

# COMPUTERIZATION MOVEMENTS AS A FRAME FOR E-GOVERNMENT STUDIES

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## Abstract

*The authors present a framework for e-government research that draws heavily on Iacono and Kling's work on computerization movements. They build on this work by appropriating cognate studies of organizational informatics by Kling and his colleagues, and sociotechnical research in the UK. From this blend, they derive a construct, the 'ideology-artefact complex'. Using empirical work (including recent case studies of their own), they indicate how this may inform e-government research. They discuss ways in which the construct may act as a bridge between the two traditions of US social informatics and UK/European sociotechnical research. They discuss a potential research agenda for CM in e-government that focuses on three main problem areas: macro level social order, counter-movements and material realisation.*

**Keywords:** e-government, computerization, ideology, artifact, social movement, social network

The authors present a framework for e-government research that draws primarily on the concept of Computerization Movements as developed by Iacono and Kling. The framework also appropriates cognate additional work by Kling and his colleagues, and by sociotechnical researchers in the UK. These add a number of conceptual and methodological insights for CM work. The authors introduce a working concept – the ideology artefact complex – that has enriched their understanding of e-government initiatives in the UK and Europe. They suggest that this may be used to identify and explore problem areas in CM.

## 1. INTRODUCTION

The concept of computerization movements (CM) is powerful. It entails a long view and large scale approach to the study of technology while acknowledging that these are often based on cumulated micro studies; those who study computerization movements can thus explore how observations of the local and specific intersect with de-contextualised high level versions of events. Those who work with the concept combine work on social movements with sociotechnical analysis, exploring areas of interest to both traditions –such as political opportunities, mobilising structures and the framing process (McAdam et al., 1996) that shape the work of technology at different levels of organisation. Kling and Iacono (1994) liberate social movements from their earlier anchoring in grievance and resistance, and demonstrate that they may generate or initiate action where political (as distinct from market) circumstances and interests converge to create group advantage. Drawing on their own and their colleagues' earlier work of sociotechnical analysis, they suggest that CMs communicate 'key ideological beliefs about the favourable links between computerization and a preferred social order which helps legitimate relatively high levels of computing investment for many potential adopters. These ideologies also set adopters' expectations about what they should use computing for and how they should organize access to it' (Kling & Iacono, 1994)

Iacono and Kling's (1998) formulation of CM resonates strongly with work undertaken in the UK by Williams and his colleagues. (Kubicek et al.,1997; Williams, 1999) which shares the long view perspective and builds on concepts such as 'social choices', 'social learning', 'technology trajectories', the 'technology complex' that reflect the concerns of social informatics researchers (Williams,1999). We have discussed elsewhere (Horton, Davenport & Wood-Harper, 2005) similarities and differences between sociotechnical approaches in the UK, and signature concepts<sup>1</sup> developed by Kling for social informatics have been addressed in a recent paper (Horton, Davenport & Wood-Harper, 2005). The CM tradition within Social Informatics, however, is hardly recognised in the UK: a recent paper by Munir and Jones (2004) reviews a number of historically oriented 'social' approaches to studying information systems and

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<sup>1</sup> 'Five big ideas' – multiple points of view; social choices; the production lattice; socio-technical interaction networks; institutional regimes of truth.

implementation; the authors suggest that no work has been done linking social movements and technology studies.

As UK researchers aware of US, UK and European traditions of sociotechnical research, we are surprised by European reticence about CM, an idea that has immense syncretic and interpretive power. In the text that follows, we try to establish where CM research may enhance lines of work with which we are familiar in UK/European tradition. We address two core concepts in CM (ideology and artefact), discuss their implications for inquiry at different levels, reflect on how they are related to cognate ideas in other research traditions, and, taking e-government as an instance of a computerization movement, and draw on recent experiences (our own and those of colleagues) with empirical research in this area to construct a preliminary CM research agenda for this domain.

