges exist between Transition Heathrow and other vertices. As these edges signal greater interaction, the vertices appear closer to the centre in an inner circle. This means that out of the total number of users/vertices (103), 28 of these possess a duplicate edge (27%) with the number of duplicate edges being 60%. What these figures show is that Transition Heathrow has a greater number of users which it replies to only once but possesses a small core of users which it replies to multiple times.

There are a group of five vertices which are closest to Transition Heathrow and what is immediately noticeable is the difference between them in terms of their focus and background (Figure 6.42).

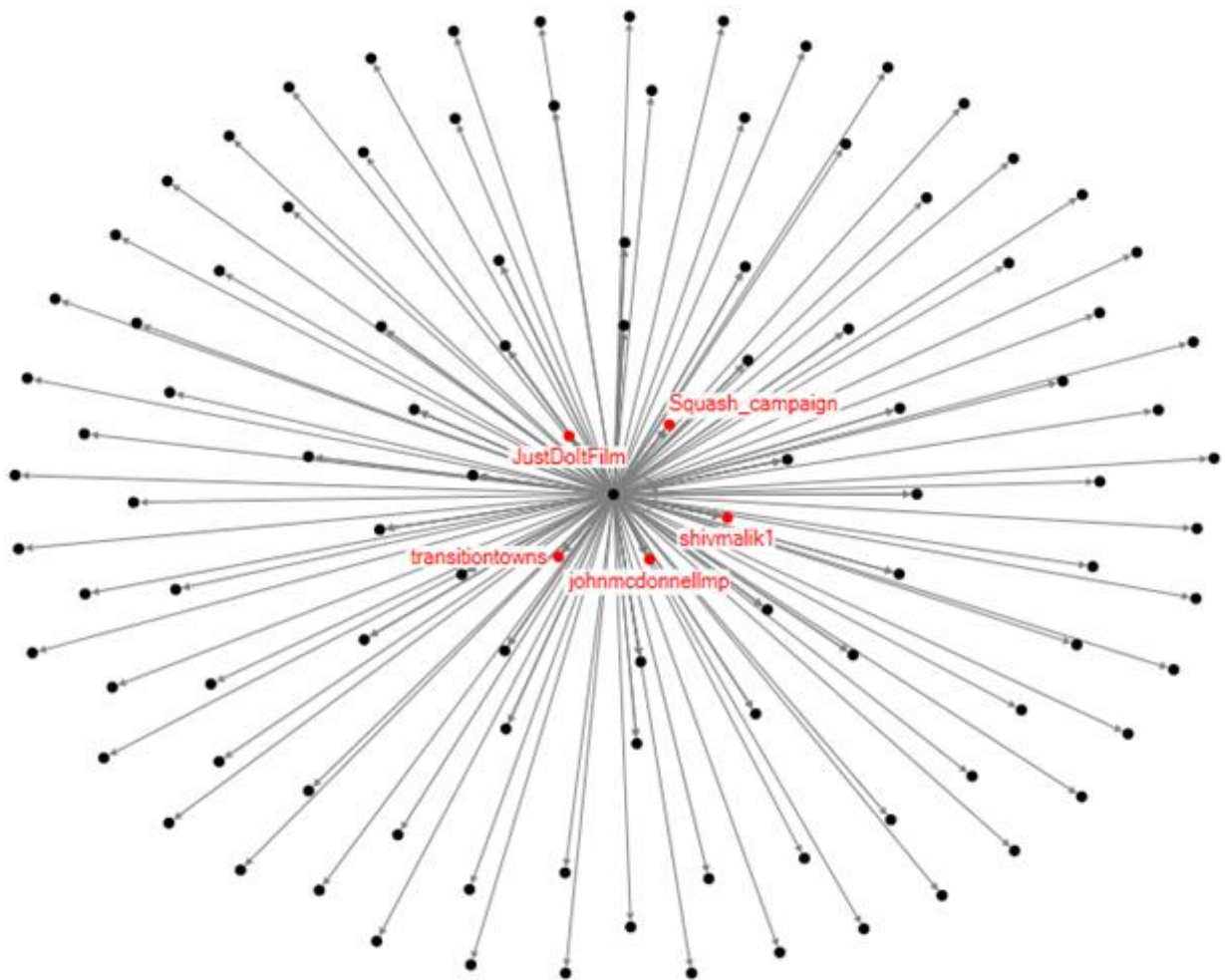


Figure 6.42: Core of close individuals

@JustDoItFilm is replied to 11 times, @johnmcdonnellmp is also replied to 11 times, @transitiontowns – nine times, @Squash_campaign – eight times, and @shivmalik1 - seven times.

Within the inner circle other users possess duplicate edges with Transition Heathrow; meaning two or more interactions take place. There are numerous other protest groups within the inner circle which vary in campaigning ideology from anti-airport expansion to broader climate change and environmental issues. For example @climatecamp is replied to four times, @planestupid - three times, @nodashforgas – three times, @ClimateRush – three times and @theedgefund is replied to twice (Figure 6.43).

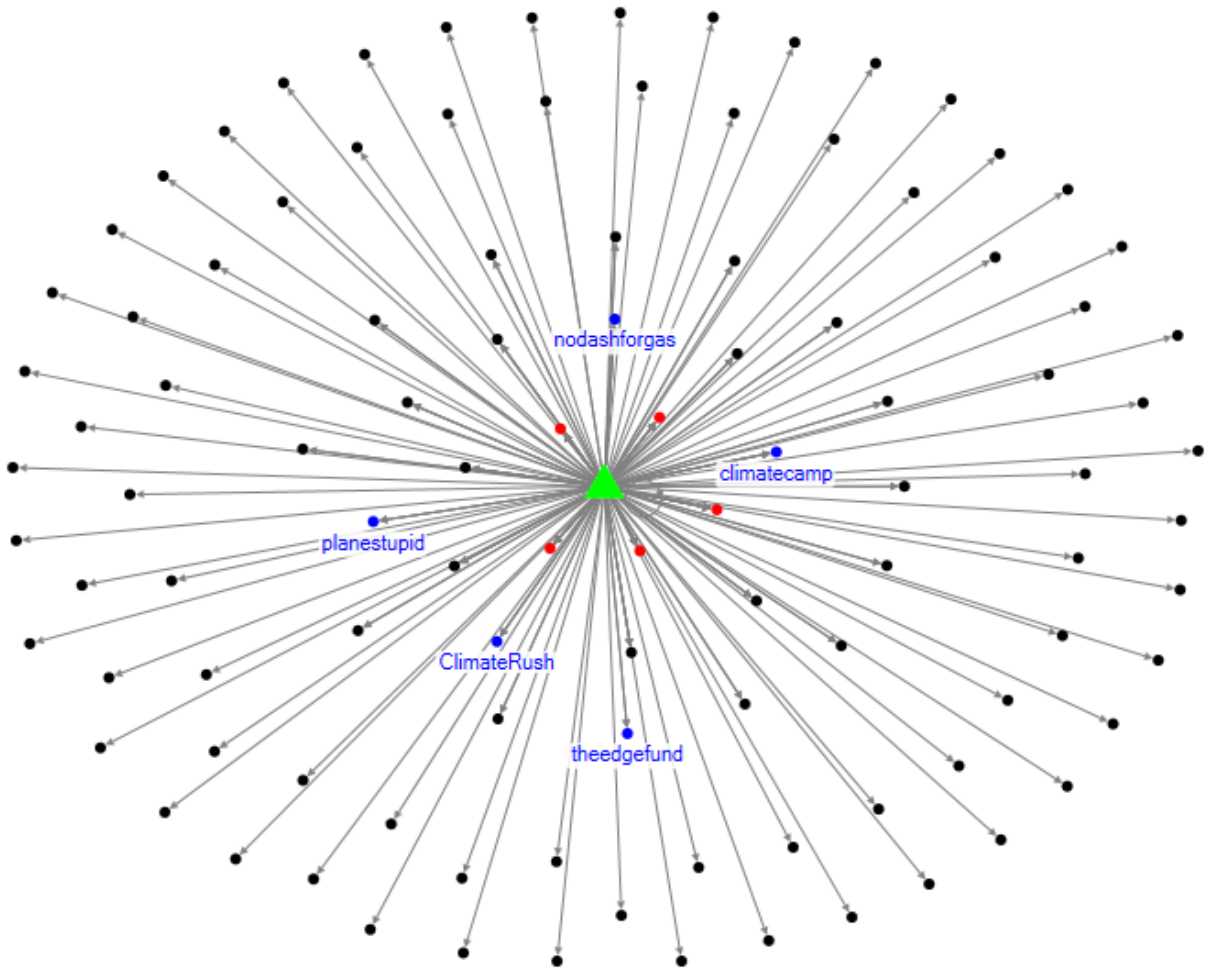


Figure 6.43: Other protest groups within the inner circle

Unlike the other Transition Heathrow networks, there appears to be interaction with five different media organisations and personnel. For example @jhgriffth is replied to three times, @adamvaughan_uk – three times, @StirToAction – three times, @UxbridgeGazette – twice and @mrmattthewtaylor – twice (Figure 6.44).

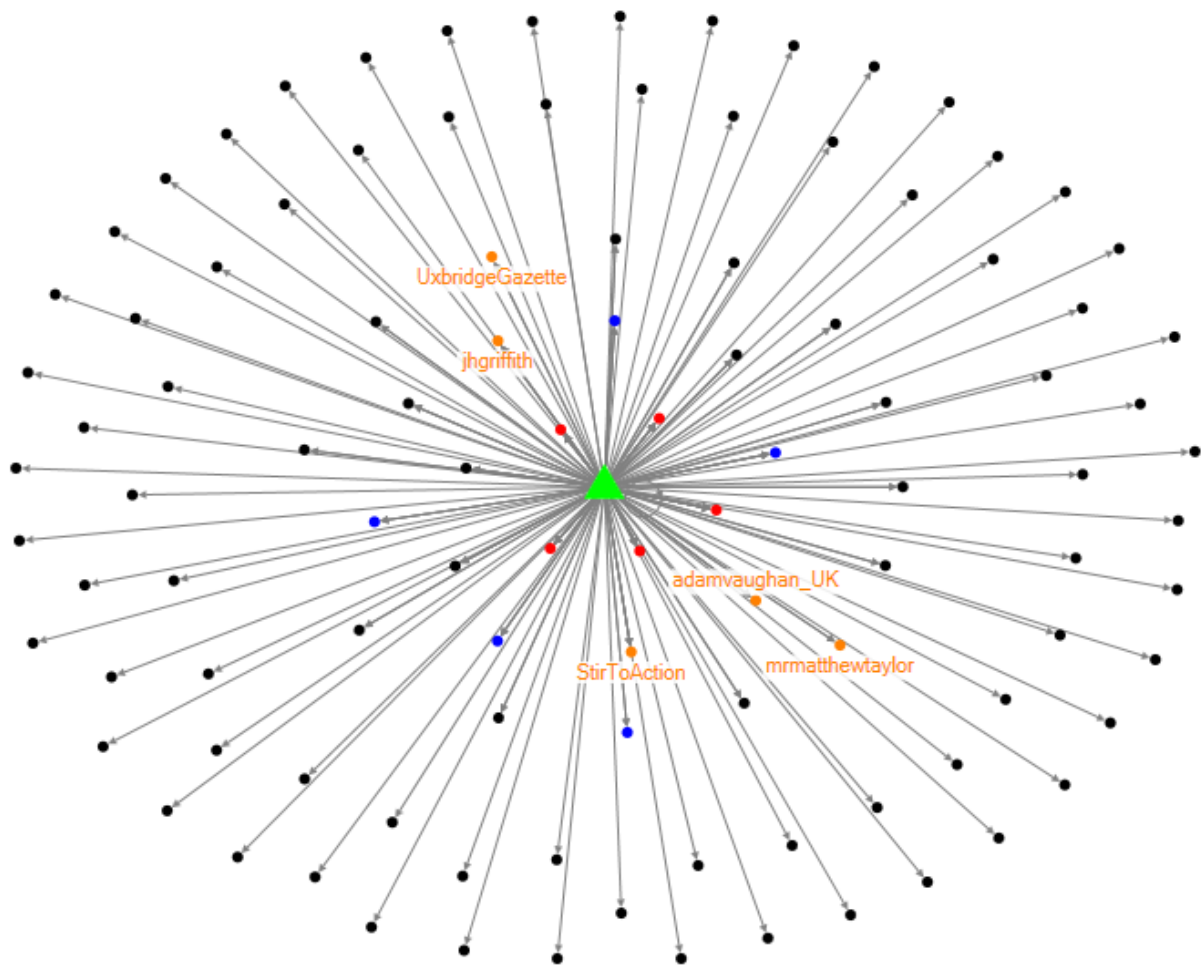


Figure 6.44: Media organisations in the inner circle

Other vertices exist within the inner circle with various individuals taking a role within contemporary grassroots activism. Some of these include: @vacuumcleaner who is mentioned four times, @robintransition - twice, @katforrester – twice, @MarinePepper – twice and @WolvoPingu – twice (Figure 6.45).

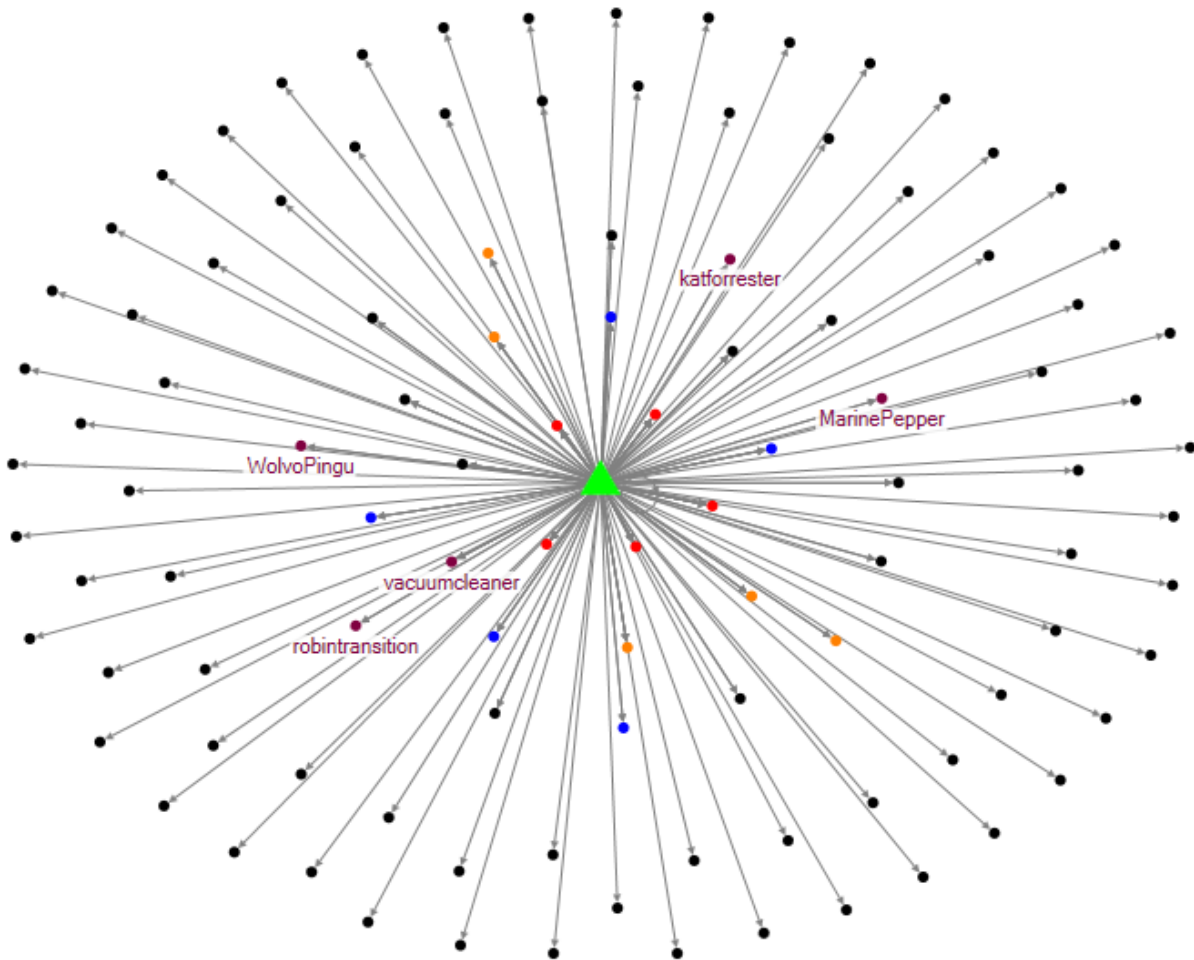


Figure 6.45: Grassroots individuals within the inner circle

There are other individuals within the inner circle but it is not clear whether they are activists or just simply people who have a particular viewpoint which Transition Heathrow agrees or disagrees with. The outer circle of the network contains all users which have been replied to only once, within this are other protest groups with a wider protesting ideology (and not just climate and environmental groups as witnessed in the inner circle). For example @Adbusters, @freetheland, @Feeding5k, @foodcoops, @Frack_Off, @UKAntifascism, @Takeflourback, @noon14523, @OccupyLondon, @OteshaUK, @peopleandplanet. However certain environmental and climate change groups do exist and are replied to once. For example @CJ_Collective, @campaigncc, @CleanAirUK, @Dothegreenthing and @HillingdonFoE (Figure 6.46).

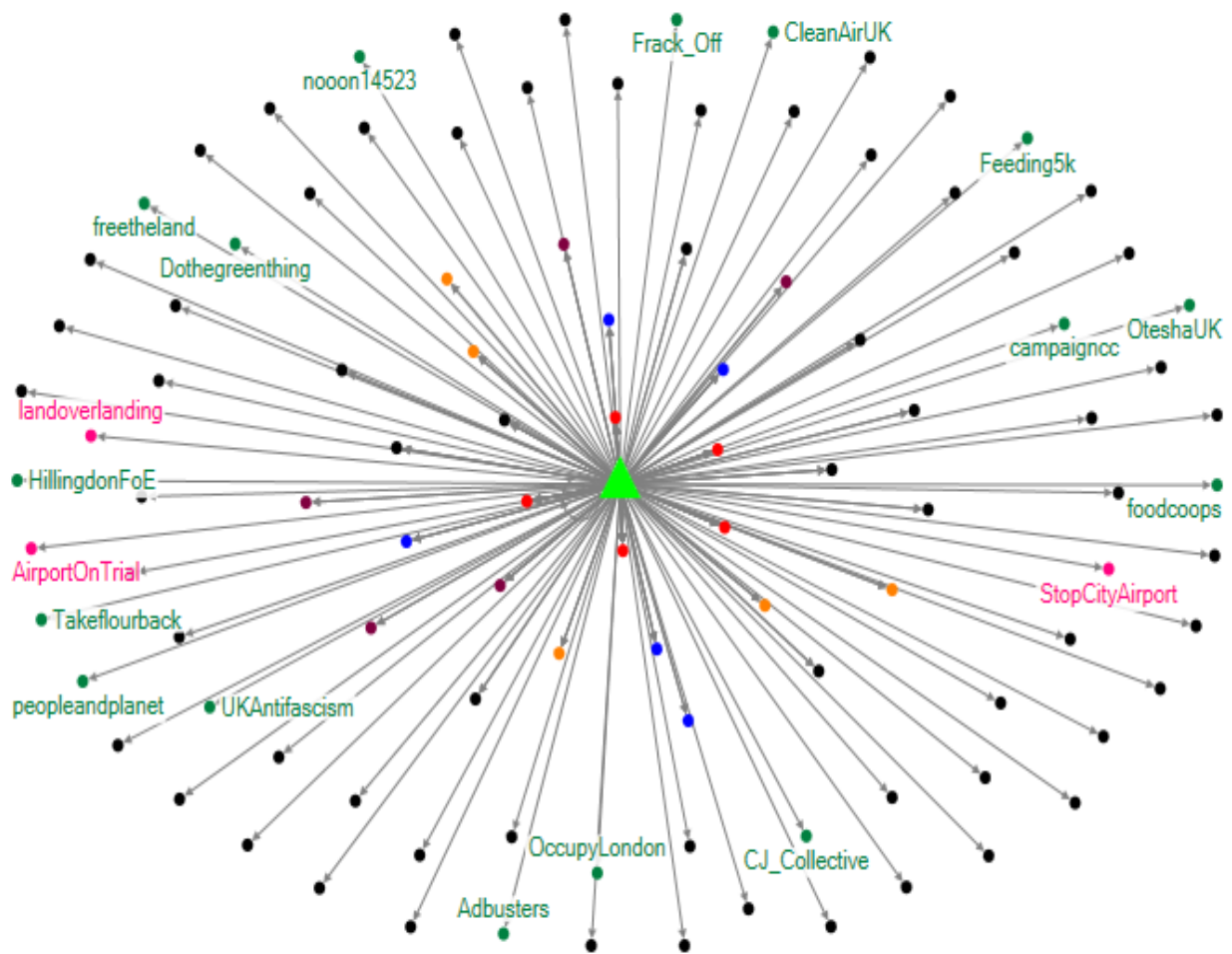


Figure 6.46: Protest groups in outer circle with a wider protesting focus

Anti-airport expansion groups appear within the outer network as well but none reside in the inner circle. @StopCityAirport, @AirportOnTrial, @landoverlanding are the three groups but others such as HACAN Clearskies and Airport Watch are not replied to at all.

There are yet more individual users in the outer circle. These are a representation of different backgrounds which further aid different channels of communication that exist within grassroots groups (Anderson, 2001) (Figure 6.47).

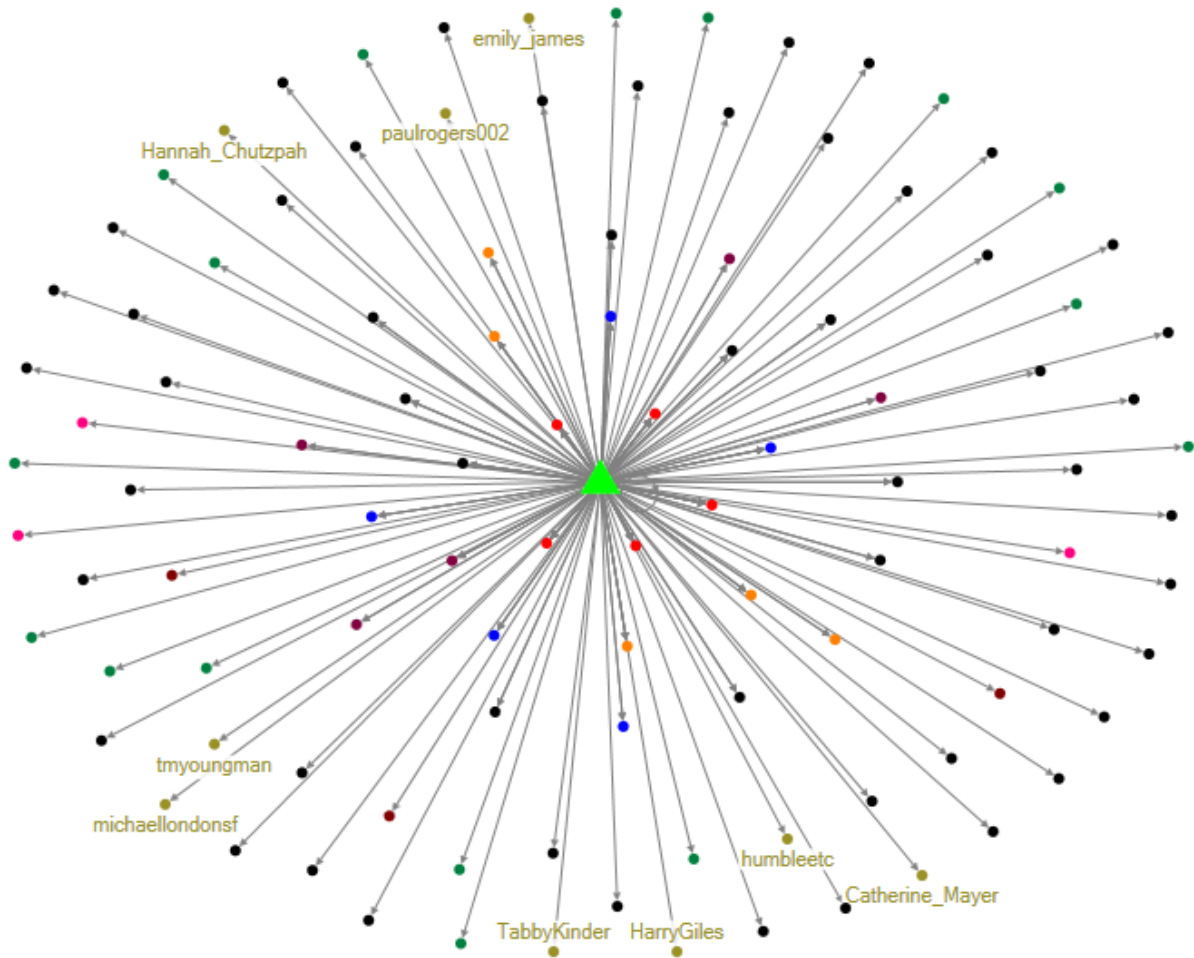


Figure 6.47: Selected Individual users within the outer circle

These include: @HarryGiles, @Catherine_Mayer, @emily_james, @humbleetc, @Hannah_Chutzpah, @tmyoungman, @michaellondonsf, @TabbyKinder and @paulrogers002.

6.4.5 Facebook Group

Transition Heathrow’s Facebook group contains the highest amount of members yet has the least amount of interaction though not in terms of actual interaction between users but rather the percentage of the 1,070 members which equates to 16% who actually interact. These users possess 1,232 edges between them. The 1,070 members in the group at the time of extraction demonstrates a large number of people who share a similar interest in this case, Transition Heathrow’s ideology. A smaller network of users exists within Facebook and a larger network of users is present on Twitter.

The graph metrics for Transition Heathrow's Facebook group show that 171 vertices exist within the network, that is 171 different users visualised because of their interaction with other similar users. Certain vertices appear detached from the rest of the network, this means that these users post a comment on the group wall but do not receive a like or comment and thus an edge does not exist to any other vertex. Of the other vertices where interaction is mapped, a total of 1232 edges occur, 650 of which are unique edges where a one off interaction occurs. In contrast, the remaining 582 edges possess a duplicate structure meaning two or more interactions take place. There are 111 self-loops (the hollow loops back to the central vertex) which are displayed as a vertex being connected to itself. This emphasises that these users add additional information to their original posts either by simply 'liking' them or 'commenting' on them. This can be done if the user has forgotten to post a piece of information or wishes to add something to their existing message.

Within Transition Heathrow's (Figure 6.48) network there are two users which possess significantly higher Betweenness Centralities than other vertices: Holly Creighton-Hird (6378.7) and David Moncoeur (4781.8).

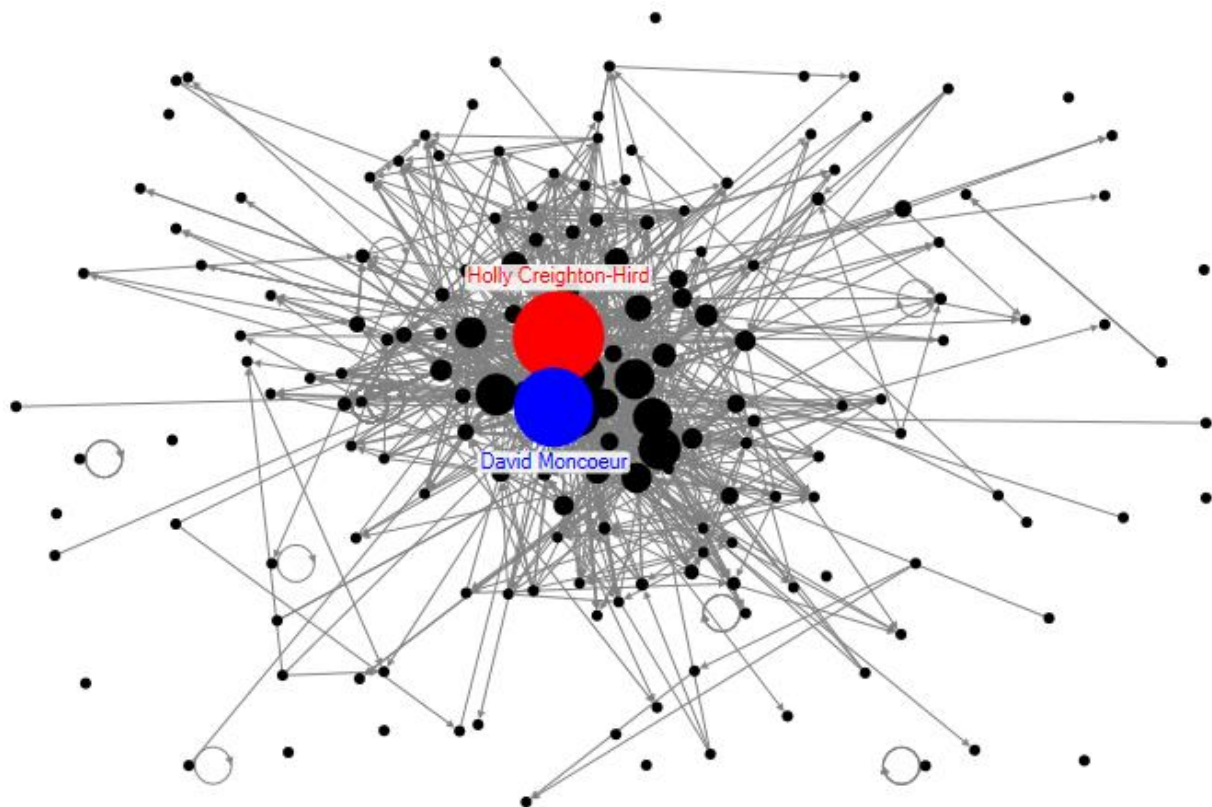


Figure 6.48: Vertex by Betweenness Centrality Scores

These users also have the highest in and out degrees meaning greater interaction between themselves and others and a greater dissemination of information. Holly Creighton-Hird has an in-degree of 65 and an out-degree of 36 meaning she interacts with 36 other vertices and 65 vertices interact with her. David Moncoeur interacts with fewer users (29 vertices) than Holly Creighton-Hird but more users interact with him (47 vertices). These users are not bridging two separate communities but rather are brokers within one network, disseminating information between various users and encouraging interaction. All vertices with high Betweenness Centralities are positioned centrally where most of the interaction occurs, further away from the centre the edges between vertices are visible as fewer interactions occur. The users with the high Betweenness Centrality within the network provide the connections between other users which would not be connected otherwise hence their importance within the network as brokers of information dissemination. In this sense they (Holly Creighton-Hird and David Moncoeur) can be considered as being powerful, more so than any of the other vertices, and as Hanneman and Riddle (2005: 164) suggest that this power could be due to a perceived structural basis as ‘they are different from others in the population.’ Clearly these two users are predominantly the ones which make ‘things happen’ within the network as they are ‘between’ most other users within the group with lower betweenness centralities, the power in the network could be ‘important for group formation and stratification’ (ibid). The highest Closeness Centralities of selected users are shown in Figure 6.49.

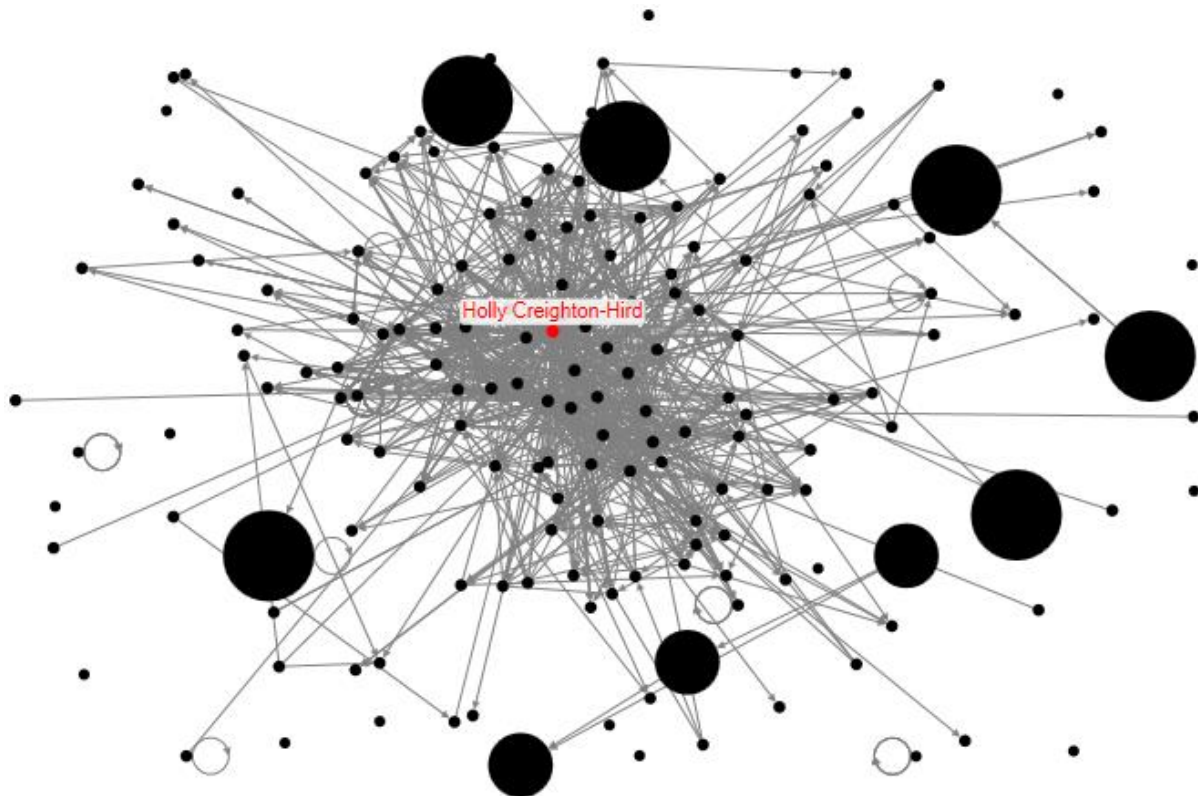


Figure 6.49: Vertex by Closeness Centrality Scores

In Transition Heathrow's network there are users with higher Closeness Centrality scores, Barnali Ghosh, Dan Glass, Isobel Braithwaite, Joe Duggan, Paul Sousek and Rodrigo Calvet (a score of 1) which shows their central nature within the network. However, it is important to highlight that these vertices possess higher scores because they contain one or two edges to one or two other vertices and are ultimately not connected to the rest of the network. There are users who are connected to the majority of others in the network but exhibit lower scores than those who are only connected to few others. Therefore, and to avoid misinterpretation, the values from the users who are connected to the majority of others are used to measure Closeness Centrality. Holly Creighton-Hird has a Closeness Centrality value of 0.005 which is the highest out of any of the other vertices who are connected to the network – although there is little difference between Closeness Centrality scores within the whole network (from 0.005-0.002).

