

# IDEOLOGY AND UTOPIA: A TECHNOLOGY ACTION FRAMES PERSPECTIVE ON IT ADOPTION

*Complete Research*

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## **Abstract**

*This paper reports on the adoption and diffusion of information technology in three UK universities. The authors draw upon detailed longitudinal case study research of UK universities utilising an analytic framework drawing upon computerisation movements and technology action frame perspectives. The technology in question is captured within the term Managed Learning Environment. The ambitions for this technology are considerable. The research highlights a range of constraints and affordances that help to explain some of the unpredictability of the trajectories of information technology adoption and diffusion in these universities. However, the research also explore the influence of ideology, and in particular the variety of ideological influences that can go unreported in studies of IT adoption. In this paper the authors explore the interplay of technology action frames, localised technology framing, institutions and professional groups around momentum for change, which in these cases was considered to be influenced by ideological strands prevalent not just in UK HE, but also in the UK public sector. The outcomes are twofold. First, the ways in which frame congruence and incongruence can influence outcomes. Second, the ways in which actions of key advocates, aligning with networks of influence, mobilised support for and limited opposition to IT vision.*

*Keywords: Adoption, Information Infrastructures, Computerisation Movements, Ideology.*

## **1 Introduction**

Those tasked with introducing new technology to organisations often resort to utopian visions of the technological potential, which Elliott & K. Kraemer (2001) note in their research on technology diffusion; they draw attention to the ways in which utopian visions of what a technology might be able to ‘do’ and how it can be utilised can help to shape technology acceptance and diffusion. The broad environmental dynamic in which technology diffuses within and across organisations has been called a computerisation movement (Kling & Iacono, 1988); this being a powerful conception of the way that a technology may be diffused across multiple sites of adoption and development, which may influence the (non-)mobilisation of support through the framing of expectations. Computerisation movements (CMs) build from earlier work on web models of computerisation, that viewed computer technology developments as “complex social objects constrained by their context, infrastructure and history” (Kling & Scaachi, 1982, p.69). CMs therefore often reflect contextually specific ideological beliefs. By ideology we refer to those systems of ideas, beliefs or ideals that influence the outlook of people upon their world. Although patterns of technology diffusion are relatively well understood at a broad level across multiple organisations, the particular dynamics of the socio-technical relational processes within organisations amid the influences of ideology are much less well researched.

Information technology (IT) has long been viewed as encompassing more than artefacts (Woodward, 1970). Similarly the inseparability of technical and social practices has been widely recorded, whether for example as a web (Kling & Scaachi, 1982), or in terms of mutuality (Child, 1987), or indeed in terms of sociomateriality (Orlikowski, 2007). The relationships between the social and the technical do however remain a matter of intense debate (c.f. Mutch, 2013; Cecez-Kecmanovic, Galliers, Henfridsson, Newell, & Vidgen, 2014). The adoption and diffusion of information technologies in and across organisational settings has evolved from a focus on specific systems to encompass a much more distributed and pervasive sense of technological assemblages, which span devices, data and networks, as well as time and space. One way of describing this sense of interconnectedness, ubiquity, openness, and evolution is through the concept of information infrastructure. Information infrastructures may be characterised by their ‘openness to number[s] and types of users .. interconnections of numerous modules/systems .. dynamically evolving portfolio of systems and shaped by an installed base of systems and practices .. typically stretched across space and time .. shaped and used across many different locales and endure over long periods’ (Monteiro, Pollock, Hanseth and Williams, 2013, P.576). Given the inherent complexity of such information infrastructures, it would seem appropriate to reflect upon how adoption and diffusion may be evaluated. It can be argued that longitudinal research that trace trajectories as they evolve is a valuable, if not a necessary component of studies that seek to contribute to and inform debates about the diffusion of IT in contemporary organisational settings.

This paper reports upon research in UK universities that has investigated the way that trajectories of computerisation movements (CMs) evolve within settings that have competing ideological influences, evaluating these influences in relation to local perceptions of the success or failure of a particular CM vision. For this study, the researchers developed and utilised a multi-faceted framework that drew upon both literature on computerisation movements (e.g. Kling, 1994), as well as from literature on technology action framing (e.g. Orlikowski & Gash, 1992). In addition, the research evaluated the CM trajectories over time through technology action framing at a number of levels, these being at the level of individuals, of groups, as well as at a macro sectoral level. The study is based upon three in-depth longitudinal case studies of UK universities, and tracks the development and diffusion of specific information technologies over several years across these institutions.

