

Spring 3-19-2013

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## Recommended Citation

Heeks, Richard and Seo-Zindy, Ryoung, "ICTs and Social Movements under Authoritarian Regimes: An Actor-Network Perspective" (2013). *UK Academy for Information Systems Conference Proceedings 2013*. 14.  
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# ICTs and Social Movements under Authoritarian Regimes: An Actor-Network Perspective

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## **Abstract**

*There has been significant recent interest in the role of information and communication technologies (ICTs) in social movements protesting against authoritarian regimes. Much of the literature on this topic can be framed in terms of dualities: seeing either technology or (less often) society as the cause of impacts characterised as either liberation or repression. This paper seeks to move beyond those dualities by using actor-network theory (ANT) to study the role of ICTs in Iran's Green Movement; specifically by applying Callon's moments of translation.*

*This analysis turns the focus from causes or impacts of social movements, to the dynamics of their trajectory. It presents ICTs as an active actor within this social movement of protest; an actor which rapidly made this movement into a global network. Yet ICTs also betrayed the protest. They simultaneously worked for the Iranian regime. And they allowed a shallowness of translation which enabled quick problematisation, intersement and enrolment, but which equally enabled quick de-enrolment, and which undermined the full mobilisation of this social movement and ultimately led to its disintegration.*

*Recognising the limits but also the originality of actor-network theory, the paper ends by suggesting directions for future ANT-based work on ICTs and social movements.*

**Keywords:** social movements; actor-network theory; e-democracy; social media

## **1. Introduction**

Social movements can be understood as “networks of informal interaction between a plurality of individuals, groups and/or organisations, engaged in a political or cultural conflict on the basis of a shared collective identity” (Diani 1992:13). They can be traced back many centuries; for example, England's Peasants' Revolt of 1381. Social movements have been particularly associated with the politics of Europe in the 19<sup>th</sup> century (for example, the Chartists in the UK in the mid-1800s), with the pre- and post-Independence eras of nations in the global South (such as the Sarvodaya democratic movement in India) and with specific issues in the global North (such as the Civil Rights movement of the 1960s in the US) (Tilly 2004).

Social movements are seen as a universal feature of current societies, with arguments that they have been catalysed by both globalisation and the spread of information and communication technologies (ICTs) (Tarrow 2011). The mainstream narrative of ICTs and social movements has been both positive and tending towards technological determinism. Recurrently-cited case studies discuss the Mexican Zapatista movement's use of the Internet to attract global solidarity in the 1990s (Van de Donk et al 2004), the central role of mobile phones in coordination of protests to oust President Estrada in the Philippines in 2001 (Shirky 2011), and the "Twitter Revolutions" from Moldova and Iran in 2009 through to the Arab Spring uprisings of 2011 (Mungiu-Pippidi & Munteanu 2009, Stepanova 2011).

Alternatives to or critiques of this dominant narrative have been several; claiming that the role of ICTs in these social movements has been significantly overstated (van Laer & van Aelst 2010), that ICTs have been equally used as tools of political repression by authoritarian regimes (Morozov 2011), and – taking a socially-deterministic position – that ICTs merely reinforce existing political structures rather than transforming them (Luke 2006). The relation between ICTs and social movements remains a topic of active debate with these critiques also being counter-critiqued (Diamond 2010).

These are dualistic disagreements about the role of ICTs in social movements: the impacts with which they are associated, and the extent to which technology or other factors are the cause of those impacts. At root, they represent different conceptualisations of the relationship between technology and society. Attempts to steer beyond these dualisms sometimes focus on impacts, arguing for a mixture of liberation and repression (Golkar 2011); and sometimes focus on causes, arguing that impacts derive from a mixed interaction of social and technological factors (Lievrouw & Livingstone 2006).

Yet there have been criticisms of all these accounts – in terms of their conceptualisation, their simple association of cause and effect, and their focus on outcomes rather than process – which prompt a continuing search for alternative perspectives (Nielsen 2009, Rahimi 2011). In this paper, then, we wish to take a different path – that laid out by actor-network theory – which seeks to move beyond

the dualities of technology and society; and beyond conventional notions of cause and effect, and which helps expose the processes that underpin the trajectory of a social movement network.

Our main research question is: from an actor-network perspective, what role do ICTs play in the development of a social movement network? We answer this through the use of ANT to analyse one particular social movement: the Iranian “Green Movement” of 2009 that arose following contested presidential elections.

In the next section, we review the literature on ICTs and social movements in more detail, leading into a brief resumé of key ANT ideas that will be applied here. Following an overview of our methodology, the main body of the paper is given over to analysis of the Green Movement framed using Callon’s moments of translation approach. We end by drawing some conclusions about ICTs and social movements from an actor-network perspective.

## **2. Literature Review**

As noted in the Introduction, the history of social movements can be traced back many centuries while the literature on social movements can be traced back several decades. Early literature drew from social psychology to investigate the motivations of those involved in social movements (e.g. Cantril 1941, Toch 1965), or from sociology to study the broader patterns and causes of social movements (e.g. Turner 1969, Oberschall 1973). There has also been a focus on the broader cultural and political impact of social movements (e.g. Giugni 1998, Tilly 2004).

Within the literature on social movements there has been a continuous interest in the role of communication networks and the role of the media; seen as fundamental in both organising and promoting any social movement (Freeman 1999). It is therefore not surprising that the growing global diffusion of ICTs has prompted an expanding literature on the relation between ICTs and social movements (McCluskey 2012). That literature has especially grown with the sense – particularly following the interpreted experiences in the late 1990s of the WTO meeting protests in Seattle and the Zapatista movement in Mexico – that ICTs were not merely helpful but central to

the current organisation and promotion of social movements (Kahn & Kellner 2004, Chadwick 2006).

Picking up on broader themes within the social movement literature, discussion within the ICTs and social movement literature can be related to a number of core issues, including the impacts of ICTs and the causes of those impacts. In relation to impacts, two opposing views have emerged which can be characterised as the ‘liberation technology’ vs. ‘repression technology’ perspectives.

The liberation technology perspective (Diamond 2010) has been the more dominant. It recognises a set of key affordances that ICTs provide for social movements: dramatically lowering the cost of communication, accelerating the diffusion of information, and transcending barriers of time and space in order to develop collective identity and mobilise protest (Diani 2000, Leizerov 2000, Elin 2003). This – for example – empowers citizens living under authoritarian regimes, enabling them to mobilise together and to attract global support. This creates the basis for a defiance of state power and then an enactment of political change that would not otherwise have been possible; with a number of real-world cases cited in which ICTs are argued to have been fundamental to changes in political regimes e.g. in the Philippines (Castells et al 2006) and Ukraine (Goldstein 2007).

Three different responses can be identified from authoritarian regimes, which have emerged over time: rejection, control, and repression. The response was originally seen in terms of the “dictator’s dilemma”: autocrats know that ICTs are essential to economic development in their countries but that the technology will also facilitate political protest (Hachigian 2002). Some therefore chose to largely reject the technology; not allowing it to be used, or allowing data processing but not communication.

As this type of electronic isolationism became harder to sustain, some regimes would allow diffusion of ICTs but with restrictions and controls imposed on their usage. This might include the blocking of particular communication channels (e.g. North Korea largely permitting only in-country communications), or the blocking of particular websites (as in China), or filtering out of particular communications

(Kalathil & Boas 2003, Morozov 2011). This might happen continuously, or might only be imposed during times of political tension, e.g. cutting off services during civil unrest (Robertson 2011).