Holly Creighton-Hird (0.039) and David Moncoeur (0.034) possess the highest Eigenvector Centrality scores (Figure 6.50). This means that both are connected to other users with high Eigenvector Centralities and are ultimately the most powerful users in the network as all other users are paying attention to them more than any other users.

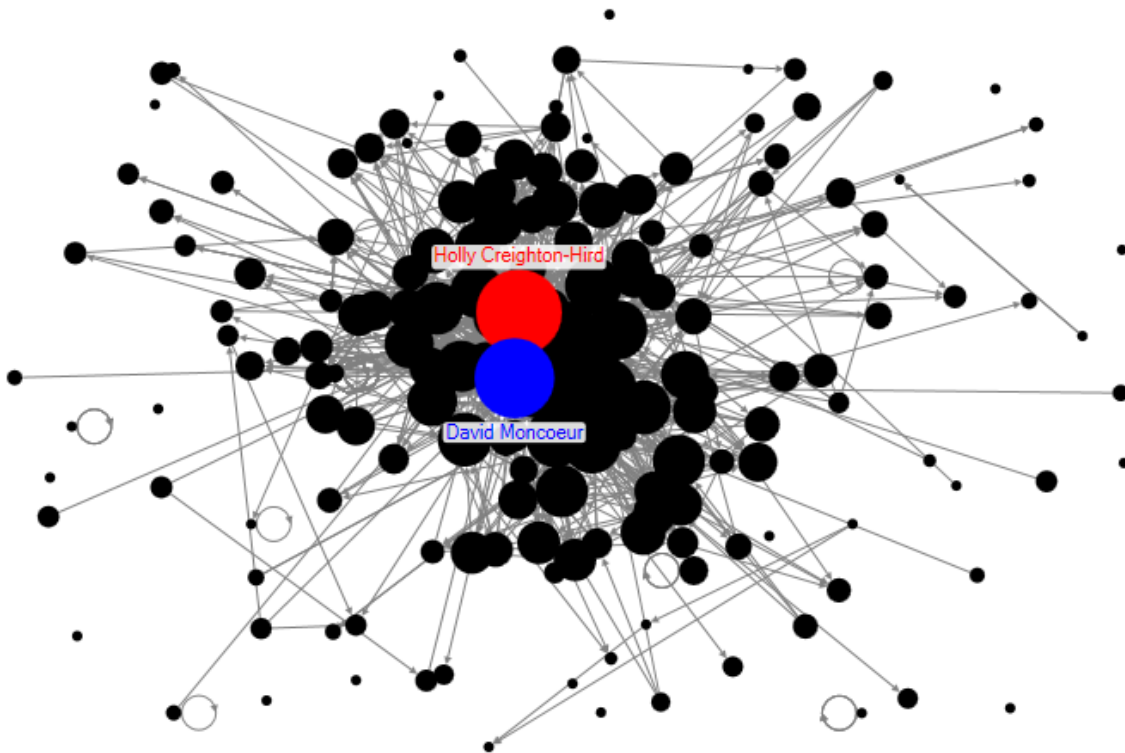


Figure 6.50: Vertex by Eigenvector Centrality Scores

This means that the network, as a whole, features numerous users who are more influential than others and more active in disseminating messages relating to Transition Heathrow. Notwithstanding, other users who may appear peripheral in the network are not as they still have access to the information being spread. Although this is only true of users which are connected to the main cluster of users (those with low Closeness Centralities) as there are other vertices within the outer portion of the network which are either totally disconnected (meaning they post to the group but no user either likes or comments on their post) or they are only connected to one other vertex outside of connections with the main network. This is because their connections are either reciprocal, with a vertex that is connected back to the original vertex or the vertices are connected to an unconnected vertex. This is also why their Closeness Centrality scores are high because they are only connected to each other and not to any other vertex outside of them thus meaning the information is restricted to being transferred between two or three vertices.

Within Transition Heathrow's Facebook network it is, unsurprisingly, the same two individuals who possess the highest Page Rank scores of 7.6 and 6.4 respectively. This demonstrates their overall importance within the spread of information in the network and

also their central nature. This variant of Eigenvector Centrality as Graham (2014) suggest takes into account the in and out degree of each vertex when calculating the Page Rank score.

6.5 The Characteristics of Social Networks on Social Media

One of the characteristics of social networks is related to the creation of new protest spaces by new forms of social media and the concept of reciprocity⁶ and whether users on social media seek reciprocal actions from others for interactional purposes (Pelaprat and Brown, (2012). Figure 6.51 takes the follower/following relationships utilised in Java et al (2007) and applies them to each social network of the three anti-airport expansion groups to determine whether people seek reciprocal follower/following relationships on Twitter to engage with other users and whether this can increase the likelihood of interaction. The concept of reciprocity on Twitter is measured by uncovering who users follow and, in turn, which of those users follow back. It is easier to measure this type of reciprocity on Twitter because the focus is on each group's ties with other users in its network and users do not require a reciprocal relationship with others to interact (unlike on Facebook). Similarly all interaction networks on Twitter for each group (mentions, retweets and replies to) should exhibit users who possess reciprocal follow/following relationships with Airport Watch, HACAN Clearskies and Transition Heathrow (Pelaprat and Brown, 2012). Figure 6.51 provides an overview of the number of reciprocal relationships for each group on Twitter and how that then transcends into the interaction networks.

⁶ Reciprocity being the idea of mutual exchange (of ideas, information and interaction) between people (see Pelaprat and Brown, 2012).

Figure 6.51: Reciprocal Relationships on Twitter

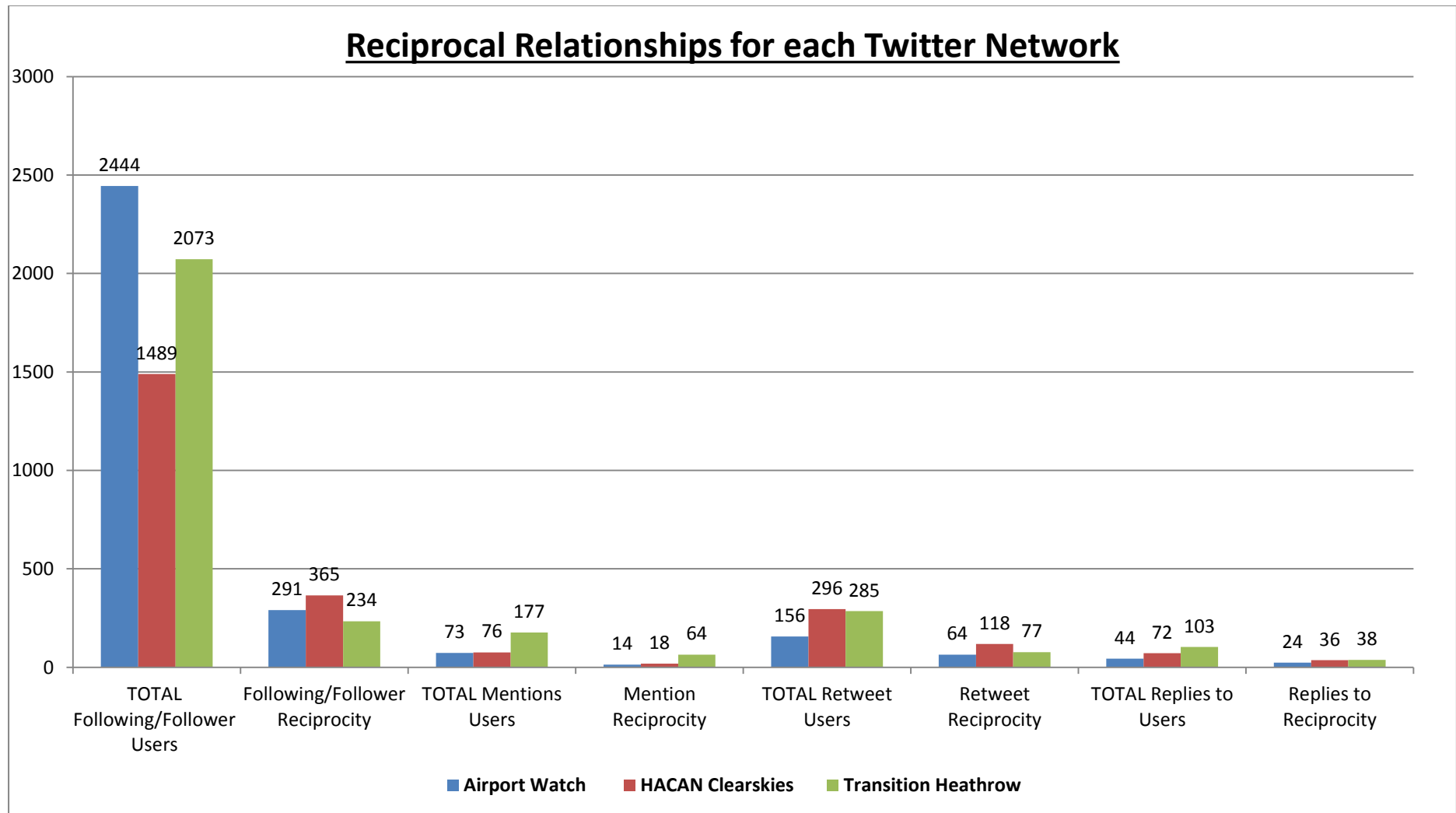


Figure 6.51 shows the total number of users for each Twitter network and the total number of reciprocal users. Reciprocity was calculated from the following/follower networks as those users who appeared in an inner circle that were recognised as having two-way (reciprocal) edges; much as it was utilised in Java et al (2007), with these numbers being compared with each Twitter network to determine reciprocal users.

Airport Watch has the largest number of users in its following/follower network (2,444) which is not surprising given its national campaign group status. This is then followed by Transition Heathrow which possesses 2,073 and HACAN Clearskies which has 1,489. HACAN Clearskies exhibits a smaller number in its network because of its narrower focus on the very specific cause specifically, issues of airport operation and expansion, at Heathrow airport. Transition Heathrow's number is higher because of its broader protesting remit which does not just cover airport expansion but also climate change, sustainability, community cohesion, housing, grassroots activism and squatting networks. The difference comes in the number of reciprocal users for each network. For the following/follower network, Airport Watch possesses 12% of reciprocal relationships, whereas HACAN Clearskies has 25% and Transition Heathrow 11%. Both Airport Watch and Transition Heathrow have a greater number of users in each of their networks than HACAN Clearskies but possess a smaller number of reciprocal relationships with these users. Whilst HACAN Clearskies may have a smaller number of users in its following/follower network; it retains a larger degree of reciprocity between them.

The proportion of reciprocal mention relationships differ between networks, it is Transition Heathrow who mentions considerably more users (177) than HACAN Clearskies (76) and Airport Watch (73) and thus possesses a considerably higher reciprocity rate of 36% when compared to HACAN Clearskies (24%) and Airport Watch (19%) respectively. Interestingly, within the retweet networks, it is HACAN Clearskies who retweet more users (296) than Transition Heathrow (285) and Airport Watch (156) but it is Airport Watch which has a fractionally higher reciprocity rate of 41% when compared to HACAN Clearskies (40%) and Transition Heathrow (27%). Both Airport Watch and HACAN Clearskies retweet similar users to their own campaign (see Sections 6.2.3 and 6.3.3). However, there are certain users who fall outside of this close proximity, due to the benefits of social media in providing connection opportunities internationally. Finally, with regards to the replies to networks, it is Transition Heathrow who replies to more users (103), more than HACAN Clearskies (72) and Airport Watch (44) but, as with its retweet network it is Airport Watch which has a higher

reciprocity rate of 55% when compared to HACAN Clearskies (50%) and Transition Heathrow (37%) respectively.

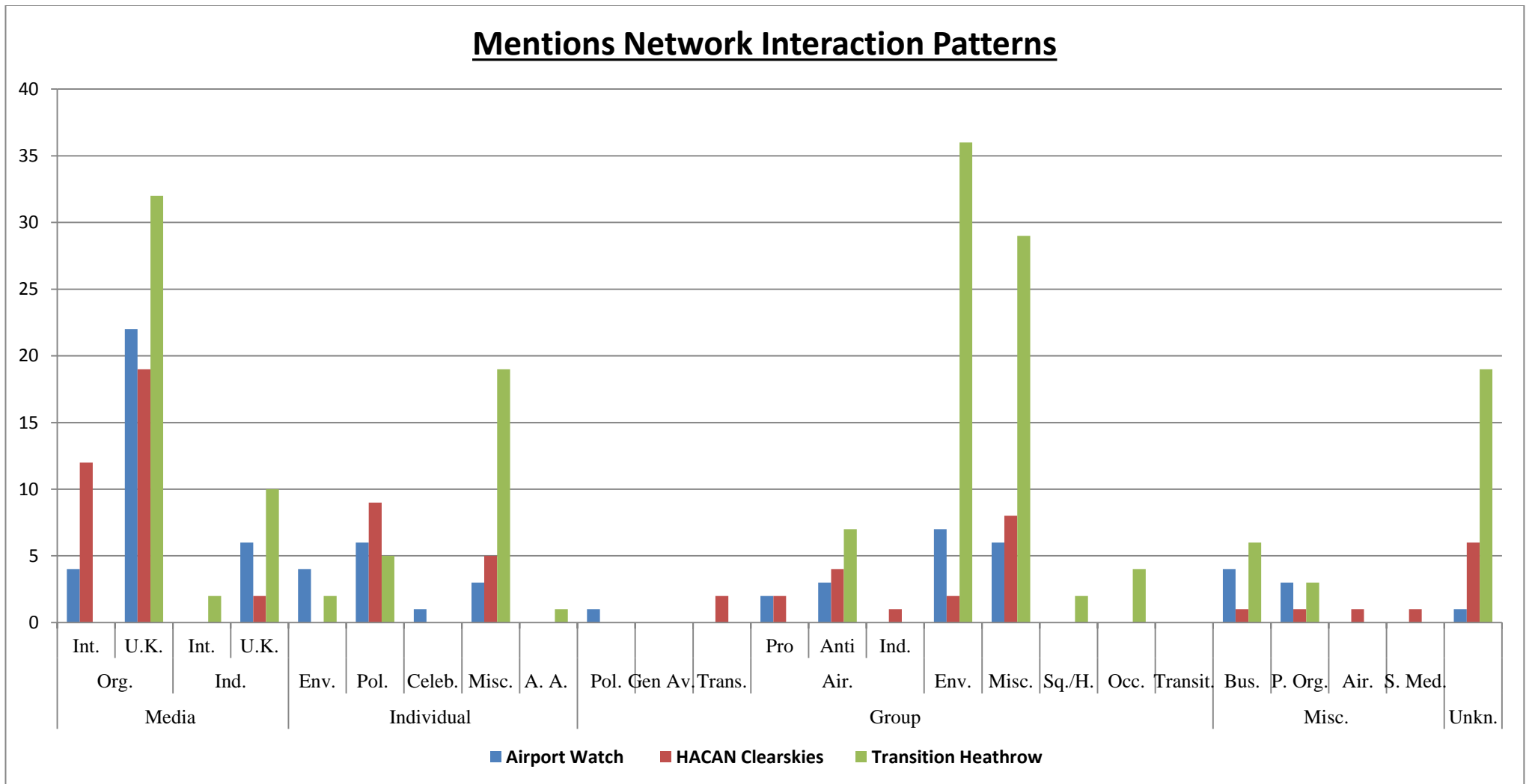
An additional characteristic of social networks on social media is the interaction possibilities it provides as well as the number and type of user communicated with, as indicated by mentions, retweets and replies. This illustrates how the groups are utilising social media which in turn is able to provide the extent of the challenges and opportunities of social media's current operation. Once again, the type of user on Facebook is difficult to decipher as, unlike Twitter, Facebook does not have a description of the user on each profile.

Moreover, without being a "friend" of each of the users within the groups or pages, it is often impossible to view details of their profiles because of restricted privacy settings. Therefore Twitter users are able to be easier categorised due to the openness of user profiles. The categories in Figures 6.52, 6.53 and 6.54 were sought by assessing each user's Twitter profile description. The Twitter description on a user's profile is used to provide information to readers about the background and interests of the person/organisation. Therefore these categories were the result of extensive analysis of each user in each network. Table 6.1 highlights what each category represents.

Media	Org.	Int.	International Media Organisation
		U.K.	U.K. Media Organisation
	Ind.	Int.	International Media Individual (Journalist/Editor)
		U.K.	U.K. Media Individual (Journalist/Editor)
Individual	Env.		Environment Individual (Campaigner)
	Pol.		Political Individual (MP, Politician)
	Celeb.		Celebrity
	Misc.		Miscellaneous
	A.A.		Anti Airport Individual (Campaigner)
Groups	Pol.		Political Groups
	Gen Av.		General Aviation Groups
	Trans.		Transport Groups
	Air	Pro	Pro Airport Expansion Groups
		Anti	Anti Airport Expansion Groups
		Ind.	Independent Groups
	Env.		Environment Groups
	Misc.		Miscellaneous Groups
	Sq./H.		Squatting/Housing Groups
	Occ.		Occupy Groups
	Transit.		Transition Network Groups
Misc.	Bus.		Businesses
	P. Org.		Political Organisations
	Air.		Airports
	S. Med.		Social Media
Unkn.			Unknown

Table 6.1: Categories relating to Type of User

Figure 6.52: Type of 'Mentioned' User

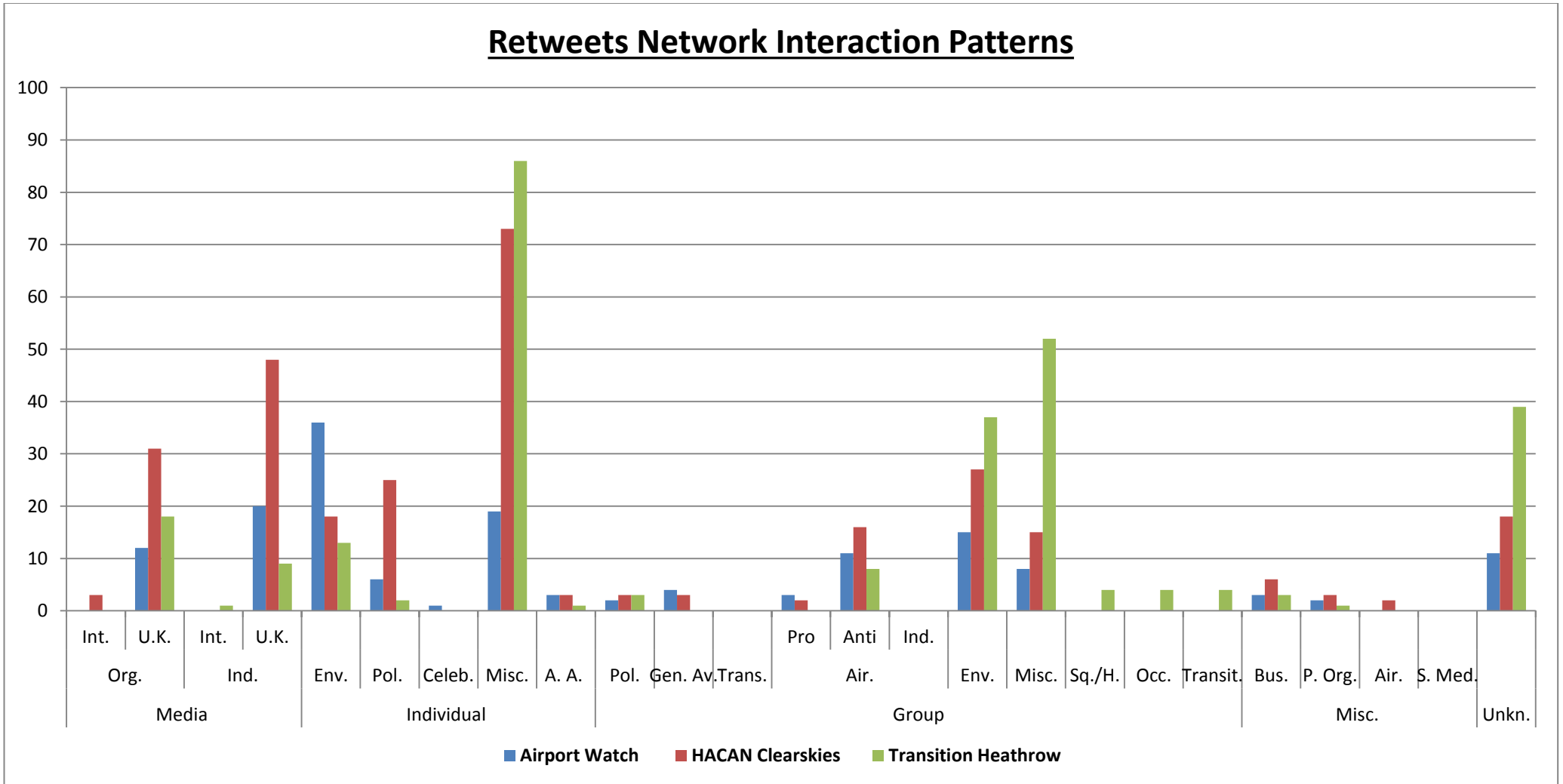


HACAN Clearskies and Airport Watch mention a similar number and type of users but this is still considerably less than Transition Heathrow. Figure 6.52 illustrates that Transition Heathrow mentions a broad variety of users. Of the 177 different users mentioned in Transition Heathrow's mention network; 20% are environmental groups, 18% are UK based media organisations and 16% are miscellaneous groups from background such as: arts, sustainability, food growth, film making, the metropolitan police and those against austerity and 11% are miscellaneous individuals. The environmental groups in particular are from a broad background both nationally and internationally.

Both Airport Watch and HACAN Clearskies demonstrate different patterns in their mentions networks. Firstly, they do not mention as many users as Transition Heathrow and prefer to interact with a smaller number of users in total. Of the 76 users in HACAN Clearskies' mention network, 41% are media organisations and within this, 61% are UK based whilst 39% are international (predominantly French and German) compared to Airport Watch's mention network where 37% are media organisations and within it. 85% are UK based whilst 15% are international. This shows that one of the most important channels of communication for national, regional and local environmental groups is with news media. For the remaining part of HACAN Clearskies' mention network, 12% are political individuals such as MPs and 11% are miscellaneous groups from backgrounds such as: 1) Digital content; 2) popular content and documentary makers; and 3) 7% are miscellaneous individuals. Whereas the remainder of Airport Watch's mention network shows that 10% are environmental groups from backgrounds such as: air pollution, fracking, energy, wildlife, sustainability and climate change, 8% are miscellaneous groups such as local charities, tourism and workers unions and 8% are also from political individuals.

Comparatively all groups mention groups from environmental and broader backgrounds. Although Airport Watch is the national umbrella organisation under which all other anti-airport groups reside, it links less with other international groups irrespective of environmental focus. This is surprising as social media has reduced barriers associated with place and connected people on an international scale. On the other hand, it is regional, and to an extent local, campaign groups against Heathrow expansion which possess a more international dimension to their campaigns by engaging with a larger and more diverse selection of international environmental groups. The same categories were applied to the retweet networks for all three groups; this graph is shown in Figure 6.53.

Figure 6.53: Type of 'Retweeted' User



Airport Watch and HACAN Clearskies retweet similar anti-airport expansion groups most often (see Sections 6.2.3 and 6.3.3), thus forming stronger ties because of their close affiliation and friendship with them. But within the network as a whole, discounting the number of interactions, there are differences in terms of the type of user each group retweets. One of the only similarities in the retweet networks is that both HACAN Clearskies and Transition Heathrow retweet a considerable number of miscellaneous individuals from a variety of backgrounds; HACAN Clearskies retweets 25% overall whilst Transition Heathrow retweets 30%. This constitutes the largest group. Most miscellaneous individuals are within this category because of a lack of information on their Twitter profile, but other users within this category for HACAN Clearskies include: aviation engineers, transport for London employees, entrepreneurs, lawyers, economists and PR consultants. Whilst Transition Heathrow's miscellaneous individuals comprise of: university students, authors and poets. There is a clear difference between the backgrounds of the individuals within each retweet network as HACAN Clearskies prefers to retweet white collar professionals whilst Transition Heathrow prefers to retweet literalists and students. This also demonstrates the type of user of interest to their campaign. Therefore a retweet is seen as a type of endorsement for these campaign groups.

The remaining types of users retweeted in HACAN Clearskies' are composed of: media individuals (16%), media organisations (11%), environmental groups (9%), political individuals (8%) and other anti-airport expansion groups (5%). Consequently HACAN Clearskies has an international focus when retweeting and is more likely to retweet other international anti-airport expansion groups than any of the other user types (1 USA group, 1 French group, 2 German groups and 1 Canadian group). Within Transition Heathrow's retweet network the key remaining type of users retweeted are as follows: miscellaneous groups (18%), unknown (14%) and environmental groups (13%). Unlike its mentions network, Transition Heathrow's retweet network is made primarily of users based in the UK. In fact, despite it mentioning a network of environmental groups globally, it only retweets UK based environmental groups from a variety of ideologies: nature, bio fuels, fracking, renewable energy and climate change. Transition Heathrow's grassroots campaign is similar to others in the UK and does reside under a broader Transition Network umbrella, which may be the reason behind its reluctance to retweet other international environmental groups. For Airport Watch, its retweet network also demonstrates a difference from the other groups. It is

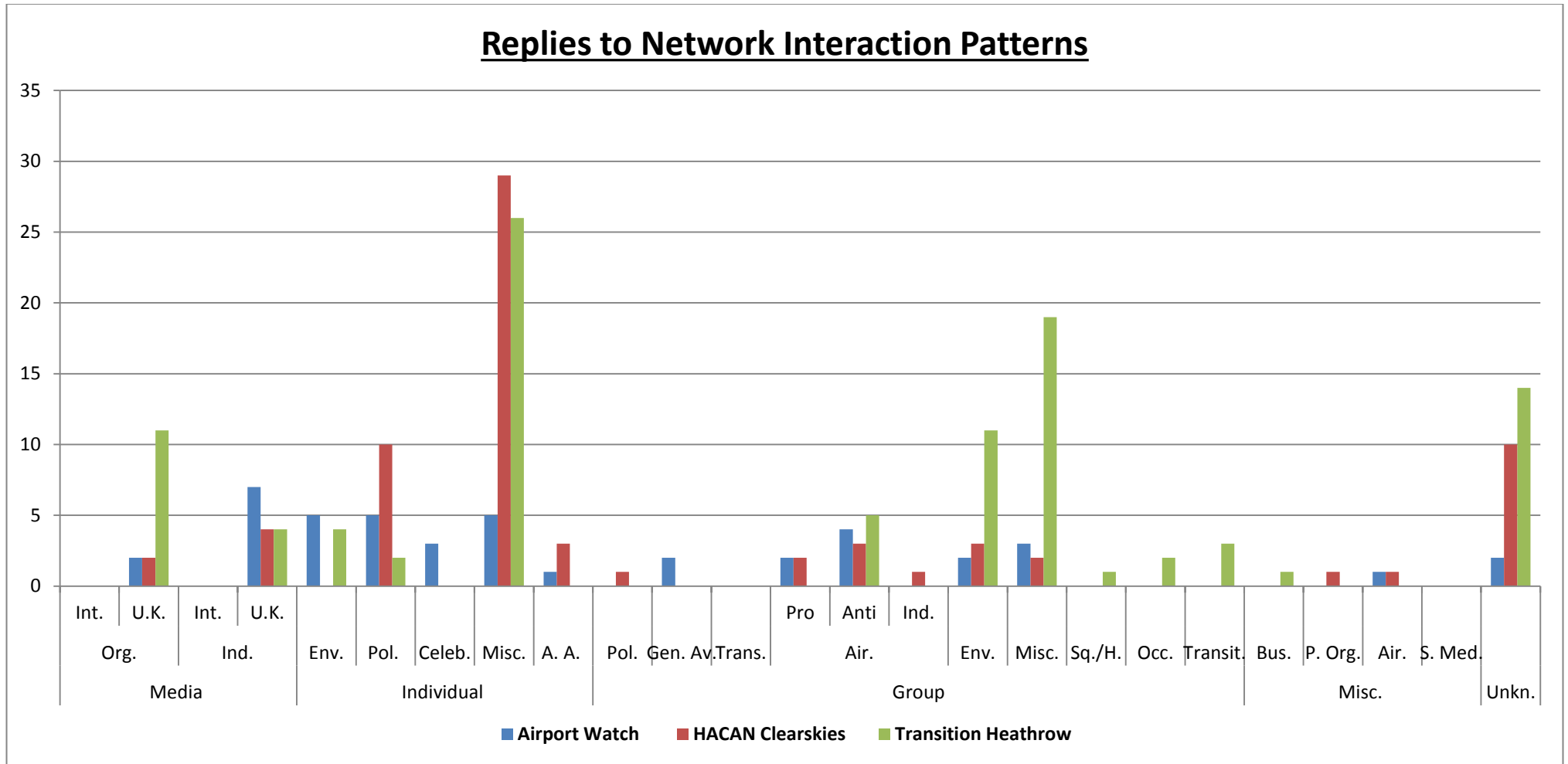
composed of: environmental individuals⁷ (23%), media individuals,⁸ (13%), miscellaneous individuals (12%) and environmental groups (10%). All users highlighted in these categories are based in the UK, apart from an environmental group: the Indian branch of Greenpeace. This illustrates that Airport Watch is more likely to retweet individual users than other groups. Conversely, its mentions network is more likely to mention organisations and groups. Social media has shown that for the anti-airport expansion groups under investigation, the patterns of interaction have been broadened due to the incorporation of social media – Airport Watch is just as likely to interact with individual users as well as groups. The introduction of social media has meant that these groups are able to link with different users to acquire information, thus breaking down the barriers between national, regional and local campaign groups and their associated individuals.

Once again, in Figure 6.54, the same categories were applied to each group's replies to networks.

⁷ Those users that show an interest in the environment and campaign for its protection.

⁸ Also known as key journalists.

Figure 6.54: Type of 'Replied to' User



Within the reply to social networks on Twitter there are similarities between the types of user replied to most often; typically those associated with promoting a third runway at Heathrow airport. Although in their replies to network overall, the type of users are shown in Figure 6.54. Both HACAN Clearskies and Transition Heathrow share further similarities with the type of user they reply to. They both reply to a large number of miscellaneous individuals which comprise the largest category (40% for Transition Heathrow and 25% for HACAN Clearskies). HACAN Clearskies' and Transition Heathrow's miscellaneous individuals consist mostly of those individuals with a lack of information on their Twitter profile. But there are certain individuals, firstly for HACAN Clearskies, who come from: marketing, infrastructure, policy, blogging and analyst backgrounds. This is compared with Transition Heathrow's proportion of individuals which comprise of: authors, poets, activists and historians. The remaining type of user within Transition Heathrow's replies to network is as follows: miscellaneous groups (18%), environmental groups (11%) and media organisations (11%). Transition Heathrow's replies to network is almost solely consisted of UK based users; apart from a Canadian anti-airport expansion group and so by replying to these users it is broadening its campaigning to them and the incorporation of social media into their campaign has meant that they are able to take control of their own news network.

For HACAN Clearskies' replies to network, as well as a large number of miscellaneous individuals replied to there are 14% of individual users from a political background, 14% who are unknown and 6% UK based media individuals. When compared to its other networks there is continuity in the type of users mentioned, retweeted and replied to, in all three Twitter networks: the media and politicians. This ultimately shows who they are aiming their campaign at and who they are looking to influence. For Airport Watch, who reply to users considerably less than the other two groups, the type of user consists of: UK media individuals (16%), and environmental, political and miscellaneous individuals all 11%. Much like with HACAN Clearskies, Airport Watch interacts with a large proportion of media users across all three of its Twitter networks but differs in the sense of linking to other environmental groups and environmental individuals.

More specifically, an in depth exploration into the use of social media by these social networks can be drawn from social network theory in the form of the concept of weak ties (Granovetter, 1973) and more recently latent ties (Haythornthwaite, 2005). These provide the ability to further uncover the characteristics of these social networks on social media and are seen as an opportunity for users who especially want to utilise social media to spread

information (Gladwell, 2010; Grabowicz et al, 2013). The strength of the ties on Twitter for each of the three groups is judged on each group's connections alone and not within the whole network between all users. But it is accepted that by the three groups constantly mentioning, retweeting and replying to users on Twitter, stronger ties are formed (Granovetter, 1973; Easley and Kleinberg, 2010; Gilbert and Karahalios, 2011). Therefore, by using these definitions of social networks on social media, particularly for the three groups investigated, they would never solely have either strong, weak or latent ties; instead there would always be a combination of the three because of interaction flows, or lack of, which occur between users. This calculation of tie frequency between users is able to determine the strength of the tie exhibited by each group (Granovetter, 1973). Whereas Facebook tie strength relates to the group or page as a whole and those within it whom exhibit and in or out degree of 1 or less. The two general conceptualisations of tie strength according to Granovetter (1973) is the duration of the tie and how often it is exercised. The definition of strong and weak ties by Brown (2011) implies that the least amount of interaction in a network shows weak ties whilst the most interaction shows stronger ties. Likewise, Easley and Kleinberg (2010), Marlow et al (2009) and Huberman et al (2009) show that stronger ties can be calculated as having at least two interactions with another user and weak ties a single interaction. Therefore, strong ties require investment of time and effort whilst weak ties are not necessarily maintained continuously which is why they accumulate in such large numbers (Easley and Kleinberg, 2010).

Latent ties possess the ability to be activated when needed and Heckscher (2015: 121) suggests that 'good latent tie networks can be more effective than those who just use active connections,' because users who are not spoken to everyday typically respond quicker when help is required (ibid). It is possible from definitions provided by Ellison et al (2011) and Zhang and Gearhart (2014) to suggest that although latent tie opportunities may be endless, particularly on social media, how they develop is by learning about other users and this is done by following others on Twitter and joining Facebook groups and pages. There are those users who exist within these networks who do not interact at all with the three groups and are passive; therefore representing a low involvement (Tuten and Solomon, 2015). This research is interested in the groups themselves and their own networks and thus, as mentioned, the latent ties can be seen as those users within the overall follower/following network (for Twitter) and those who are a part of the group's or pages (for Facebook) who are not engaged with by the three groups but are still aware of what is happening. These ties are activated into

weak ties, as Haythornthwaite (2005) describes, by sporadic interaction and into stronger ties by frequent interaction.