## **2. TWO CORE CONCEPTS: IDEOLOGY AND ARTEFACT**

We believe that the concept of ideology and the concept of the artefact, and the relations between them lie at the heart of CMs, and, indeed, that they distinguish this type of movement from scientific movements (artefact and theory) or design movements (artefact and use). What kind of ideologies attract what kinds of artefacts? What kinds of ideologies produce what kinds of artefacts? In the context of CMs, ideologies are always complex (they must meet the demands of many interest groups), though what is made explicit often masks complexity. In e-government, for example, in the UK, the rhetoric of ‘modernising’ government is preferred to ‘privatising’, or ‘totalising’ though the former entails an ambitious programme of outsourcing and integration that has boosted indigenous computer, consultancy and software industries, and supports high resolution profiling of citizens. Ideology mobilises resources, and shapes technology in many different ways. Current mainstream approaches to design and implementation, sustain the efficiency myth by employing standardised protocols (such as project planning templates) that smooth the lumpy texture of social life, leaving little or no room for the negotiation and adjustments that collaboration inevitably requires (Davenport, 2004). Many post-installation studies of technology describe ‘organisational culture’ as a barrier to the realisation of the benefits that technology brings. Culture is made a scapegoat, and, thereby, the vagaries of local practice, the workarounds and tweaks that characterise technology in use, and that constitute a

form of ongoing validation and development. This elision of the social is consolidated in norms for evaluation within project planning protocols, as these rigorously constrained to address the validation of pre-scribed functions and features. Emergent and contingent localised behaviour is thus construed as problematic – the phenomenon of the ‘problematization of the user’, explored in depth by Lamb and Kling (2003)<sup>2</sup>.

The power of project proposals (industrial and academic) often lies in their presentation of broad sweeping visions that are inherently untestable. The small print deals with details of formal specifications that must be realised as rules and actions with material effects. Kling (1996) characterises such aspirational visions as ‘utopian’, and contrasts them with their often sorry effects (‘dystopian’) in terms of the degradation of work practice and work environments. We suggest an additional take on the term. It means in Greek, no place (‘outopia’) not good place (‘eutopia’) (‘ou’= ‘not’; ‘eu’ = ‘goodly’). A utopian technology is thus one that has no material realisation in a place or locality: what is described in plans, contracts, formalisms, specifications, the writings of enthusiasts, come into this category. From this perspective, implementation is, de facto, bound to disappoint, a point first explored in depth by Suchman. (1986) almost twenty years ago. In addition, the current trend in e-government (and organisational computing generally) is to assemble components designed and validated elsewhere – these exogenous assemblages have emergent effects that are not acknowledged in the utopian planning stages of implementation. Two lines of thought emerge from this: firstly, notions of place and location (‘material realisation’) have been under-theorised in CM research; secondly, that we find it useful to explore the gaps between utopianism and realism at a higher level of resolution than that taken by previous analysts.

The CM framework draws its strength by recognising that ideology and artefacts are tightly coupled; technology may be better understood if this articulation is de-constructed, to reveal the assemblages and alliances that have produced and sustain that technology. Iacono and Kling (1998) suggest that this association may best be described in terms of a technology action frame (TAF), a rich construct developed from the earlier notion of a ‘technology frame’ (Orlikowski &

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<sup>2</sup> These issues observations have been fully explored by SST and CSCW analysts; see contributions to Luff, Hindmarsh & Heath, 1997).

Gash, 1994) that accounts for sense-making among disparate actors faced with a common system. Artefacts that are the focus of a TAF vary in size and scope. Cornford and Williams (2004) have recently started a project, for example, that explores a formalism (the standard software package); Elliott and Scacchi (2005, in press) have for some years examined the Free Software Movement (focused on a style of coding); analysts of large ‘e-programmes’ (e-government, e-science, e-learning) are concerned with suites or assemblages of artefacts that have broad scope and reach. Though they differ in terms of material presence or physicality, all of these embody social choices.