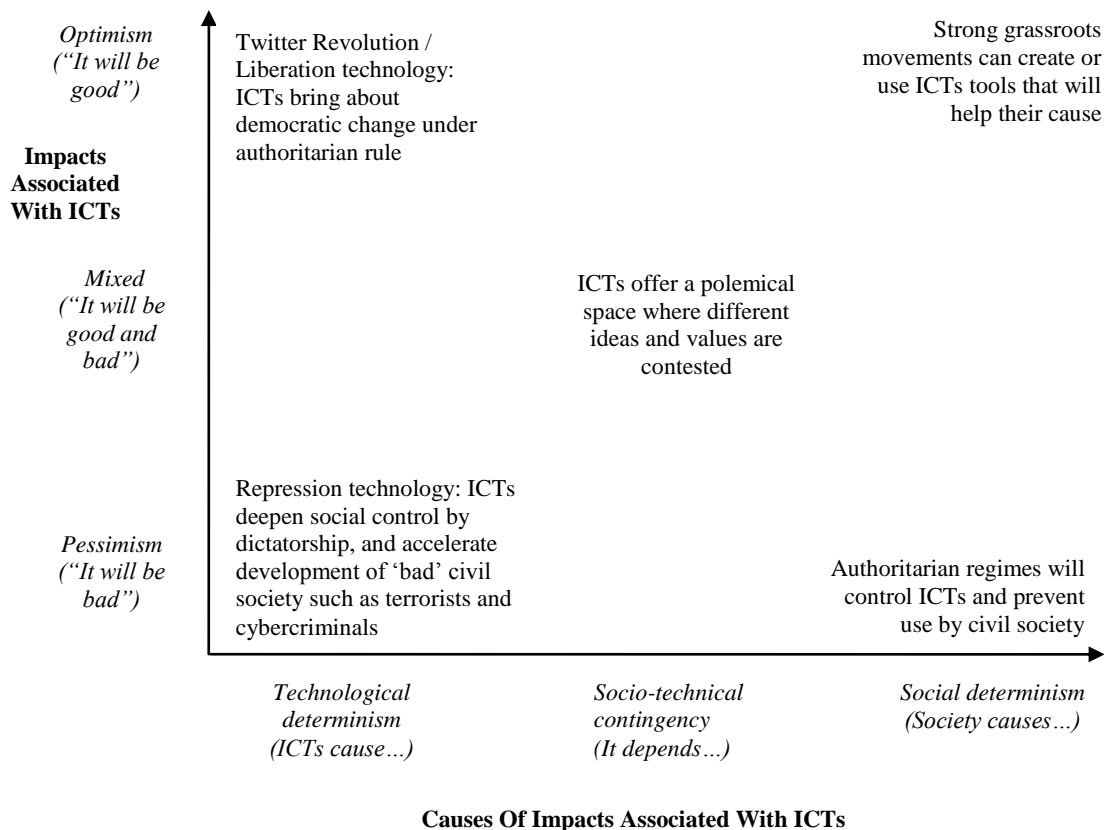
These reactive strategies would generally exist alongside the monitoring of electronic communications, which represent a first step towards a more proactive and repressive stance by regimes (Kalathil & Boas 2001). In these situations, states make use of e-surveillance to gather evidence that is used to repress their opponents. But they also actively use ICTs for repressive purposes: disseminating propaganda inside and outside the country; hacking into the websites of internal social movements and the email/mobile accounts of organisers; planting disinformation into social movements' communications; using viruses and other tools of cyberwarfare to attack political challengers (*ibid.*, Karlekar & Cook 2009). This "repression technology" literature thus stands in opposition to the liberation technology claims, and presents evidence that the dictator's dilemma is solved: ICTs can be simultaneously harnessed for economic growth and political restraint. ICTs may also be seen as repressive if they enable the hatred and fundamentalism of "bad civil society" (Lunat 2008, Chambers & Kopstein 2011).

Alongside these contrasting positions about the political impacts associated with ICTs, there are contrasting views on the causes of those impacts which can be characterised as the 'technological determinist' vs. 'social determinist' perspectives. The former is much the more dominant and assumes that it is technology which constructs society and, hence, which should be seen as the prime cause of the types of impacts just described (Winner 2003). Although stronger in the simplicities of public statements such as by politicians (e.g. Hillary Clinton cited in BBC 2011), this has still been a current within much of the literature. Mainly associated with the liberation technology perspective that can reduce the complexity of social movements to the functionalities and appropriateness of the technology that accompanies those movements (e.g. Castells 2001, Shirky 2011), it is also found in repression technology discussions (e.g. Morozov 2009).

Socially-deterministic perspectives on ICTs and social movements are less prevalent, but are reflected in work drawing from a sociological perspective and from ideas on

the social construction of technology. These see the context and structures of ICT-enabled social movements as most relevant in explaining the outcomes seen (Salter 2003, Luke 2006). The differences in those contexts and structures help explain why different outcomes are seen in different situations involving the same digital technologies.

These perspectives on cause and effect – summarised in Figure 1 – of course represent relatively extreme statements of position, and stereotypes which are readily critiqued (not least by the mirror image positions). The typical resolution to the dualisms of both cause and effect, and to their critiques, would be a socio-technical compromise, which recognised a multiplicity of political outcomes; as represented by the central position in Figure 1. Such resolution has not been quite as easy as it sounds because debates have had a tendency to become polarised rather than converging (Diani & McAdam, 2003). But we can recognise a rich literature that encompasses both the positive and negative associated with ICTs and social movements, and which brings together both social and technical elements (e.g. Cammaerts 2005, Chadwick 2006, Drezner 2010, Golkar 2011).



**Figure 1: Literature Views on ICTs and Social Movements (adapted from Heeks 2002)**

While acknowledging the significant value and contribution of this literature – dominant narratives, counter-positions, attempted resolutions – it can be noted that there are still some broader criticisms which have been levelled. These suggest we should not abandon the search for other perspectives (McAdam et al 2001, Jasper 2002, Della Porta & Diani 2006, Nielsen 2009, Rahimi 2011):

- Much of the literature has rather limited explicit conceptualisation, tending to review and describe case examples rather than build from a clear theoretical foundation.
- The technology is typically recognised as an enabler that changes some of the landscape within which social movements operate. But it is still treated as separate from society despite the increasing blurring of boundaries between the technical and the social.
- There tends to be a relatively simple association of cause and effect, despite the complexity of elements at play within the workings of modern social movements.



- Agency has tended to be underplayed in favour of broader social or technological factors in explaining outcomes, with technology portrayed only as a tool rather than being seen to play any active role.
- The literature is seen to focus either on the initial causes of ICT-enabled social movements or, more often, on their political outcomes, rather than seeking to explain the process and dynamics of those social movements.

So, while not seeking to substitute for the work that has already been done, there do appear to be grounds for supplementing the current literature. That supplement could come from a number of directions but here we make use of actor-network theory (ANT). There have been a few applications of ANT within the social movement literature, which show its potential in understanding movement formation (e.g. Routledge 2008, Ernstson 2011). In specific relation to ICTs and social movements, it appears that ANT has been just occasionally used as part of a general conceptualisation that demonstrates its potential relevance, rather than directly being applied as a core analytical frame (e.g. Nielsen 2009, Zheng & Zhang 2011).

Space is too limited here to provide an exposition of ANT, for which readers must be referred elsewhere (e.g. Latour 2005). However, we can note within its foundational ideas (e.g. Latour 1999, 2005) the potential to move beyond the dualisms and to provide a fresh perspective on some of the broader criticisms described above:

- While acknowledging the complexity of ANT, the different streams of ideas within it, and the question mark over its status as a theory (Mol 2010) we can say that it does provide a conceptualisation of the world.
- Its principle of free association rejects any *a priori* distinction between the social and the technological/natural (Callon 1986, Tatnall & Gilding 1999).
- Traditional notions of cause and effect are largely rejected, with the social and technological identified more as what is caused or “as interactional effects rather than primitive causes” (Law 1992).
- ANT sees a world full of actors and its principles of agnosticism and generalised symmetry treat human and non-human actors as categorically equivalent; focusing on how these actors join together in a series of processes of association and translation that create heterogeneous networks (Callon 1986, Law & Callon 1988).

- From this perspective, then, social networks are hybrid and contingent associations of human and non-human elements that are in constant flux, with ANT not seeking to uncover causes or effects but spotlighting the dynamic processes of collective action reflected in network formation, growth, dissolution, etc.

As a particular means of analysis, we take a well-trodden path within information systems of looking at translation – the means by which dispersed actors mobilise, connect, juxtapose and hold together in heterogeneous associations (Law 1992) – and in particular, Callon’s (1986) four “moments of translation” which may be seen in the flux of networks over time:

- *Problematization*: particular actors (seen as a “focal actor”) position themselves as indispensable, by defining the route from current problems to future goals in terms of an “obligatory passage point” (OPP) through which all actors must pass.
- *Interessement*: focal actors try to convince other actors to accept the roles and relations they are assigned, by imposing themselves and strengthening other actors via devices that they suggest.
- *Enrolment*: focal actors put the roles and relationship they established in interessement into action with a set of negotiation techniques which might include physical violence, seduction, persuasion, transaction or consent without discussion.
- *Mobilisation*: focal actors ensure their legitimacy and become spokespeople for collectives they represent without betraying their allies.

When observed through the moments of translation, social movements therefore become a constant flux of power: endless attempts to connect and influence other actors (whether they are human or non-human) to join and follow the movement; or to betray the movement and detach or join other networks.