Table 6.2 illustrates the overall total number of vertices (users) which each of the three anti-airport expansion groups interact with on Twitter and the number of edges (ties) which exist between the groups and vertices.

	Airport Watch		HACAN Clearskies		Transition Heathrow	
	Vertices	Edges	Vertices	Edges	Vertices	Edges
Mentions	73	176	76	221	177	671
Retweets	156	855	296	1502	285	667
Replies to	44	104	72	187	103	186

Table 6.2: Vertices and Edges in the Twitter Networks

As shown, all groups have a large network of users which they interact with using mention, retweet and reply messages. The figures show that HACAN Clearskies interacts more than the other two groups but with a smaller network of users than Transition Heathrow. In terms of number of users interacted with it is Transition Heathrow which has the largest network of users collectively and interacts with a wide variety of individuals and organisations as each vertex represents a different user on Twitter. Moreover, it has a large network of users which it replies to least often (only once) (Table 6.3).

	Airport Watch	HACAN Clearskies	Transition Heathrow
Mentions	48	51	95
Retweets	75	171	182
Replies to	21	47	75
TOTAL	144	269	352

Table 6.3: Number of Vertices Interacted with once on Twitter

Table 6.3 shows the total number of users each group replies to only once. The definition of weak ties by Brown (2011) and similarly Easley and Kleinberg (2010), Marlow et al (2009) and Huberman et al (2009) all point to the fact that the least number of interactions between a user and others in its network corresponds to a calculation of weak ties. This also corroborates one of Granovetter’s (1973) conceptualisations of tie strength: how often it is exercised. On the other hand, the other factor which Granovetter (1973) discussed, the duration of the tie, is difficult to visualise as NodeXL does not provide consistent dates and times for the number of interactions and so only the volume of interactions is able to be taken into account to determine tie strength. Therefore by this definition, from the evidence in Table 6.2, Transition Heathrow has the largest network of weak ties. But the other groups also have weak tie connections. These weak ties form an essential pool of connections and all groups incorporate social media for information dissemination purposes and so the weak ties are important in the spread of information and accessing new information (Tufecki, 2010).

The tie strength of each specific Facebook group and page network for each of the three groups is once again taken in the form of interaction frequency (Granovetter, 1973). The number of edges is thus greater in these networks because of its ability to illustrate all connections between all interacting users in each Facebook group and page. Table 6.4 illustrates the overall number of interacting vertices and the edges in the Facebook networks for each of the three groups.

	Airport Watch		HACAN Clearskies		Transition Heathrow	
	Vertices	Edges	Vertices	Edges	Vertices	Edges
Facebook	42	289	105	6,310	171	1,232

Table 6.4: Vertices and Edges in the Facebook Networks

The calculation of the number of unique vertices, and thus weak ties, is more difficult given the fact that Facebook networks show the connections between people. Similarly, as with the Twitter networks, the unique edges in Facebook networks are described as those vertices which exhibit an in or out degree of 1 or less (Easley and Kleinberg, 2010). This shows that they only interact with one user and thus highlights the weak ties to them. Table 6.5 shows the number of these users.

	Airport Watch	HACAN Clearskies	Transition Heathrow
Facebook	16	5	29

Table 6.5: Number of Vertices Interacted with once on Facebook

Transition Heathrow possesses the highest number of vertices with a unique interaction, much like its Twitter network and so has a high volume of weaker ties within its Facebook group. However, it is Airport Watch which has the highest number of unique vertices in relation to its total number of interacting vertices. Therefore within the three networks it is actually Airport Watch who has the greater number of weaker ties in proportion to its number of interacting vertices. Where there are one or two distinct users who are most influential and control the flow of information within their Facebook page network, the number of weak ties available are able to transfer information across large social distances and to the networks of each individual within the network are able to see their interaction (De Meo et al, 2014) thus broadcasting the message of Airport Watch and those within the page.

There are also those ties which are ‘latent’ (Haythornthwaite 2005: 137) which in the cases of the three groups would show those users who are a part of the Facebook network but do not interact at all. For Twitter these latent ties are calculated as those users who each group follow and what percentage/number of these are mentioned, retweeted and replied to. Table 6.6 shows the number of latent vertices for both Twitter and Facebook and it is Airport Watch on Twitter which has the largest number of latent ties and Transition Heathrow on Facebook.

	Airport Watch	HACAN Clearskies	Transition Heathrow
Mentions	652	435	227
Retweets	569	215	194
Replies to	582	439	302

	Airport Watch	HACAN Clearskies	Transition Heathrow
Facebook	200	165	899

Table 6.6: Latent Vertices on Twitter and Facebook

As each of the social network graphs for both Twitter and Facebook only show those users who interacted with each group, there are thus many more individuals who Airport Watch, HACAN Clearskies and Transition Heathrow follow on Twitter but do not interact with and many individuals who have liked or joined their groups and pages on Facebook and do not post a single comment or like a single post (Heckscher, 2015). These wider users are thus interpreted as latent ties and it is these which are larger in volume than weak ties. For Airport Watch on Twitter and Transition Heathrow on Facebook, which possess latent ties in the largest quantities, the ties can lie dormant but can be activated into weak ties when needed and so these two groups possess the greatest potential of interaction possibilities on Twitter and Facebook respectively (ibid).

6.6 Conclusions

This chapter produced the social media data which helps to address the aim of the thesis (Section 1.2). It is able to show the incorporation of social media into each campaign which ultimately provides an indication into how social media is utilised. Moreover, this section has addressed objective three: “to analyse the social media pages of three anti airport expansion groups” by presenting the findings of the social media data in the form of social network analysis.

The social network graphs for both Twitter and Facebook profiles of each of the three groups demonstrate important similarities and differences. For Twitter, Airport Watch and HACAN Clearskies interaction patterns are surprisingly similar in all Twitter networks. They both engage with key journalists, media outlets and anti-airport expansion groups which provides an insight into what they utilise social media for as a result of incorporation into their existing campaigns; as a means of producing and consuming information (Murthy, 2011). Twitter has thus meant that these groups have become citizen journalists (ibid), highlighting their campaign to other key journalists who may possess more influence. They are also more likely to retweet similar others to create a groundswell of opinion against airport expansion not just nationally but internationally also. This forms part of the questioning in the form of semi-structured interviews, highlighted in Chapter 8.

Transition Heathrow exhibits distinctly different Twitter networks than Airport Watch and HACAN Clearskies. Transition Heathrow’s interaction patterns reflect their broader

environmental focus and there is a reduced focus on the media and key journalists. Instead, Transition Heathrow prefers to disseminate information through similar grassroots networks on Twitter and as such relies upon interaction with grassroots groups both nationally and internationally. Their interaction is also inclusive of all campaign groups which fit into its broader environmental, grassroots ideology; from anti-airport expansion groups to squatting campaigns and direct action groups to those with a climate change focus. This is in stark contrast to Airport Watch and HACAN Clearskies who clearly prefer to utilise more formal channels of interaction.

Similarly, all Facebook pages and groups for each group possess key differences. Airport Watch is the most influential and important user within its Facebook page network. It has control over the flow of information to ensure it is disseminated to every user in the network and utilises the Facebook page to produce information. HACAN Clearskies incorporates a Facebook group within its social media campaign and within it there exists a high volume of interaction between vertices. The centrality measures surprisingly demonstrate that John Stewart, despite being the creator of the group and chair of HACAN Clearskies, does not possess power or influence within the group. As such, there are more influential users within the group who have control over information and how it is disseminated. Transition Heathrow also possesses a Facebook group but unlike HACAN Clearskies, its two influential users are affiliated to the Transition Heathrow campaign. This suggests that Transition Heathrow has control within its own Facebook group and can control what and where the message is disseminated.

The characteristics of social media can be measured by the analysis of many facets to uncover the inner workings of social media for each of the three groups. Notably, the concept of reciprocity is able to show that groups do not necessarily require a reciprocal relationship with others on social media to interact with them. However, this research highlights that out of the three groups studied; HACAN Clearskies has a considerably larger number of reciprocal relationships with other users as many of those within HACAN Clearskies' network maintain an increased interest in their campaign.

The characteristics of the social networks also show the number and type of user interacted with. The mention, retweet and reply to networks, for all group's shows that all users prefer to interact more with a smaller group of individuals. On the other hand, Airport Watch prefers to retweet and reply to larger groups of users encompassing different viewpoints in

the form of retweeting and replying to a larger proportion of users when compared to HACAN Clearskies and Transition Heathrow. These groups interact with various types of user which differs slightly across each network. But the type of user commonly interacted with, across all of their Twitter networks, firstly for Airport Watch consists of media individuals, environmental individuals and environmental groups.

Finally, HACAN Clearskies networks comprise of the general media and political individuals and Transition Heathrow's networks consist of environmental groups and miscellaneous groups. Each group also possess large numbers of weak and latent ties which have been highlighted as essential pools of connections (Tufekci, 2010). As Haythornthwaite (2005) and Heckscher (2015) explain, these connections may lie dormant but can be activated when required and so a greater proportion of interaction possibilities exist.

The social media data is able to be utilised in different ways to show the utilisation of social media which provides an insight into the extent of incorporation within the existing campaign groups; as the time series analysis also demonstrates.

Chapter 7

Time Series Analysis

7.1 Introduction

This chapter also addresses objective three (Section 1.2). It shows how social media is utilised within the three groups' campaigns and it uncovers certain issues of social media incorporation into their existing campaigns. The time series analysis (Section 7.2) shows the daily number of tweets and posts to discover the frequency of social media usage for Airport Watch (Section 7.2.1), HACAN Clearskies (Section 7.2.2) and Transition Heathrow (Section 7.2.3). Section 7.3 highlights the relationship between the residuals (those values left once the time series has been modelled) in the form of a cross correlation analysis of Twitter and Facebook which determines the link between social media platforms, for Airport Watch (Section 7.3.1), HACAN Clearskies (Section 7.3.2) and Transition Heathrow (Section 7.3.3). The intervention analysis, in Section 7.4, provides the final facet of how social media is used to see whether the impact of a specific event in time related to the anti-airport expansion campaign (the Davies Commission interim report publication; 17th December 2013) initiates a change on each group's time series and how each groups prepared for and responded to it on Twitter and Facebook. Conclusions of the chapter is drawn in Section 7.5.

7.2 Time Series Analysis

This section highlights the time series of each of the three groups studied to show daily fluctuations and cycles of activity. The ARIMA model models observed data points into those which are able to be utilised in further analysis of the relationship between social media platforms. Each ARIMA model is then applied to the whole of the time series including each intervention type.

7.2.1 Airport Watch

For the time series analysis of the Twitter data, Expert Modeller in SPSS produced non-seasonal and seasonal components of an ARIMA model in the form of $(0,1,1)(1,0,1)$. This model was run with observed data points and the residuals were saved in order to undertake a cross-correlation. The time series model shows rapid fluctuations indicating cycles of activity and it is difficult to suggest whether Airport Watch's Twitter activity has increased over time because of this. Although there is little activity in August 2013 and peaks and troughs in every month thereafter. The Facebook data underwent the same process and the ARIMA $(0,0,6)(1,0,1)$ model was produced (Figure 7.1). The residual data points from this series were also saved to be compared to the Twitter residuals in the cross-correlation analysis. Although there is more data available for Facebook; there are also more periods of inactivity, typically around the holiday seasons. Whereas daily Twitter posts are regularly in double figures, the maximum number of daily Facebook posts throughout the study period never exceeded six. This demonstrates that overall, Airport Watch uses Twitter far more than it uses Facebook. Moreover, this was a further line of questioning in the semi-structured interviews to uncover the reasons why which would provide an insight into the challenges and opportunities incorporating social media brings.

The $(1,0,1)$ for the seasonal part of both models indicates a mixed model. Clifford and McClatchey (1996: 102) explain that mixed models are 'desired when examining complex series, since these provide more parsimonious model fits,' than a purely AR, I, or MA model. Both time series models incorporate moving average parts in their non-seasonal model (with Twitter including a differencing part) and auto-regressive and moving average forms for their seasonal models. A 'mixed ARIMA model with a low order AR model together with a low order MA component could capture the system dynamics equally well and in most cases would require fewer parameters' (Bisgaard and Kulahei 2011: 171) and can also achieve greater flexibility when describing time series data (Box and Jenkins, 1970). For Twitter, the non-seasonal differencing (D, d) value of 1 indicates that only one differencing was needed to transform the time series from non-stationary to stationary where the series no longer drifts and the linear trend is removed. There is also a moving average part of the model (MA, ma) of 1 in the non-seasonal form. These values combined demonstrate that the non-seasonal part of the model is a first order moving average model which requires one differencing term to make it stationary. The mixed autoregressive form of the seasonal part of the model $(1,0,1)$ shows that each observation is influenced by the previous observation 'as well as the previous

random shock' (Nugent 2010: 39). It is these residuals which are used to undertake the cross-correlation analysis. For Facebook, the non-seasonal part of the model represents a sixth order moving average model. This means that deviations from the mean value of each of the previous six time periods are used to predict each value in the series. Also, the seasonal part of the model (1,0,1) is similar to that of the Twitter seasonal time series data where a first order autoregressive and first order moving average form exist with stationarity of the series (Figure 7.2). It provides a parsimonious description of daily data.

Figure 7.1: Airport Watch's Facebook Page Time Series

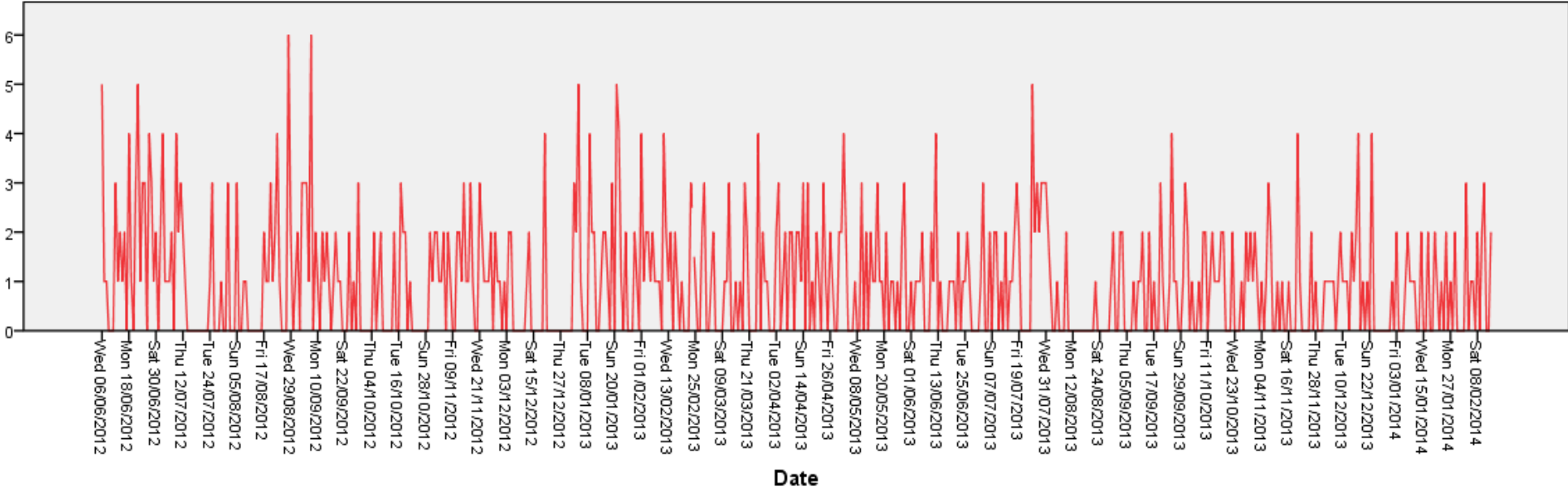
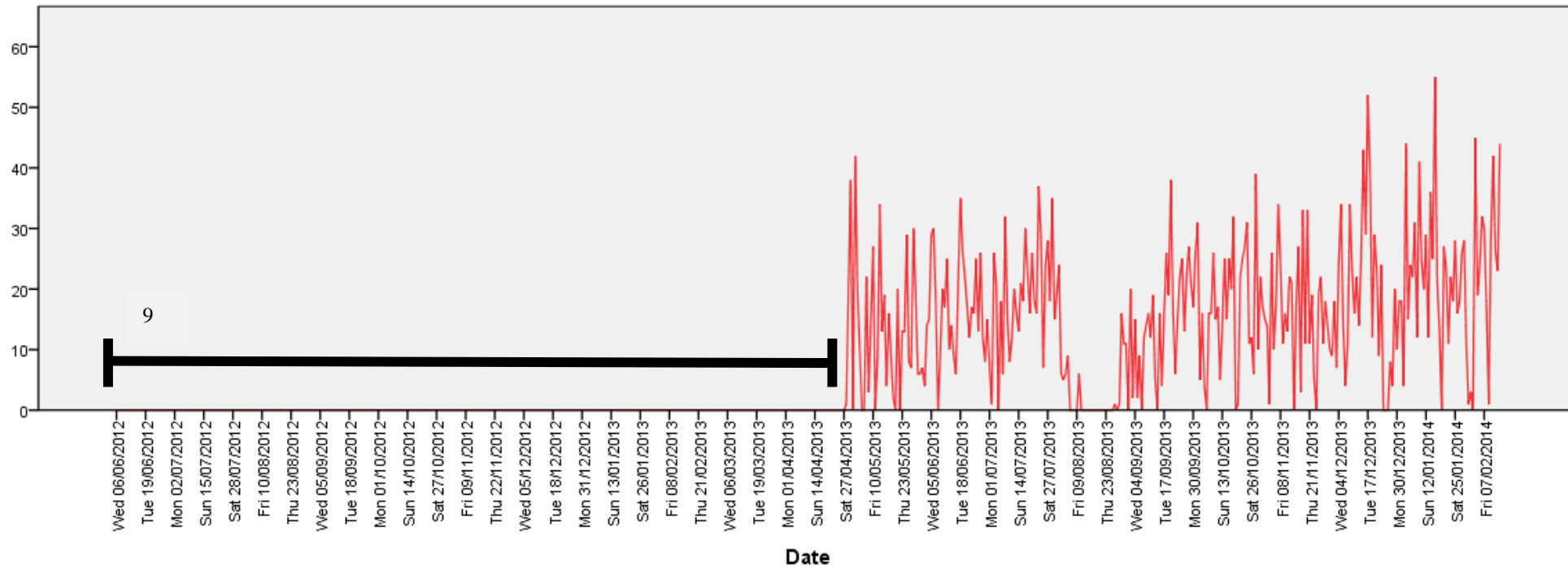


Figure 7.2: Airport Watch's Twitter Time Series

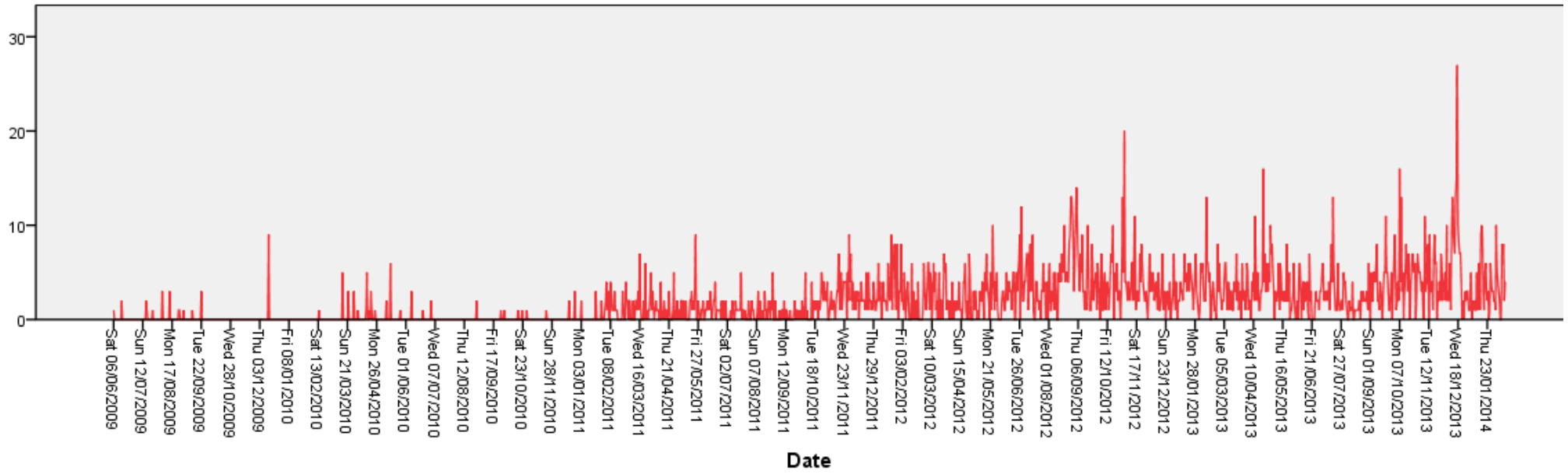


⁹ The significant gap showing a lack of Twitter activity is explained by Airport Watch creating a Twitter page on 6th June 2012 but not utilising it until 27th April 2013. The reasons why will be a line of questioning in the semi-structured interviews.

7.2.2 HACAN Clearskies

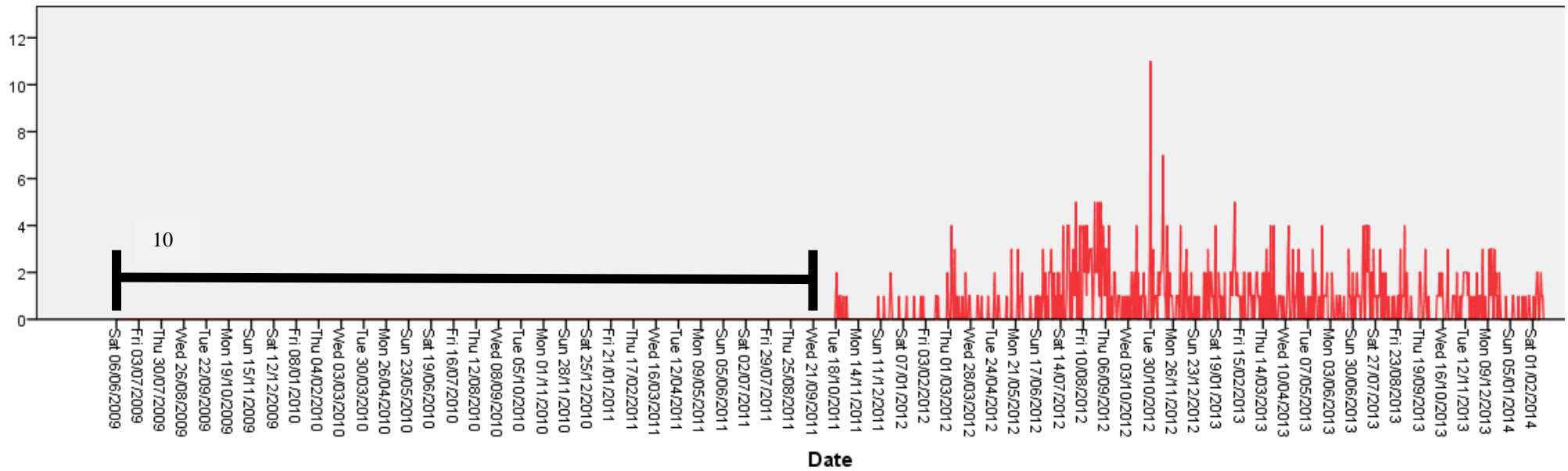
Expert modeller in SPSS was used to fit ARIMA models to the Twitter and Facebook data for HACAN Clearskies. This reveals that an ARIMA (1,0,1)(1,0,1) form was used on the daily data from when HACAN Clearskies created its Twitter account in June 2009. It demonstrates that a differencing component was not added to both the seasonal and non-seasonal ARIMA model forms – which means that the data is already stationary (Reddy, 2011; Zucchini and Nenadic, 2011). The analysis of the model form can begin only when the data is stationary. The Twitter data possesses both autoregressive and moving average components for its non-seasonal and seasonal ARIMA parts. This mixed ARIMA highlights non-seasonal and seasonal factors. ‘Seasonal models formulate the between-season periodic variation, whereas non-seasonal models formulate the within-season variation’ (Yaffee and McGee 2000: 163). The implication being that the Twitter data for HACAN Clearskies has seasonality with variations within the seasons and between the seasons. The p and P values of 1, which represent the autoregressive function of the model demonstrate that the previous observation in the series was used to predict the next observation. The q and Q values of 1, which determine the number of moving average terms in the model imply that a particular observation depends on the previous preceding random shock. Interestingly, from June 2009 – January 2011 HACAN Clearskies sporadically used Twitter, but it is arguably at this stage (until May 2010) that its campaign became more high profile as it actively protested against the expansion at Heathrow (Figure 7.3).

Figure 7.3: HACAN Clearskies' Twitter Time Series



It was only from January 2011, nineteen months after its Twitter account was created and eight months after the third runway plans at Heathrow were abandoned, that HACAN Clearskies began starting to use Twitter more regularly. From January 2011 the Twitter time series exhibits various peaks and troughs with lesser activity occurring during the summer and Christmas periods (with the exception of December 2013). These periods of slight inactivity for HACAN Clearskies' Twitter profile are comparable to Airport Watch's Twitter profile. For the HACAN Clearskies Facebook group, an ARIMA (2,0,2)(0,0,0) model form was implemented on the whole of the time series using expert modeller in SPSS. The seasonal part of HACAN Clearskies' Facebook ARIMA model form did not require any autoregressive, differencing or moving average terms as it was already stationary. The non-seasonal part of the model underwent two autoregressive terms where an observation is predicted by two previous observations and two moving average terms where an observation depends on two preceding random shocks. There is an extended period between June 2009 and 18th October 2011 where there were no posts on HACAN Clearskies' Facebook group, this is because it did not create its Facebook group until 18th October and the dates before have had to be implemented to correspond with its Twitter profile which was created on 6th June 2009 (Figure 7.4).

Figure 7.4: HACAN Clearskies' Facebook Group Time Series



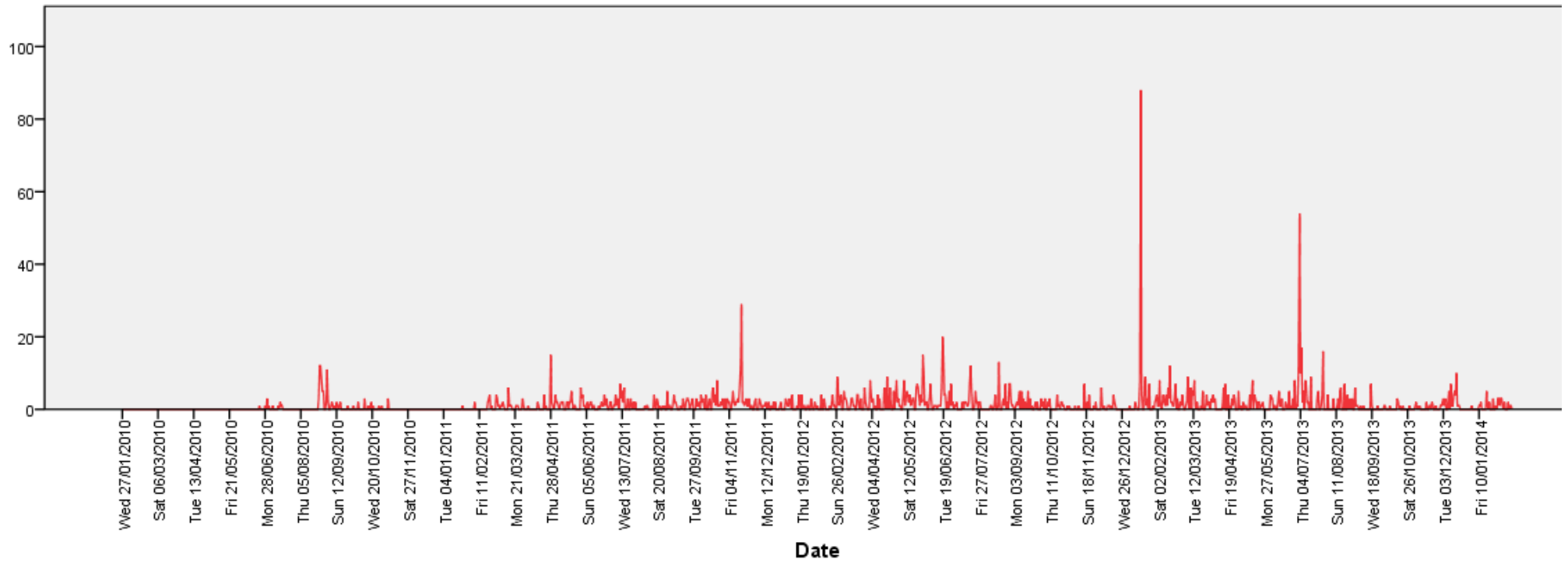
¹⁰ The significant gap, similar to Figure 7.2, shows the time it took for HACAN Clearskies to create a Facebook group and for someone to post in it. Once again, the reasons will be uncovered in the semi-structured interviews.

It appears from HACAN Clearskies' Facebook group that, unlike its Twitter profile, there is no trend or cycle to the Facebook group posts. Overall there are inconsistencies with the daily data. There are extended periods where no posts were posted but similarly there are occasions where at least one post is posted everyday for several weeks. This is similar to Airport Watch's Facebook page where periods of inactivity exist. Also, another comparison is illustrated between the two groups regarding their use of Twitter more than Facebook in their campaign.

7.2.3 Transition Heathrow

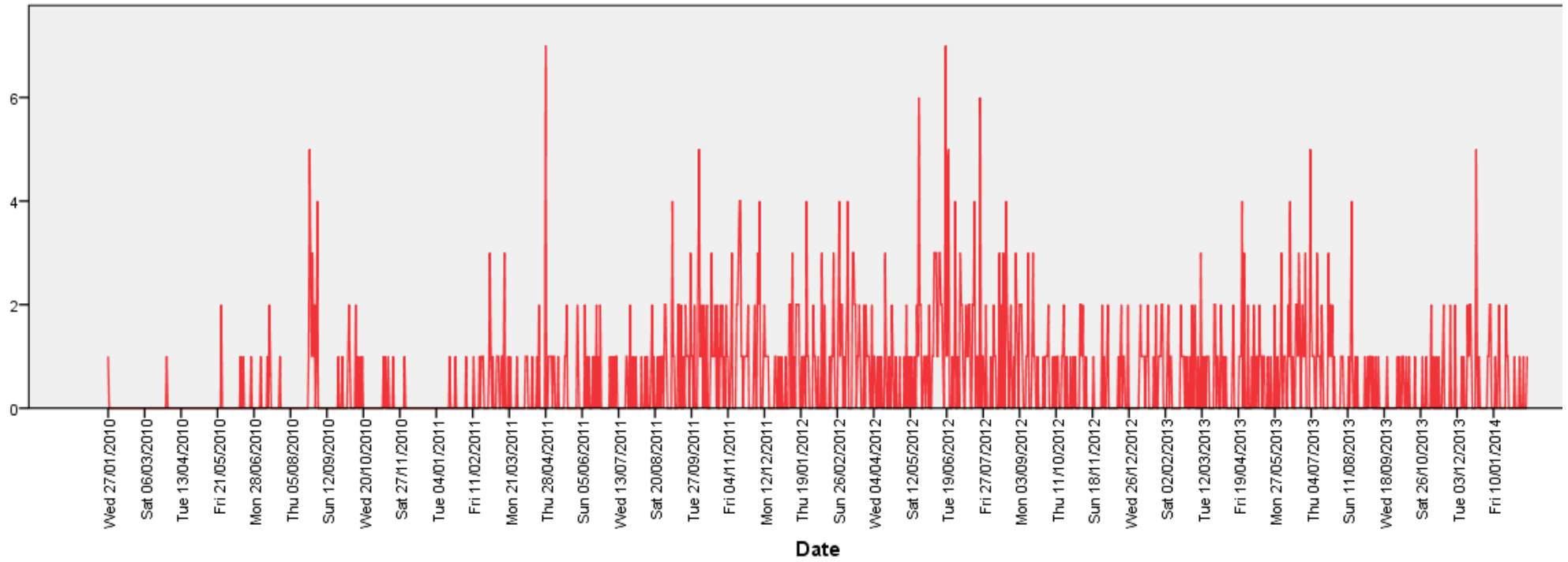
The time series analysis was modelled on the whole of the Twitter data using expert modeller to create an ARIMA model which produced the $(1,0,5)(1,0,1)$ form. The model has both non-seasonal and seasonal components. Seasonality can be defined as 'any cyclical or periodic fluctuation in a time series that recurs or repeats itself at the same phase of the cycle or period' (Box-Steffensmeier et al 2014: 43). The non-seasonal elements of the model show that the data does exhibit certain non-seasonal characteristics, the number of tweets remains relatively constant from 27/1/10 to 14/2/14 apart from certain peaks in the time series. The AR (p, P) term of 1 which represents the non-seasonal and seasonal parts of the model shows that each point in the time series was influenced by the previous observation and their random shocks (Nugent, 2010). The differencing term for both the non-seasonal and seasonal parts of the model (d, D) of 0 highlight that no differencing terms were added to the series to make it stationary. Finally, the MA terms for the non-seasonal and seasonal parts of the model (q, Q) indicate that the non-seasonal form represents a fifth order moving average model. Although the moving average 'does not extend for the whole time span of the series' (Yaffee and McGee 2000: 19), the moving average of a specific point in this time series is the mean of the five preceding time periods. The period between January and June 2010 shows no Twitter activity because a Twitter account was not created until June 2010. The dates correspond to that of the Facebook group which was created in January 2010 (Figure 7.5).

Figure 7.5: Transition Heathrow's Twitter Time Series



The time series for the Twitter page of Transition Heathrow illustrates that there are several peaks in activity although there is no activity between 7/11/10 and 23/1/11. Unlike the other groups, the volume of Transition Heathrow's tweets does not decline over the summer months although there is less activity around the Christmas and New Year periods. For Facebook, the ARIMA (1,0,4)(1,0,1) model form is used to model the time series of the daily number of posts within Transition Heathrow's group. The different non-seasonal and seasonal parameters within the ARIMA model are very similar to that of the Twitter time series. The difference being the value of the moving average component in the non-seasonal part of the model (4 compared to 5 in its Twitter ARIMA model). The value of 4 means that at any specific point on the time series is calculated by the mean of the four preceding time periods (the previous four days in this case). Transition Heathrow's Facebook time series shows that from the date its Facebook group was created (27/1/10) for almost a year (January 2011), the number of posts in the Facebook group was sporadic. It is only after mid-January 2011 that people begin to post more consistently (Figure 7.6).