### **3. THE IDEOLOGY-ARTEFACT COMPLEX**

Ideology and artefacts are linked by a sequence of intergroup transformations and transactions (what we label the ‘ideology-artefact complex’) which may be explored by means of sociotechnical network analysis. The notion of the STIN (sociotechnical interaction network) is important here. Lamb and Kling’s (2003) original formulation focused on interactions with installed artefacts; we suggest that this can be extended to interactions around the ‘utopian’ artefact in the procurement and early design stage. Attention must be paid to a further set of artefacts – the entities that are assembled into compound artefacts – or configurational technologies (Fleck & Howells, 2001) that are characteristic of current organisational habitats. These comply to a greater or lesser extent with proprietorial interests and involve a range of brokers or intermediaries. Fleck’s explication of this ‘technology complex’ provides a comprehensive template for observation and analysis –it does not, however, address ideology at the macro level, focusing on micro level ‘constituencies’ or ‘interest’ groups.

The politics of formalisms and categories have been amply described by sociologists of technology (e.g. Star, 1999), though little work has been done applying techniques for social network analysis (SNA) to unpick the alliances and diffusion paths that create installations out of ideological alignments. It may be noted, however, that recent research into social movements has featured a number of SNA studies. (Diani and McAdam, 2003)

### 3. E-GOVERNMENT

Grönlund (2002) introducing a recent edited volume, describes e-government in terms of ‘changes in the internal government operations that come about as IT is used for automation, cooperation, integration...current spark of interest in this field is most of all due to the fact that now also external operations are transformed as information and services become increasingly available on the Internet’ (Grönlund, 2002, p. 2). In a subsequent chapter he describes a ‘general trend to re-structure government operations by means of deregulation, outsourcing and competition, the advent of a cheap unifying technology standard, and the increasing use of strategic IT tools such as Warehousing, Enterprise Resource Planning, Work Management Systems, Data Mining.’ (p. 24). The phenomenon clearly instantiates a number of ideological biases identified in 1991 by Kling and Iacono as characteristic of CM.<sup>3</sup>

According to Grönlund, e-government emerged in the 1990s; he takes the establishment of the NII in 1993 as a starting point, and traces a trajectory in Europe through the Bangemann report, to the eEurope vision laid out in 2000 and beyond. (A comprehensive review of this trajectory is provided by von Basterlaer, 2002), who describe these programmes as examples of ‘persistent technological utopia and determinism.’ (p. 4) She continues ‘the political discourse...simplifies in an exaggerated way the social reality, neglecting many differences, and erasing most difficulties. The absence of references is a way of simplifying texts and discourses.’ (p. 23) For Grönlund, a Swede, technology is clearly the driver of e-government. In the UK, the phenomenon is best explained in terms of a privatization movement that has evolved over almost twenty years, starting with the publication of a UK government report in 1986 paving the way for the privatisation of government data, and the establishment of an industry-government nexus that has continued to expand under both Conservative and New Labour administrations. In addition, an uncompromising deployment of e-commerce and business models and applications has produced a service ecology dedicated to improved efficiency and quality of service; this could as easily support private as it does public administration. E-government in the UK promotes itself as process-oriented and customer-focused, and, currently, offers little scope for

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<sup>3</sup> CBTs contribute to a reformed world; the improvement of CBTs will reform society; no-one loses from computerization; more computing is better than less and there are no conceptual limits to the scope of appropriate computerization; perverse or undisciplined people are the main barriers to social reform through computing – the last statement is often reworked as the ‘digital divide’.

the direct participation of citizens in service design.<sup>4</sup> At the hub of the system is the managed citizen ID, an as yet utopian artefact whose smooth trajectory across seamlessly integrated systems will allow benefits to flow to citizens wherever and whenever they require them. A number of timelines for the realisation of this vision have been proposed. Modernising Government, a key manifesto published by the UK Cabinet Office (1999), suggested full implementation by 2008 – though the schedule has slipped.

This brief history can explain some features of e-government development in the UK that are, on first glance, perplexing. On 16 October, 2004, for example, in a not untypical feature, the Economist reported on the latest initiative, the National Health Service National Project for IT (NPfIT)<sup>5</sup>: ‘It is a familiar tale: the government announces an ambitious information technology (IT) project, awards contracts and sets deadlines. But then the costs start to rise and deadlines pass. The project is eventually completed years late, way over budget, and fails to deliver the promised benefits – or is scrapped altogether.’ The week before, a respected technology correspondent (Naughton, 2004) described the same project as an example ‘RFS’, or repeated failure syndrome (‘we never seem to learn from the persistent trail of expensive disasters’), summarised in the Economist article as ‘previous fiascos (air-traffic control, benefit cards, the Passport Office, the Child Support Agency)...’ The bulk of these have involved a small coterie of large commercial firms – EDS, Capita, Syntegra, for example – who are repeatedly rewarded contracts even after formal ‘correction’ in the form of fines. We suggest that this behaviour is not as irrational as at first appears, if we assume that quality of service is a collateral objective, and that a privatisation ideology has a higher priority<sup>6</sup>.