### **3. Methodology**

The methodology adopted in order to answer our core research question – “from an actor-network perspective, what role do ICTs play in the development of a social movement network?” – was qualitative. We selected a single case study design which

allows for in-depth analysis over time (Stake 1995) and which has been argued as particularly suitable for ANT-based research (Greener 2011).

Our specific case study was the Green Movement in Iran, which came to prominence as a protest against contested presidential election results in June 2009. Iran has experienced significant diffusion of ICTs since 2000, is particularly active in the sphere of social media, and has seen ICTs used as an important arena for political activism (Rahimi 2008). The Green Movement itself has been identified as one of the largest actions of civil resistance utilising ICTs but one which is also representative of other recent actions such as those of the Arab Spring (Golkar 2011).

The Green Movement has been very well documented already as a social movement with an annotated bibliography (Forte 2009), with subsequent analytical books and articles (Dabashi 2011, Golkar 2011), text and audio-visual resources available from news organisations and blogs, and with directly-posted resources from Iranian citizens on YouTube, Twitter, Facebook, etc. In order to produce the case study that follows, we have triangulated from all of these sources, taking as our time frame the period just before the election in May 2009 to June 2010, the first anniversary of the Green Movement.

#### **4. Case Study of ICTs and Iran's Green Movement**

Figure 2 summarises Iran's political system since the 1979 Islamic revolution with the country's Supreme Leader being the most powerful element but with the country's President also having significant power (Bruno 2008). Mahmoud Ahmadinejad was first elected President in 2005 against a more moderate and reformist candidate but with a disappointing level of turnout. That disappointment led to a reaction which particularly targeted ICTs and the mass media.

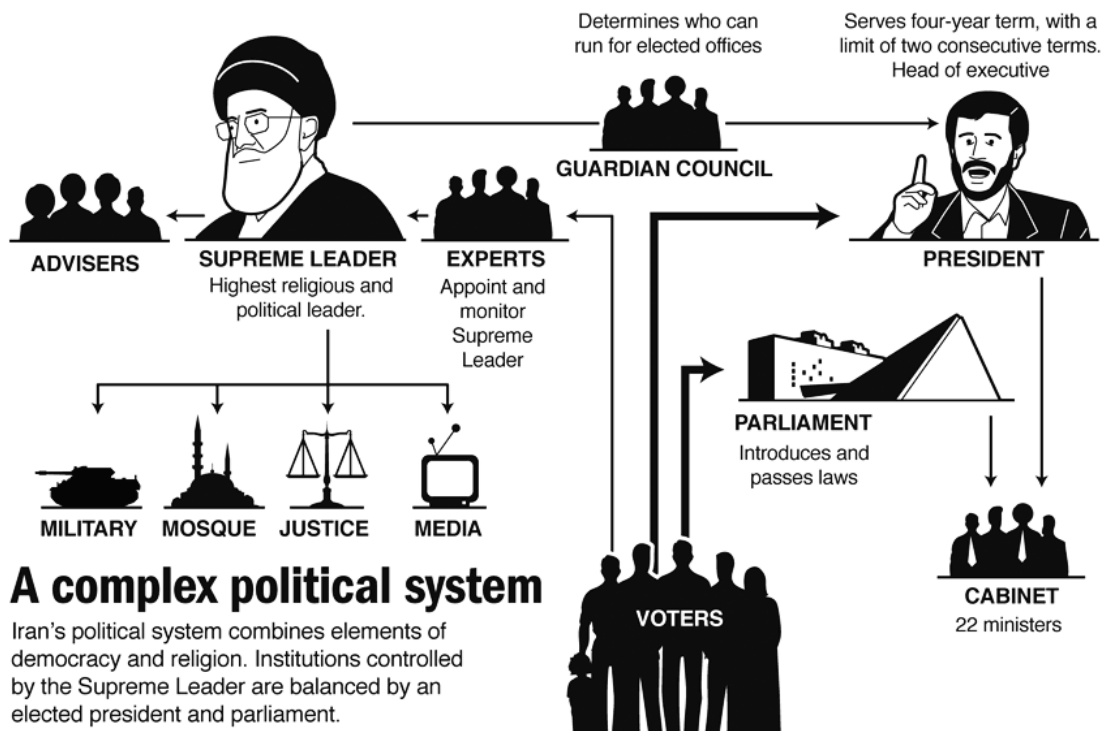


Figure 2: Iran's political system (Rapp 2009)

56% of Iranians are aged under 25. The country also has high youth unemployment, relatively high levels of education and literacy, strong ICT diffusion, and state control of television, radio and print media (CIA 2012). Not surprisingly, this combination led the Internet to become a forum for political debate and even dissent, with young Iranians especially keen on blogging (Razzaghi 2011). Using Internet-based media individuals were able to mobilise around particular issues such as women's rights (Ameripour et al 2010). Although never seen as likely to unseat Ahmadinejad's regime, the political threat posed by this new forum was recognised and from 2005 onwards more restrictions were put in place with online activists being jailed and the regime setting up filtering and surveillance technologies (OpenNet Initiative 2009, CBS 2010).

As the June 2009 election approached – in which Ahmadinejad was seeking re-election - the Ministry of Information and Communication started to throttle Internet speed down to 128 kilobytes per second, but the Ahmadinejad campaign also sought to make use of ICTs. A first live presidential debate was held and shared on YouTube, Ahmadinejad created a Facebook page, and supporters were encouraged to

use social media to promote his candidacy, disseminate information about rallies, etc (Sreberny & Khiabany 2011).

Despite the restrictions, the Internet also became a main space for other candidates. One campaign – supporting Mir-Hossein Mousavi – was particularly active; adopting the colour green as a unifying emblem that supporters used in profile pictures, images, videos, etc that were shared online. Members of the Iranian diaspora also participated via the Internet, and the use of ICTs started to attract the attention of foreign media (Hodge 2009). Mousavi rallies were organised in part via social networking and their large turnouts led the government to starting blocking key websites (Kahtami 2009). It is at this point in proceedings that we begin our analysis through the lens of moments of translation.<sup>1</sup>

#### **4.1 Problematisation**

Mousavi’s election campaign started to make visible a potential network of dispersed actors. Realisation of that network’s potential began when the 12<sup>th</sup> June election result was announced, indicating that Ahmadinejad had been re-elected with 63% of the vote. Many in Iran did not believe this result and felt it to be fraudulent. Some of them took to the streets in protest, and we will identify these protestors as our focal actor; an actor that sought to frame the goals and problems of other actors in their own terms, as we will describe next.<sup>2</sup>

The *protestors* are a diverse group but generally seen as dominated by middle-class, urban, well-educated youths. Their goals were sometimes rather unclear but clustered around a more democratic polity within Iran which they saw the current political system as preventing. Their immediate problems were with the election result, which they believed to be rigged, and by association the regime it had maintained in power: typical slogans were “Where is my vote?” and “Down with the dictator”.

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<sup>1</sup> Although triangulated from many sources, this ANT-based analysis particularly uses the following, which will not be continuously cited in the text: Alexanian 2009; Forte 2009; Ghorashi & Boersma 2009; Gerecht et al. 2010; Gheidary 2010; Sohrabi-Haghighat & Mansouri 2010; Naghibi 2011; Sreberny & Khiabany 2011.