Figure 7.6: Transition Heathrow's Facebook Group Time Series



The seasonal elements show that the Facebook and Twitter feeds are relatively similar in when they post. The Facebook group also highlights periods of inactivity around the Christmas and New Year break. Although this form of social media is not widely used by Transition Heathrow, it is Twitter which is used to publicise its message more.

7.3 Cross – Correlation Analysis

This section shows another form of how social media is used by providing evidence to show the relationship between the Twitter and Facebook campaigns for each of the three groups and whether one series leads or lags the other; ultimately highlighting if there is a link between the groups posting on one social media platform and then posting on the other. The exploration of this involves the residuals of each group's time series which are used in the cross correlation function (CCF) to determine a relationship between Twitter and Facebook at different time lags.

7.3.1 Airport Watch

The lags of each cross correlation (-7 - +7) show the relationship between the residual data points for Twitter and Facebook. The lags correspond to the number of days before and after a message is posted on Twitter or Facebook; seven days before and seven days after. The lags in all of the cross correlation analyses are displayed over this period; at 95% confidence limits (Figure 7.7).

Noise residual from Tweets-Model_1 with Noise residual from Posts-Model_1

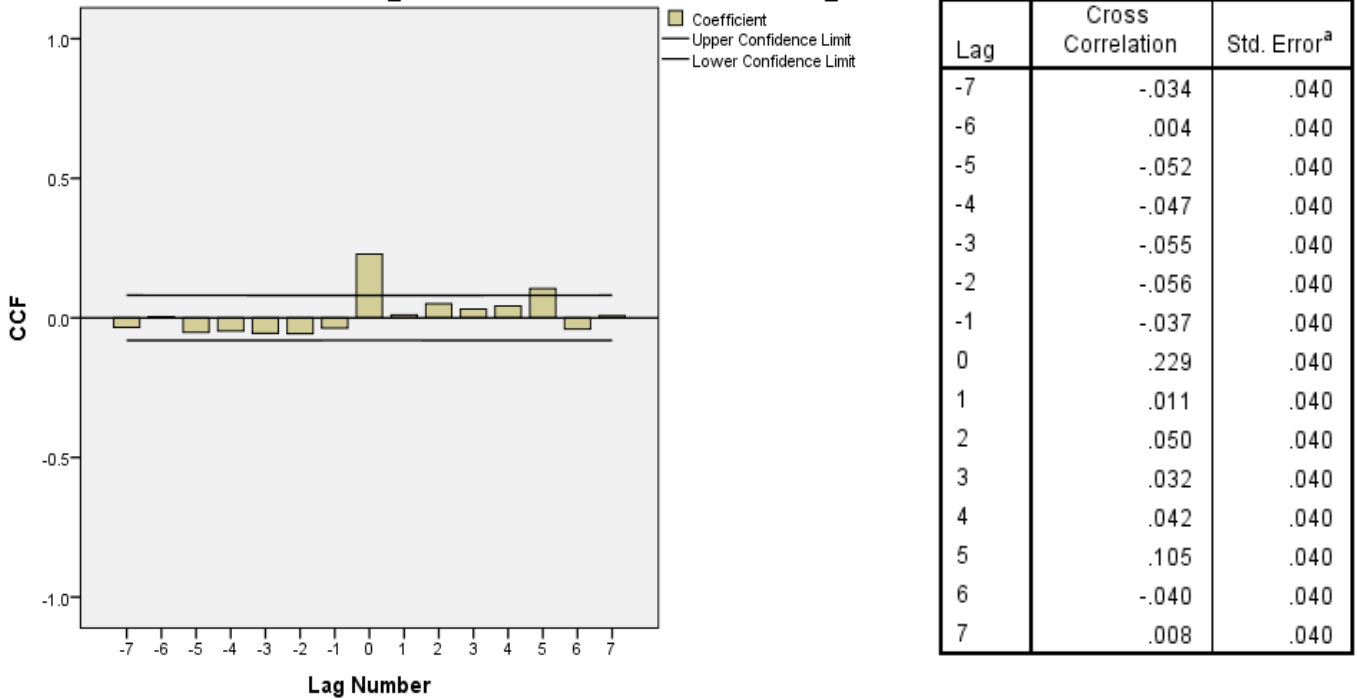


Figure 7.7: Airport Watch Cross Correlation

The Twitter data residuals were plotted against the Facebook data residuals to give a significant value of 0.229 at lag 0. As a result, there are no leads or lags between Twitter and Facebook. This means that Airport Watch does things on both social media platforms simultaneously; thereby producing a highly integrated social media campaign. It was this integration of Facebook and Twitter which played an essential role in creating and increasing protest in the Middle East (Kravets, 2011). The link between protest movements’ social media platforms can allow ‘for rapid growth of the supporter base of the protest movement, both online and in the real world’ (Martens-Edwards 2015: 80). There is also a significant value of 0.105 at lag 5 meaning that Twitter leads Facebook at lag 5. The significance being that when Airport Watch posts on Twitter it can take 5 days before it posts on Facebook. Although this shows that their social media platforms are somewhat connected, albeit 5 days apart, this time lag could signal that the information is delayed in its broadcast to their followers. The lag in time of five days could indicate that it uses both Twitter and Facebook to produce different messages and regards them as two separate entities which may be the case if one person is in charge of the Twitter account and someone else for the Facebook page. As a result, this will be a line of questioning in the semi-structured interviews to

explore more depth use of Twitter and Facebook and whether there is a difference between the two platforms. None of the other coefficients at the other various lags are of statistical significance as they do not fall outside the upper and lower confidence levels.

7.3.2 HACAN Clearskies

The residual values are used in the cross correlation analysis to visualise the relationship between two series at different time lags (Figure 7.8).

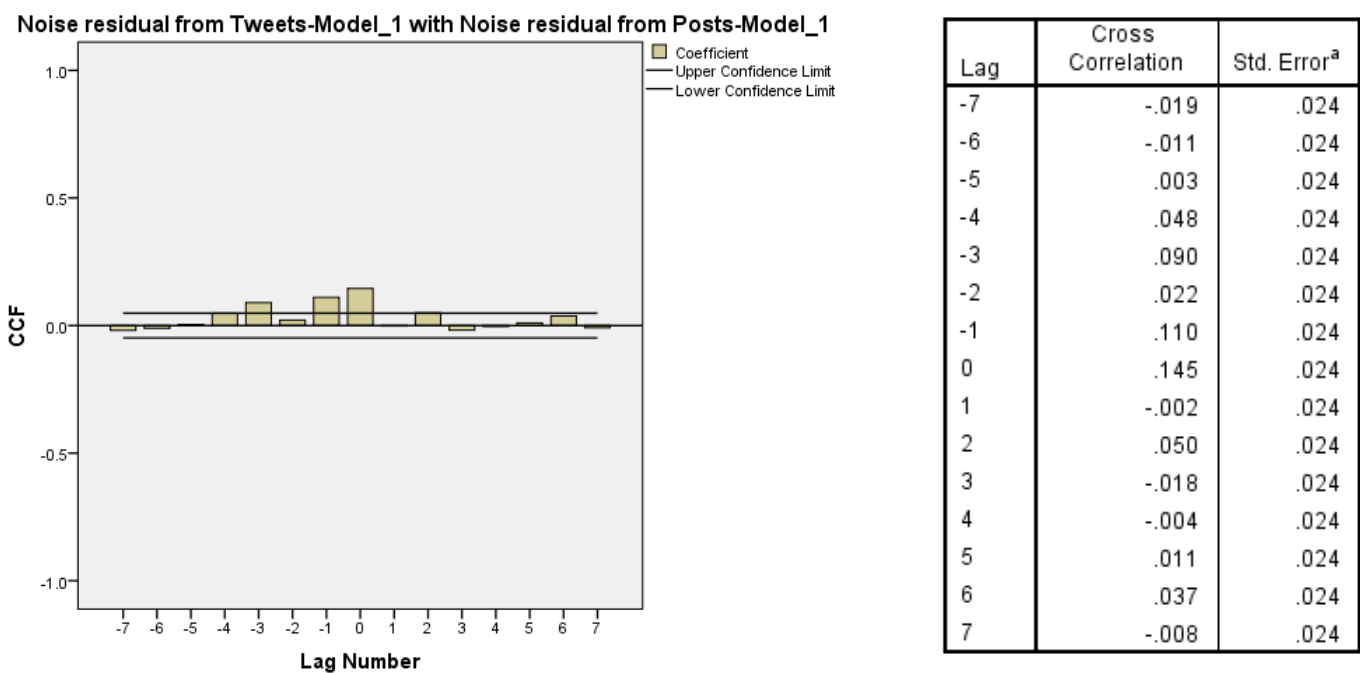


Figure 7.8: HACAN Clearskies Cross Correlation

HACAN Clearskies' CCF shows 7 lags each side of 0 (-7 - +7) which represent the number of days. There is a significant value at three of the lags in the cross correlation – lag -3, lag -1 and lag 0. Crucially the value at lag -3 (0.090) indicates that a Facebook post to HACAN Clearskies' Facebook group three days before a Twitter post is significant. This means that HACAN Clearskies' Facebook group leads its Twitter profile. HACAN posts to Facebook and then three days later posts to Twitter. Although it is not as significant as the value at lag -1 (0.110). This illustrates that, once again, Facebook leads the Twitter profile for HACAN Clearskies. HACAN posts on Facebook then posts on Twitter a day later which still

highlights the lags between the two. The semi-structured interviews will be asked to uncover the extent of the preference between the two platforms and the reasons for their popularity. Furthermore, it is the value at lag 0 which demonstrates the most significant (0.145) correlation. Like Airport Watch’s cross correlation, HACAN Clearskies’ stronger significance at lag 0 shows that it posts on Twitter and then on Facebook on the same day. This is important because it extends the reach of the messages to a variety of users – certain people might have a Facebook account and not a Twitter account or vice versa.

7.3.3 Transition Heathrow

The cross-correlation function takes the residual data points which remain of each date after the model has been run and compares the two time series to one another – assessing significant correlation levels. When comparing the residuals for both Twitter and Facebook there is only one significant correlation, above the 95% upper confidence level, at lag 0 (0.28) (Figure 7.9).

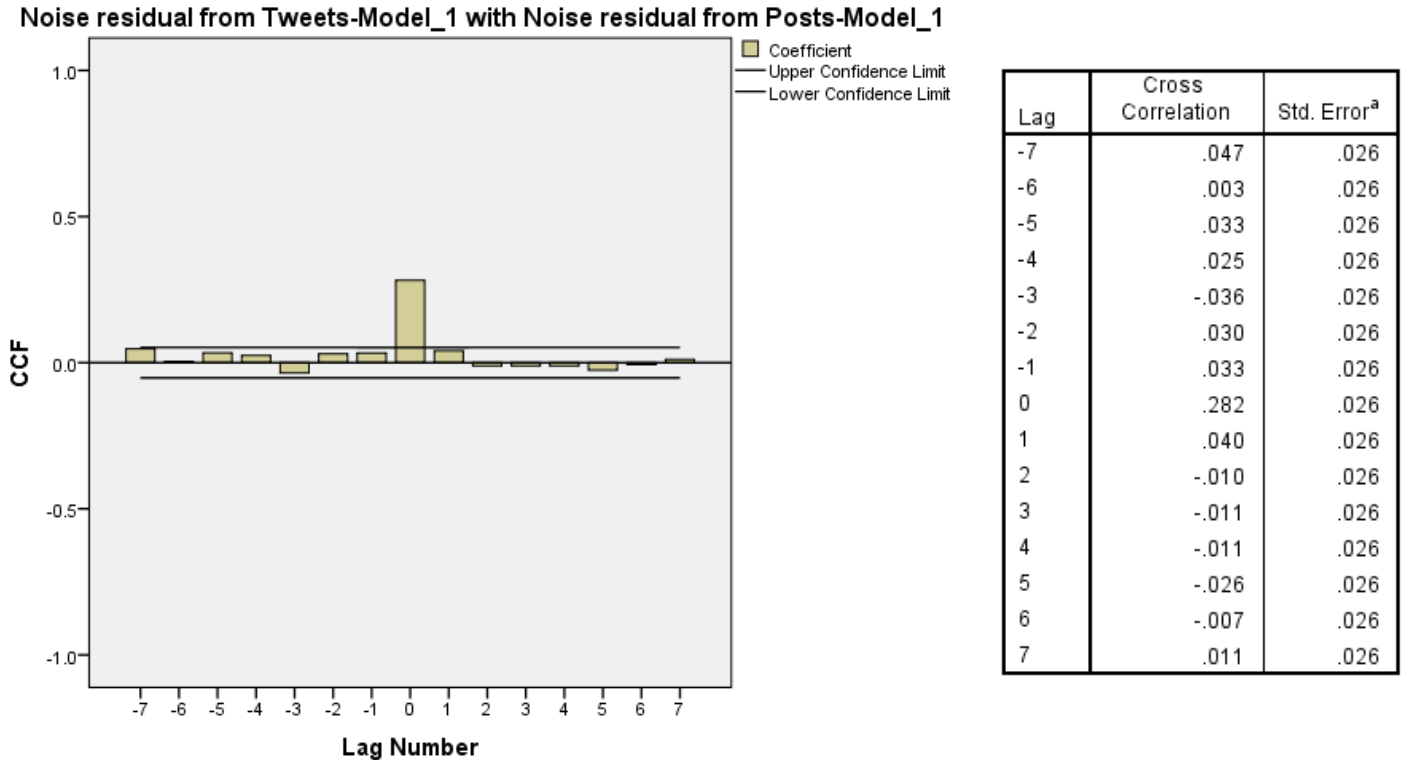


Figure 7.9: Transition Heathrow Cross Correlation

This shows that Transition Heathrow has a highly integrated social media strategy – the highest cross correlation value at lag 0 when compared to HACAN and Airport Watch illustrates the simultaneous and integrated nature when posting on both Twitter and Facebook. The other two groups exhibit other significant correlations at different lags which highlights their more disjointed social media campaign when compared to Transition Heathrow. Transition Heathrow has effectively utilised the immediacy of social media to its advantage by communicating to different groups of people on both Twitter and Facebook which people are able to then read, react, share and comment instantly.

The cross correlation analysis shows a clear link between Twitter and Facebook. This relationship enables a virtually instantaneous response from one platform to the other. It also demonstrates the link between social media platforms for each group in turn. This enabled a focus on the individual groups themselves and not as a collective.

7.4 Intervention Analysis

The intervention analysis uses the ARIMA models created by expert modeller in SPSS on each time series. It also demonstrates how each group is using social media to broadcast certain key events in their campaigns against airport expansion at Heathrow and accurately assesses the fluctuations in each time series and the impact of a specific intervention; the Davies Commission interim report.

7.4.1 Airport Watch

The following sections show the results of the intervention analysis for Airport Watch's Facebook and Twitter pages. They utilise the models created in the time series and reapply them to each time series, but this time including the 18 different intervention types highlighted in Chapter 5, Section 5.9.2.

7.4.1.1 Facebook

The intervention analysis for Airport Watch's Facebook page shows an ARIMA model form of $(0,0,6)(1,0,1)$ obtained through Expert Modeller when the data up to the dates of the interventions were modelled. The model form was then applied to the whole of the Facebook series plus the different intervention types to see which best describe the data. The date of the Davies Commission interim report (17th December 2013) was chosen as it is the best representation of any report which affects all three anti-airport expansion groups. 18 intervention types were modelled on the Facebook series to determine the pattern in the data and investigate whether the intervention led to a significant change (increase or decrease) in the number of posts. The t parameter at lag 0 is used to calculate whether the specific intervention type is statistically significant. A value above 2 or below -2 at a 5% level, which corresponds to a 95% confidence level, indicates that the specific intervention is statistically significant. Although, it is not just the t value which determines the fit of the model to the intervention type. Numerous other fit statistics must be taken into account if the t value is statistically significant. A lower MAPE value and higher stationary R squared, R squared, RMSE, MaxAPE, MAE, MaxAE and Normalized BIC provide insights into model fit (SPSS, 2012). If the t value is above 2 it signifies that there has been an overall increase in posts during the intervention period and if it is below -2 it shows there has been a decrease in tweets during the intervention period. The intervention for the Facebook posts found that the best fit for the data was an instant intervention (Figure 7.10).

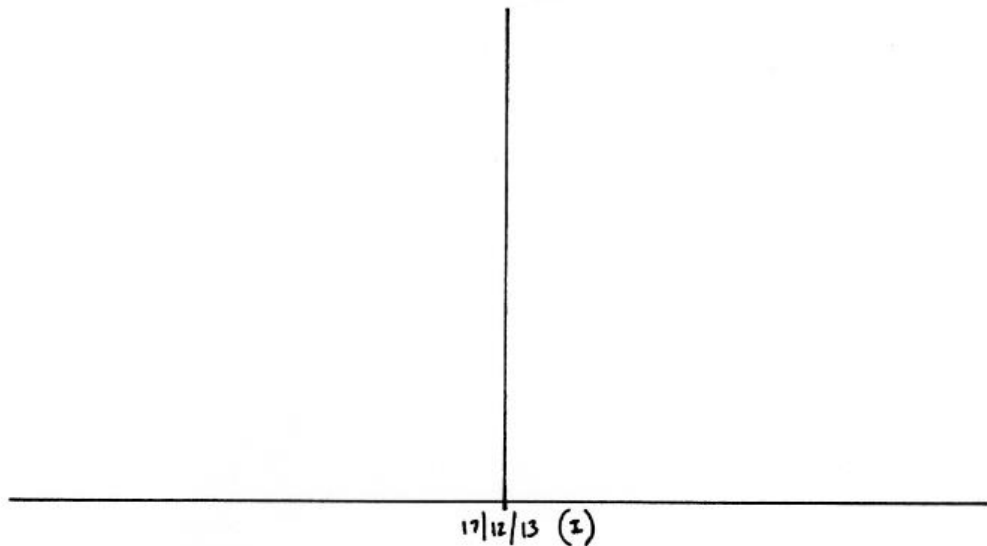


Figure 7.10: Instant Change Intervention Type

Out of the 18 intervention types; three are statistically significant. Although the instant intervention type has the lowest t value (at lag 0) than one of the other types (2.301) (compared to 2.762 for a week delay instant and 2.605 for the exponential instant), it is the fit statistics which fit the data better for this intervention type (Table 7.1). The statistics with higher values mean that the intervention type under consideration is a better fit for the data than the original model (sought from the time series analysis). This is why higher values are assessed. A lower MAPE value is significant because it shows that the intervention model would vary less from the original model. The t statistic value shows that the greater the value of t (either positive or negative) the greater the evidence that there is a significant difference in the time series caused by the intervention, a t value closer to 0 shows that there is not a significant difference in the time series.

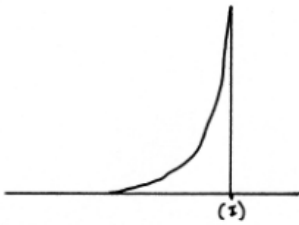
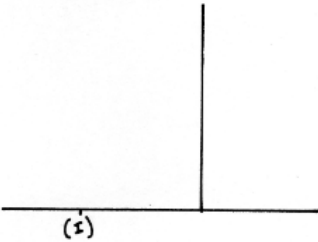
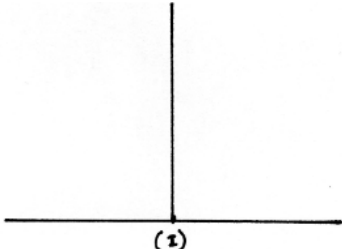
<u>Fit Statistics.</u>	<u>Exponential-Instant Week Before.</u>	<u>Week Delay Instant.</u>	<u>Instant Change.</u>
			
Stationary R-Squared	0.059	0.061	0.057
R-Squared	0.059	0.061	0.057
RMSE	1.150	1.149	1.151
MAPE	38.627	38.859	38.662
MaxAPE	83.927	83.984	83.826
MAE	0.915	0.916	0.918
MaxAE	5.036	5.037	5.030
Normalized BIC	0.383	0.382	0.385
t statistic	2.605	2.762	2.301

Table 7.1: Model Fit Statistics

Conceivably, all models shown in Table 7.1 could be interpreted as accurate representations for the data but the higher fit statistics for the instant intervention type show that this fits the data best. The pattern shows that the increase in Facebook posts starts and ends on the same day as the intervention showing no gradual build up or drop off. This highlights that the event was not anticipated due to the peak occurring on the 17th December. The problem with a lack of anticipation, especially for a high profile report such as this, is that the information may not have been disseminated before or after the event.

7.4.1.2 Twitter

For Airport Watch's Twitter profile, the ARIMA (0,1,1)(1,0,1) model form was implemented on the series after Expert Modeller was used to identify the best form up to the intervention date. Out of the 18 intervention types four are statistically significant all of which have a t value below -2. The intervention type which best fits the data is an instant power-week delay form (Figure 7.11).

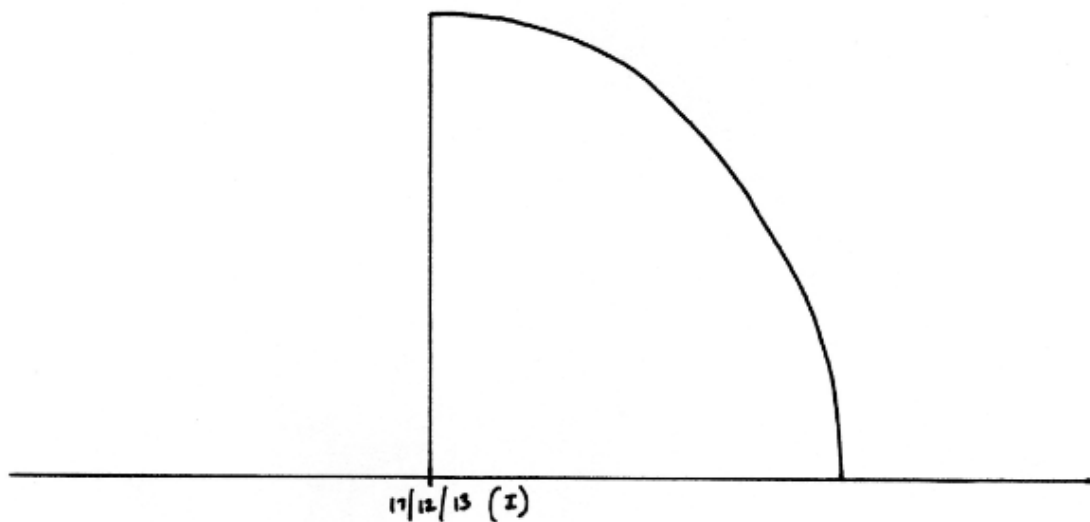


Figure 7.11: Instant Power-Week Delay Intervention Type

Despite the instant power-week delay intervention type having the lowest t statistic (Table 7.2) when compared to the other three significant intervention types, five out of the eight model fit parameters provide an insight into the strength of this model fit as it best describes the pattern of the intervention. Significant RMSE, MAPE, MaxAPE, MAE and Normalized BIC as well as the t statistic reaffirms the strength of the instant power week delay model fit. Table 7.2 shows the intervention types which best fit the data.

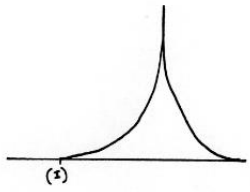
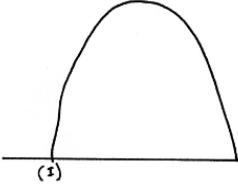
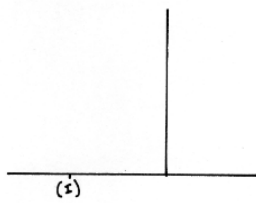
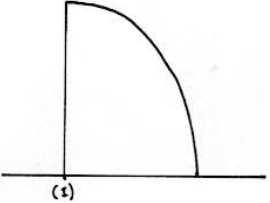
<u>Fit Statistics.</u>	<u>Exponential Change 1 Week Later + 1 Further Week.</u>	<u>Power Change 1 Week Later + 1 Further Week.</u>	<u>Week Delay Instant Change.</u>	<u>Instant Power Week Delay.</u>
				
Stationary R-Squared	0.430	0.426	0.427	0.423
R-Squared	0.587	0.585	0.585	0.582
RMSE	7.207	7.230	7.226	7.252
MAPE	92.111	92.288	91.696	91.682
MaxAPE	2044.412	2050.505	2039.724	2036.352
MAE	3.926	3.951	3.929	3.953
MaxAE	33.979	34.049	34.067	33.932
Normalized BIC	4.002	4.009	4.007	4.014
t statistic	-4.364	-3.815	-3.957	-3.145

Table 7.2: Model Fit Statistics

The instant-power week delay shows that the Twitter posts peaked on the day of the intervention, without prior build up, and gradually decreased over the course of the week after. This highlights the fact that Airport Watch (through its mentions, retweets and replies) was still talking about the event several days after it happened. This is important for two reasons; firstly because it initially focused on the report which is shown by the peak in tweets and secondly, it was still disseminating information about the event for over a week after thus reaching people who might not have realised the report had been published on the 17th December 2013 or had just completely forgotten about the event. The significance up to a week after therefore enables the prolonged discussion of the report and gives users a chance to read it in greater detail before interacting with Airport Watch. The time lag in this

intervention type is slightly different to that noted in Airport Watch's page. Compared to an instant intervention type, the instant power week delay shows that it is Twitter which can help spread the details of a high profile event over a longer period of time than Facebook.

7.4.2 HACAN Clearskies

The following sections show the results of the intervention analysis for HACAN Clearskies' Facebook and Twitter pages.

7.4.2.1 Facebook

The intervention analysis for HACAN Clearskies' Facebook group shows an ARIMA form of $(2,0,2)(0,0,0)$ up to the date of the intervention – 17th December 2013. These non-seasonal and seasonal values were then modelled to the whole of the series with intervention terms added to determine which of the 18 intervention types are statistically significant. The t statistics at lag 0 shows the significance of the intervention type, the values being between -2 and 2. The fit statistics: stationary R squared, R squared, RMSE, MAPE, MaxAPE, MAE, MaxAE and Normalized BIC illustrate how well the model fits the data. A higher/lower t statistic does not necessarily mean that it is the best intervention type for the data, the fit statistics ultimately highlight which is the most accurate fit. Out of the 18 intervention types, ten were statistically significant. The best fit was an instant change intervention (Figure 7.12). Whereas Table 7.3 highlights the number of interventions which best fit the data.

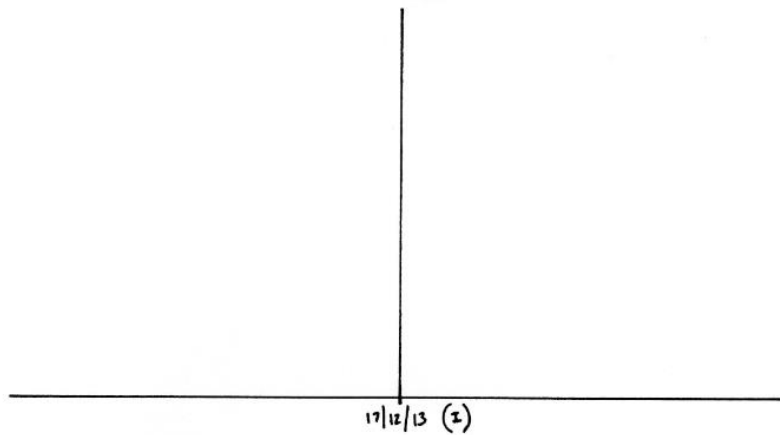
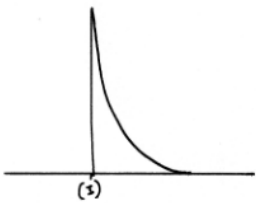
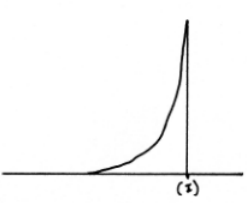
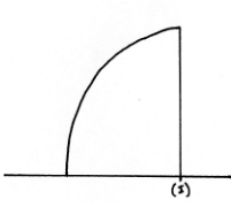
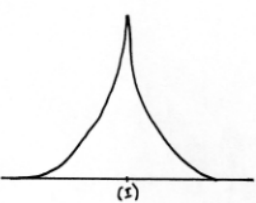
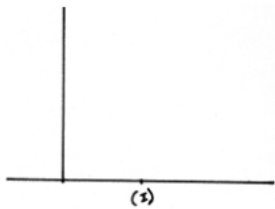
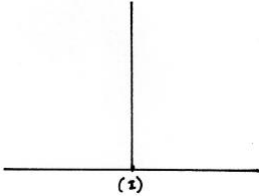
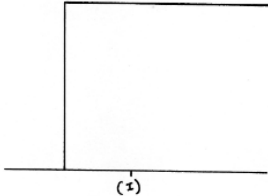


Figure 7.12: Instant Change Intervention Type

<u>Fit Statistics.</u>	<u>Instant Exponential Week Later.</u>	<u>Exponential Instant Week Before.</u>	<u>Power Instant Week Before.</u>	<u>Exponential Change 1 Week Before and 1 Week After.</u>
				
Stationary R-Squared	0.290	0.290	0.291	0.289
R-Squared	0.290	0.290	0.291	0.289
RMSE	0.749	0.750	0.749	0.750
MAPE	50.226	50.032	50.280	50.194
MaxAPE	150.763	150.546	148.729	149.493
MAE	0.392	0.392	0.393	0.392
MaxAE	10.068	10.067	10.073	10.071
Normalized BIC	-0.551	-0.550	-0.551	-0.550
t statistic	3.507	3.254	3.570	3.184

<u>Fit Statistics.</u>	<u>Week Before Instant Change.</u>	<u>Instant Change.</u>	<u>Week Before Instant Step-Change.</u>
			
Stationary R-Squared	0.290	0.291	0.288
R-Squared	0.290	0.291	0.288
RMSE	0.749	0.749	0.751
MAPE	50.176	50.060	50.351
MaxAPE	151.291	151.989	151.764
MAE	0.393	0.392	0.392
MaxAE	10.071	10.065	10.091
Normalized BIC	-0.551	-0.552	-0.548
t statistic	3.519	3.689	2.584

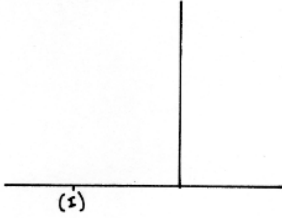
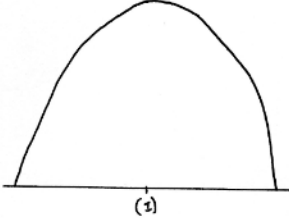
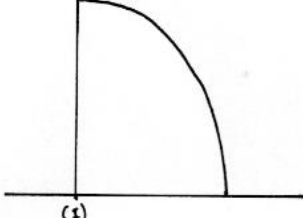
<u>Fit Statistics.</u>	<u>Week Delay Instant Change.</u>	<u>Power Change 1 Week Before and 1 Week After.</u>	<u>Instant Power Week After.</u>
			
Stationary R-Squared	0.288	0.289	0.287
R-Squared	0.288	0.289	0.287
RMSE	0.751	0.750	0.751
MAPE	50.117	50.214	50.168
MaxAPE	151.000	147.754	149.539
MAE	0.394	0.392	0.393
MaxAE	10.074	10.077	10.074
Normalized BIC	-0.547	-0.549	-0.546
t statistic	2.351	3.054	2.129

Table 7.3: Model Fit Statistics

Out of 10 intervention types, it is the instant change type which best models the data and is the most accurate representation. The instant type has higher MaxAPE and a lower MAPE value than the second best fitting model, the power instant week before type. The pattern shows that, for the Facebook group, the increase in posts on the day of the intervention. Thus it starts and ends on the same day with no gradual build up or drop off before and after the intervention. The intervention type also compares to that of Airport Watch's; both are instant changes. This shows that statistically the report experienced no anticipation since the peak occurred on the 17th December 2013.

7.4.2.2 Twitter

For HACAN Clearskies' Twitter profile, the ARIMA (0,1,5)(1,0,1) was used on the whole of the time series including each intervention type. Out of the 18 different intervention types, 13 are statistically significant – 12 of which have a t statistic value of below -2. The intervention type which best fits the data is the week before step change (Figure 7.13).¹¹ Again, Table 7.4 shows all possible interventions which best fit the data.

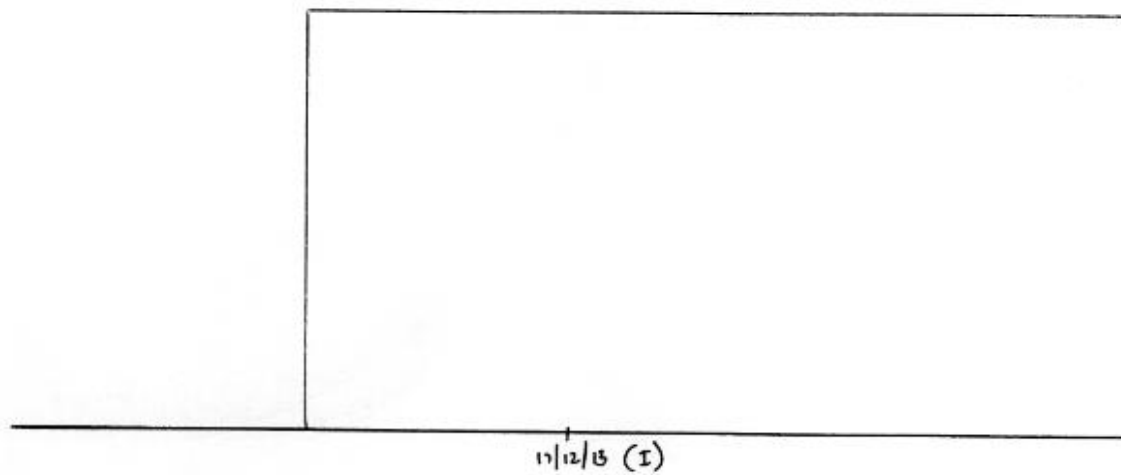
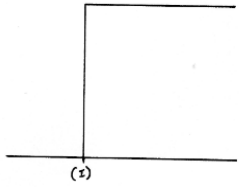
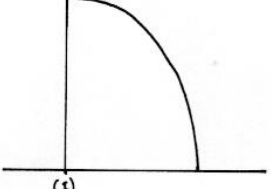

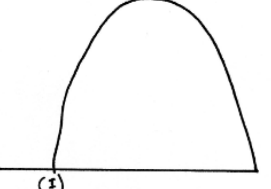
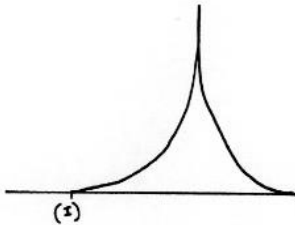
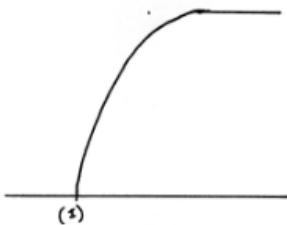
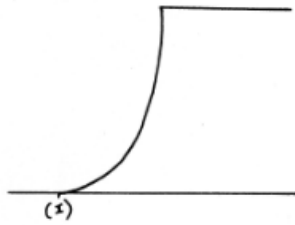
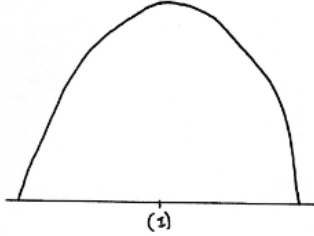
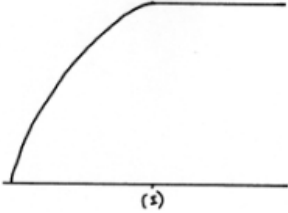
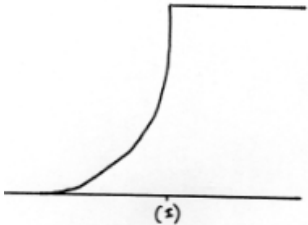


Figure 7.13: Week Before Step Change

¹¹ Which shows the intervention type until the end of the series.