#### **4. THE IDEOLOGY-ARTEFACT COMPLEX IN PRACTICE**

Europe is a peculiarly appropriate field site for work on e-government as a computerization movement, as policy directives, legal compliance and technology installation are interlinked

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<sup>4</sup> It thus goes against the recommendations of analysts such as Lenk (2002) who suggests that e-government and e-business are different as the former emphasises law enforcement and the regulation of society rather than the delivery of public services to individuals. The situation in other European countries is different – see Antirreiko (2002) for an account of e-government in Finnish public administrations.

<sup>5</sup> This scheme is due to absorb 4% of the health budget by 2008

<sup>6</sup> A further analysis may explain the relationship as a form of tacit public subsidy, unmentionable as nationalized industries are not held to be politically correct.

across different levels of administration; a researcher can thus follow the thread from a high level utopian policy (the ‘Information Society’) to a local implementation in a municipality. In the past few years researchers at Napier University have been involved in a number of studies of e-government at different levels<sup>7</sup> (several transnational European projects, a quality assurance agency, a social work rapid response team, a group of lawyers complying with EU standards for legal practice)<sup>8</sup>, drawing on a number of research bases. An early inspiration was Kling and Scacchi’s ‘Web of computing’ (described as a ‘crude framework’ (!) in Kling and Iacono, 1994), which allowed us to move across a range of social orders and understand pre-implementation configuration of resources and post-implementation unintended consequences of computerization in a number of contexts.

The process of collaboration on large trans-institutional projects is, in itself, a rich source of data on the interplay of mobilization of resources, opportunism and ideologies. As we note above, the structure of project proposals (as is the case in other funded research environments) is articulated in standard documentation (an online project management template) that requires proposers to place their work in the dominant rhetorical/ideological frame, and to describe the achievement of their goals in terms of prevailing workflow models. Each European project requires a mix of industry and academic partners, and, over time, networks or cliques have evolved who have learned to exploit the various preparation meetings with EC officials effectively and to co-develop compelling proposals. As Gröndlund (2002) has observed, EC projects tend to focus on products in the interests of portability across national boundaries, and the industry/vendor nexus is thus a powerful one in any collaborative negotiations.

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<sup>7</sup> See the websites for the Social Informatics group and the International Teledemocracy Centre at [www.soc.napier.ac.uk](http://www.soc.napier.ac.uk) On two European projects, SmartGov and Eden, Napier colleagues have been involved in both evaluating and building specific AI applications (Adams et al) a ‘trust’ general user requirements and evaluation, usually ethnographic. Inevitably, sociotechnical evaluation in situ reveals gaps between design and implementation. And See Macintosh et al. (2002); Davenport & Horton (2004); Horton & Davenport (2004).

<sup>7</sup> List the publications here: Adams, Maintosh, Horton and Davenport and Davenport and Horton etc ontology for e-government, and NLP protocols (to support the routing of queries in an address system). In addition to evaluating AI applications, Napier’s work involves more general user requirements and evaluation, usually ethnographic. Inevitably, sociotechnical evaluation in situ reveals gaps between design and implementation.

<sup>8</sup> List the publications here: Adams, Maintosh, Horton and Davenort and Davenport and Horton etc



The outcomes of projects (artefacts) fail to realise the aspirations that are outlined in the proposal stage. Though dissemination plans are an obligatory part of proposal writing, it is rare that products emerge that are ready for any market. The important thing is the relational process that consolidates and extends ideology by bringing bright academics into the industry church, and supporting the formation of macro-level sociotechnical capital (Resnick, 2003) across projects between industry, government (the funders) and academe. This triadic formation (recognised as a major lever of science (Leydesdorff, 2004), deserves attention from CM researchers.