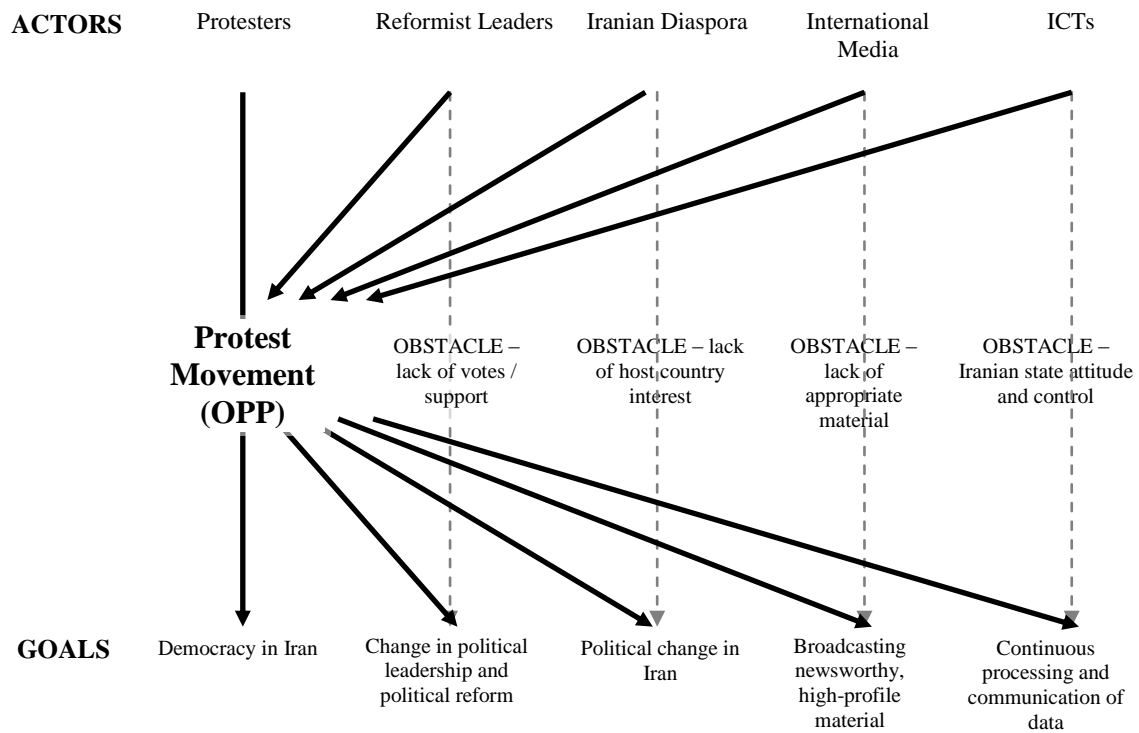
<sup>2</sup> As with all ANT-based accounts, we have had to set a limit on the number of actors included. For example, there are other actors who at times associated themselves with the protest actor-network; such as Western governments and Western citizens. But their involvement was somewhat at arms-length or short-lived and we have chosen to talk largely about those actors who became more actively aligned with the protestors.

*Reformist leaders* in Iran included not just Mousavi and his coterie but others such as the other reformist candidate Mehdi Karroubi and former President Mohammad Khatami who had earlier withdrawn from the election and endorsed Mousavi. Their goal was election of a reformist leadership, with the claimed lack of enough votes being the main obstacle to realisation. Of course the declared election result represented a key problem for them.

Estimates of the size of the *Iranian diaspora* vary between one and four million (Hakimzadeh 2006), with particular concentrations in North America, Europe and the Middle East. The majority are those who left the country following the 1979 revolution or their children. They tend to be opposed to Iran's current political dispensation and want change. Given their position, a main focus will be on seeking support for change within their host nation – e.g. by translating articles, contacting the media, undertaking advocacy – and a main obstacle has been generating sufficient political momentum within their new home nations. There are strong divisions within a group that consists of many religious faiths and of leftists, reformists, nationalists, monarchists and more (Slavin 2010). This has made it hard to develop a unified focus for change but the 2009 election result clearly presented a problem that many in the diaspora acknowledged.

The *international media* of TV, radio and print have an ultimate goal of disseminating newsworthy material that will attract public attention. They face a main obstacle in the lack of such material, especially in regard to material from foreign countries. They had been covering the Iranian election but at first struggled to raise the profile of the event, and then struggled post-election as the Ahmadinejad regime started to harass, arrest and intimidate foreign journalists based in Tehran (Addis 2009).

Finally, the *ICTs* themselves have a goal of processing and communicating data, with their main obstacle being the ambivalence and at times antipathy of the Iranian regime; a regime which has significant control over the ICT infrastructure. As seen, the regime had begun to interfere with ICTs' ability to achieve its goals pre-election, and this continued post-election e.g. with mobile/SMS coverage being periodically cut.



**Figure 3: Problematisation just after Iranian election**

With the actors, goals and obstacles identified, we can also see how protestors were – at least temporarily – able to translate the paths of those actors and identify their electoral protest movement as an obligatory passage point for achievement of goals; as summarised in Figure 3. For reformists and the diaspora, the protest movement is the only viable means to attract the mass support necessary for political change. For the diaspora and the international media, the movement represents the only apparent way to attract public attention. For ICTs, the movement provides a means for them to continue to perform digital functions which the regime seeks to deny them.

#### **4.2 Interessement**

The presence of this social movement of protest in Iran has offered various actors a single way forward which in theory enables them to circumvent current obstacles and achieve their goals. But the focal actors must now get the other actors to engage with, and commit to this course of action. They will do this through devices that seek to lock that commitment in place, blocking the actors from alternative courses of action. For all the other actors, those alternatives certainly exist – reformist leaders and the

diaspora could accept the result and look to 2013 elections when Ahmadinejad can no longer stand; the international media could look elsewhere for stories, ICTs can choose to work only for the regime or not to work at all.

A key device was the act of protest which served to frame Iranian politics in Manichean terms. Shades of grey and compromise routes disappeared in a situation in which other actors were either with the protestors or against them and with the regime. Faced with this framing, reformist leaders, members of the diaspora and some ICTs felt they had little choice but to accept connection with the protest movement; something in which they were joined by many ordinary citizens who were now drawn into the category of ‘protestor’. The protests also provided graphic imagery and narrative that persuaded the international media not to look elsewhere.

Use of the colour green was another device. Originally Mousavi’s campaign colour, it was widely adopted by the protestors as a material confirmation of their problematisation. Not only did this help lock Mousavi and his leadership into the protest movement, it provided a continuous focus on the protestors’ goals and a means to lower the barriers to association with the identity of the actor-network. Members of the diaspora and – more importantly – Iranian citizens, could declare their identity by wearing green (and without having to physically join in street protests). ICTs could also readily assume the identity of a protestor by disseminating green as a colour for social networking sites and other websites.

And protest images were a device of interessement, with the following process being typical (Gheidary 2010). During the protests and particularly when key incidents occurred, protestors took video or photo images on their mobile phones. These were then posted onto social networking sites whenever Internet access became available. Those images could then be disseminated to other protestors and to the Iranian diaspora, and then be available for broadcast by the international media. They served to heighten the definition of protestors as democratic underdogs on the side of good; the regime as authoritarian tyrants on the side of evil.



### **4.3 Enrolment**

Problematization presented a set of theoretical ideas and interessement developed devices that framed the validity of those ideas; defining actors, identities, interests, problems and solutions. However, until these are put into action, it is uncertain whether each actor will actually follow these ideas and take on defined roles and relations. Enrolling other actors into practice, therefore, becomes a series of tests and negotiations with each of the other actors (Callon 1986).

At first, enrolment appeared to be successful with the acts of protest and other devices creating a social movement actor-network. These were the biggest protests since the 1979 revolution. They involved tens of thousands of people gathering almost every day for two weeks, with hundreds of thousands more aligning themselves with the Green Movement and entering themselves into the category of ‘protestor’. Reformist leaders risked exclusion to the political wilderness if they failed this test, and most chose to become part of the actor-network; declaring their support although calling for non-violence (BBC 2009). The diaspora also recognised what might be a once-in-a-lifetime moment for political change. Members readily adopted the assigned role of international mouthpiece and supporter, with many staging protests of their own.

Other actors also enrolled, though with more difficulty. ICTs’ assigned role was as channel for organisation, recording and dissemination of the social movement’s actions and ideas, but it found it difficult to enact this due to the regime’s access restrictions. One successful negotiation was the agreed use of proxy software, which allowed some access to social networking sites and other websites via proxy servers (Christensen 2009). Others sought to enrol oppositional ICTs – those hosting government and pro-Ahmadinejad information – by hacking them and substituting protest-related materials (Moscaritolo 2009).

The international media was persuaded to fulfil its role as global broadcaster and political lever by being continuously provided with suitable material. While this was hard to obtain from Tehran-based journalists, ICTs provided the means for ongoing enrolment via Twitter (with key accounts such as Persianikiwi and Mousavi1388 being picked up by media such as the New York Times and Daily Telegraph), via blog accounts (with some protestors switching to writing in English so foreign media could

use their material), and through photo/video imagery. One particular image – the amateur footage showing the death of Neda Agha-Soltan on 20 June after being shot by a government militiaman – was rapidly and widely circulated and broadcast (Ravitz 2009).

These actions and materials constitute a series of continuous micro-negotiations that helped keep all key stakeholders enrolled into what now appeared to be an important, global social movement. Protestors, reformist politicians, diaspora members, ICTs and mass media all had a defined role which they were agreeing to fulfil. Indeed, during the first two weeks, the network appeared to be so strong and sizeable that others were drawn in. The US State Department for example became more vocal in its expressed concerns about the election results. It reportedly asked Twitter to delay a planned upgrade which might affect Iranian access to the service (Pleming 2009), and supported development of Haystack: software designed to bypass Iranian government monitoring and censorship (Schleifer 2009).