<u>Fit Statistics.</u>	<u>Step Change.</u>	<u>Instant Power Week Later.</u>	<u>Instant Exponential Week Later.</u>	<u>Power Change 1 Week Later + 1 Further Week.</u>
				
Stationary R-Squared	0.402	0.407	0.403	0.409
R-Squared	0.448	0.453	0.449	0.455
RMSE	1.951	1.943	1.949	1.938
MAPE	64.333	63.758	64.142	63.340
MaxAPE	586.017	579.035	582.343	576.556
MAE	1.214	1.208	1.210	1.208
MaxAE	18.178	18.904	19.407	17.985
Normalized BIC	1.376	1.367	1.373	1.363
t statistic	-2.469	-4.069	-2.849	-5.170

<u>Fit Statistics.</u>	<u>Exponential Change 1 Week Later + 1 Further Week.</u>	<u>Power Change 1 Week Later (step).</u>	<u>Exponential Change 1 Week Later (step).</u>
			
Stationary R-Squared	0.410	0.402	0.401
R-Squared	0.456	0.448	0.448
RMSE	1.937	1.951	1.952
MAPE	63.311	64.411	64.525
MaxAPE	577.633	585.015	586.563
MAE	1.206	1.214	1.215
MaxAE	18.010	18.137	18.134
Normalized BIC	1.361	1.376	1.377
t statistic	-5.511	-2.380	-2.128

<u>Fit Statistics.</u>	<u>Power Change 1 Week Before + 1 Week After.</u>	<u>Power Change 1 Week Before (step).</u>	<u>Exponential Change 1 Week Before (step).</u>
			
Stationary R-Squared	0.401	0.402	0.402
R-Squared	0.448	0.448	0.448
RMSE	1.951	1.951	1.951
MAPE	64.424	64.345	64.316
MaxAPE	587.092	584.162	582.990
MAE	1.213	1.213	1.213
MaxAE	18.882	18.278	18.211
Normalized BIC	1.376	1.376	1.375
t statistic	-2.192	-2.344	-2.453

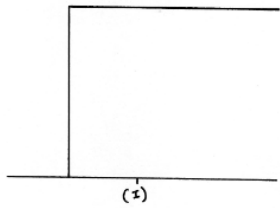
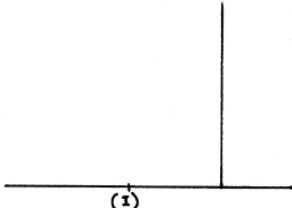
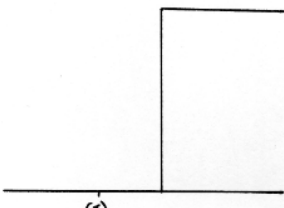
<u>Fit Statistics.</u>	<u>Week Before Step Change.</u>	<u>Week Delay Instant Change.</u>	<u>Week Delay Step Change.</u>
			
Stationary R-Squared	0.401	0.412	0.401
R-Squared	0.448	0.457	0.447
RMSE	1.952	1.934	1.952
MAPE	64.406	63.386	64.576
MaxAPE	587.993	578.209	587.215
MAE	1.214	1.206	1.215
MaxAE	18.297	18.037	18.139
Normalized BIC	1.376	1.359	1.377
t statistic	-2.185	-5.771	-2.036

Table 7.4: Model Fit Statistics

Conceivably, several of the models fit the data well with the various statistics amongst certain intervention types being very similar. What is noticeable is that those intervention types which are the best representation for the data all involve a ‘step’ form which is a continuation of tweets over an extended period past the date of the intervention. It is the week before step change intervention type which models the data most accurately. This shows that the significant increase in tweets happened a week before the intervention and continued until after the event. Instead of peaking on the day of the event the step change illustrates that a permanent shift in the level of the time series occurred. In relation to Twitter posts a peak in anticipation happened a week before the 17th December 2013 and thereafter. This indicates that people were posting about the Davies Commission interim report before it was published

and continued. This significant shift highlights the importance of the report to HACAN Clearskies compared to posts on Facebook which did not have the sustained impact on the time series.

7.4.3 Transition Heathrow

The following sections show the results of the intervention analysis for Transition Heathrow's Facebook and Twitter pages.

7.4.3.1 Facebook

The intervention analysis for Transition Heathrow's Facebook group shows an ARIMA model form of $(1,0,1)(1,0,1)$ using expert modeller. This was then applied to the whole of the time series plus each intervention type. Numerous model fit statistics and parameters are generated to show the overall fit of the model to each intervention type. A t statistic above 2 or below -2 shows whether the model is statistically significant provided the t statistic (at lag 0) falls within these boundaries then the model can be disregarded. Overall, 18 intervention types were modelled on the time series of which five produce statistically significant results. The best fit is the week delay instant change type (Figure 7.14) and all possible best fitting intervention types are shown in Table 7.5.

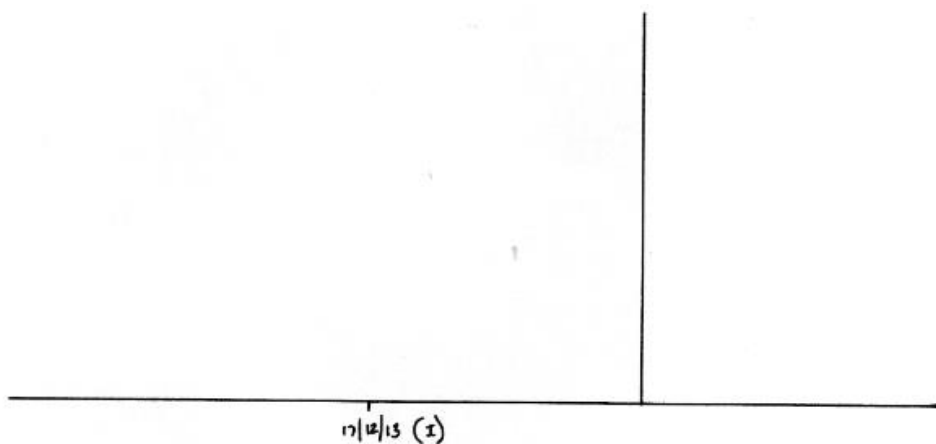


Figure 7.14: Week Delay Instant Change

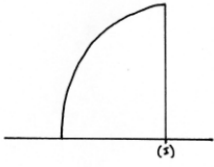
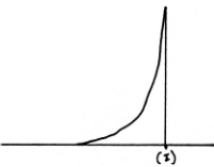
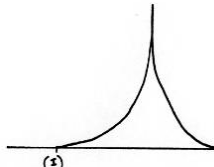
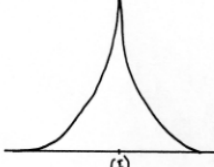
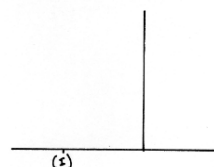
<u>Fit Statistics.</u>	<u>Power Instant Week Before.</u>	<u>Exponential Instant Week Before.</u>	<u>Exponential Change 1 Week Later + 1 Further Week.</u>	<u>Exponential Change 1 Week Before + 1 Week After.</u>	<u>Week Delay Instant Change.</u>
					
Stationary R-Squared	0.154	0.154	0.160	0.153	0.166
R-Squared	0.154	0.154	0.160	0.153	0.166
RMSE	0.844	0.845	0.842	0.845	0.838
MAPE	50.563	50.571	50.921	50.564	50.741
MaxAPE	100.675	100.511	101.016	100.470	100.555
MAE	0.579	0.580	0.580	0.580	0.578
MaxAE	6.680	6.679	6.682	6.678	6.680
Normalized BIC	-0.309	-0.308	-0.315	-0.308	-0.323
t statistic	2.400	2.363	3.957	2.098	5.242

Table 7.5: Model Fit Statistics

Two of the intervention types: 1) Exponential change 1 week before and 1 week after; and 2) the week delay instant change show very similar statistically significant fit parameters both possessing four best fit parameters each. Although the t statistic does not determine which is the best fitting model alone, the week delay instant change type possesses the highest t statistic and is therefore the marginally best fit for the intervention. It shows that there is a significant peak in Facebook posts a week after the intervention which could indicate one of

two things: either firstly, that there was a delay in posting anything to the group about the Davies Commission interim report or secondly it is other posts which have led to this peak.¹²

7.4.3.2 Twitter

The intervention analysis for Transition Heathrow's Twitter profile shows an ARIMA model form of $(1,0,5)(1,0,1)$ which was implemented on the time series plus each intervention type – overall there are five significant intervention types. The best fit is the exponential instant week before (Figure 7.15) with other best fitting intervention types shown in Table 7.6.

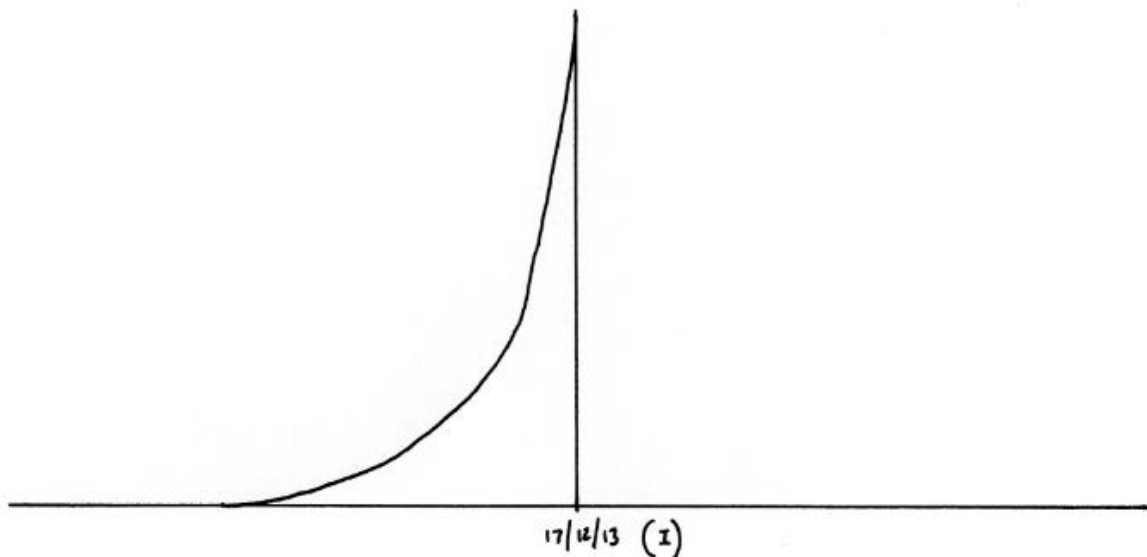


Figure 7.15: Exponential Instant Week Before

¹² The intervention analysis was able to see the number of posts; but not their content.

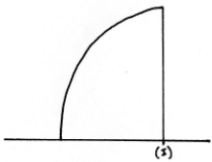
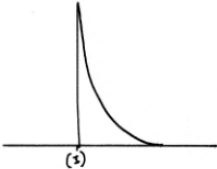
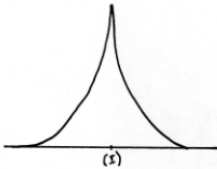
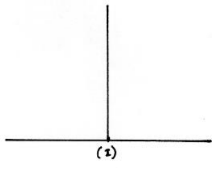
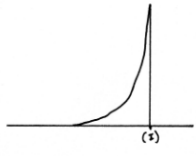
<u>Fit Statistics.</u>	<u>Power Instant Week Before.</u>	<u>Instant Exponential Week Later.</u>	<u>Exponential Change 1 Week Before + 1 Week After.</u>	<u>Instant Change.</u>	<u>Exponential Instant Week Before.</u>
					
Stationary R-Squared	0.093	0.093	0.093	0.094	0.094
R-Squared	0.093	0.093	0.093	0.094	0.094
RMSE	3.320	3.320	3.319	3.318	3.317
MAPE	55.239	55.473	55.525	54.749	54.644
MaxAPE	520.439	506.068	514.136	511.824	514.609
MAE	1.334	1.336	1.334	1.334	1.331
MaxAE	85.253	85.258	85.256	85.246	85.259
Normalized BIC	2.449	2.449	2.448	2.448	2.447
t statistic	2.023	2.026	2.259	2.408	2.603

Table 7.6: Model Fit Statistics

The exponential instant week before intervention type is the best fit for the data. Four fit parameters are significant compared to three for the instant change type. The t statistic is also the highest out of all the significant intervention types but the number of higher/lower fit statistics shows its prominence as the best fitting intervention type. It illustrates that the data begins a gradual increase starting the week before the intervention with a peak in tweets occurring on the date of the intervention. The number of tweets then suddenly declines, returning to pre-week before levels after the event. This would imply that as the Davies Commission interim report witnessed a build-up in anticipation, Transition Heathrow began talking about the report publication on Twitter a week before it happened with a high volume of discussion occurring on the 17th December 2013.

7.5 Conclusions

Airport Watch's time series analysis shows periods of inactivity for both Twitter and Facebook, typically around the holiday seasons. There is also a considerable difference in the number of daily tweets and posts per day. The data shows that Airport Watch uses Twitter far more than it uses Facebook. For HACAN Clearskies, it created its Twitter account in June 2009 but did not actively start using it until January 2011. Again, and like Airport Watch, HACAN Clearskies' social media campaign illustrates lesser activity during the holiday seasons. Transition Heathrow social media campaign demonstrates more constant periods of activity although less during the Christmas months. The cross-correlation analysis shows that all groups exhibit the most significant value at lag 0. This means that Airport Watch, HACAN Clearskies and Transition Heathrow all have a greater relationship where they respond to posting on Twitter by simultaneously posting on Facebook. The interview questions will uncover the link between Twitter and Facebook and what they are utilised for.

The intervention analysis mapped different intervention types onto the modelled stationary time series of each of the groups for the Davies Commission interim report publication on 17th December 2013. For Airport Watch's Facebook page, the instant intervention type means that the increase in Facebook posts starts and ends on the same day as the intervention showing no gradual build up or drop off. Airport Watch's Twitter page shows an instant-power week delay intervention type best represented the data. This means that the Twitter posts peaked on the day of the intervention, without prior build up, and gradually decreased over the course of the week after. This is significant because Facebook appears to have been utilised as an instantaneous tool in the reporting of the event whereas Twitter was utilised to spread the details of the interim report over a longer period of time. HACAN Clearskies' Facebook group, like Airport Watch's, possessed an instant intervention type. Its Twitter page shows a week-before step change implying that the significant increase in tweets happened a week before the intervention and continued until after the event. This suggests that Facebook also spread the information of the report on the day of publication, providing instantaneous reaction. In contrast Twitter may have provided a more comprehensive account of the report over a number of weeks. Transition Heathrow's Facebook group exhibited a similar intervention type to that of Airport Watch's and HACAN Clearskies' Facebook group but albeit a week later. Its Twitter page illustrated an exponential instant week before change indicating that the data begins a gradual increase starting the week before the intervention

with a peak in tweets occurring on the date of the intervention. The number of tweets then suddenly declines, returning to pre-week before levels after the event. This is also significant because, as with the other groups, Facebook enabled an instant reaction to an event in time whereas Twitter, once again, provided longevity in the build up to and reporting of the Davies Commission interim report. The reasons behind the difference in the utilisation of platforms formulate a part of the semi-structured interviews.

Chapter 8

“What’s depressing about social media is it’s very ephemeral:” the Views of Social Media by Campaigners

8.1 Introduction

Each of the three findings chapters, including this one seek to “analyse the social media pages of three anti-airport expansion groups (objective 3).” Additionally, the interview findings shown in this chapter also seek to satisfy objective 4: “to examine the challenges and opportunities existing groups face when incorporating social media into their campaigns.” The key individuals that were interviewed are shown in Table 5.6 (Chapter 5). John Stewart from HACAN Clearskies, Sarah Clayton from Airport Watch and Ian Westmoreland from Transition Heathrow were chosen as they are the social media coordinators of their groups (the interview questions asked to each group are shown in Appendix E).

This chapter looks at themes which were coded, according to a thematic coding approach, into four distinct categories (as described in Chapter 5, Section 5.10.5). These themes were chosen in accordance with the research gap detailed in Chapter 3 and come from the view of the interviewees. Section 8.2 discusses the extent of the incorporation of social media into the three campaigns. Section 8.3 illustrates the benefits of incorporating social media. Similarly, the problems of incorporating social media are presented in Section 8.4 and finally Section 8.5 discusses the future role of social media within each group’s campaigns. All sections have similar sub-sections which exist for each of the three campaign groups; Airport Watch, HACAN Clearskies and Transition Heathrow. Conclusions of the chapter are then drawn in Section 8.6.

8.2 Incorporating Social Media

This section details the issues each group faced when incorporating social media into their existing campaigns against airport expansion at Heathrow. It presents the interview findings from Airport Watch (Section 8.2.1), HACAN Clearskies (Section 8.2.2) and Transition Heathrow (Section 8.2.3).

8.2.1 Sarah Clayton, Airport Watch

The incorporation of social media into Airport Watch's campaign against Heathrow expansion has led to a somewhat one dimensional approach from Sarah Clayton:

“Because I hate Facebook [laughs]. I hate Facebook.”

For Airport Watch, Twitter has become a more useful tool for its campaign. This usefulness has been born out of the dislike for Facebook but Sarah Clayton suggests that Twitter's role for Airport Watch's campaign is more of “an alternative mini website.” This is designed in such a way that news and segments of information can be reduced succinctly into the 140 character format. Although, not everyone visits Airport Watch's website so:

“I regard Twitter as the instant shorthand version of putting information out there in small form.”

The main reason for Airport Watch incorporating social media into its campaign is to “spread information as widely as possible” through numerous social networks of their followers to provide a balanced argument and counter what the aviation industry produces. Sarah Clayton argues that the information produced by industry is “very biased” and there are only a small number of people who are “countering that.” So, as a producer and disseminator of information, Sarah Clayton does not actively set out to engage with people, in fact:

“I've never engaged with people at all. I am a one way channel really, I put stuff out there.”

She also points out that she rarely gets into conversations with people on either social media platform and never uses hashtags to formulate debate but acknowledges that “I don't use Twitter the right way, I don't do it correctly – I'm not interacting.” On the other hand Sarah Clayton confirms that the aim of incorporating social media is to engage with more people than would usually go to their website.

Airport Watch also tweets and posts mainly on aviation and climate change and “nothing else really, occasionally one in every 100 something else creeps in.” Moreover there is a relatively strict policy on whom to follow on Twitter. Sarah Clayton has a list of about fifty people and groups of people who she can only generally follow, who are of interest to the campaign against airport expansion. They are generally:

“people who I know who will be saying something useful.”

This could be climate change campaigners, journalists or other anti-airport expansion colleagues. From her experience, it is these people who would want to read something that is posted on Airport Watch’s profile. Likewise, these people are really the only ones which Airport Watch wants to see what they are saying.

8.2.2 John Stewart, HACAN Clearskies

Incorporating social media into existing campaigns against airport expansion at Heathrow requires those campaigners who had campaigned against expansion for years previously to adapt to changing technologies and learn how to use these new social media platforms. The value of social media as a campaigning tool was first brought to John Stewart’s attention by other campaigners and:

“as campaigners we are essentially about communication and if you don’t communicate well, your campaign is not successful. You have to use the most modern and most relevant means to communicate. Social media is now that.”

Furthermore, incorporating social media to an extent requires a policy of whom to follow, particularly on Twitter. Whilst HACAN Clearskies, as an organisation does not have a clearly defined policy, there are thoughts on whom they should follow:

“Certainly MPs, politicians and journalists but there’s other people: the aviation industry, local authorities and other campaigners – we would follow because we want to hear what they have to say.”

Whilst social media has been incorporated into other protesting repertoires, it has changed the ways in which they protest but, in John Stewart’s words: “I’m not sure if it’s changed the basic element of campaigning.” The presence of other offline and online repertoires in each of the three existing anti-airport expansion groups’ campaigns makes incorporating social media challenging. There is an issue of balancing all tactical repertoires of protest whilst still

appealing to all members, followers and supporters. In this instance, social media would not replace all other repertoires in their campaigning strategy and it is integrated because of the different forms of communication their members and supporters utilise. However, there is no doubt that social media has brought something additional to their existing, on-going campaign against airport expansion:

“I think social media is critically important now in campaigning. I think with Twitter and Facebook they are now, I think, key ‘flags’ of our social media strategy.”

But with incorporation, there is also an issue of how to utilise social media and whether the different social media platforms studied are being used differently to one another. The literature pointed out that typically Facebook is used to plan and organise events whilst Twitter articulates the protest ‘on the street’ but certainly for John Stewart, he sees social media as serving a slightly different function than organising mass protest:

“We don’t use it to organise mass protest. They are largely for information, opinion and reaction.”

Within this use of social media for information dissemination purposes, Twitter and Facebook are also used for different functions, much like how they are utilised in ‘on street’ demonstrations:

“Twitter is for immediate news”

It also enables the groups to speak with different audiences’ particularly key politicians and journalists. Facebook does not particularly have this option as you have to be “friends” with someone before you engage with them. As a result:

“We don’t use Facebook to engage with the more important journalists”

Even with the incorporation of social media into their campaign and it being utilised for a number of years, John Stewart is aware of the strengths of each social media platform and is constantly learning about the various elements of each. Just before the interview, he appointed a dedicated social media person who can operate both social media platforms and add something to their existing campaign.

8.2.3 Ian Westmoreland, Transition Heathrow

Transition Heathrow's campaign is one of a grassroots nature. As well as campaigning against the expansion of Heathrow airport it is involved in many different community interests from building community resilience to encouraging sustainable living. These are some of the reasons "why we don't have a very clearly defined strategy for using social media." The incorporation of social media into Transition Heathrow's campaign has not replaced the more physical contact, such as leafleting or face to face conversation the group has with local residents, environmentalists and councillors: "all that stuff seems to be more important for getting local support." But what social media does do is it enables Transition Heathrow to:

"get a message out to a much wider audience – it's become quite international."

Much like the other two groups, Transition Heathrow utilises social media mainly as an information producing platform. There is no particular preference between Twitter or Facebook either. "Facebook is more appropriate for some things and Twitter is more appropriate for other things" But they are used to publicise themselves and the events they organise and run and "there's information about why we're doing them and some of the reasons why Transition Heathrow exists." Similarly, there is a difference between the usage of each social media platform:

"Facebook group is mostly for publicising the events and it is also a place where we can link to other interesting things that are happening. Twitter account is a lot more to do with the campaign work that we're involved in and other campaigns."

Transition Heathrow also describes that it is beneficial to them to keep it interesting so that "people who use both are still likely to have something new when they are checking both of our accounts." But there is generally a mixed approach from platform to platform regarding what information is produced.

On the other hand there is a link offline with the media and key local journalists:

"We do have good relations with a few journalists but only a small handful. They have covered what we're doing and they have been quite open when we have had a story that we think they would like to cover."

However, the focus of their campaign is very much on a local scale so a good relationship with local media is important as Transition Heathrow tries to "keep good relations so that we

are more likely to get good publicity in the paper.” Unlike the national media outlets which are a “much trickier game to play; if it is a game really.”

8.3 Benefits of Social Media

The incorporation of social media into existing campaigns against expansion at Heathrow can bring with it many benefits and opportunities for campaign groups. These codes are discussed in relation to each of the three anti-Heathrow expansion campaign groups, Airport Watch (Section 8.3.1), HACAN Clearskies (Section 8.3.2) and Transition Heathrow (Section 8.3.3).

8.3.1 Sarah Clayton, Airport Watch

The benefits of Facebook, in particular, display those “high quality followers” who have deliberately chosen to follow Airport Watch and these users are individual users as:

“I don’t have any journalists who follow me on Facebook.”

These followers, who have joined the Airport Watch Facebook page, have done so because they are interested in the fight against airport expansion and the associated issues it causes. “These followers are some of the most passionate, more dedicated and more genuine campaigners” and have put a “big effort in who to choose to follow or friend on Facebook.” But certainly for younger campaigners social media has “helped them, certainly Facebook has helped them.”

On the other hand, and for Airport Watch’s campaign and despite the value of the followers mentioned on Facebook, “Twitter, by its nature, is much easier to use and share and is quicker to do and I suspect it reaches more people, faster.” Also, the ability of social media to not just incorporate text, but photographs and pictures, was seen as a particular advantage, especially when utilising Twitter:

“Twitter doing that [ability to add photographs] has made it massively, massively easier to share stuff. That actually makes it even more useful than Facebook.”

Twitter, again, has developed into a “fabulous campaigning tool” for Airport Watch as people are able to campaign with minimum effort or cost and reach so many more people than what they would do offline:

“I think that’s the great joy of Twitter. Certainly there is no other means by which you can put your message out there so effectively and quickly to so many people with so little effort at so little cost.”

In addition, social media, encompassing both platforms, has enabled Airport Watch to acutely follow the opinions and reactions of its followers and it has been “useful to be able to see how many people are out there, what they’re passionate about, what they’re upset about and what they’re saying.” But, similarly, with Twitter, as with Facebook, there are those users who are interested in what Airport Watch is saying and its “rewarding to know how many people are out there.” Moreover, without Twitter, Airport Watch would struggle to engage with these people personally:

“You’d guess that they are out there but you just don’t know but with Twitter you know these are the ones with Twitter accounts that are saying what they think and that’s quite helpful.”

Overall, social media has provided numerous benefits for Airport Watch’s campaign but it is Twitter which stands out as the most favoured platform because of the number of people which can be reached and the speed in which this happens.

8.3.2 John Stewart, HACAN Clearskies

For John Stewart of HACAN Clearskies, there are clearly benefits of utilising social media within their protest campaign and there are advantages of both social media platforms. Facebook is a particularly useful tool for sharing information with other campaign groups across the country and Europe whilst Twitter is useful for rapid information dissemination and engaging with politicians and journalists:

“You can probably guess I rather like Twitter [laughs]. I think it is, for me, it’s more immediate, it’s more of a campaign tool. For me it’s more of a campaign tool because part of what I would do is relate to the press and try to influence the politicians, try to get the message out to people. Twitter can do that very well.”

There is also a link between Twitter and Facebook and their website, some information is put on Facebook directly from the website but, more importantly, Twitter is able to provide HACAN Clearskies with “immediate reaction and immediate opinions but you also, you know more of whom you are reaching on Twitter” more so than the use of the website. Moreover, with Twitter they are able to get messages to key people as “you don’t know if they are going to be checking your website or not.” In turn, these key people – “be it Zac

Goldsmith or Caroline Lucas” then retweet HACAN Clearskies’ tweets and “you know that you’re getting the bonus of all their followers as well.” Therefore, John Stewart contends that, the reach of social media is far greater than they could get on the website:

“We can now reach so many more people. We can reach so many more people so much more quickly. We can organise events if we have got to at much shorter notice and guarantee getting more people there than we previously would have done.”

This has meant that social media has enabled groups to link together under Airport Watch’s umbrella, “communicate and actually use social media – starting with email then moving onto Facebook and Twitter.” Additionally, groups like HACAN Clearskies are able to:

“Communicate in a way which was just inconceivable frankly years ago.”

They have become much more aware of what is happening within protest movements across Europe and it has been much easier to bring people together. Similarly, by linking with other anti-airport expansion campaigns, they have a general approach to support one another on Twitter. “We sort of know what the other person is going to think and we’d back them up.” Therefore, HACAN Clearskies and other anti-airport expansion campaigns are able to:

“Create in the journalists mind and politicians mind a ground swell of opinion in a particular direction.”

Twitter has become more of a useful tool for HACAN Clearskies than Facebook as it is more relevant to their campaign and “I think that it’s more relevant to what we’re trying to do.” The number of people responding to HACAN Clearskies on Twitter is greater and this “may be a reflection of how badly we use Facebook” but notwithstanding:

“In many cases the messages reaching more people through Twitter because when that happens, it encourages you to use Twitter more.”

There was also an expectation, for Twitter in particular, that it would contribute something to their campaign due to the interaction and communication potential it holds. But rather than replace other tactical repertoires in their campaign, “it hasn’t become a substitute for press releases but it has become almost that, because you can get something out there very quickly in reaction.” But the social media tools combined serve a slightly different audience and John Stewart acknowledges that he is beginning to learn that fact:

“I am beginning to learn...less decision makers and more ordinary people often look at Facebook in the evenings. People use Facebook at different times to Twitter. It dawned on me

actually that there's no point putting some big breaking news on Twitter and no one is there."

In previous years, before email, press releases would be faxed or posted and "that meant that there was a delay in getting your press release out." Moreover, this meant that instant reaction was quite difficult. Social media has changed this:

"[But] now that's all gone. Social media has enabled us to react more instantly, get things out more quickly."

Large corporations because of the resources they possessed; typically dominated smaller campaign groups but the advent of social media "has created a much more level playing field" between themselves and large corporations. It has also made communication directed at them easier and "helped us to have more influence than we would have had."

It also provided HACAN Clearskies with a means of communicating the response to the Davies Commission interim report. Their preparation and instant reaction, particularly on Twitter was evident; "we were very proud by our Twitter performance on the interim report." This was because of prior information they had received from Howard Davies about his recommendations:

"Davies rang Heathrow, Gatwick, Gatwick campaigners and myself up the night before the report was due to be published and to give us a heads up on the headlines and he kind of trusted us, obviously, he was going on the Breakfast programme at 7am in the morning. I am very proud of myself, I had everything ready for Twitter.... I was prepared."

Therefore, social media has had such an impact on their campaign that "we couldn't ever see us going back without it."

8.3.3 Ian Westmoreland, Transition Heathrow

The initial advantage of Transition Heathrow utilising social media in their campaign is that it enables them "to reach a lot more people and we were able to see how many people we were actually reaching. It also ties in with our website well." Furthermore, it has broadened their appeal to include other national and international campaign groups at numerous scales:

"Yes I would say it has, definitely."

Transition Heathrow also shows a difference when discussing the benefits of social media for their localised campaign. More specifically, Twitter dominates the benefits of social media for their campaign and is generally seen as a more useful tool. To match their ideology of a grassroots campaign, “Twitter is definitely a lot more grassroots” and because the Grow Heathrow site, which Transition Heathrow occupies, receives media attention, “we have a few key journalists that we follow and they follow us in return.”

The operational aspects of Twitter are of benefit to Transition Heathrow’s campaign as it is able to operate quicker than other platforms and “like anything else. So we are able to get things out immediately. That immediate, initial commentary or updates to things that we are doing.” Moreover, for events which Transition Heathrow organises, especially within the local communities around the Grow Heathrow site, social media is used to publicise and provide ongoing commentary:

“we have ongoing coverage using our Twitter account and that’s not something we’d really use on Facebook – it’s the immediacy on Twitter than Facebook.”

The advantage with Transition Heathrow’s Facebook page is that they are able to get the members (who live on the Grow Heathrow) site to post under their own personal accounts creating a volume of traffic on the page but with Transition Heathrow’s Twitter page, “it’s things coming from Transition Heathrow as a group” rather than as individual members.

But for their campaign, Twitter is easier to use, a point contended by Airport Watch (Section 8.3.1) and it enabled them to “put up a short comment because of the character length restriction – if you just need to announce something that’s happening then you can do that a lot easier on Twitter.” However, they contend that they particularly use Twitter to retweet other pieces of information from different groups and individuals.

Transition Heathrow had a reasonably clear plan on responding to the Davies Commission interim report, much like HACAN Clearskies. When the interim report recommended two options at Heathrow, “we wanted to give our take on that and we have used social media to do that” as well as sharing some of the information seen in the media.

8.4 Problems of Social Media

Whilst incorporating social media within existing campaign groups can produce many benefits, there are also problems and challenges with employing social media as an additional tactical repertoire.

8.4.1 Sarah Clayton, Airport Watch

Incorporating social media has also posed problems for Airport Watch's campaign. Initially, creating social media profiles on Twitter and Facebook proved difficult because "John and I are not the generation that does these things." However, there was a realisation that "this has to be done and this is what campaigning has to be." Although, age does appear to be a prevailing factor into why people do not utilise social media:

"I don't think many people over a certain age do Twitter. So there's always that problem."

Conversely, with Facebook there appears to be a difficulty in operating and interacting with others. "I hate Facebook..... I struggle with it, I find it difficult, awkward and time consuming." Although there does not seem to be a similar problem with Twitter, because Sarah Clayton finds it easier to use and operate (see Section 8.3.1):

"But I find it very difficult to interact with people on Facebook because if you try and look what everyone else is saying after 5 minutes of going through everyone else's stuff about what they've done with their weekend, holiday photos, photos of their cat, a terrible injury their aunt had last weekend – I just lost interest, I can't do."

The problems with Twitter are more concerned with its instantaneous nature and information being produced at that moment in time, "what's depressing about social media, it's very ephemeral." A tweet is broadcast on social media and there is reliance for people to read it there and then:

"You put something up on Twitter, in particular, and for most people if they go back more than four hours of tweets, if they have been out all day and they go back four hours of tweets, the rest is too much, you don't ever see them."

Sarah Clayton also explains that for Twitter there is a lot of effort to devise the perfect, interesting tweet which receives numerous likes or retweets and reaches numerous people, because it has to be seen within the moment. "You put something up and in a way it's gone.

It's a lot of effort for something that is of the moment. You put the effort in and 90% of it is wasted but if 10% is achieved, it's worth doing."

But there is also a problem with the general utilisation of social media, it is seen as a means of acting as a one way communication channel, as almost an additional resource to their website:

"I don't set out to try to tweet at them, I don't tweet to them.... I don't go out to engage with them. And I know I'm not using it properly and I know I should."