Fleck and Howell's (2001) concept of a 'technology complex' has been heavily applied in our e-government work. As we note above, this is a multi-faceted framework for analyzing the complex factors that may be observed in the ongoing work of configuration (the de facto customization in practice of new and existing components). He has described both organizational communities of practice in this context (that shape technology at work) and communities of interest that shape pre-implementation policy-making and decision-making. The discourse of organizational communities defines a common agenda, but may also a source of competitive strength where social capital or social network effects come into play. The messages from an interest group within the organization have more weight if they resonate with those of more powerful external allies (c.f. Kling and Iacono). Many large corporate contracts in e-government are awarded not on the basis of requirements analysis, but on the basis of industry ecology (a phenomenon that has been charted by Dutton, 1999).<sup>9</sup>

The distinction between the two types ('interest' and 'practice') of community can be elaborated using the 'ideology-artefact' axis that we describe above. The ideology (or discourse that defines) an 'interest' community will tend to simplify the issues involved in systems implementation, and downplay risk by emphasizing the track record of those who share the rhetoric. This discourse is what the public (or external audience) will hear. The discourse of a 'practice' community, will, in contrast, focus on the artifact, the difficulties of implementation,

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<sup>9</sup> Parallel work has been undertaken in Denmark, by Flyvborg (1998), whose ten –year study of the implementaton of traffic policy in the city of Aalborg is a good example of the approach advocated here.

and on ways of working around infeasible features, and of informal education in these processes for newcomers to a workplace. This process well analyzed in studies of ‘articulation’ or ‘invisible’ work (Suchman et al., 1999; Gerson & Star, 1988). The audience for this discourse is internal, though containment may be leaky, as apologetic ‘officers’ may share the ‘work-around’ with clients.

Our plotting of this dissonance between interest and practice groups resonates strongly with a number of observations of ideological complexities by Kling and Iacono. They point out, for example, in one study of an urban information system (‘Riverville’) that the system’s ‘primary value was in enhancing the welfare agencies’ image when they dealt with Federal funders and auditors’ though local administrators ‘gained substantial advantage by keeping the story of its administrative value alive even when they could not realise those dreams’. They (1998) further observe that ‘When new understandings become part of local discourse they often remain local, rather than being widely circulated across other organisations and social settings...It is for this reason that public discourse about new technologies and the technological frames embedded in them can remain relatively stable and misrepresent actual practice for long periods of time’.

The ecology of communities of interest is partly shaped by social network effects. This means that there are likely to be a few very strong players who have links to most of the networks in the relevant field. This elitism is manifest in the small and oligopolistic market that has developed for e-government service implementation, where repeated contracts are awarded to large corporate developers whose previous contracts have not been delivered to budget, on time or to a performance standard that satisfies agreed criteria.<sup>10</sup> The ‘winning’ discourse among competing rhetorics of interest will draw its strength by association with proven players, who can offer ‘integrated off-the-shelf solutions’ in the form of implementation plus training and economies of scale undercut the costs of those involved in detailed local user requirement analysis.<sup>11</sup>

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<sup>10</sup> Under European Union procurement rules, past performance cannot be considered when awarding public sector contracts.

<sup>11</sup> User requirements analysis is an atavistic presence, however, in most of the approved methodologies for e-government systems development and design (it is, for example, a staple component of UK public sector (Prince) and EC 5<sup>th</sup> and 6<sup>th</sup> Framework projects).

## 5. REFLECTIONS AND CONCLUSION

As e-government researchers, working within the social informatics domain, we believe that a research programme underpinned by the concept of computerization movements may enlarge our understanding in a number of ways. Firstly, it would integrate and consolidate a body of existing work and allow that work to be re-considered more coherently under the ‘long view’ perspective. The cumulation of micro studies may reveal long term patterns of interaction among interest groups and lines of ideological development (Horton & Dewar, 2001). Secondly, such a programme can add to what has been achieved by addressing areas that have been under-explored or overlooked. There are a number of candidate areas, and we have selected three examples: links across the social order; counter-movements; and ‘material realisation’.