#### **4.4 Regime Attempts at De-Enrolment**

Despite all this positive evidence of network formation and enrolment, there were other dynamics in play that sought to challenge the social movement. The Iranian regime itself is typically black-boxed as a homogeneous entity but – as Figure 2 indicates – it is an actor-network of some size and diversity. At times, it seemed as if the black box might open up and reveal that diversity, with differences in tone and emphasis in the reaction to protest, and with disagreements and uncertainties apparent between its various constituent actors.

That this did not happen came in part from the regime's ability to attack and weaken the counter-network that had emerged around the protest movement. One de-enrolment tactic was a relentless association of the social movement with Western powers. This was made easier because of the transnational nature of the protest movement with the involvement of the diaspora in the USA and Europe, the role of foreign media, and of Western-developed ICTs: Facebook, Twitter, Google, etc (Time 2009). Sensitivities about the West in Iran had restrained Western governments from clearly joining the protest actor-network, but the regime continued to associate the

protestors with foreign powers. Some were charged on that basis as Western spies seeking to undermine Iranian national security (Worth & Fathi 2009).

The reformist leaders – more followers than leaders of the protest movement – were targeted for intimidation that included arrests and violence and death threats (with Mousavi's nephew shot and killed by security forces during a protest towards the end of 2009 (Fletcher 2009)). Some members of the diaspora were directly affected when relatives who still remained in Iran were threatened by the Iranian state (Fassihi 2009).

The international media were courted with alternative messages: not just obvious pro-Ahmadinejad propaganda but stories about protestor violence and also more subtle variants which did find a wider audience, such as those showing how the unrest in Iran was disrupting ordinary people's lives (CNN 2009). As noted, ICTs were subject to continuous attempts to make access difficult: shutting down mobile or Internet communications from time-to-time and also blocking proxy servers once their details were shared on Twitter (Christensen 2009). The government also sought to subvert ICTs' role within the counter-network through various acts: placing pro-government messages on protestor social networking sites, hacking protestor accounts, and placing contradictory messages about the timing and location of planned protests, or about incidents that occurred during protests (Moscaritolo 2009).

#### **4.5 Attempted Mobilisation and Disintegration**

Mobilisation of a protest social movement means, in actor-network terms, that each actor accepts its own representatives, and that those representatives are in effect silenced by having the focal actor speak on behalf of the entire network (Callon 1986). The focal actor is thus determinant of what the whole network wants, is and does. But the ability of the Iranian protestors to mobilise the social movement in this sense was severely challenged.

First, the nature of the protestors as actor-network was problematic. This was not a formal, long-formed network with strong connections but an ad hoc, relatively-spontaneous one. Alongside a core committed to fundamental political change were a much larger penumbra who could contingently be enrolled but as readily de-enrolled.

This was a structure that ICT was essential to enabling and which has been seen in other recent Middle East protests (Hassan 2012): decentralised, flexible and without formal representatives. Such an actor-network could readily continue operating if individual components were attacked or removed by the regime. But this loose structure weakened the depth of translation of interests and identities within the protestors, and weakened the ability of the protestors to translate the interests and identities of other actors in practice.

As noted above, the regime used the nature of the broader actor-network to challenge the representativeness of the focal actor protestors. Where the protestors portrayed themselves as representing a disenfranchised majority of Iranian citizens, the regime portrayed them as channels for Western governments, influenced by Western media and Western technology. This weakened their ability to mobilise as representatives of other actors. Reformist leaders were placed in a difficult position – knowing that association with the West would be politically very damaging, and thus having to maintain some distance from the protest network. These actions also worked on the contingently-enrolled penumbra of local citizens, leading some to reject the identity of ‘protestor’.

Utilisation of Internet-based ICTs for the translation of these local citizens was relatively limited compared to more traditional tools such as phone or door-knocking (Schechtman 2009). ICTs were of greater relevance in attempting to interesse and enrol the other actors. But those other actors were heterogeneous, fragmented and themselves lacking agreed representatives: as described above, the diaspora is a collective noun covering a multitude of religious and political views. The reformists varied in their views about the outcomes they sought and would not all unite under Mousavi’s leadership (Gooya 2009). Neither the international media nor ICTs have any single leader or agreed representative.

As a result, not only was it impossible to fully mobilise this actor-network but de-enrolment was relatively easy to achieve. The regime’s actions rarely led to high-profile de-enrolment of actors dissociating themselves from the social movement. It more often led to less visible departures from the network: protestors, politicians and diaspora members silenced by threats, arrests or serious violence; the de-enrolment of

ordinary citizens who no longer counted themselves as protestors and who came – perhaps begrudgingly and temporarily – to accept the status quo. And it led to a loosening of associations: reformist leaders calling for an end to street protest in favour of more peaceful actions, and the attention of the international media turning away from Iran following the death of Michael Jackson and never returning in strength thereafter (Ali 2009, Wold 2012).

Because of these challenges – the loose organisational structure of the protestors, challenges to their representativeness, lack of representation within other actors, and the strength of alternative translations on offer – the protestors were never able to fully mobilise this social movement actor-network. Media attention moved on, ICTs agreed to play a dual role for both regime and protestors, reformist leaders accepted compromise, ordinary citizens who had been involved disengaged, and there were disagreements between protestors and members of the diaspora (MacFarquhar 2010). Simultaneously any initial opening up of the regime actor-network subsided. It closed once again and mobilised around the Ahmadinejad presidency (Glendinning & Siddique 2009).

The broader actor-network disintegrated, leaving a much smaller and still loose alliance that went into a period of “soul-searching and re-grouping” as from 2010 (Milani 2010).

## 4.6 Summary

Figure 4 summarises the trajectory of this social movement actor-network.

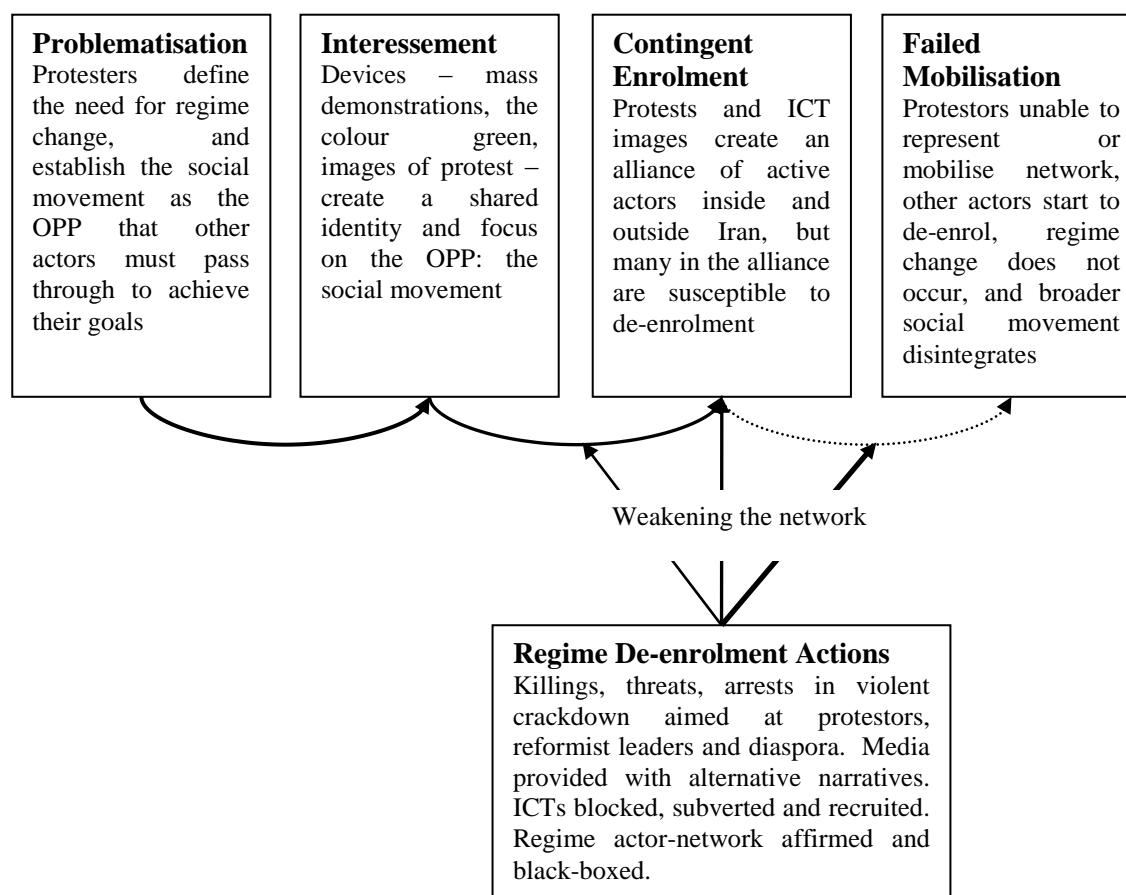


Figure 4: Iranian Green Movement moments of translation

## 5. Conclusions

The question posed initially was this: from an actor-network perspective, what role do ICTs play in the development of a social movement network?