Moreover, Sarah is the only person who operates Airport Watch's social media accounts:

"I don't get paid or anything it's purely a voluntary effort."

This means that she has the:

"luxury to do what I want. I probably should be organised by somebody but I do my own thing."

Additionally, as the sole operator, Sarah has control over Airport Watch's news network on Facebook and Twitter and therefore the way the campaign is seen by those on social media is dependent on her interpretation of what social media is and what it should be used for:

"I'm a bit of a snob for grammar and I hate tweets that are full of hashtags and '@' because you can't read them. I see Twitter as being something as the text you read rather than hashtag, hashtag, hashtag, '@,' '@' and two words – you can't retweet words and I regard those as awful."

Overall, however, there is a general concern about social media and its role within campaigning. The main concern is centred on people being overwhelmed with social media as "it's impossible to keep up with." Also, it does not provide the thoroughness that the website provides, for example:

"It's impossible to follow it thoroughly. So it gets tiring trying to follow it. People might think 'I can't deal with this – I've got a life to lead.' Whether some will go off social media I'm not sure."

8.4.2 John Stewart, HACAN Clearskies

The initial phase of incorporating social media into their campaign proved slightly problematic for HACAN Clearskies as there was no real means of training on how to use

social media in campaigning and so John Stewart began to read a book on an introduction to social media:

“You start to read the book and it’s another language! French is easier! So I did learn as I went along.”

Moreover, there was a delay on Twitter with creating a profile and then writing the first tweet (19 months). But that was mainly due to a lack of experience and a general reluctance to utilise Twitter within their campaign, “Somebody said to me ‘look you’ve got to get on Twitter it’s good for campaigning,’ and initially I thought ‘no, rubbish.’ I went through the motions of setting it up and then didn’t tweet for about a year. It’s simply me learning the technology.” This is also the reason why John Stewart’s name appears on the HACAN Clearskies Twitter handle:

“I think if we were starting again we may do it separately but that’s how people know us now.”

There are also certain circumstances in which social media is actually not beneficial to their campaign. The physical face-to-face contact with people when leafleting, for example, is not able to be replicated on social media, so “there are certain times when email, or Twitter or Facebook couldn’t do that.” More interestingly, one of the main reasons why social media has proved to be slightly problematic for HACAN Clearskies is because of a social media reluctance membership base. Not enough of their members or supporters are familiar enough with social media and whilst they “may be more ok with it now, they’re not using it in the way in which the Occupy generation does;” that is to organise mass protest. John Stewart explains that:

“This is both interesting and frustrating because the HACAN members, of which there are several thousand, they still tend to operate by reading the newspaper.”

And so, if there is an event which HACAN Clearskies are organising then email is the preferred method of communication:

“I suppose, our members and reaching people and reaching people quickly and in bulk numbers email has made the biggest change.”

It has enabled HACAN Clearskies to send reports, newsletters and information of interest out:

“More quickly, cheaply and some of our members still insist on having paper copies of our newsletter.”

But HACAN Clearskies’ membership base would not “think, although many of them now have Facebook, of how events can be organised on Facebook – they wouldn’t think of looking there.” Similarly, John Stewart contends that he would like social media to be used more for the organisation of events and mobilisation of people, and the introduction of a social media savvy member of staff has helped, but “I am sceptical because of a different generation and slightly different mindset.”

The creation of HACAN Clearskies’ Facebook group highlights another problem with social media incorporation. It was initially created as a “way of getting the message across” and as a producer of information to wider audiences, but it has “turned into something of a self-help group where everyone who is affected by aircraft noise reassures each other that they are not alone.” This was not the intention of the Facebook group, argues John Stewart. However, it’s “clearly serving a purpose” as a space to vent frustration of the noise associated with Heathrow airport’s operation.

8.4.3 Ian Westmoreland, Transition Heathrow

For Transition Heathrow’s social media campaign, there are many advantages of incorporating social media but few disadvantages. Principally, the main problem appears to be with the rotation of members who occupy the Grow Heathrow site. These numbers can change relatively frequently and so it requires new members to learn about the campaign and the use of social media. Currently there are “myself, but also half a dozen others” operating the social media pages of Twitter and Facebook but, as mentioned, this:

“Has gone through quite a few different hands.”

Additionally, with Grow Heathrow being run by volunteers, there may be times of the year when numbers are reduced and so it “essentially comes down to what our capacity is and who’s around in order to take those things on.”

Moreover, and more so than with the other anti-airport expansion groups, Transition Heathrow appears to suffer from incidences of trolling by others whereby users post rude or

malicious comments although Ian Westmoreland contends that these have been “nothing serious.”

The few problems associated with incorporating social media mean that Transition Heathrow is satisfied with their social media campaign and:

“I can see it remaining very similar to what it is at the moment..... I don’t think I would [change anything about it]”

In light of the challenges discussed, the next section discusses the future role of social media within these campaigns against airport expansion.

8.5 Future Role of Social Media

The issues, both positive and negative, have been explained in relation to the incorporation of social media. This section presents how the three groups, Airport Watch (Section 8.5.1), HACAN Clearskies (8.5.2) and Transition Heathrow (Section 8.5.3), perceive the future role of social for their campaigns as well as explaining what they would change about the utilisation of social media within their campaign.

8.5.1 Sarah Clayton, Airport Watch

Airport Watch also discuss the fact that social media has the potential to play an important role in the future of its campaign but there still remains a degree of uncertainty as to the extent of its ability to fulfil that potential. One certain fact is that social media will not replace any other means of communication but it will continue to be integrated within a broader protesting repertoire:

“You can’t replace a website for putting proper detail up. I find organisations with only a Facebook page infuriating and I say I can’t make out what your campaign is.”

Moreover, importance is placed upon the website as a primary source and origin of information and campaigns, which are entirely dependent on social media, are viewed as being “muddled” because of an uncertainty of what they are campaigning about:

“I think websites should not die for the basic origin of information but you can’t put the whole thing on social media, just the link to it or a few basic concepts.”

The ephemeral nature of social media, highlighted as a main problem of incorporation, means that people rarely “actually go back and look back at pictures, diagrams and charts” and so having a proper website, “as the basic origin of information” means that information is readily available.

On the other hand there is a general acceptance that social media could be utilised better and “I suppose just in terms of numbers, to get a sheer number of people sharing information and being prepared to do something.” There is also an acknowledgement that although social media, on its own, is not going to change “anything but it can share the anger and information and get people mobilised.” This requires people to do more than:

“Contact their MPs, they’ve got to be getting out there doing something. We don’t quite know what they’re going to be doing – campaign on many, many fronts. This is one of the fronts.”

There is also a recognition that, in future, Airport Watch may need to be more proactive in following a number of different users, particularly MPs and journalists as:

“In the early days I did that, I went through every journalist I could find and looked them up, MPs as well but that was 3 years ago and a lot didn’t have Twitter.”

But there is uncertainty as to whether these types of followers would be interested in Airport Watch’s campaign at all, “what I’ve never known is whether journalists who are interested would find my tweets.” This ultimately comes from experience in actively utilising social media to interact with others, something which Airport Watch admits to doing little of.

8.5.2 John Stewart, HACAN Clearskies

Social media has the ability to play a future role in HACAN Clearskies’ campaign against Heathrow airport operation and expansion. However, whilst there is a local element to campaigning, which relies upon offline repertoires, “it’s not going to replace the offline stuff.” But the role of social media is going to become:

“more and more dominant in any campaign and I think it’s going to make campaigns more effective and I think on the whole it creates a more level playing field between big corporations and campaigns. I think that will happen.”

Similarly, this indicates that HACAN Clearskies’ campaign would never be able to become totally social media based. That would require “local people to be ok with social media but it

would need certain parts to have the resources” but also with local activism “you have got to make sure you bring the local people with you. You almost have to move at their pace.”

Despite an increased incorporation of social media, groups such as HACAN Clearskies which have a strong offline presence are not in a position to solely rely upon social media “as the Occupy generation can, they use social media to get a big attendance - we just wouldn’t get it and most of our HACAN members will tell me they haven’t been informed.” And so, moving forward, John Stewart contends that HACAN Clearskies’ campaign against airport expansion at Heathrow will become more social media focused:

“Whether we will ever entirely campaign on social media I don’t think so. I think there will always be an element that we need face to face contact, whether we need leafleting and we will have to watch that we take our constituency, our membership and supporters with us.”

Therefore because of HACAN Clearskies’ membership base, solely utilising social media would not be beneficial instead there will be a combination of both online and offline repertoires.

More specifically, the future of HACAN Clearskies’ Facebook campaign is to move away from a Facebook group structure, but still keeping the group active to enable people within it to carry on discussing noise complaints, and move towards a Facebook page. “I think we have got to get better at promoting ourselves on Facebook. We are experimenting with ways to pay to boost ourselves on Facebook.” The creation of a Facebook page would also mean that HACAN Clearskies could produce more information under its own name. “I could see in time the Facebook page being a tool to organise events..... [but] we are going to have to get better at [that].” The challenge for HACAN Clearskies is to increase its social media presence:

“We certainly haven’t got a multi media social media operation and that’s what we need to aim towards. Trying to integrate everything and I think that’s right and probably make it snappier and visually more exciting. That, I think, is the challenge for the next little while.”

Social media was not previously utilised to organise mass demonstrations in the protests against the third runway at Heathrow, “we wouldn’t have done [it] with the third runway because interest wouldn’t have been relevant to mobilise enough people.” But nevertheless for possible future mobilisation, social media “in that sense, would make it easier,” although “I would still [need] to do the emailing around” in order to disseminate details to those without access to social media.

8.5.3 Ian Westmoreland, Transition Heathrow

Ian Westmoreland has discussed numerous benefits of incorporating social media within Transition Heathrow's grassroots campaign against airport expansion and to promote community cohesion and environmental sustainability. It has also highlighted few costs with social media and so the future of the social media campaign is simple; to continue with its current level of social media operation and "I don't think I would [change anything about its social media campaign]":

"It's never going to replace the offline campaign. We haven't talked about doing more things with social media but essentially I can see it remaining very similar to what it is at the moment."

Similarly, it will continue to forge a beneficial working relationship with the media, a relationship which it currently relies heavily upon. As well as continuing to utilise social media to publicise events related to their campaign and to mobilise local support for their cause.

8.6 Conclusions

The extent of the incorporation of social media is similar throughout all of the three group's campaigns. All integrate social media within varying offline and online repertoires and all prefer the utilisation of Twitter to Facebook because of its ease of use, its ability to spread information across numerous social networks and the interaction opportunities and possibilities it provides. However, there are differing extents of social media use within this incorporation. For instance, Airport Watch prefers to be a one-way channel of information; HACAN Clearskies actively interacts with journalists and MPs in particular and Transition Heathrow uses social media to publicise their own campaign and link with other campaigns.

The benefits of incorporating social media are vast and both platforms of Twitter and Facebook present different opportunities for the three groups. Facebook, certainly for Airport Watch, consists of more high quality followers who have chosen to 'like' the Airport Watch Facebook page because they are genuinely interested. Whilst for Transition Heathrow it provides their members and supporters with an opportunity to post under their own personal accounts, creating a volume of traffic. Twitter, for all groups, have numerous benefits and are

more relevant for each of the campaigns because of its ability to reach vast numbers of people instantly and its perception as being more of a campaign tool than Facebook.

The problems of incorporating social media are smaller in number but there are still issues which the campaign groups discuss. The disadvantages vary between groups with Airport Watch citing social media's ephemeral nature and difficulty with operating Facebook.

Similarly, HACAN Clearskies contends that Facebook has been problematic for their campaign as the Facebook group has become more of a self-help network which was not its original intention. Additionally, there are problems with HACAN Clearskies' membership base being social media reluctant and in a sense holding their social media campaign back.

But Transition Heathrow poses a different set of problems with social media altogether. The main issue for them is a constantly changing network of people living on the Grow Heathrow site which do not provide continuity.

The future role of social media, overall, envisages social media playing a larger role in their campaigns but not at the expense of other offline or online repertoires. But generally, there is an understanding that social media requires better utilisation from Airport Watch in respect to interacting with others and becoming more proactive in following journalists and MPs on Twitter. For HACAN Clearskies organising more events and increasing the utilisation of a Facebook page appears to be on their future agenda whilst Transition Heathrow's campaign will remain very similar to what it is currently.

Chapter 9

Social Media and Campaigning – Incorporation, Utilisation and Issues

9.1 Introduction

The characteristics of the social media pages of each of the three groups (see Chapter 6) and the utilisation of social media (see Chapters 7 & 8) all provide an indication of the opportunities and challenges these existing groups face after the incorporation of social media into their campaigns against airport expansion at Heathrow. This is an important consideration because new forms of social media are creating new forms of protest space which can thus have implications for the operation of social media and consequently for future protest. The interaction patterns of these campaign groups are shown through social network analysis and illustrate what the incorporation of social media has meant for the type of user each group interacts with. This informs the current direction of protest which can, in turn, show the implications of social media for future protest. This is important because it provides campaign groups with an informed decision on the opportunities and challenges of incorporating social media into protest campaigns. The purpose of this chapter is to draw the findings together and discuss them as well as to summarise them in relation to the literature and research questions proposed in Chapter 5. Section 9.2 will focus on the research question related to the extent of social media incorporation for objective four. Section 9.3 will address the research questions associated with objective three on utilisation and Section 9.4 will discuss the latter part of the research question associated with objective four related to the challenges and opportunities of incorporation of social media into existing campaigns. Section 9.5 provides the concluding remarks to the chapter.

9.2 Incorporation

This section presents the incorporation of social media into the existing campaign groups repertoires against airport expansion at Heathrow. It is associated with how social media fits within their campaigns, the extent of coordination of both Twitter and Facebook and the relationship between these platforms and other offline methods which are utilised in their campaigns.

The methods utilised in this research demonstrate the various levels of incorporation of social media into existing campaigns against airport expansion at Heathrow. NodeXL and Twitonomy are able to initially extract both Facebook and Twitter data respectively and highlight key similarities and differences between the three groups in terms of interaction flows from themselves to others but also within groups or pages they have created. This is important because it provides the initial reporting of social media characteristics and highlights interesting findings which are able to be uncovered in more detail through the questioning of the social media coordinators of each group. The time series analysis produces a more in-depth analysis of social media incorporation within each group, through cross-correlation analysis. This focuses on the relationship between the social media platforms themselves and the extent to which they are linked to one another in a coordinated approach to information production and dissemination since both social media platforms have been identified as possessing different characteristics and uses (Chapter 6, Section 6.5).

Additionally, it is through the interview process where the extent of incorporation can be uncovered in detail. The social media coordinators of each group were interviewed because they have either created their respective groups social media pages or have been in post for a number of years and so are aware of what social media offers, what challenges it brings and how social media is incorporated within their wider campaign repertoires; with specific reference to other online and offline tactics.

The use of NodeXL and Twitonomy as primary methods to both extract and analyse social media data uncovers interaction patterns, information dissemination, user positionality and tie strength. These are able to, in part, provide a background as to where social media fits, and is incorporated into their campaigns. The previous section detailed that Airport Watch and HACAN Clearskies are reasonably particular in terms of who they interact with on Twitter whilst Transition Heathrow demonstrates a more varied interaction network. It is generally accepted by all three groups that social media has provided them with an opportunity to

connect to a more diverse range of individuals (Theocharis, 2013). But the interaction patterns alone are able to suggest the extent of social media incorporation and have provided questions which were answered in the semi-structured interviews. Through linking with the media both Airport Watch and HACAN Clearskies have enabled the rapid proliferation of media articles by the social coordinators of each group as they publish articles by these media pages (Murthy, 2011), or seek to promote their own campaign. Overall, NodeXL and Twitonomy have provided the background information to the inner workings of each campaign group and have picked up on certain interesting interactions which required further explanation.

The time series analysis suggests that between the two social media platforms of Twitter and Facebook, there is coordination between them and each group has incorporated them together within their social media campaign. They have become inextricably linked and indicate that the publication of their campaign on social media has become so intertwined that neither social media platform leads or lags the other; indicating coordination between them. Despite the time series showing that Twitter was utilised more than Facebook, the cross-correlation analysis shows their relationship with one another demonstrating the interchangeable link between the publication of tweets and posts. Social media was identified, in the previous section, as being a channel of information production and despite the coordinated approach between the two platforms, it does not increase the likelihood of on-street demonstrations and does not necessarily harness widespread collective action, as both Valenzuela et al (2014) and Gerbaudo (2012) respectively suggest. On the other hand, if, at some stage, social media were to be utilised as a tool to promote demonstration and on-street campaign, then having a coordinated approach between them, albeit a difference in terms of who it reaches, can help to recruit different participants and may enhance mobilisation (Barbera and Metzger, 2013; Bastos et al, 2015; Grytsenko and Walker, 2013). There are also other factors which influence the decision not to utilise social media as an outward action (Cammaerts, 2015) after incorporation. These will be discussed in Section 9.5. There are comparisons which can be drawn between revolutions in the Middle East and the anti-airport expansion campaign in terms of the importance of social media for campaigns which existed long before its use as a protest tool (Papacharissi & de Fatima Oliveira, 2011; Tufekci & Wilson, 2012).

The true extent of social media incorporation within the three existing campaigns against airport expansion at Heathrow can be determined through the interviews with all groups. They highlighted how social media is incorporated within a broader campaigning repertoire

and the extent to which it is integrated with other online and offline repertoires. This confirms the explanation by Rucht (2013) who stated that activism has shifted towards a strategy of combining offline and online activism. But despite social media platforms for each group being linked to one another, their use remains different. As Facebook is explained as being used in the planning stages of protest (Poell, 2013) and Twitter articulating protest on the street (Theocharis, 2013), there also exists separate roles for both platforms when disseminating information. As a result, on-street protest events have not been organised using social media, in contrast to other protest organisations, because of a proportion of Airport Watch and HACAN Clearskies' members lack a social media account and as a result email dissemination 'has made the biggest change' (Stewart interview, July 2015). This integration of both social media and email use has become important because they are able to reach different audiences (Bachmann, 2014). Similarly there is also critical importance placed on the websites of each group. Whilst they are used to spread information (Della Porta and Mosca, 2009), they are also heavily incorporated with social media as social media provides the comment function that their websites lack. This means that information produced on the websites is recycled and the important segments can be put across on Twitter, in particular. Moreover, one of the main aims of incorporating social media was cited as its ability to engage with more people than would usually visit their websites.

It was John Stewart of HACAN Clearskies who identified that the presence of other online and offline repertoires can make incorporating social media challenging as they have to appeal to all members, supporters and followers. The continued use of other online and offline methods by supporters and followers means that social media would not replace other repertoires, a point contended by Van Laer and Van Aelst (2010) and as a result activism does not have to remain either online or offline (Bachmann, 2014). Instead it is incorporated to encompass both. All groups agree that social media has become a useful tactic in their repertoire (Harlow and Harp, 2012) but despite the incorporation of both offline and online repertoires, they remain distinct and serve different functions for different audiences. But, as Juris (2012) rightly explains, although social media has not replaced them it has helped to bring new ideas into their campaign and new opportunities; as well as challenges.

The interviews suggested social media acts as a one way channel of information which conforms to the concept of citizen environmental journalists coined by Cox and Pezzullo (2016). These are defined as playing important roles in producing related news stories and are making the most of internet enabled technologies which redraw the balance of news reporting

between journalists and the general public. More specifically for HACAN Clearskies, it is Facebook and not Twitter which is more useful to share information with other campaign groups across Europe. This is because Facebook is seen from their perspective as enabling the opportunity to interact with supporters whilst Twitter provides the ability to interact with key journalists and politicians (Cottle, 2008). Although Facebook provides the opportunity for HACAN Clearskies to interact with other campaign groups across Europe, particularly France and Germany, Twitter enables the engagement with international media organisations not just from across Europe but from across North America also. Similarly, local groups tend to interact with other local organisations where an active campaign exists against the proposed expansion of Heathrow airport (Rootes, 2008) and this is true for Transition Heathrow. Although as well as affiliating to other national organisations (Saunders, 2008), they are increasingly engaging with other international organisations; particularly ones with an environmental focus. This has no doubt been aided by the incorporation of social media into their campaign as all environmental groups are able to campaign on one platform, sharing information with others who may be interested both nationally and internationally.

These campaign groups have allowed individuals and organisations to influence government decision making and represent viewpoints of people who are dissatisfied with noise and future expansion at Heathrow. They are also able to focus on specialised issues and they play an important part in the democratic process by offering opportunities and a political voice to people and organisations (Shoveller and Nathoo, 2002). Overall, as Baggott (1995: 2) suggests: ‘there should be a large number of pressure groups in society’ as they strengthen the democratic process by giving a voice to a variety of people and increase the information and expertise available to the government to assist in policy delivery (Coxall, 2015). Social media has aided this voice and has enabled the creation of many new protest groups who campaign because of the opportunities social media offers them. These groups have proliferated in number and campaign on various levels over a multitude of issues; but there are still those campaign groups which existed before the advent of social media as a tool for protest. Thus the incorporation of these social media tools into existing protest campaigns has increasingly created both opportunities and challenges which is important in understanding the implications for future protest.

9.3 Utilisation

This section illustrates the use of social media from the interaction patterns of each social network on Twitter. It determines whether possessing reciprocal relationships with other users is a prerequisite for interaction and assesses how campaign groups prepare for and respond to particular events in time. It also uncovers the extent of weak and latent ties which inform the spread of information within and between social networks.

NodeXL provided in-depth analyses of each individual campaign group's interaction patterns with users in their respective Twitter and Facebook networks. There were striking similarities between the interaction patterns of Airport Watch and HACAN Clearskies in their Twitter networks. Whilst Transition Heathrow's Twitter networks were more diverse in terms of whom they interacted with; which adheres to their broader environmental campaign. Twitter was able to provide a more complete sense of the characteristics and type of user interacted with whilst Facebook demonstrated that each group also engages with numerous individuals through their use of groups and pages.

Initially, the concept of reciprocity was explored as a broader characteristic of the social networks on Twitter for each group. Pelaprat and Brown (2012) argue that users on social media seek reciprocal actions with other users for interaction purposes. But the findings from Chapter 6, Section 6.5 demonstrate that within the interaction networks (mentions, retweets, replies to) reciprocity is not a driving force behind the interaction between people, which affirms Soboleva et al (2015) belief that there is no requirement for reciprocity on social media. Although the three groups may typically respond more to those with a reciprocal relationship, it is not a prerequisite of communication. Similarly, all the networks show that interaction is limited to a few users despite the groups being followed and following larger numbers of people (Huberman et al, 2009). On the other hand, HACAN Clearskies possess almost double the number of reciprocal users than Airport Watch and Transition Heathrow and this suggests that there may be a larger number of users who are interested in HACAN Clearskies' campaign, as reciprocity also signals mutual interest (Lomborg, 2014).

It is noticeable that social media has enabled all groups to interact on a much larger scale with other groups and individuals globally. The variety of users shown in Chapter 6, Section 6.5 highlights that these groups form affiliations and other collaborative relationships with like-minded others and social media has been the tool to help them achieve this

internationally. The interaction patterns on Twitter for the three anti-airport expansion groups are used to lobby politicians and communicate with those political individuals who back their campaign to create a groundswell of opinion to influence government decision making. Moreover, the interaction with environmentalists forms another key characteristic and has enabled grassroots groups such as Transition Heathrow to interact on a much larger scale (Shirky, 2011) and has created a more level playing field (Gladwell, 2010) with larger groups both nationally and internationally. Therefore, grassroots groups play far more than a 'discovery role' (Rootes 1999: 5), and have become networked with others globally and from a range of different environmental backgrounds: nature, fracking, climate change, food waste, noise pollution and wildlife conservation amongst others. This ultimately means that Transition Heathrow's message is able to reach through these channels of communication to numerous users across various campaigns.

For Airport Watch and HACAN Clearskies social media has also become a means to specifically target who they communicate with, given that all the groups have users which they mention, retweet or reply to most often on Twitter. The introduction of social media has meant that these groups are able to link with different users to acquire information, thus breaking down the barriers between national, regional and local campaign groups and their associated individuals. Therefore, this is why the users which Airport Watch interact with fluctuate between organisations and individual users, something which is an advantage of utilising social media by allowing interaction opportunities between different types of user (Tsatsou, 2016). Ultimately, they mention articles of interest to others and promote themselves. Both Airport Watch and HACAN Clearskies demonstrate different patterns in their mentions networks. Notably, they do not mention as many users as Transition Heathrow and prefer to interact with a smaller number of users in total. This is surprising given that national environmental groups, in particular, tend to form the most important collaborative relationships with other groups (Saunders, 2008), have a larger membership base and interact, particularly offline, with a network of other national and local environmental groups (Rootes, 1999).

Comparatively all groups mention groups from environmental and broader backgrounds. This, in particular, has led to the internationalisation of environmental issues by linking environmental groups with similar organisations overseas (Rawcliffe, 1998) as they look to broaden their horizons to include others (Carter, 2007); particularly when there is a very specific focus. The use of NodeXL has also uncovered that both groups mention media

organisations and key media personnel often. This confirms two arguments. Firstly, they are particularly important channels of communication for national, regional and local environmental groups whilst news coverage is seen as imperative for the mobilisation of groups and the recruiting of new members (Corbett, 2006). Secondly, the advent and incorporation of social media has not changed the campaign group's willingness to seek media attention (Cottle 2008; Cox and Schwarze, 2015), as they had used them for publicity and gaining public and political attention (Cox and Schwarze, 2015). Instead it has made their interaction with them visible by aiming a part of their social media campaign to the media and key journalists. Despite social media becoming a tool for increased interaction opportunities, the media still play a key role in publicising their campaigns, help them gain attention and highlight articles of interest to their own followers. Moreover, the concept of citizen journalism (Cox and Pezzullo, 2016) through the introduction and incorporation of social media into environmental group's campaigns has enabled these groups to take control of their own news networks. Social media has thus completely revolutionised the ways in which news can be produced and consumed by groups and individuals.

The groups retweet to endorse other similar groups. Their retweet networks, whilst endorsing similar users, possess users across large geographic distances and so this interaction does not just occur within a close geographic proximity, as Kwak et al (2010) suggests, but rather also occurs on a global scale. They also reply to correct what is being said by other individuals or campaigns. On the other hand for Transition Heathrow, it has enabled communication with a variety of users and despite social media not changing the principle of interacting with other grassroots groups and those experiencing similar problems (Saunders, 2008); it has helped to magnify the problems and assists groups to relate to each other on a much larger scale.

Although national, regional and local campaign groups may interact with one another offline (Rootes, 1999); frequent interaction occurs through the medium of social media enabling campaign groups to control their own news network and become citizen journalists (Murthy, 2011; Cox and Pezzullo, 2016) in their own right by connecting with diverse individuals and sharing information and knowledge with other campaigns. Information in these social networks is not just produced but it is consumed and countered, to an extent, by recycling important media articles and providing a different voice against the case for expanding Heathrow airport. The fact that these groups all link with key media organisations and personnel on Twitter particularly shows the usefulness of the media in covering in-depth issues which is difficult to replace (Murthy, 2011). Although, there still remains inherent

differences between the two social media platforms investigated in terms of their usage, it has enabled different forms of communication with different users. Overall what they have been able to do is take control of their own news network. The Facebook networks also provide different perspectives. The Facebook page of Airport Watch is not necessarily utilised for interaction purposes but as a one-way channel of publicising and disseminating information whereas the Facebook groups for HACAN Clearskies and Transition Heathrow enable greater discussion and interaction between the members of the groups.

These interaction characteristics are able to demonstrate a facet of how social media is used in these campaigns against airport expansion at Heathrow by exploring which users they look to engage with to spread their message through their social networks on social media. This conforms to what Segerberg and Bennett (2011) describe as social media becoming a networking agent for protest ecologies by which groups utilise it as an interaction mechanism but also as a tool to organise themselves. The three campaign groups do not necessarily possess a loose (Gladwell, 2010), leaderless (Castells, 2012) and unstructured (Earl and Kimport, 2011) organisational structure. Instead, networks representing each campaign group can be seen as structured as there are identifiable leaders of each network and these control what is published and the distribution of information. These are key individuals who have pivotal roles in the dissemination of the message (Gerbaudo, 2012) and certainly where the Facebook group networks are concerned, the leaders have not been appointed. This confirms the argument put forward by Smith (2016) that leaders are able to act without formal authority and have become increasingly emergent. Moreover, the leaders have been automatically appointed because they have become the communicators of each specific campaign (Gerbaudo, 2012).

The interaction patterns sought through NodeXL confirm Granovetter's (1973) contribution to social network theory in the form of weak ties which when related to social media shows that different users are able to provide different sources of information. These are the strength of relationships between people and are defined as an individual's acquaintances where limited interaction takes place. As a result, social networks particularly on social media, are constructed of many weak ties providing a source of information (Granovetter, 1973). Moreover, they are able to link different communities of people together from across the world. This ability to interact and connect with others, as Gladwell (2010) correctly states, is due to the globalisation of social media and its ability to facilitate these weak ties between users. This is not to suggest that social media does not also exhibit strong ties between users,

because there are many users which all groups interact with frequently; further cementing strong ties. The weak ties, as shown in Chapter 6, Section 6.5 form an essential pool of connections and it is Twitter which possesses them in large numbers because of the interaction opportunities available to each group. Thus, as Tufecki (2010) suggests, the weak ties which exist are important in the spread of information and the ability to access new information. If these groups continue to utilise social media to disseminate information then weak ties are seen as the most beneficial way to undertake this (ibid) as they rarely lead to sustained or successful mobilisation offline (Gladwell, 2010).

There are also those latent ties which are ‘technically possible but not yet activated socially’ (Haythornthwaite 2005: 137). They can only be activated (converted from latent ties to weak ties) ‘by some sort of social interaction between members’ (ibid). The numbers of latent ties for each group’s social media networks shows that Transition Heathrow has a greater number of latent ties available to it. According to Heckscher (2015) this would imply that Transition Heathrow’s Twitter and Facebook networks are thus made up of users who would be more likely to help the campaign group when asked. These users who form the latent ties obviously have an awareness of Transition Heathrow’s campaign, are learning more about other users and are using latent ties on social media to learn about what others have to say through following (on Twitter) or by joining a Facebook group or page (Ellison et al, 2011). The latent tie has not yet been ‘activated’ (Haythornthwaite 2005: 137) because an interaction has not occurred.¹³ There are many latent tie opportunities which exist for these campaign groups on social media because ‘they represent a low-involvement, low-effort channel to maintain these bonds’ (Tuten and Solomon 2015: 126). Furthermore, social media has enabled an increase in interaction possibilities and although Zhang and Gearhart (2014) suggest that social media is primarily used to seek further information about people which users have some offline connection with, the globalisation potential of social media means that there will evidently be some users which the three groups have never engaged with offline.

The time series analysis provides a further analysis of the use of social media and how it is utilised to respond to key events related to their campaigns; in this instance it was the publication of the Davies Commission interim report. Initially, it uncovered that Twitter is utilised more than Facebook for all three campaign groups. This demonstrates where their social media campaigns are focused, more on Twitter than Facebook. Many factors were

¹³ Interaction in this instance being to follow Transition Heathrow on Twitter or join their Facebook group.

identified through interviews with the social media coordinators of each group to uncover the reasons behind this finding and the opportunities provided by Twitter over Facebook (see Section 9.4).

The use of social media as an outward action (Cammaerts, 2015) highlighted that the mobilisation of people on the street occurred in reaction to a stimuli; usually for engaged people to demand accountability from policymakers (Boulding, 2014). The intervention analysis illustrated both similarities and differences between the three campaign groups in how they responded to the publication of the Davies Commission interim report. By analysing the impact of the interim report on the possible increase in the number of tweets and posts, campaign groups use this data to inform their responsiveness to future events in time related to their campaigns. The reaction to events using social media channels to broadcast information, such as the one analysed, enabled their supporters, followers and general public to keep up to date with the interim report (Smith, 2014). Social media has thus made the real-time reporting of events much easier and it is able to be broadcast to large audiences of people (Tierney, 2013). The ways in which campaign groups respond to such events vary in terms of how sustained their approach is, whether before, during or after the event or a combination of all three. Twitter was the social media platform which enabled the most significant impact in the number of tweets and posts over time for all three campaign groups. This is in accord with Beaumont (2009) who also found Twitter's importance in the G20 summit protests in London. Twitter enabled conversations between people a week before the event as they were easy to follow. Similarly, the use of Twitter increased a week before the Davies Commission interim report for Transition Heathrow but there was also more variety in the reporting of the event between the other two groups. Airport Watch's tactics were to report on the day and for the week after whilst HACAN Clearskies preferred a more sustained approach which involved reporting from a week before to a week after the interim report publication. This demonstrated that Twitter was utilised for the account of the protest (Poell, 2013), before, during and after the event whilst Facebook was used differently. Whilst Poell (2013) explained that Facebook played an important role in the planning stages of protest, the intervention analysis for the campaign groups suggested a different response. Facebook was instead used as an instant tool to broadcast the breaking news of the Davies Commission interim report; whether on the day or a week after. Therefore, the use of these social media tools not just provides instant information (Veglis, 2012) but allows campaign groups to publicise detailed build-up and more considered reaction.

The semi-structured interviews with the social media coordinators of each group explained that social media has been used to interact with larger numbers of people that it did not previously engage with. Social media has thus been able to spread information far more quickly for these campaign groups enabling information to reach places which it may previously have not reached (Lopes, 2014). On the other hand, these groups have proved to be conventional in their campaigning repertoires due to the fact that they possess membership bases, largely utilise social media for informational purposes and still rely upon other offline and online methods to reach different audiences. Whilst Cox and Schwarze (2015) explain that environmental groups have utilised the media to attract attention for their own campaigns, the authors argue that the groups still lack channels for proposing their demands to government decision makers. However, social media has enabled these campaign groups to narrow the gap between themselves and decision makers (Tsatsou, 2016). This is especially true of the three groups studied. They interact with a wide network of politicians mainly those who support their campaigns (such as Zac Goldsmith and John McDonnell). The interaction and lobbying of politicians remain 'key areas for us' (Stewart interview, July 2015). However, for these groups the interaction with these individuals has not altered with the advent and incorporation of social media into their campaigns but social media has made it easier to engage with them more frequently. This is one of social media's most salient attributes - its ability to place the interaction and engagement with key figures into the public sphere as campaigners look for important individuals to tweet (Lopes, 2014).