Kling and Iacono conclude their 1995 paper by pointing out that we still have to assemble ‘a credible composite historical portrait of the links between computerization and the larger social order’, a task which remains undone. Though they scope out the population for such a project, we need to find appropriate focal areas. While links can be made between e-government and shifts in the larger social order (such as remote working, or the creation of an underclass ‘the digital divide’) these can be explained in terms of CM other than e-government such as e-learning, or the mobilisation of the workforce (Iacono, 2001). We have identified at least possible lines of work. The first is to explore the new instruments of government. A case in point is the bill to establish ID cards in the UK, for example, is currently before Parliament justified on the grounds of protection against terrorism. The ID technology is what may be described as a ‘technology-in-waiting’<sup>12</sup> (previous attempts to introduce such a thing have been repulsed) that has found its moment owing to the seizing of political opportunity and strategic framing. A second line of work is a longitudinal study of ‘valence issues’ (MacAdam et al., 1996, p. 309) in government. An example (pertinent in the UK) is accountability in a system where technology supports work that is composite and distributed across private contractors. The complex population of brokers and intermediaries described in an earlier section above as bridges between ideology and artefact has resulted in an attenuated civil service whose values are primarily managerial. Links between organisational configurations of technology (the assemblage of

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<sup>12</sup> See Horton and Davenport (ECIS 2004)

components produced elsewhere) and the rise of this working group have not been fully explored.

A second CM agenda item, the emergence of counter-movements, is closely linked to points raised in the previous section. Government evolves continuously through programmes of legislation that address (more or less rapidly) contingencies. Legislation to establish e-government to date corroborates the (somewhat pessimistic) observations of Kling and Iacono in 1994: ‘The movement activists, the computer revolutionaries, are working hard to make a revolution with varying success. Their visions suggest a socially conservative revolution which will primarily advantage already powerful social interests ...it is far easier for us to criticise their visions than develop a sounder sociology of alternative futures.’ Though there are candidates (counter movements such as consumer rights activism, privacy watchdogs) Kling and Iacono suggest that these specialized views do not add up to a coherent alternative humanistic vision for appropriate computerization. The Free Software Movement, held by many to be such an alternative (Elliott and Scacchi, 2005 in press) is an example that is pertinent to e-government, as the adoption of Linux in several European municipalities has been hailed as a move against private monopoly, but the diffusion pattern so far does not constitute a ‘movement’. As it is easier for public authorities to tinker with their installed base than migrate, it may be that counter-moves, rather than counter movements are what we can observe. These may be made not at the level of overtly mobilised resources, but in the workarounds and post-implementation adjustments from which resistance may emerge. McCarthy talks of ‘The everyday life ‘micromobilization’, or structuring that is aimed not at movement mobilization but where mobilization may be generated’ (p. 141).

In addition, we note above that the press persistently questions the validity of IT investment, and that this has political consequences. The National Audit Office (a guarantor of transparency and accountability) is now involved at the start of projects (Economist, p. 6) – to check, as it were, the ‘realism’ of what is proposed: in the case described at the start of the paper, one of the main commercial partners, BT, was fined. So there is some evidence that where political expediency dictates, government may self-correct.

A further possibility line of research that emerges from a CM framework is ‘material realisation’, an area somewhat neglected in the original formulation. Munir and Jones (2004) observe that ‘the material character of technology may be seen to give it an anomalous ontological status in the context of the social phenomena this theory [social movement theory] was developed to address.’ A CM line of inquiry in this area needs to be wide in scope. It might cover, for example, the geography and time-lines of the e-government-industrial complex (meeting locations, industry nodes, trade fairs) – a micro-version of this is presented in Van Bastelaer (2002). New questions (such as ‘where and when does e-government happen’) can be asked that allow conflicting points of view to be explored. Ideologists (back-room) may give the answer ‘in the system’ to our sample question; artisans (front-line workers) may say ‘in a number of different places where we negotiate what needs to be done with the support of technology’ (Horton & Davenport, 2005, submitted) . By exposing the rationale behind such conflicting points of view, CM facilitates possible ways of managing synthesis.

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