ANT firstly sees ICTs as playing an actor's role; attributing interests, identity, agency to ICTs. In foreshortened accounts of the type necessitated in a paper, there is a danger that this emerges as little more than a linguistic device that describes technology in human-like terms. However, this has allowed a treatment of ICTs that differs from accounts of social movements based on other theorisations. In which the technology sits not categorically above, below or separate from human actors but

alongside them with conceptual equivalence. And in which ICTs are not just devices a social movement uses and interacts with, but an actor that can explain its own agenda and reasons for associating or not associating with the movement.

ICTs have been seen to play a participatory and facilitating role within the social movements. They have enabled a global movement to form, permitting the ideas and actions of the focal protestors to have a much greater influence than might otherwise be possible. The size, reach and rapidity of formation of this social movement would not have been achieved without ICTs, and they were central to the translation of other actors' ideas and identities; central to the creation and dissemination of an identity of protest that came to be shared across the network. ICTs provided a flexibility of translation and a flexibility of network formation; continuing to perform particularly their global role even when severely challenged by the Ahmadinejad regime.

Yet ICTs can also be seen to have betrayed the social movement in two ways.

Because of their heterogeneity, ICTs could not form a single, represented actor. Instead, while in part playing the supportive roles defined by the protest network, ICTs simultaneously undermined that network by playing the role defined by the regime network: refusing access to the protestors, disseminating false information, even helping to identify protest activists. At times, then, ICTs could no longer be a trusted member of the social movement.

ICTs also offered the social movement rapid but shallow support for actor-network formation. Translation processes occur more quickly but also more contingently when undertaken via ICTs (Korac-Kakabadse & Korac-Kakabadse 2002). There is a 'distancing' that limits depth of engagement generally, and a facilitation of multiple identities and interests that limits depth of engagement with any one network and role (Murphy 2009).

In all this, there are features of ICT-enabled social movements that can be seen across the Middle East. Formation of an actor-network via the first three translation processes – problematisation, intersement, enrolment – can happen with surprising speed and scale. Enrolment may be sufficient to topple an existing regime. The

loose, flexible structure of the network enables it to survive attacks while the regime continues. But that ICT-enabled structure of an atomised protest movement makes it hard to mobilise and makes the network fragile at the periphery, with membership outside the core protestors liable to de-enrol (Etling et al 2010); that de-enrolment being partly ICT-enabled. One result, as in this case or as seen in countries like Bahrain, is survival of the existing regime. When there is regime change there may be emergence of other focal actors based around pre-existing, formal networks – such as the Muslim Brotherhood in Egypt, or Ennahda in Tunisia – who can make better claims to mobilisation.

Overall, we can say that ICTs were deeply embedded in the dynamics of this social movement. They played an active role to shape, interact with, enable and undermine Iran’s Green Movement, demonstrating the complex socio-technical dynamics of social movements in a digital age. That role stood outside the dualisms identified in earlier literature. Social movement outcomes were measured not in terms of good or bad but in terms of network formation, non-formation or dissolution. Causes were not identified and there was no *a priori* distinction of the social and the technical: ICTs themselves were an actor-network with human and non-human components.

In practice, it has been hard to escape duality: an overlain sense from the Western perspective of the authors of “regime bad, protestors good” and a shorthanded treatment of ICTs as a technological actor-network. But these are limitations introduced by the authors because ANT does stand outside the dualities. It is amoral (Walsham 1997); offering the researcher no inherent signposts and helping move away from the “liberal-democratic values inherent in studying social movements in authoritarian regime” and the value-laded terminology of “liberation” and “repression” technologies (Deibert & Rohozinski 2010). And it is descriptive of network dynamics rather than explanatory, thus avoiding any sense of determinism (Heeks & Stanforth 2007, Law 2007).

This does impose a limitation. ANT has been helpful in exposing the dynamics of ICT-enabled social movements. It can provide a rich description of how actors come to join or leave such a movement, but tells us little about why the actors made those choices or what the implications are of those choices. As previously acknowledged, it



may therefore be better to regard ANT more as a methodology for study of social movements than as a theory let alone a critical theory (McNamara et al. 2004, Andrade & Urquhart 2010), recognising that it may better be used in combination with supplemental causal and moral frameworks.

Alongside the obvious idea of analysing other cases, this framework addition suggests a direction for future ANT-based work on ICT-enabled social movements. Other directions are identifiable from elements we could not address in the current study. More understanding of social movements under authoritarian regimes could be derived from switching to analyse the regime as focal actor, including ICTs as an actor within its network. Methodologically, longitudinal research based on primary data should provide a deeper understanding than our post hoc, secondary data-based study. Finally, more could be understood about the technology by selecting ICTs as an actor-network and opening that network up to understand its constituent actors and dynamics.

## References

- Addis, C.L. (2009) *Iran's 2009 Presidential Elections*, Congressional Research Service, Washington, DC <http://www.fas.org/sgp/crs/mideast/R40653.pdf>
- Alexanian, J.A. (2009) Eyewitness Accounts and Political Claims: Transnational Responses to the 2009 Postelection Protests in Iran, *Comparative Studies of South Asia, Africa and the Middle East*, 31(2), 425-442
- Ali, E. (2009) Iran: Khameini, Rafsanjani, Michael Jackson and the threat of war, *QW*, 15 Jul <http://www.qwmagazine.com/2009/07/15/iran-khameini-rafsanjani-michael-jackson-and-the-threat-of-war/>
- Ameripour, A., Nicholson, B. & Newman, M. (2010) Conviviality of Internet social networks: an exploratory study of Internet campaigns in Iran, *Journal of Information Technology*, 25, 244-257
- Andrade, A.D. and Urquhart, C. (2010) The affordances of actor network theory in ICT for development research. *Information Technology & People*, 23(4), 352-374
- BBC (2009) Ahmadinejad Defiant on "Free" Iran Poll, *BBC News*, 14 Jun [http://news.bbc.co.uk/1/hi/world/middle\\_east/8099115.stm](http://news.bbc.co.uk/1/hi/world/middle_east/8099115.stm)
- BBC (2011) Hillary Clinton: Internet Repression "Will Fail.", *BBC News*, 15 Feb <http://www.bbc.co.uk/news/world-us-canada-12475829>
- Bruno, G. (2008) *Backgrounder: Religion and Politics in Iran*, Council on Foreign Relations, New York <http://www.cfr.org/iran/religion-politics-iran/p16599>
- Callon, M. (1986) Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay, in *Power Action and Belief: A*