The semi-structured interviews also uncovered that whilst the social media platforms of Twitter and Facebook were used for the spread of information, they were still utilised for different means. The research into the coordination of social media platforms varies differently, in some instances a combination of platforms were important (Papacharissi & de Fatima Oliveira, 2011; Gerbaudo, 2012; Tufekci & Wilson, 2012) whilst in others, Facebook was used more than Twitter or vice versa (Grytsenko and Walker, 2013). The difference in the tactical use of social media for these campaigns illustrates its use to mobilise people and that it varies on a case-by-case basis. This research shows that despite social media being used as an inward action (Cammaerts, 2015), its use still varies. Unlike other campaigns across Europe, Twitter was used significantly more than Facebook which was attributed to its ease of use and ability to reach far more people. Twitter provides a means of knowing who is being engaged with and this means that groups know which messages are reaching people. More generally, both social media platforms are seen as extensions to their websites and

provide the comment function that the websites are lacking. But their function still differs. Twitter is used for immediate news and reaction and to interact with a wider variety of users. Facebook pages are used to provide more considered reaction to articles produced on the website and Facebook groups are able to promote in-depth discussion. This is in contrast to the argument put forward by Lucie-Smith (2015) who suggested that Facebook is more useful than Twitter because it is built around a network of friends. This research suggests that Twitter is more beneficial because it offers several distinct opportunities for their campaigns (discussed in Section 9.4) and provides a means of wider interaction with varying others with whom weak and latent ties are formed. On the other hand, Facebook is viewed as being cumbersome.

Lovejoy and Saxton (2012) explain that by these three anti-airport expansion groups utilising social media to share information, the building blocks for more complex functions such as the ability to mobilise are in place, but a largely social media reluctant membership means that, for Airport Watch and HACAN Clearskies in particular, they are not able to organise protest. This adheres to Cammaerts (2015) description of social media as an inward action. ‘This is both interesting and frustrating because the HACAN members of which there are several thousand, still tend to operate by reading the newspaper, if there’s an event we have to send an email out to them to tell them, they wouldn’t think, although many of them now have Facebook, of how events can be organised on Facebook – they wouldn’t think of looking there. So for our members actually it wouldn’t work’ (Stewart interview, July 2015). More specifically, as HACAN Clearskies has to adhere to the position of its members, who form a part of its campaign direction and decision making process and thus cannot utilise social media for protest creation purposes. Whilst the regional airport expansion group studied use social media ‘largely for information, opinion and reaction’ (Stewart interview, July 2015), the national umbrella airport group (Airport Watch) utilise social media as a countering mechanism and to publicise information. The grassroots group studied use social media to promote their own campaign, events and link with other relevant campaign groups.

Saunders (2008) highlighted the role campaign groups play in information dissemination. She explained that regional groups are seen as being brokers and information providers rather than collaborators. However, HACAN Clearskies, as a regional campaign group, has become more involved in the overall campaign against airport expansion because of its management

structure¹⁴ and the fact that Airport Watch does not actively engage with people on social media. HACAN Clearskies also has a strong relationship with other protest campaigns throughout Europe and links together with them mainly through Facebook. The data for grassroots organisations, such as Transition Heathrow, show that they are more likely to engage on social media than the other groups as previous barriers associated with limited resources restricted them otherwise (ibid). Moreover research into how knowledge is gathered outside of the realms of the internet show that grassroots groups pass information through other grassroots networks (ibid). However this transfer of information has become different through the medium of social media. Whereas grassroots organisations in the 1990s were linking with other like-minded grassroots groups nationally (Saunders, 2007; Carter, 2007) the process of gathering knowledge is undertaken through communicating with networks of varied users and groups across a broad range of campaigns with Transition Heathrow linking to other grassroots campaigns both nationally and internationally, and on a much larger scale.

Transition Heathrow have also become more reliant upon local media and have ‘good relations with a few journalists but only a small handful’ (Westmoreland interview, July 2015) whilst, in their opinion, the national media tend to focus more upon high profile, national issues of interest. Therefore, because of Transition Heathrow’s campaigning remit and position of influence within the local community of Sipson, the local media are incredibly useful to their campaign. The use of new media provides the opportunity to visualise the communication patterns of grassroots groups and whilst their underground channels of communication (Anderson, 2001) may still exist because of a lack of interaction with the national media, there is not a heavy reliance upon them as social media has enabled the instant publication of information, the promotion of their campaign and more importantly the ability to reach a lot of people.

The next stage in this section focuses on the issues of social media incorporation by the social networks of the three anti-airport expansion groups. This incorporation of social media has enabled a rapid dissemination of information across various social networks and to numerous audiences. Whereas certain campaign groups have received high profile attention for their use of social media in creating and organising violent in situ protest, there are those campaigns who receive less attention in trying to influence political decision making and who prefer to

¹⁴ John Stewart is chair of both HACAN Clearskies and Airport Watch.

utilise more formal channels of communication and dissemination through attracting media attention. It has also led to a visualisation of their communication patterns and has revealed that not all campaign groups use social media to incite mass public demonstration. Instead, their campaigning focuses on the dissemination of information and lobbying (Carter, 2007) much as it did without social media. And so, even with social media now firmly embedded into their campaigns, groups are still bound by conventional forms of pressure (ibid).

9.4 Issues

This section highlights the issues, which include the challenges and opportunities, that incorporating social media brings to the campaign groups. It discusses social media's ephemeral nature, its operation, the reluctance of group memberships to use social media as well as its ability to rapidly disseminate information across vast distances instantly.

NodeXL and Twitonomy have provided the opportunity to highlight that social media has enabled an increased awareness of who each group are interacting with. Moreover, there is a general awareness for HACAN Clearskies and Airport Watch campaign on Twitter about which users should be followed and which are most relevant to their campaign. They target their campaign to those who may be interested in what they have to say and the speed in the spreading of information (Nissen, 2015) aids this as these groups are able to provide virtually instantaneous updates. Similarly, the interaction patterns show who they are looking to aim their campaign towards and what they seek to use social media for. Whilst Chapter 3, Section 3.6.1.1 demonstrated that a similarity between the utilisation of social media platforms is important for campaigning, it was Lucie-Smith (2015) and Enli and Skogerbo (2013) who explained that Facebook was far more useful for protest campaigns because its networks are based around friends rather than followers. However, this research shows that incorporating Twitter into existing campaigns brings the most opportunities and there is a clear preference for Twitter over Facebook. For these existing anti-airport expansion campaigns, which have campaigned for a number of years and want to utilise social media to spread information quickly, to a variety of audiences transcending friendship networks, Twitter is able to accomplish this because of its ability to harness weak ties (Granovetter, 1973).

The opportunities which social media provides for existing campaign groups are vast in number. Firstly, its incorporation as either an inward or outward action (Cammaerts, 2015),

or combination of both, have advantages for existing campaign groups. For the groups researched in this thesis their utilisation of social media as an inward action enables them to rapidly disseminate information across the social web. Secondly, it has meant that these groups are able to campaign without the monetary costs associated with offline methods and are able to reach a larger audience on social media as this is something which incorporating social media can provide (Shirky, 2011). Social media data, analysed through time series analysis, found that there is an opportunity in providing a platform for groups to respond to certain key events related to their campaign, and disseminate their response to a large audience on social media (Beaumont, 2009). Social media provided a platform in which these campaign groups can promote their voice towards an event, or as Murthy (2011) explains, it has become a microphone to a large number of people and provided an example of how social media is used in anticipation of government decision making (Poell and Van Dijck, 2015; Mekouar, 2016). It also showed how groups prepared for and responded to the interim report and the frequency in which they did things. Twitter enabled a lasting impression before, during and after the event whereas Facebook was useful in promoting the findings of the report on the day, without prior build-up. It has amplified their voices (Bridger, 2009) because of the ease in which communication between people can occur. Face-to face communication between key stakeholders of each campaign group was still significant which, as Fuchs (2015) rightly contends, helps to spread the word about events on social media. The important prolonged opportunity Twitter provided in response to the Davies Commission interim report was that campaign groups were able to direct their responses to media outlets, individual journalists, similar groups and politicians; all within the confines of one social media platform. This is the distinct advantage which Twitter holds above Facebook. Social media has modernised their campaigns and provided them with vast interaction potential (Shirky, 2011). Moreover, responding to key publications, government related or otherwise has the potential to create a huge groundswell of opinion from other groups, interested individuals and affected residents and this is where Twitter, more so than Facebook, can seek to spread information about the event quickly through the use of weak ties both within and between social networks on social media (Gladwell, 2010; Swain, 2010).

The interviews uncovered certain challenges of social media incorporation for existing campaign groups. These groups because of a strong offline presence, campaigning experience and recognition within local communities, possess different challenges when incorporating social media because they have different viewpoints and opinions to take into account. The

main challenge existing campaign groups face when incorporating social media, as explained by John Stewart of HACAN Clearskies, is associated with membership bases of conventional protest organisations. The ability for followers, supporters and members of existing campaign groups to embrace social media as a tactical repertoire for their campaign is important. For HACAN Clearskies, a social media reluctant membership base exists which prohibits its campaign from moving forward on social media and organising demonstration or future mobilisation because of their members preferring email and leaflet dissemination. This means that those campaigns with social media reluctant memberships can only really ever utilise social media as an informational platform, rather than to mobilise people because ultimately they are answerable to their members and supporters. Their reluctance stems from a lack of understanding about social media's potential as an additional repertoire for campaign groups, the unequal nature of internet access (Van Laer and Van Aelst, 2010) and conversation is limited to those who have a social media profile (Tierney, 2013).

Social media has dominated the recent protest landscape, has created new spaces (Johnston, 2016) and has become more popular with campaign groups given that numerous anti-airport expansion groups have formed purely through social media channels since 2015. As a result, the challenge for existing campaign groups is to incorporate social media within a wider protesting repertoire network of those tools offline but also online. The challenge for existing groups is to retain an influence offline whilst appealing to those that may have moved to utilise more contemporary tools online. This is important for these groups because they utilise social media for information dissemination purposes and so face to face trust building offline is still hugely important (Cammaerts, 2015). These online spaces have contributed to existing spaces on the ground to formulate a more inclusive campaigning repertoire; one which incorporates many different facets and as Rucht (2013) rightly suggests, and what all three groups demonstrate, is that a strategy of combined offline and online activism is beneficial for those existing campaign groups in order to reach different audiences (Bachmann, 2014).

Additionally, there are challenges with the operation of Airport Watch's social media pages, in particular, given that only one person not just operates Airport Watch's social media campaign but its campaign in general. Klemanski et al (2016) explained that there are many different components which constitute a campaign and the recruiting of more volunteers can aid the dissemination of social media profiles. But currently Sarah Clayton only spends approximately an hour a day on Airport Watch's campaign and in this time she has to write both website and social media material. This challenge was recognised by John Stewart of

HACAN Clearskies who appointed two additional members of staff to assist with the social media campaign of HACAN Clearskies. Consequently the anti-airport expansion groups of HACAN Clearskies and Transition Heathrow have dedicated teams of social media personnel who operate and manage both social media and website content.

The other issue of incorporating social media into existing campaigns is associated with social media's ephemeral nature. Despite social media increasing the speed of both producing and consuming information, it is quick to lose focus as information is very much of the moment (Solomon, 2011). This was a point supported by Airport Watch as from their perspective, and for their campaign in particular, if information is not seen within a couple of hours after production it is lost as from their experience people are unlikely to engage with their post days or weeks after. But in fact the ephemerality of connections, through weak ties, on social media to some extent determines the information flow between people (Muller, 2006; Chin, 2014). Therefore the challenge for existing campaign groups, which HACAN Clearskies tries to do, is assess when its supporters and followers are most likely to be online and produce targeted messages at this stage, therefore maximising the potential reach of their social media campaign to others. However, another key challenge of social media faced by one existing group in particular, Airport Watch, is the utilisation of social media as purely a means of producing and disseminating information. However, this is a shortcoming of the group and not of the social media platforms themselves as currently Airport Watch is not setting out to interact with others on social media. Bennett and Segerberg (2013) explain that social media is a networking agent and that communication and interaction are important factors on social media to allow information to flow within and between networks (Gonzalez-Bailon and Wang, 2016). This is something which Airport Watch does not actively set out to do as social media is merely viewed as an extension to its website.

Despite Al Sayyad and Guvenc (2013) explaining that social media has lead to increased offline mobilisation, this research suggests this not to be the case. Moreover, online involvement on social media has not shaped offline protesting events, contrary to the findings of Enjolras et al (2013); Steinert-Threlkeld et al (2015); Skoric et al (2011) and Fuchs (2015) but has rather shaped the reporting of offline events; again providing another means of information publication. This means that social media has not been viewed as a communicative tool in isolation, similar to what Della Porta (2013) suggests, as there are other means available existing protest groups who have a wide range of campaigning repertoires. Instead, social media has become an extension of each group's website, serving

as the primary way to comment on longer, more in-depth articles produced on the website which also contributes to their campaigns offline. Similarly, these inward actions have enabled groups to consume and produce news, as Murthy (2011) suggests and they have become citizen journalists in their own right (Cox and Pezzullo, 2016), raising awareness of their campaign by not just disseminating information but linking with other similar groups both nationally and internationally (Cammaerts, 2015).

9.5 Conclusions

The need for people on social media to seek reciprocal actions with one another (Pelaprat and Brown, 2012) was refuted as the uncovering of social media characteristics found that although the three groups did respond to those who they possessed a reciprocal relationship with on Twitter, it was not a prerequisite of communication. The interaction patterns on social media also uncovered more information about their Twitter networks. The Facebook pages and groups detailed interaction within a closed setting and whilst the power relationships, calculated by NodeXL, proved to be interesting as it suggested that Airport Watch and Transition Heathrow had control of their Facebook networks, whilst HACAN Clearskies did not. This illustrated that it no longer has sole control over what is posted and where within the group it reaches. The interviews illustrated that the prominent members within HACAN Clearskies' group in particular were self appointed (Smith, 2016) and not asked to take on a bigger role. The Twitter social networks demonstrated variety about who the groups look to interact with and as a result who they focus their campaign towards. Whilst Transition Heathrow is incredibly varied in terms of its interaction pattern encompassing different users to adhere to its broader campaign against environmental change, Airport Watch and HACAN Clearskies are focused and have clear ideas about who they should interact with. The media tend to be interacted with often as they look to promote their campaign and highlight key articles of interest to their followers (Cox and Schwarze, 2015). Each group plays a networking role by which groups utilise social media primarily as an interaction mechanism and organise their campaign in terms of who they choose to interact with (Segeberg and Bennett, 2011). Weak and latent ties were also analysed as for groups wanting to utilise social media for information consumption and production purposes and weak ties are beneficial to do this (Gladwell, 2010). The social networks of each campaign group consisted of many weak and latent tie possibilities and these highlighted that

information could be passed between groups and through the social networks of people who were sporadically interacted with by each of the three groups.

The utilisation of social media to respond to key events varied between social media platforms and between the campaign group's themselves. Whilst social media did enable them to broadcast the findings of the interim report to a much larger audience, it was Twitter in particular which led to a more sustained impact over time before, during and after the publication of the Davies Commission interim report. In contrast Facebook was very much used as an instantaneous tool in response to the report. As a result, Facebook did not have the same impact over time as Twitter. Despite both social media platforms being used as extensions to their websites, it was Twitter which was deemed more useful for their campaigns because of the reach and interaction opportunities available to campaigners. Although Facebook pages and groups were able to produce more considered reaction and in-depth articles. Moreover, social media was utilised as an information platform which enables the groups to consume information and produce and highlight key articles of interest related to their campaigns.

The incorporation of social media analysed where social media fits into their broader campaign against airport expansion. Despite the research uncovering that all groups use social media as an inward method of communication, spreading information, attracting media attention and engaging with different individuals and groups who may be of interest to their campaigns, it also demonstrated that these groups are bound by conventional forms of pressure from membership bases due to an incorporation of social media into a wider campaign repertoire both offline and online. Although it was suggested that email has made the biggest change to their campaigns in terms of sending information in bulk numbers to people. As a result, these new information communication technologies have not replaced traditional offline repertoires (Van Laer and Van Aelst, 2010) but have rather been incorporated into a broad strategy to increase the message reach to different audiences. Moreover, there is coordination and a relationship between the social media platforms of each individual group. This means that Twitter and Facebook are used interchangeably on the same day and they are able to reach different audiences at the same time.

The incorporation of social media into these existing campaigns against airport expansion has brought with it associated issues, challenges and opportunities. The main challenge highlighted in this research, and not picked up on in the literature, is that existing campaign

groups have problems with their existing membership bases when utilising social media. A social media reluctant group of members, supporters and followers means that they can only operate within the confines of what they allow and believe in. Therefore, if social media is not utilised by all members then the groups are restricted as to what social media can be used for. This ultimately has implications on social media being used as an outward action (Cammaerts, 2015) for mobilisation and organising protest. Nevertheless, it is accepted that email has made the biggest change for their membership and not social media. On the other hand there are more opportunities which social media enables including it being able to reach a variety of different users across a large social space and being able to utilise social media as a platform to articulate thoughts, opinion and reaction to key events in time related to their campaigns. Moreover, each group feels like it has reduced the communication gap between themselves and larger organisations and so has created a more level playing field particularly on social media. Crucially what this research also demonstrates is that incorporating social media does not necessarily indicate that it is a prerequisite to mobilisation and it has shaped the reporting of offline events rather than shaping the events themselves.

The final chapter of this research provides concluding remarks, summarises the main findings in relation to the aim, objectives and research questions, addressing the final objective and its associated research question, highlights the contributions to knowledge and also the limitations and areas for future research.

Chapter 10

Conclusions and Recommendations

10.1 Introduction

Campaign groups have enabled people to participate in politics particularly over a high-profile decision to increase airport capacity at Heathrow; one which has been debated for over a decade. These groups have increased in number since 2014, campaigning at different sites where potential expansion would have an impact. This has been enabled by the creation of new information communication technologies (ICTs) which have become an important resource to campaigners.

This concluding chapter draws together the findings and the discussion of the research and shows how it contributes to the achievement of each research objective, set out at the beginning. Additionally, it suggests contributions to knowledge, recommendations to the groups themselves in relation to social media operation and practice before identifying limitations of the research and possible areas for future research. Table 10.1 summarises each chapter and their respective research objective.

Chapter		Objective Number	Objective Description
2	A Background to Airport Development in the South East and Community Response	1	To investigate the role of social media within popular protest
3	Social Media and Protest Movements		
4	The Theoretical Approach	2	To identify an appropriate theoretical underpinning to the research
6	Social Network Analysis	3	To analyse the social media pages of three anti-airport expansion groups
7	Time Series Analysis		
8	“What’s depressing about social media is it’s very ephemeral:” the Views of Social Media by Campaigners	4	To examine the challenges and opportunities existing groups face when incorporating social media into their campaigns
9	Social Media and Campaigning – Incorporation, Utilisation and Issues		
10	Conclusions and Recommendations	5	To make recommendations for practice and areas for future research

Table 10.1 Meeting of Objectives by Chapter

10.2 Findings

10.2.1 Objective One: to investigate the role of social media within popular protest

The first objective is associated with a critical review of the literature. This was conducted to initially provide an understanding of the chronology of protest against airport development in the south east with attention on key government commissions and white papers which have shaped airport capacity in the south east. It also documented high profile examples of campaigning against them. This provided a background of how protest by the anti-airport expansion campaign was undertaken before the advent of social media and shows the utilisation of tactical repertoires. Chapter 3 broadened the protest movement to the environmental campaign and the use of direct action as a means of protest articulation from the latter part of the twentieth century. The literature review then highlighted that the advent

of social media has enabled campaign groups to do new things and alter the ways in which they articulate their campaigns.

The literature did suggest that social media has provided a new space for protest and participatory politics and has enabled a new form of protest to emerge. It also indicated that campaign groups have utilised social media in new social movements particularly in the Arab Spring uprisings against dictatorial leadership, beginning in 2011. But, importantly, it highlighted little research examining the challenges and opportunities of incorporating social media into existing campaigns against airport expansion. This research was important as it provided campaign groups with an opportunity to assess their social media practice in light of incorporation.

10.2.2 Objective Two: to identify an appropriate theoretical underpinning to the research

The challenges associated with identifying an appropriate theoretical underpinning were concerned with exploring social networks on social media and so theories which concentrated on social movements themselves and not the campaign groups within them, or theories which placed similarity on human and non-human actors such as Actor Network Theory (ANT) were rejected. The study of social media requires an understanding of relationships and tie strength between users within social networks. Additionally as social media is used by human actors who control social media profiles, a theoretical approach was required which solely focused on these actors.

The implementation of social network theory as a theoretical underpinning aligns with the study of social networks on social media to uncover social interactions, the inner workings of each existing campaign and their incorporation of social media. It introduced the centrality measures utilised in this research to determine influence, power and positionality which all affect how information is disseminated through a social network. These are important because they are not just the basis for social network theory and subsequent social network analysis but they provide the initial analysis of how social media is used in this mixed method approach to inform the other methods and, in part, the extent of social media incorporation.

The development of social network theory highlighted the importance and significance of the work of Granovetter (1973) and the understanding of tie strength between people and how

this can affect how information is passed between and within social networks. Granovetter's strength of weak ties, as a part of a broader social network theory, was identified as having applications to the strength of relationships within social networks on social media. One of the ways in assessing tie strength and ultimately determining the presence of weak ties according to Granovetter is to explore interaction frequency.

Social network theory leads to the data collection method of Twitonomy and NodeXL which both provide the data which then can be utilised in different ways using different types of analysis.

10.2.3 Objective Three: to analyse the social media pages of three anti-airport expansion groups

The social media data extracted by Twitonomy and NodeXL was utilised initially in social network analysis to uncover interaction patterns and frequency and forms a key method in determining how social media is utilised. Similarly, the data obtained was used in a time series analysis to explore the relationship between social media platforms and how social media is used in relation to a specific event in time; the Davies Commission interim report. This ultimately enables the extent of social media incorporation within the existing campaigns against airport expansion at Heathrow.

The social network analysis graphs were separated into four graphs for Twitter: 1) Following/follower; 2) mentions; 3) retweets; and 4) replies to - whilst there was only one Facebook graph for each group. The findings of the Twitter graphs identified similarities between Airport Watch and HACAN Clearskies in who they interact with and consequently who their campaign is broadcast to. Media outlets and journalists are mentioned most often in an attempt to highlight their articles to others and to publicise their own campaign to them. Similar anti-airport expansion groups both nationally and internationally are retweeted most often highlighting a form of endorsement for their campaigns and pro-expansion groups are replied to most to correct and counter what the other is saying. Transition Heathrow's Twitter networks do not exhibit similarity and are diverse in terms of whom they interact with. The Facebook groups and pages exhibit influential users who have control of the flow of information within each network. Airport Watch utilises a Facebook page as a one-way channel of information and so appears as the most influential in all centrality measures.

HACAN Clearskies has several distinct users within its Facebook group, John Stewart surprisingly does not appear as most influential and so does not have most control of information dissemination. A similar pattern exists with Transition Heathrow albeit the two influential users have, or have had, an affiliation with the campaign group.

The time series analysis uncovers fluctuations in the daily social media with observed data points. Once the time series is modelled using expert modeller to produce a seasonal and non-seasonal ARIMA model, the residual data points (those left over once the model has been run) are utilised in a cross-correlation analysis. Cross-correlation was used because of its ability to highlight integration of social media platforms within each group. This explored the relationships between social media platforms for each individual campaign group as the focus was on individual campaign groups and not on them as a collective. It found that there was a higher statistical significance at lag 0 meaning both Twitter and Facebook are used simultaneously. The intervention analysis demonstrated that for the Davies Commission interim report publication, Facebook was utilised for instantaneous, on the day reporting whilst Twitter had a longer impact over a longer period of time whether before or after the event; or both. This is important because it demonstrates how information was spread over a period of time which can ultimately show the extent of coverage of the report before, during and after the event (Earl et al, 2013). Therefore, more information that is produced over a longer period, about the report, typically enables the content to spread further (Nissen, 2015); particularly when reporting on real-time events (Davis and Davis, 2012).

10.2.4 Objective Four: to examine the challenges and opportunities existing groups face when incorporating social media into their campaigns

The findings from both the social network and time series analysis formed the basis of the questioning in the semi-structured interviews. This is where further analysis took place of the challenges and opportunities of incorporating social media within their campaigns. The key themes identified were that social media has enabled all groups to interact with a larger number of people and link with other anti-airport expansion campaign groups both nationally and internationally. It has also broadened their appeal as social media has a greater reach than more conventional campaigning repertoires. There was a preference for Twitter rather than Facebook which confirmed the findings from the time series analysis, because of its ease of use and ability to speak to journalists, politicians, residents and key decision makers and

stakeholders. The interaction potential, ease of use, low associated cost and speed in which information is disseminated are the main opportunities which incorporating social media has provided to these existing campaigns. However, there have been several distinct challenges of social media incorporation. The biggest, particularly for HACAN Clearskies, continues to be encouraging a social media reluctant membership base who do not utilise social media and so for groups such as this, it is the advent of email which has made the biggest change to campaigning. This suggests that groups accountable to members and supporters can only, particularly where campaigning on social media is concerned, move at their pace which permits what they are able to use social media for. This is part of the reason why Airport Watch and HACAN Clearskies, in particular, use social media as a means of information production and consumption (Murthy, 2011) and an extension to their websites.

The discussion was framed as providing answers to the research questions (shown in Figure 5.1) in the data collection and synthesis chapters. The extent of social media incorporation for the three existing groups was further explored; the findings chapters provided an insight at its extent but it was the interviews with the social media coordinators which provided a more in-depth view. It illustrated that social media has not replaced other methods but in fact has been incorporated into a broader tactical repertoire. There currently exists a heavy online focus through websites which are the major communication channel to produce information related to their campaigns. Similarly there is a heavy reliance on email to distribute newsletters and other information to members who do not possess a social media account. For its ability to reach these large numbers of people quickly, it is this which has arguably made the biggest change to their campaigns. Moreover, the three campaign groups have varying offline repertoires and so for HACAN Clearskies and Transition Heathrow in particular, social media is incorporated within a strong offline presence which includes leafleting, flyering and community organisation. Social media is thus able to reach an audience which local offline means cannot.

10.2.5 Objective Five: to make recommendations for practice and areas for future research

This final objective is addressed in the following sections and presents the recommendations from this research for campaign groups and their social media practice. It also addresses the

final research question which focuses on the implications of social media and social networking for future protest.

10.3 Contributions to Knowledge

This research intended to explore the challenges and opportunities of incorporating social media into existing campaigns at Heathrow airport. Previous research studied the roles and utilisation of social media as a protest tool for contemporary protest campaigns and their resulting actions but little work had explored social media incorporation within existing campaign groups and what challenges and opportunities this brought about. This has been enabled through the five objectives of the research which have achieved the aim: “to explore the challenges and opportunities of incorporating new forms of social media into existing protest campaigns through a case study of anti-airport expansion groups in the UK.” The findings through primary research, the applied theoretical framework of social network theory and time series analysis contribute to the understanding of the extent of social media incorporation within existing protest campaigns.

Social media has been highlighted as becoming important in the repertoires of campaign groups. Its incorporation has meant that campaign groups can publicise information to a much larger audience both nationally and internationally. Moreover, certain groups are able to utilise social media to create large-scale on-street protest events and mobilise people quickly. However, the initial contribution to knowledge of this research suggests that whilst campaign groups campaign on behalf of members, these membership bases are social media reluctant because they have become accustomed to campaigning using other means and do not fully understand social media’s far-reaching implications. This restricts what social media can be utilised for as members prefer to receive information about the campaign via email, hence social media’s incorporation as an information production and consumption platform. Ultimately, campaign groups are accountable to their members and have to direct their social media campaign in a way which suits the views of their members.

The second contribution to knowledge is related to the importance, role and influence of the chairperson within each group’s social media strategy. Whilst campaign groups rely heavily upon networks of volunteers, it is the chair that is able to plan and direct the campaigns groups become involved in. The chairperson, along with the membership base, is able to

influence how social media is utilised; as a means of information dissemination in this instance. However, because the chairperson is often involved in all operational aspects related to their respective campaign group, they are unable to fully commit to effective social media practice and response. The ability to engage, respond to and interact is a requirement of good social media operation and practice.

The third contribution to knowledge is associated with how campaign groups prepare themselves to respond to significant events in time. The results highlighted that when responding to the Davies Commission interim report, there was a variety in response between each group on each social media platform. This shows a difference between how groups prepare for and respond to events on social media. HACAN Clearskies demonstrated a more considered reaction before, during and after the event which was confirmed in the interview with John Stewart. For these groups, the preferred method was to utilise Facebook as an instant information production tool whereas Twitter was used over a longer period of time to provide more in-depth coverage. Overall, the response to events in time on social media can determine how many people are kept up to date (Smith, 2014) and the reach and distribution of information across social networks on social media.

The final contribution is a methodological one. The combination of mixed methods utilised in this research, to ultimately answer the research problem, show a variety and innovation in their implementation and usage and whilst the time series analysis does not strictly adhere to a broader social network theory, it provides a different means to illustrate how social media is utilised. Therefore the combination of methods was able to contribute to a multi-dimensional approach when addressing social media usage and is thus able to comprehensively inform interview questioning. The employment of semi-structured interviews, along with the other methods, was able to provide a complete view of the challenges and opportunities of social media incorporation by existing campaign groups. Moreover, the variety of methods used are also able to address the need to employ different methods which are fully able to uncover patterns in the richness and variety of social media data.

10.4 Recommendations

The research within this thesis has focused upon anti-airport expansion groups at Heathrow but recommendations, from this, could be applied more broadly to any campaign group whether for or against development projects considering incorporating social media into an already existing campaign. Social media is playing an increasing role within the anti-airport expansion campaign and has enabled these groups to do new things and broaden their appeal to a more global audience. For these groups in particular it has become a crucial part of campaigning and cemented its place within a broader campaigning repertoire.

The chairperson, network of volunteers and members which exist within Airport Watch's campaign provide a vital contribution to the ways in which the group does things. The interviews demonstrated that the control of social media content was either viewed as a hobby and thus a limited amount of time was spent on their social media campaign or the chairperson did not have relevant expertise in judging how social media should be operated in relation to their campaign. Campaign groups should seek to appoint a dedicated social media person who controls what is publicised and is able to influence the interaction patterns which take place. Social media is a highly complex communicative platform requiring expertise in analytics and so dedicated social media personnel would enable a greater control of the content and message, freeing up the networks of volunteers and the chairperson to do other things.

The next recommendation is associated to the operation of social media in the preparation for significant events in time. The research highlighted that both Twitter and Facebook were utilised differently in response to a specific event despite an overall relationship between social media platforms. The frequency in which groups post in the build-up, on the day and after the event can determine the spread of the message and consequently the number of people informed. Campaign groups should seek to actively post and tweet where possibly before, during and after an event. A consistent broadcasting of the event on both social media platforms enables the message to be spread across both social media channels; as both the social network analysis and interviews suggest a difference in interaction on Twitter and Facebook.

The final recommendation is based upon the membership bases themselves and their social media reluctance. These members were highlighted as restricting what social media is able to

be utilised for and as a result, campaign groups can only ever use social media as an information production and consumption platform rather than for high-profile on-street protest organisation. Members prefer to receive emails and so the lack of internet connection is not a reason for the unwillingness to utilise social media. Campaign groups should look to introduce social media training and workshops for their members to inform them of the opportunities social media offers to campaigning and the potential in helping their campaigns reach more people on a global stage.

10.5 Limitations

This research has provided an insight into the challenges and opportunities of incorporating social media into existing anti-airport expansion groups at Heathrow airport. This was undertaken through a mixed method approach utilising a pragmatic research design. Whilst considerable effort was made to minimise the issues mentioned in the following sections, there are still certain limitations with this research.

10.5.1 NodeXL

The study of social media is a challenging area due to restrictions with the amount of data that is able to be extracted. It was highlighted in Chapter 5, Section 5.7 that NodeXL only allows the first 1,500 tweets or one week's worth of tweets (whichever comes first). Moreover, even if the last week's worth or 1,500 tweets would have been extracted, Twitter has another limitation on how much data can be obtained at any one time. For example, fifteen tweets can only be extracted every fifteen minutes before NodeXL has to pause and wait for the Twitter API to allow it to extract fifteen more. This can be a long and arduous process. As a result Twitonomy was used for the mentions, retweets and replies to networks as this enabled 3,200 tweets to be obtained. Whereas HACAN Clearskies and Transition Heathrow's Twitter pages were able to be acquired from when they first started to use Twitter only Airport Watch's latest 3,200 tweets were available. This is the initial limitation of the data, as Airport Watch's data was only a representation rather than a complete look at its Twitter networks.

The other limitation with the Twitter networks shown on NodeXL is that only the edges between the central user and every user in the network could be visualised. Unlike Facebook, Twitter does not allow the edges between all alters (those users within the network) to be shown due to restrictions placed by Twitter on the type of data obtained by third party packages; such as Twitonomy or NodeXL. Despite this proving useful in showing who each group interacts with, it does not allow an accurate picture to be constructed of which users are actually the most influential and important within each network. Therefore, unsurprisingly, all centrality measures within Twitter networks demonstrate that each group is at the centre of their own network in terms of information flow and distribution; whereas in reality this may not be the case.

10.5.2 Interview Participants

This research sought the opinions of the social media coordinators of each group as these were highlighted as having knowledge about their respective group's social media campaigns. They had also been operating their accounts for a number of years and so were able to accurately determine what challenges and opportunities incorporating social media had brought to their campaign. However, a limitation with this research is that only the three social media coordinators were interviewed when in actual fact, HACAN Clearskies has two other employees which sometimes post on social media and Transition Heathrow has a network of activists who have access to their social media accounts. Airport Watch comprises only of one individual who operates both social media pages.

Interviewing all members within each group who have access to social media accounts would enable a more complete view of the challenges and opportunities experienced when incorporating social media. The broader network of users for HACAN Clearskies had only been in the post a short period of time and Transition Heathrow's network of environmental activists residing at Grow Heathrow constantly change which is part of the reason behind deciding not to interview them. But also time restrictions and a lengthy process involved in contacting the three social media coordinators had an impact.

10.5.3 Groups Studied

Whilst each group exhibits an active social media presence and a certain position of interest centred on the expansion of Heathrow airport; they only provide one aspect of campaigning. There are those groups who are supportive of expansion and therefore campaign for the expansion of Heathrow airport. The main limitation of this research is that these groups were not studied and used in comparison with anti-airport expansion groups. Moreover, there are more anti-airport expansion groups at Heathrow who utilise social media but their profiles were only created in 2014 or later.

10.6 Areas for Future Research

The main challenge of incorporating social media into existing anti-airport expansion campaign groups at Heathrow was related to the presence of a social media reluctant membership base which is prohibiting groups, particularly HACAN Clearskies, move their campaign on social media forward to utilise it for different means. Future research into interviewing of these members would uncover the reasons as to why they do not wish or want to use social media to campaign against airport expansion at Heathrow.