- New Sociology of Knowledge*, J. Law (ed.), Routledge & Kegan Paul, London, 196–223
- Cammaerts, B. (2005) ICT-usage among transnational social movements in the networked society, in: *Media, Technology and Everyday Life in Europe*, R. Silverstone (ed), Ashgate, Aldershot, UK, 53-72
- Cantril, H. (1941) *The Psychology of Social Movements*, Wiley, New York, NY
- Castells, M. (2001) *The Internet Galaxy: Reflections on the Internet, Business, and Society*, Oxford University Press, Oxford
- Castells, M., Fernández-Ardèvol, M., Qiu, J. & Sey, A. (2006) Electronic Communication and Socio-Political Mobilisation: A New Form of Civil Society, in *Global Civil Society 2005/6*, M. Glasius, M. Kaldor & H. Anheier (eds.), Sage Publications, London, 112-131
- CBS (2010) Blogger sentenced in Iran to 19 years, *CBS News*, 28 Sep <http://www.cbc.ca/news/world/story/2010/09/28/iran-blogger-hossein-prison.html>
- Chadwick, A. (2006) *Internet Politics: States, Citizens and New Communication Technologies*, Oxford University Press, New York, NY
- Chambers, S. & Kopstein, J. (2001) Bad Civil Society, *Political Theory*, 29(6), 837–865
- Christensen, C. (2009) Iran: Networked Dissent, *Le Monde diplomatique*, July <http://mondediplo.com/blogs/iran-networked-dissent>
- CIA (2012) *The World Factbook: Iran*, Central Intelligence Agency, Washington, DC
- CNN (2009) Chaos prevails as protesters, police clash in Iranian capital, *CNN World*, 20 Jun [http://articles.cnn.com/2009-06-20/world/iran.election\\_1\\_protesters-riot-police-president-mahmoud-ahmadinejad?\\_s=PM:WORLD](http://articles.cnn.com/2009-06-20/world/iran.election_1_protesters-riot-police-president-mahmoud-ahmadinejad?_s=PM:WORLD)
- Dabashi, H. (2011) *The Green Movement in Iran*, Transaction Publishers, New Brunswick, NJ
- Deibert, R. & Rohozinski, R. (2010) Liberation vs Control: The Future of Cyberspace, *Journal of Democracy*, 21(4), 43-57
- Della Porta, D. & Diani, M. (2006) *Social Movements: An Introduction*, 2<sup>nd</sup> edn, Blackwell Publishing, Malden, MA.
- Diamond, L. (2010) Liberation Technology, *Journal Of Democracy*, 21(3), 69–83
- Diani, M. (1992) The Concept of Social Movement, *The Sociological Review*, 40(1), 1–25
- Diani, M. (2000) Social Movement Networks Virtual and Real, *Information Communication Society*, 1(3), 386–401
- Diani, M., & McAdam, D. (2003) *Social Movements and Networks*, Oxford University Press, Oxford
- Drezner, D. W. (2010) Weighing the Scales: The Internet 's Effect On State-Society Relations, *World Affairs*, 16(2), 31–44
- Elin, L. (2003) The Radicalization of Zeke Spier: How the Internet Contributes to Civic Engagement and New Forms of Social Capital, in *Cyberactivism: Online Activism in Theory and Practice*, M. McCaughey & M. Ayers (eds.), Routledge, New York, 97–116
- Ernstson, H. (2011) Re-translating nature in post-apartheid Cape Town, paper presented at *Understanding Development Through Actor-Network Theory* international workshop, London School of Economics, 30 June
- Etling, B. Faris, R. & Palfrey, J. (2010) Political Change in the Digital Age: The Fragility and Promise of Online Organizing', *SAIS Review*, 30(2), 37-49

- Fassihi, F. (2009) Iranian Crackdown Goes Global, *The Wall Street Journal*, 3 Dec  
<http://online.wsj.com/article/SB125978649644673331.html>
- Fletcher, M. (2009) Seyed Ali Mousavi, opposition leader's nephew, may have been targeted, *The Times*, 29 Dec  
<http://www.thetimes.co.uk/tto/news/world/middleeast/article2605639.ece>
- Forte, M. (2009) *Annotated Bibliography: Twitter and the Iranian Election Protests*, Open Anthropology Project, Montreal
- Freeman, J. (1999) On the origins of social movements, in: *Waves of Protest: Social Movements since the 1960s*, J. Freeman & V.L. Johnson (eds), Rowman & Littlefield, Lanham, MA, 7-24
- Gerecht, R., Khalaji, M., Sazegara, M. & Kristol, W. (2010) The Panel Discussion on Iran: State of the Green Movement, discussion transcribed from *Iran: Prospects for Regime Change* conference, The Foreign Policy Initiatives, Washington, DC, 6 Apr
- Gheidary, L.K. (2010) Social media and Iran's Post-Election Crisis, paper presented at the *7th International ISCRAM Conference*, Crowne Plaza Hotel, Seattle, WA, 2-5 May
- Ghorashi, H. & Boersma, K. (2009) The "Iranian Diaspora" and the New Media: From Political Action to Humanitarian Help, *Development and Change*, 40(4), 667-691
- Giugni, M.G. (1998) Was it worth the effort? The outcomes and consequences of social movements, *Annual Review of Sociology*, 24, 371-393
- Glendinning, L. & Siddique, H. (2009) Ahmadinejad sworn in for second term amid walkouts and protests, *The Guardian*, 5 Aug  
<http://www.guardian.co.uk/world/2009/aug/05/mahmoud-ahmadinejad-sworn-iran-president>
- Goldstein, J. (2007) *The Role of Digital Networked Technologies in the Ukrainian Orange Revolution*, Berkman Center for Internet & Society, Cambridge, MA
- Golkar, S. (2011) Liberation or Suppression Technologies?, *International Journal of Emerging Technologies and Society*, 9(1), 50-70
- Gooya (2009) Details of 'Green Path', *Gooya*, 18 Aug  
<http://news.gooya.com/politics/archives/2009/08/092369.php>
- Greener, I. (2011) *Designing Social Research*, Sage, London
- Hachigian, N. (2002) The Internet and Power in One-Party East Asian States, *The Washington Quarterly*, 25(3), 41-58
- Hakimzadeh, S. (2006) *Iran*, Migration Information Service, Washington, DC
- Hassan, H. (2012) *Islam, SMOs, and the Arab Spring*, Lehigh University, Bethlehem, PA
- Heeks, R. (2002) i-Development Not e-Development, *Journal of International Development*, 14(1): 1-11
- Heeks, R. & Stanforth, C. (2007) Understanding e-government project trajectories from an actor-network perspective, *European Journal of Information Systems*, 16(2), 165-177
- Hodge, N. (2009) Iran's Wired Generation Challenges Ahmadinejad, *Wired*, 10 Jun  
<http://www.wired.com/dangerroom/2009/06/irans-wired-generation-challenges-ahmadinejad/>
- Jasper, J. M. (2002) A Strategic Approach to Collective Action: Looking for Agency in Social-Movement Choices, *Mobilization*, 9(1), 1-16
- Kahn, R. & Kellner, D. (2004) New Media and Internet Activism: From the "Battle of Seattle" to Blogging, *New Media & Society*, 6(1), 87-95

- Kahtami, E. (2009) Victory requires Facebook friends, *The Seattle Times*, 9 Jun  
[http://seattletimes.nwsourc.com/html/nationworld/2009316395\\_iranweb09.html](http://seattletimes.nwsourc.com/html/nationworld/2009316395_iranweb09.html)
- Kalathil, S. & Boas, T.C. (2001) The Internet and State Control in Authoritarian Regimes: China, Cuba, and the Counterrevolution, *First Monday*, 6(8), 1–17
- Kalathil, S. & Boas, T.C. (2003) *Open Networks, Closed Regimes: The Impact of the Internet on Authoritarian Rule*, Carnegie Endowment for International Peace, Washington, DC
- Karlekar, K.D. & Cook, S. (2009) *Access and Control: A Growing Diversity of Threats to Internet Freedom*, Freedom House, Washington, DC
- Korac-Kakabadse, A. & Korac-Kakabadse, N. (2002) Information technology's impact on the quality of democracy, in: *Reinventing Government in the Information Age*, R. Heeks (ed.), Routledge, London, 211–228
- Latour, B. (1999) On Recalling ANT, in *Actor Network Theory and After*, J. Law & J. Hassard (eds.), Blackwell, Oxford, 15–25
- Latour, B. (2005) *Reassembling the Social*, Oxford University Press, Oxford
- Law, J. (1992) Notes on the Theory of the Actor-Network: Ordering, Strategy and Heterogeneity, *Systems Practice*, 5(4), 379–393
- Law, J. (2007) *Actor Network Theory and Material Semiotics*, Centre for Science Studies, Lancaster University, UK
- Law, J. & Callon, M. (1988) Engineering and Sociology in a Military Aircraft Project: A Network Analysis of Technological Change, *Social Problems*, 35(3), 284–297
- Leizerov, S. (2000) Privacy Advocacy Groups Versus Intel: A Case Study of How Social Movements Are Tactically Using the Internet to Fight Corporations, *Social Science Computer Review*, 18(4): 461–483
- Lievrouw, L.A. & Livingstone, S. (2006) Introduction, in: *Handbook of New Media*, L.A. Lievrouw & S. Livingstone (eds), Sage, London, 1–14
- Luke, T.W. (2006) Power and political culture, in: *Handbook of New Media*, L.A. Lievrouw & S. Livingstone (eds), Sage, London, 163–184
- Lunat, Z. (2008) The Internet and the Public Sphere: Evidence from Civil Society in Developing Countries, *The Electronic Journal of Information Systems in Developing Countries*, 35(3), 1–12
- MacFarquhar, N. (2010) Challenging Iran, With YouTube Views, *The New York Times*, 9 Apr  
[http://www.nytimes.com/2010/04/10/world/middleeast/10sazegara.html?\\_r=3](http://www.nytimes.com/2010/04/10/world/middleeast/10sazegara.html?_r=3)
- McAdam, D., Tarrow, S. & Tilly, C. (2001) *Dynamics of Contention*, Cambridge University Press, Cambridge
- McCluskey, M. (2012) Social movements, in: *Oxford Bibliographies Online: Communication*. Oxford University Press, Oxford, UK  
<http://www.oxfordbibliographies.com/view/document/obo-9780199756841/obo-9780199756841-0075.xml>
- McNamara, C., Baxter, J. and Chua, W.F. (2004) Making and managing organisational knowledge(s), *Management Accounting Research*, 15(1), 53–76
- Milani, A. (2010) The Green Movement, in *The Iran Primer: Power, Politics, and U.S. Policy*, R. Wright (ed.), United States Institute of Peace, Washington, DC, 41–44
- Mol, A. (2010) Actor-Network Theory: Sensitive Terms and Enduring Tensions, *Köllner Zeitschrift für Soziologie und Sozialpsychologie*, 50(1), 253–269

- Morozov, E. (2009) Iran: Downside to the “Twitter Revolution”, *Dissent*, 56(4), 10–14
- Morozov, E. (2011) *The Net Delusion: The Dark Side of Internet Freedom*, Allen Lane, London
- Moscaritolo, A. (2009) Iran election protesters use Twitter to recruit hackers, *SC Magazine*, 15 Jun <http://www.scmagazine.com/iranian-election-protestors-use-twitter-to-recruit-hackers/article/138545/>
- Mungiu-Pippidi, A. & Munteanu, I. (2009) Moldova’s “Twitter Revolution”, *Journal Of Democracy*, 20(3), 136–142
- Murphy, E.C. (2009) Theorizing ICTs in the Arab World, *International Studies Quarterly*, 53(4), 1131-1153
- Naghibi, N. (2011) Diasporic Disclosures: Social Networking, Neda, and the 2009 Iranian Presidential Elections, *Biography: An Interdisciplinary Quarterly*, 34(1), 56–69.
- Nielsen, R. K. (2009) The Labors of Internet-Assisted Activism: Overcommunication, Miscommunication, and Communicative Overload, *Journal of Information Technology Politics*, 6(3), 267–280
- Oberschall, A. (1973) *Social Conflict and Social Movements*, Prentice-Hall, Englewood Cliffs, NJ
- OpenNet Initiative (2009) *Internet Filtering in Iran*, OpenNet Initiative, Toronto
- Pleming, S. (2009) U.S. State Department speaks to Twitter over Iran, *Reuters*, 16 Jun <http://www.reuters.com/article/2009/06/16/us-iran-election-twitter-usa-idUSWBT01137420090616>
- Rahimi, B. (2011) The Agonistic Social Media: Cyberspace in the Formation of Dissent and Consolidation of State Power in Postelection Iran, *The Communication Review*, 14(3), 158–178
- Rapp, N. (2009) *Iran Political System*, Associated Press, <http://nicolasrapp.com/?p=683>
- Ravitz, J. (2009) Neda: Latest Iconic Image to Inspire, *CNN World*, 24 Jun [http://articles.cnn.com/2009-06-24/world/neda.iconic.images\\_1\\_neda-gha-soltan-tiananmen-square-iran?\\_s=PM:WORLD](http://articles.cnn.com/2009-06-24/world/neda.iconic.images_1_neda-gha-soltan-tiananmen-square-iran?_s=PM:WORLD)
- Razzaghi, S. (2011) *Iran: Internet Rights and Democratisation*, GIS Watch
- Robertson, J. (2011) The Day Part of the Internet Died: Egypt Goes Dark, *The Washington Times*, Jan 28 <http://www.washingtontimes.com/news/2011/jan/28/day-part-internet-died-egypt-goes-dark/>
- Routledge, P. (2008) Acting in the network: ANT and the politics of generating associations, *Environment and Planning D: Society and Space*, 26(2), 199-217
- Salter, L. (2003) Democracy, New Social Movements and the Internet: A Habermasian Analysis, in *Cyberactivism: Online Activism in Theory and Practice*, M. McCaughey & M. Ayers (eds.), Routledge, New York, 117-144
- Schectman, J. (2009) Iran’s Twitter Revolution? Maybe Not Yet, *BloombergBusinessWeek Technology*, 17 Jun [http://www.businessweek.com/technology/content/jun2009/tc20090617\\_803990.htm](http://www.businessweek.com/technology/content/jun2009/tc20090617_803990.htm)
- Schleifer, Y. (2009) Why Iran’s Twitter Revolution is Unique, *The Christian Science Monitor*, 19 Jun <http://www.csmonitor.com/World/Middle-East/2009/0619/p06s08-wome.html>
- Shirky, C. (2011) The Political Power of Social Media, *Foreign Affairs*, 90(1), 28–41

- Slavin, B. (2010) Iranian diaspora struggles to find unified voice, *Inter Press Service*, 29 Jun <http://www.ipsnews.net/2010/06/iranian-diaspora-struggles-to-find-unified-voice/>
- Sohrabi-Haghighat, M.H. & Mansouri, S. (2010) “Where’s My Vote?”: ICT Politics in the Aftermath of Iran's Presidential Election, *International Journal of Emerging Technologies and Society*, 8(1), 24–41
- Sreberny, A. & Khiabany, G. (2011) *Blogistan: The Internet and Politics in Iran*, I.B. Tauris, London
- Stake, R. (1995) *The Art of Case Study Research*, Sage, London
- Stepanova, E. (2011) *The Role of Information Communication Technologies in the “Arab Spring”*, Policy Memo no. 159, PONARS Eurasia, Washington, DC
- Tarrow, S.G. (2011) *Power in Movement*, 3<sup>rd</sup> edn, Cambridge University Press, New York, NY
- Tatnall, A. & Gilding, A (1999) Actor-network theory and information systems research, in: *Proceedings of the 10th Australasian Conference on Information Systems*, P. Yoong & B. Hope (eds), School of Communications and Information Management, Victoria University of Wellington, New Zealand, 955-966
- Tilly, C. (2004) *Social Movements, 1768-2004*, Paradigm Publishers, Boulder, CO
- Time (2009) Tehran’s Trials: Blaming the West, Google and Twitter, *Time*, 8 Aug <http://www.time.com/time/world/article/0,8599,1915399,00.html>
- Toch, H. (1965) *The Social Psychology of Social Movements*, Bobbs-Merrill, Indianapolis, IN
- Turner, R.H. (1969) The theme of contemporary social movements, *British Journal of Sociology*, 20(4), 390-405
- Van De Donk, W.B., Loader, B.D., Nixon, P.G. & Rucht, D. (2004) Introduction: social movements and ICTs, in *Cyberprotest: New Media, Citizens, and Social Movements*, W. van de Donk, B. Loader, P. Nixon & D. Rucht (eds), Routledge, New York, 1–25
- van Laer, J. & van Aelst, P. (2010) Cyber-protest and civil society: the Internet and action repertoires in social movements, in: *Handbook of Internet Crime*, Y. Jewkes & M Yar (eds), Willan Publishing, Cullompton, UK, 230-254
- Walsham, G. (1997) Actor-network theory and IS research: current status and future prospects, in *Information Systems and Qualitative Research*, A. Lee, J. Liebenau & J. DeGross (eds.), Chapman and Hall, London, 466–480
- Winner, L.. (2001) Where Technological Determinism Went, in *Visions of STS Counterpoints in Science Technology and Society Studies*, S.H. Cutcliffe & C. Mitcham (eds.), State University of New York Press, NY, 11-18.
- Wold, S. (2012) Michael Jackson spoils the Green Revolution, *Norwegian Broadcasting Corporation*, 11 Feb <http://www.nrk.no/nyheter/verden/1.7991838>
- Worth, R. & Fathi, N. (2009) As Ahmadinejad Is Sworn In for 2nd Term, Deep Fissures Are Laid Bare, *New York Times*, 5 Aug <http://www.nytimes.com/2009/08/06/world/middleeast/06iran.html>
- Zheng, Y. & Zhang, C. (2011) Decentering Collective Action: Collective Agency and Internet Activism in China, paper presented at *Understanding Development Through Actor-Network Theory* international workshop, London School of Economics, 30 June