The research explored three anti-airport expansion groups and the challenges and opportunities of incorporating social media within their existing campaigns. It also focused on the integration of social media within each group. Future research should focus on comparing Twitter and Facebook integration between anti-airport expansion groups to determine the extent of the degree of autonomy on social media.

This research has also provided numerous ways to show how social media is utilised. Research examining the Davies Commission final report, published in July 2015, would enable the investigation of the full report associated with airport expansion in the south east. It could be used in comparison with the extent to which each group prepared for and responded to the interim report, examine what lessons had been learnt, and assess what role social media played within its dissemination.

A further area of research would be to utilise social network theory in a comparative approach of both pro and anti-airport expansion groups' incorporation of social media to uncover the extent of similar challenges and opportunities. Additionally, as this research only

focuses on one example of airport expansion, at Heathrow, a comparative study could be undertaken for those campaign groups at Gatwick to determine their social media incorporation and the degree of similarity to those at Heathrow.

There are many more anti-airport expansion groups based at Heathrow who utilise social media for their campaigning; these have been created since 2014 and social media has enabled them to do new things. Future research should focus on the proliferation of these groups and explore whether this has led to any loss of identity for the anti-airport expansion campaign at Heathrow.

Chapter 11

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Appendix A

Historical Context and the Development of Social Network Theory

The purpose of this appendix is to highlight the development of social network theory in more detail from its initial conception to the slightly more contemporary view of social network theory.

‘Social Network Theory is one of the few if perhaps the only theory in social science that is not reductionist’ (Kadushin 2004: 3). Ball (2009) describes social network theory as a ‘sensibility’ (p. 3), a field of diverse studies and approaches apparent across disciplines with a method of social network analysis. Social network analysis is the tool which ‘views social relationships’ (Passmore 2011: 1) in terms of network theory and in particular social network theory which focuses on social ties. The theory applies to a ‘variety of levels of analysis from small groups to entire global systems’ (Kadushin 2004: 4). Social network analysis is part of a broader social network theory, which has been built from mathematical foundations and has borrowings from balance theory and social comparison theory (Kilduff and Tsai, 2003).

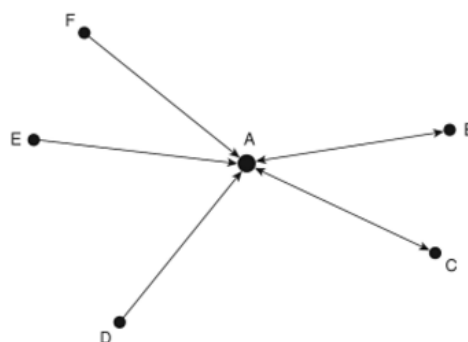
The term social networks according to Freeman (2004), is traced back to August Comte in the nineteenth century who created the term ‘sociology’ and defined it as the laws of social interconnection or the ‘laws of action and reaction of the different parts of the social system’ (Estrada 2011: 399). Secondly, several scientists including Durkheim and Simmel (Freeman, 2004; Estrada, 2011; Jones, 2013), Morgan (Freeman, 2004; Estrada, 2011) and Tonnies (Ganis, 2015) developed social networks and ‘paved the way for the development of more quantitative analysis’ (Estrada 2011: 399). It was not until the 1950s when the term ‘social network’ was first used, but before this the evolution of network theory was constructed through ‘three main traditions’ (Scott 2013: 11): sociometry, the 1930s researchers (also known as the Harvard Group – Pryke (2012)), and the social anthropologists. These key traditions are outlined in the following sections.

Sociometry

The historic accounts of social networks ‘tend to agree that the field was more or less started through the efforts of Jacob Moreno’ (Prell 2012: 21) and Helen Jennings (Freeman, 2004) through their approach of sociometry which is ‘widely considered the precursor to social

network analysis’ (Prell 2012: 21). The early Gestalt tradition, which is a theory of mind of the Berlin School of experimental psychology, was initially developed by Wolfgang Kohler in the early 1930s and ‘stresses the organized patterns through which thoughts and perceptions are structured’ (Scott 2013: 13). Social psychology, within this tradition, emphasised ‘the influence of group organization and its associated social climate on individual perceptions’ (Scott 2013: 13). Numerous Gestalt theorists fled Nazi Germany in the 1930s to the United States ‘where Kurt Lewin, Jacob Moreno, and Fritz Heider became prominent, though rather different, exponents of a gestalt-influenced social psychology’ (Scott 2013: 13).

Gestalt theorists ultimately saw ‘perceptions as guided by the structure of the mind, that is, the ‘whole’ of the mind mattered more to these thinkers than the individual parts of the mind or individual perceptions’ (Prell 2012: 21). It was this focus of the ‘interplay between perceptions and the larger structure of the mind’ (Prell 2012: 21) which influenced Moreno and his interest in the ‘psychological well-being of individuals’ (Prell 2012: 21). Together with the methodological assistance of Helen Jennings in the 1930s, a more quantitative analysis of social networks was developed called ‘sociometry’ (Freeman, 2004; Estrada, 2011; Prell, 2012; Scott, 2013). This technique, especially with the involvement of Helen Jennings, involved quantitative methodologies which uncovered the structure of groups and the positions of individuals within them (Freeman, 2004; Prell. 2012). Sociometry involved the use of sociograms which are a way of representing/ visualising individual structures and their ‘relationships with others in the group’ (Prell 2012: 22).



Scott (2013: 14)

The Sociogram: Sociometric Star

Moreno contended that these social visualisations could be represented as ‘points’ for individuals and ‘lines’ for their connections to one another. In the diagram above, the arrows show the direction of friendship, person A is the recipient of friendship from all of the members but only reciprocates that friendship to persons B and C. Person A is therefore the ‘start of attraction within the group’ (Scott 2013: 14).

However, there was a defining element of social network theory which was neglected in Moreno’s early work; there were no mathematical or computational models. This led to a collaboration between Moreno, Jennings and Paul Lazarsfeld who created a baseline model for sociometric choice (Freeman, 2004). The model calculated ‘the probability that any particular individual would be chosen by any other particular individual’ (Freeman 2004: 38). Their work was published in the journal of sociometry in 1938. As a result of this, Freeman (2004) suggests that Moreno, Jennings and Lazarsfeld had ‘displayed all four of the features that define contemporary social network analysis’ (Freeman 2004: 38). Sociometry did not progress much past the 1940s partly because of Moreno’s unpredictable character (Freeman, 2004) and he began to direct sociometry towards ‘ambiguous links to God and to psychotherapy’ (Freeman 2004: 41). This ultimately signalled the end of sociometry and structural research and Moreno ‘quit making contributions to sociometry and turned his attention almost completely to various forms of therapy’ (Freeman 2004: 41).

Harvard Group

The second part of the historic development of social network theory is concerned with Lloyd Warner and Elton Mayo and ‘it is here that the story of sociology’s trajectory and contribution to social network analysis begins’ (Prell 2012: 38). At the same time as the development of sociometry by Moreno and Jennings, Alfred Radcliffe-Born was one of the early social anthropologists who began to explore new ways for studying structural issues (Prell, 2012). He moved to Australia with student Lloyd Warner who worked in the bush for two years collecting ethnographic data amongst a community – Warner moved back to Harvard two years later (Freeman, 2004). Warner began working with Elton Mayo, who was researching work productivity and the psychological characteristics of workers at the Western Electric Company (Freeman, 2004; Prell, 2013; Scott, 2013) in 1930. The Hawthorne study, as it was known, involved ‘a careful recording of all group behaviour in a bank wiring room of the factory, and the research team used graphic images of network ties to describe the

group structure' (Prell 2012: 30). Moreover they used a Sociogram which observed the relationships, friendships and conflicts between fieldworkers (Freeman, 2004; Prell, 2012; Scott, 2013).

Warner also led a study focusing on a New England town know as 'Yankee City.' This research involved the study of an urban setting by putting people into groups based on socio-economic conditions (Freeman, 2004). His ultimate aim was to specify who interacted with whom. The studies possess three out of the four social network theory elements, but, crucially, there was no use of mathematical or computational tools (Freeman, 2004).

Therefore, members of the Harvard Group devised a 'recording typewriter to collect carefully timed data on the interaction pattern linking a pair of individuals' (Freeman 2004: 66). This was the fourth element of social network analysis which had previously been missing.

Freeman (2012) highlighted that the Harvard research group was quickly abandoned when 'Warner moved to the University of Chicago in 1935 and turned to other kinds of research, the whole Harvard movement fell apart' (p. 26).

Social Anthropologists

Berkman and Krishna (2014) suggest that a 'major wave of conceptual development [of social network analysis] came from anthropologists, including Elizabeth Bott, John Barnes and Clyde Mitchell' (p. 236). It was the influence of Radcliffe-Brown that had an impact on social anthropologists in the UK at departments in Manchester and London. Max Gluckman was one of the early anthropologists who shaped the direction of the small groups at Manchester and their work in the 1950s and 1960s produced a 'distinctive style of social anthropology known as the Manchester School' (Prell 2012: 32) Gluckman combined an interest in the Zulu society in South Africa with a 'concern to develop a structural approach that recognized the important part played by conflict and power in both the maintenance and the transformation of social structures' (Scott 2013: 29). This structural approach heavily influenced the other social anthropologists at the Manchester School and methodologically, this group 'emphasized the use of ego network data that were gathered primarily through ethnographic approaches such as participant observation and loosely structured interviewing' (Prell 2012: 33). There was also a close association between the Manchester school and the anthropologists at the London School of Economics. This group 'consisted of Elizabeth Bott, John Barnes and Siegfried Nadal' (Prell 2012: 33). Elizabeth Bott studied under Warner in

Chicago and began to study kinship relations of British families in 1950. Bott, with a background in psychology, was aware of Moreno's work with sociometry. John Barnes joined the Manchester school in 1949 and although he 'helped to formalize Bott's notion of connectedness, he is best remembered as the first person to use the term social networks in a field study' (Prell 2012: 34; Wasserman and Faust, 1994). Barnes defined a network as 'a set of points some of which are joined by lines' (Barnes 1954: 43), the points were seen as people or groups and the lines signifying interaction. Clyde Mitchell, according to Scott (2013) focused on personal order which 'generalized Barnes's conception of the sphere of interpersonal relations' (p. 32). Personal order is described as those personal links individuals have with a group of people and 'the links these people have in turn among themselves' (Mitchell 1969: 10).

Appendix B

Research Dichotomies

The purpose of this appendix is to show the different research dichotomies in relation to the research and illustrate where the adoption of a pragmatist paradigm has developed from.

Ontological Paradigm

Ontology looks at how assumptions of the world are generated and the perception about the nature of reality (Klenke, 2008). The debate around this paradigm is between subjectivism (relativism) and objectivism (realism) and how these can impact upon the direction of research. Subjectivism is the position that ‘social phenomena are created from the perceptions and consequent actions of social actors’ (Saunders et al 2009: 111). Whereas objectivism, according to Ratner (2015: 1), is the ‘notion that an objective reality exists and can be increasingly known through the accumulation of more complete information.’ In contrast, pragmatists question the traditional dichotomy having gained ‘considerable support as a stance for mixed method researchers’ (Hall 2012: 4). In a pragmatic approach, according to Mertens (2010: 36), ‘there is no problem with asserting both that there is a single “real world” and that all individuals have their own unique interpretations of that world.’ In the view of Tashakkori and Teddlie (1998: 30), those researchers undertaking research from a pragmatist ontological perspective should ‘study what interests [them] and is of value to [them], study in the different ways in which [they] deem appropriate, and use the results in ways that can bring about positive consequences within [their] value system.’

Epistemological Paradigm

Epistemology is concerned with whether the researcher becomes external to the research situation keeping an element of neutrality (positivism) or whether the researcher becomes a part of knowledge, by being immersed in the research situation (interpretivism). Positivism attempts to maintain objectivity towards studied phenomena. Trochim (2006: 1) explains that positivism is a position that ‘the goal of knowledge is simply to describe the phenomena that we experience. The purpose of science is simply to stick to what we can observe and

measure.' This contrasts the Interpretivist viewpoint which, according to Dudovskiy (2015: 1), involves 'researchers to interpret elements of the study; thus interpretivism integrates human interest into a study.' On the other hand pragmatism does not associate with these epistemological differences; instead it is a 'holistic and organic system' (Long 2002: 39) in which every part 'coheres with and relies upon' (ibid) each other.

Axiological Paradigm

It was Guba and Lincoln (1994) who argued for the inclusion of axiology in social research paradigms suggesting that researchers are entering a period of greater spirituality within research. Ethics in research is an integral part of the process, irrespective of what paradigm is used. From a pragmatic axiological perspective, according to Mertens (2010), ethical conduct is very important and pragmatists view the ethical goal of research to gain knowledge in pursuit of desired ends (Mertens, 2010; Morgan, 2007). Moreover, a pragmatic perspective justifies the rationale for mixing methods 'in situational responsiveness and a commitment to an empirical perspective' (Greene and Caracelli 1997: 9); instead of possessing fixed ideas which limits research.

Methodological Paradigm

The methodology is 'informed by the underpinning philosophy to be appropriate for the aim and objectives of the study' (Jackson 2013: 7). Postpositivists recognise that many of the assumptions developed from the natural sciences were difficult to achieve in educational and psychological studies with people, 'therefore quasi-experimental methods (methods that are sort of experimental, but not exactly) were developed' (Mertens 2010: 15). Interpretivism focuses on meaning and employs numerous methods to demonstrate different aspects of a particular issue (Dudovskiy, 2015). In a pragmatic methodology, qualitative and quantitative methods are both compatible. Pragmatists see mixed methods as offering a practical solution to the tensions concerning qualitative and quantitative methods. It allows researchers to use the methods (or combination of) that best answer the research questions (Johnson and Onwuegbuzie, 2004).

Appendix C

Participant Information Sheet

The purpose of this appendix is to provide reference to the participant information sheet emailed to each participant before the interviews took place.

As you are now aware I have already been in contact with you and you have kindly accepted the invitation to be interviewed for my PhD research; I am eternally grateful as I know you are incredibly busy! I have put together some information below but please ask any questions if anything you read is not clear or if you require further information.

The research looks at your social media campaign (both Twitter and Facebook) from when you created your accounts to a cut off point of 14th February 2014. It investigates issues around your group dynamics, interaction patterns, communication flows and structural hierarchies. Additionally, it tracks the significance of a specific event in time (in this case the Davies Commission interim report – 17th December 2013) to determine whether a statistically significant increase in tweets and posts happened uncovering patterns of coverage of this event. Certain gaps which have arisen from these methods have been used to focus your interview questions incorporating topics such as your campaign and social media, the role that social media plays and future considerations of using social media. You have been selected, along with two other anti-airport expansion groups, as you provide a representation of scale (local, regional and national groups). Each group is compared with the other groups to indicate similarities and/or differences in approaches to using social media in your campaign.

Your interview will be recorded with your permission. The data will be analysed and coded uncovering patterns and answering certain questions. The interviewer will securely store the data on his computer which is password protected and it will only be used by the interviewer for his research which may include the publication of journal articles and conference presentations. Your names will be anonymised at your request. Once the research is complete, the information you provide will be stored and used, if necessary, for future research by the interviewer. There are a total of 28 questions overall.

You have the option to withdraw from the interview at any time and can ask the interviewer to move onto the next question should you wish.

Appendix D

Group Descriptions

The purpose of this appendix is to highlight the names and descriptions of users interacted with by each of the three groups. All users listed have been mentioned, retweeted or replied to and the descriptions have been obtained from their own Twitter descriptions about themselves.

<u>Group Name</u>	<u>Twitter Handle</u>	<u>Description</u>
ACIPA	@ACIPA_NDL	French based anti-airport expansion group which opposes the construction of another airport in Nantes.
Adam Vaughan	@adamvaughan_uk	Editor of the Guardian's environment site.
Adbusters	@Adbusters	A global network of activists.
Add This	@addthis	Content engagement platform.
Airport On Trial	@AirportOnTrial	Direct action protests at Manchester Airport.
Airport Watch	@AirportWatch	National anti-airport expansion umbrella group.
Alan McGuinness	@Alan_McGuinness	An online producer for Sky News.
Alice O'Keeffe	@AliceOKeeffe	A journalist for the Guardian newspaper.
Amelia Gregory	@AmeliaGregory	Writer, activist and publisher.
Anarcha Penguin	@WolvoPingu	An anarchist who has no specific protesting focus.
Anarchist Action	@AnarchistAction	A key network of local groups organising mobilising against capitalism.
Andrew Sparrow	@AndrewSparrow	Writes the Guardian's Politics blog.
Andy Slaughter	@hammersmithandy	MP for Hammersmith.
Angie Bray	@AngieBrayMP	MP for Ealing Central and Acton.
Aoife O'Leary	@aoleary	An individual user.
Art Not Oil	@ArtNotOil	Grassroots campaign to end the fossil-fuelled sponsorship of the arts.
Art Saves World	@artsavesworld	Group focusing on art as a fundamental force of change.

Aviation Environment Federation	@The_AEF	UK based organisation campaigning on aviation policy, climate change, noise and air pollution.
Aviation Justice	@AVJustice	An American airport activist group associated with environmental justice.
Back Heathrow	@BackHeathrow	A pro-Heathrow expansion group.
BBC London	@BBCLondonNews	Regional part of the BBC.
BBC News	@BBCNews	A UK based news forum.
BBC Radio 4	@BBCRadio4	A UK radio station.
Bibi Van Der Zee	@bibivanderzee	Editor of the Guardian's 'Live Better' campaign.
Birmingham FoE	@Bham_FoE	Another local Friends of the Earth group.
Camden FoE	@CamdenFoE	Local Friends of the Earth group – associated with raising awareness on environmental issues.
Catherine Mayer	@Catherine_Mayer	Editor at large of TIME magazine.
Channel 4 News	@Channel4News	UK television news programme.
Charlotte Du Cann	@52Flowers	The editor of the Transition Network's free press.
Chris Caulfield	@chris_caulfield	A reporter for the Sutton Guardian newspaper.
Clean Air London	@CleanAirLondon	Group which provides updates on air pollution in London.
Clean Air UK	@CleanAirUK	A network of people and communities for better air quality and less air pollution.
Climate Activism	@ClimateActivism	A direct action group fighting for climate justice.
Climate Camp	@climatecamp	A direct action group promoting environmental change.
Climate Campaign	@campaigncc	Campaign against climate change which aims to mobilise people from across the UK.

Climate Justice Collective	CJ_Collective	A UK wide network taking action on the causes of climate change.
Climate Revolution	@climate_rev	An organisation founded by Vivienne Westwood which protests against climate and other environmental issues.
Climate Rush	@ClimateRush	A group inspired by the Suffragette movement with action on climate change.
Com Café	@ComCafe1	A community centre and café which runs activities and events for the whole community.
Damian Carrington	@dpcarrington	The Guardian's head of Environment.
Daniel Edwards	@SFODan	An individual user who is a pilot for British Airways.
Darren Johnson	@darrenjohnsonam	The chair of London Assembly Housing Committee.
David Cullen	@humbleetc	DJ and Blogger.
David Millward	@davidgmillward	Former Transport correspondent for the Telegraph.
Diggers 2012	@freetheland	A group of 15 people living on a site earmarked for development by Brunel University.
Do The Green Thing	@Dothegreenthing	A campaign to promote sustainable living.
Doug Parr	@doug_parr	Chief scientist for Greenpeace.
Edge Fund	@theedgefund	A grant making organisation to grassroots groups to assist them with their campaign.
Emily James	@emily_james	A documentary filmmaker.
Evening Standard	@standardnews	London based news platform.
Feeding 5k	@Feeding5k	A group that campaigns to end food waste by working at various levels.
Flying Clean	@FlyingClean	USA led campaign to clear the skies and cut pollution from the airline industry.

Frack Off	@Frack_Off	A direct action network against shalegas, coal bed methane and underground coal gasification.
Friends of the Earth	@wwwfoecouk	UK based national environmental group.
Fuel Poverty Action	@FuelPovAction	Campaign group fighting against fuel poverty.
Green & Black Cross	@GBCLegal	A grassroots environmental legal support system.
Greenpeace UK	@GreenpeaceUK	A campaign and direct action group aimed at protecting the environment and promoting peace.
Greg Hands	@GregHands	MP for Chelsea and Fulham.
Growing Communities	@growcomm	A community led organisation in Hackney which aims to grow sustainable local food.
Guardian Environment	@guardianeco	Environmental page of the Guardian newspaper.
Guardian Letters	@guardianletters	Tweets from the Editors of Guardian pages.
Guardian News	@guardiannews	News section of the Guardian.
Gwyn Topham	@GwynTopham	The Guardian's Transport correspondent.
HACAN Clearskies	@HACAN1	Regional anti-airport expansion group.
HACAN East	@HACANEast	The sister organisation of HACAN Clearskies representing residents in the East and South East London.
Hannah Cauldron	@Hannah_Chutzpah	A poet, writer, activist and feminist.
Harry Giles	@HarryGiles	A performer and poet.
Heathrow Hub	@HeathrowHub	A campaign group which is promoting an integrated air and rail facility to increase Heathrow's capacity.
Helicopter Noise	@HelicopterNoise	A group campaigning against helicopter noise in the UK.

Herne Bay Matters Group	@hernebaymatters	A community group based in Herne Bay, Kent.
Hillingdon Council	@Hillingdon	The Council page for the London Borough of Hillingdon.
Hillingdon FoE	@HillingdonFoE	Friends of the Earth representing the Hillingdon Borough.
Huffington Post UK Politics	@HuffPostUKPol	Politics sector of Huffington Post.
ITV News	@itvnews	UK based news forum.
Jack Griffith	@jhgriffith	A reporter at the South London Press.
James Cracknell	@JollyJourno	A reporter for the Waltham Forest Echo.
James Kirkup	@jameskirkup	Executive Political editor at the Telegraph Media Group.
James Titcomb	@jamestitcomb	The Business reporter at the Telegraph.
Jane Merrick	@janemerrick23	The Political editor for the Independent on Sunday.
Jason Torrance	@jasontorrance	Policy Director at the pressure group Sustrans.
Jean Leston	@JeanLeston	Ex-Transport Policy Manager for the WWF (World Wildlife Fund), now an NGO Consultant.
Jenny Bates	@BatesJenny	A campaigner against air pollution at Friends of the Earth.
Jerome Taylor	@JeromeTaylor	A former journalist at the Independent newspaper.
Jessica Shankleman	@JessicaBG	Senior Reporter for Business Green.
John Deben	@lorddeben	Chairman of the statutory committee on climate change.
John McDonnell	@johnmcdonnellmp	MP for Hayes and Harlington.
John Rentoul	@JohnRentoul	Columnist for the Independent on Sunday.
John Vidal	@john_vidal	The Guardian's Environment Editor.
John Woodcock	@JWoodcockMP	MP for Barrow in Furness.

Jonathon Goldberg	@mrjongoldberg	A London portrait and documentary photographer.
Jordan Dias	@jordandias	An individual user with an interest in aviation and politics.
Joss Garman	@jossgarman	Co-founder of the anti-aviation expansion direct action group Plane Stupid.
Just Do It Film	@JustDoItFilm	A grassroots film company set up by Emily James to film activism and protest was mentioned the most.
Justine Greening	@JustineGreening	Former Secretary of State for Transport and voice against the Heathrow expansion.
Kate Hoey	@hoeykateMP	MP for Vauxhall.
Katrina Forrester	@katforrester	A lecturer in History of Political Thought.
Keith Parkins	@keithpp	An activist and social commentator.
Ken Livingstone	@ken4london	Former Mayor of London.
Kevin Maguire	@Kevin_Maguire	Daily Mirror's Associate Editor.
Land Over Landings	@landoverlandings	A campaign group against the construction of a new airport in Ontario, Canada.
Let Britain Fly	@LetBritainFly	A campaign to expand airport capacity in London and the South East.
Lydd Airport Action Group	@LAAGsayno	A group against the expansion of Lydd Airport.
Marina Pepper	@MarinaPepper	An environmental and social activist.
Mark Reckless	@MarkReckless	MP for Rochester and Strood.
Mary Macleod	@MaryMacleod	MP for Brentford, Isleworth, Osterley and Hounslow.
Matt McGrath	@MattMcGrathBBC	Environment Correspondent for the BBC.
Matthew Beard	@matthewbeard	Transport Editor for the London Evening Standard.
Matthew Taylor	@mrmattthewtaylor	A news reporter for the Guardian.
Medway Times	@medwaytimes	Local newspaper based in Kent.
Metropolitan Police	@metpoliceuk	London's Metropolitan Police service.
Michael Edwards	michaellondonsf	A writer and campaigner.

Michael McCarthy	@mjpmccarthy	Environmental Commentator at The Independent.
Michael Savage	@michaelsavage	The Times' Chief Political correspondent.
MPBS	@mpbsquatting	A squatting network.
MULE	@manchestermule	Independent newspaper based in Manchester.
New Airport for the UK	@NewAirport4UK	Group who support plans for a new hub airport.
New Forest Transition	@newforesttrans	A branch of the Transition network in the New Forest.
Nicholas Cecil	@nicholascecil	Deputy Political Editor of the Evening Standard.
No Dash For Gas	@nodashforgas	A direct action group which occupies power stations and other sites of environmental pollution.
No Night Flights	@NoNightFlights	A group against the proposals for night flights at Manston Airport.
No Police Spies	@nopolicespies	A group calling for an enquiry into the use of undercover police officers during protests.
No Third Runway	@NoThirdRunwayLD	A liberal democrat group fighting to prevent Conservative MPs from expanding Heathrow.
Noise Limits	@noiselimits	A group aiming to reduce the impact of noise pollution on health, child development and sleep.
NoJetsTO	@NoJetsTO	A campaign to stop the expansion of Toronto Airport.
North Kent Marshes	@fonkm	A group of conservationists and communities opposing a new airport in the Thames Estuary.

Occupy London	@OccupyLondon	A part of the occupy movement focused across London.
Occupy LSX	@OccupyLSX	A part of the occupy London campaign.
Occupy Wall Street	@OccupyWallStNYC	Apart of the overall occupy movement against social and economic inequality.
Open House	@OpenHouseLDN	A nine day event in London (11-19 th May 2013) which brought together people in London to take action around housing needs.
Orchard Project	@UrbanOrchardist	A grassroots movement teaching communities to plant, care for, and harvest fruit trees.
Otesha UK	@OteshaUK	A group which aims to build communities who want social and environmental change.
Ouest France	@ouestfrancefr	A daily French newspaper.
Ox Grow	@OxGrow	An edible community garden in Oxford.
Oxford Climate Forum	@OxClimateForum	A group bringing people together to discuss environmental concerns affecting the global community.
Paul Clifton	@PaulCliftonBBC	Transport Correspondent for the BBC in the South.
Paul Lewis	@PaulLewis	The Guardian's Washington correspondent.
Paul Marks	@PaulMarks12	Senior Technology Correspondent at the New Scientist magazine.
Paul Owen	@PaulTOwen	Guardian journalist.
Paul Rogers	@paulrogers002	A political writer.
Paul Waugh	@paulwaugh	The editor of PoliticsHome.com.

PEDAL	@PEDAL100days	Community organisers, artists and food growers which support the Boycott, Divestment and Sanctions (BDS) network – a campaign fighting for Palestine freedom.
People & Planet	@peopleandplanet	Britain’s largest student network campaigning on poverty, human rights and environmental issues.
People’s Climate UK	@ClimateLdn	A protest group aimed at climate change issues.
Pete The Temp	@PeteTheTemp	A writer and grassroots activist.
Peter Dominiczak	@peterdomiczak	A political correspondent at the Daily Telegraph.
Peter Woodman	@pawoodman	Transport and Travel correspondent of the Press Association news agency in London.
Pippa Crerar	@PippaCrerar	Journalist at the Evening Standard.
Plane Stupid	@planestupid	A direct action group against airport expansion.
Platform	@PlatformLondon	An organisation which combines art, activism and education in projects that push for social and ecological justice.
Policy Mic	@PolicyMic	A news site broadcasting contemporary news stories.
r2lgw	@r2glw	A group supporting the second runway at Gatwick.
Reclaim the Fields UK	@noon14523	A collection of people and projects willing to take local control over food production.
Richard George	@sarcasmcat	UK forests campaigner for Greenpeace.
Richard Westcott	@BBCwestcott	BBC Transport Correspondent.
Road Peace	@RoadPeace	Campaigning on behalf of road crash victims for justice, rights and recognition.

Roads to Nowhere	@Roads2Nowhere	A campaign group which wants to stop the creation of new roads.
Rob Gibson	@MrCElk	Air quality, climate change and noise adviser and strategist concerned with aviation related matters.
Rob Hopkins	@robintransition	Co-founder of the Transition Network.
Rose Bridger	@RoseKBridger	Author of the book 'Plane Truth.'
Russian Embassy	@RussianEmbassy	The Twitter account for the Russian Embassy in London.
Ruth Chapple	@RuthChapple	Operations Director at the campaign for Better Transport.
Salina Patel	@SalinaPatel1	A reporter for the Hounslow Chronicle.
Save Lake Farm	@SaveLakeFarm	A campaign to Save Lake Farm Country park in Hayes from the construction of a school.
Seema Malhotra	@SeemaMalhotra1	MP for Feltham and Heston.
Shiv Malik	@ShivMalik	A Guardian journalist and author.
Sleep Deprived	@xtrand	An individual user who is a resident in Windlesham under the Heathrow flight path.
South West London Environment Network (SWLEN)	@richenvironment)	A charity in South West London supporting local populations and groups who protect and enhance the environment.
Squash Campaign	@Squash_campaign	Group campaigning against the criminalisation of squatting
Stir To Action	@StirToAction	A quarterly print magazine on the international emergence of collaborative networks and other community-based alternative.
Stop City Airport	@StopCityAirport	An anti-airport expansion group based at London City Airport.

Stop Flying	@stopflying	An organisation advocating less air travel and lower emissions.
Suzanne Goldenberg	@suzyji	Guardian's US Environment Correspondent.
Tabby Kinder	@TabbyKinder	A freelance journalist and researcher.
Take the Flour Back	@Takeflourback	Public day of action on 27 th May 2012 against genetically modified (GM) wheat.
The Climate Justice Collective	@CJ_Collective	A UK wide network taking action on the causes of climate change.
The Daily Mail	@MailOnline	UK national newspaper.
The Evening Standard	@standardnews	London based newspaper.
The Financial Times	@FT	UK national newspaper which specific reference to business and economics.
The Guardian	@guardian	UK national newspaper.
The Huffington Post	@HuffPostUK	The UK online news forum.
The Independent	@Independent	UK national newspaper.
The Sustainable Masterplan Group	@sustainablemp	USA based sustainability action group.
The Telegraph	@Telegraph	UK national newspaper.
The Telegraph News forum	@TelegraphNews	The online Telegraph news platform.
the vacuum cleaner	@vacuumcleaner	An artist and activist.
Tim Montgomerie	@TimMontgomerie	A journalist for The Times.
Tom Edwards	@BBCTomEdwards	Transport and Environment Correspondent for BBC London.
Tom Youngman	tmyoungman	An activist supporting youth-level environmental movements.
Transition Free Press	@transfreepress	The Transition Network's national newspaper.

Transition Heathrow	@transheathrow	A grassroots group promoting sustainability and campaigning against the expansion of Heathrow airport.
Transition Stafford	@TransitionStaff	A part of the Transition network in Stafford.
Transition Towns	@transitiontowns	Official Twitter account of the Transition Network which aims to bring together different local groups through various initiatives to reduce the ecological footprint.
Transition US	@TransitionUS	The US part of the Transition Towns Network.
Transition Voice	@TransitionVoice	A magazine on oil, the transition community, economy, energy and culture.
Transport and Environment	@transenv	A group campaigning for cleaner transport in Europe.
UK Antifascism	@UKAntifascism	An anti fascist campaign group in the UK.
UK Noise Association	@cutnoise	National campaign group fighting to cut noise in the UK.
UK Uncut	@UKuncut	A grassroots movement using direct action to fight the financial cuts.
Uxbridge Gazette	@UxbridgeGazette	News feed for the Hillingdon Borough.
Val Weedon MBE	@ValNoiseTzar	Appointed noise tzar by Noise Direct.
Valerie Shawcross	@ValShawcross	London Assembly member for Lambeth and Southwark fighting for better public transport in London.
World Wildlife Fund UK	@wwf_uk	The UK base for the World Wildlife Fund.
You and I Films	@youandifilms	Provides front line media production at a range of grassroots events.
Zac Goldsmith	@ZacGoldsmith	MP for Richmond Park and North Kingston and a prominent voice against Heathrow expansion.

Appendix E

Interview Questions

The purpose of this appendix is to detail the questions asked to each interviewee. The same questions were asked in order to gain a comparative perspective for each group's social media use and the extent of social media changing their campaign. Questions were split according to the findings from each method with a future plans sub-section including lessons learnt by incorporating social media.

General Questions from Social Network Analysis

1. Can you describe your social media strategy?
2. Why did you create these particular social media pages?
3. What do they offer you in terms of engagement, exposure and broadening your appeal? Does it differ from your web-pages?
4. What do you use social media for?
5. Who do you think interacts with your social media pages?
6. What did you expect social media to do for your campaign? Has it done what you expected it to do?
7. Has social media enhanced/changed your campaign? If so, how? And has anything surprised you about it?
8. Where and how has social media been incorporated into your campaign?
9. To what extent has social media changed the way in which you publicise your campaign? And how might it evolve in the future?
10. As an organisation, do you prefer one form of social media over the other? Why? And how many of your co-workers are involved in it?
11. Do you have a policy on whom to follow on Twitter? Who formulated it and why?
12. To what extent does someone actively manage your pages and/or look at what is being written on them?
13. What have you learnt by including Twitter and Facebook into your campaign?

General Questions from Time Series, Cross-Correlation and Intervention Analysis

1. Why do you use Twitter more than Facebook?
2. To what extent do you coordinate your social media campaigns? Do you actively manage your social media networks?
3. Who operates your social media accounts?
4. To what extent does each of the anti-airport expansion groups operate autonomously?
5. Do you post different messages/updates on both Twitter and Facebook? If so, why?
6. [To HACAN & Airport Watch] Why did you create a Twitter profile before a Facebook page?
7. Did you have a strategy in place to prepare for, and respond to, the Davies Commission interim report? What form did it take?
8. To what extent was there an increase in your social media activity when the Davies Commission interim report was announced on 17th December 2013?
9. Are there time periods (parts of the year) where you do not post as much? Why?
10. Have you experienced any negative feedback? And/or had 'Twitter trolls'?

Future Plans

1. What have you learnt from the Davies Commission interim report for when the full report is published? Would you do anything differently?
2. Would you change anything about your social media campaign?
3. What role will social media play for you in the future? Will it replace your offline campaign?