The paper is structured as follows. First, an evaluation of literature explores computerisation movements and technology action frames, arguing for their utility in longitudinal studies of IT adoption and diffusion. This is followed by a section describing the specific example of technology that is the focus of the research, as well as elements of the context in UK universities. A discussion of the research methods is

then followed by an outline of each of the case studies, drawing upon relevant data to sustain the subsequent analysis. The latter sections of the paper are given to analysis, discussion, and, finally, a conclusion.

## **2 Computerisation Movements and Technology Action Frames**

Computerisation movements are primarily associated with the framing of information technology (IT) in various social settings, such as organisations. The work of framing IT can help, for example, to legitimate relatively high levels of investment for many potential adopters, and to package expectations about how technology may be used in daily work routines. Such framing can present a vision of a future based on that IT use, be it utopian or otherwise. CM frames are referred to as Technology Action Frames (TAFs) (Iacono & Kling, 2001). TAFs are built up within computerisation movement discourse and circulate in public discourse where they can be used as a form of currency, the structure and meaning of which remain relatively constant across a variety of practices and settings. As with social movement framing, such TAF processes can serve to mobilise potential adherents, to garner support and to demobilise antagonists (Snow & Benford, 1988).

To mobilise support for major technological development, key players in organisations often incorporate TAF discourse into organisational discourse. This pattern is illustrated, for example, in Kling and Iacono's (1988) study of a municipal computing system which was not performing as specified. Using a TAF framework Kling and Iacono unravel the history of the project and explain that the system's most important value had become to enhance the image of the welfare agencies when they dealt with Federal funders and auditors. Within the organisation, local administrators gained substantial advantage by maintaining the story of the administrative value of the technology – even when the lived reality of the IT suggested a different view.

In a later version (1998) of the same study, this explanation is presented as a computerisation pattern for organisations. This authors describe the ways in which when new understandings of IT become part of local discourse they can often remain local, rather than diffusing across other organisational and social settings. It is for this reason, it is argued, that public discourse about new technologies and the technological frames embedded in them can remain relatively stable, thereby misrepresenting actual practice for long periods of time.

There is often a gap between a vision and the subsequent way that IT is actually used within organisations. This may be due to limitations in the technology's performance, in social adaptation to the technology, or in the nature of the vision itself. It is only as time goes by that contending discourse may evolve showing how the actual use of technology does not match expectations. It has also been argued that within CMs, ideological beliefs are communicated (Kling & Iacono, 1988), which frame and shape perceptions about the interrelation between the IT and a preferred social order. Such beliefs may in turn help promulgate and sustain the views of certain stakeholders.

Iacono and Kling (2001) argued for further detailed empirical studies to be undertaken in order to assist with the understanding of the influence of CMs, focusing on value conflicts, counter movements and also alternative organisational technology practices. Each of these elements may, it was argued, influence outcomes that may differ from computerisation movement visions. In focusing on the influence of computerisation movement at an organisational level the analysis, a variety of contextual influences are brought into the analysis. Others have noted that technology adoption visions can adapt and be adapted, which can be influential in the framing of IT by and amongst a range of social-actors, as each seeks to make sense of why, when and how technology diffusion is progressing (Hsu, Galliers, Huang; 2014).

The concept of technological framing as a broad concept of societal framing of technology uses technological frames to describe the ways that social meaning is attributed to technical artefacts that tie together interested social actors (Bijker & Law, 1992). They list the major dimensions of technological frames as goals, key problems, problem-solving strategies, requirements to be met by problem solutions, current

theories, tacit knowledge, user practices and exemplary artefacts. Taken together, these dimensions constitute the meaning of a particular technology and frame it in specific ways.

In computerisation movement theory this concept of technological frame is combined with a process of collective framing to explain how meaning can be collectively negotiated, shared and acted upon in the concept of the Technological Action Frame (TAF). A TAF is described as: ‘...composite understandings -- constituted and circulated in language -- that legitimate high levels of investment for potential users, and form the core ideas about how a technology works and how a future based on its use should be envisioned’ (Iacono & Kling, 2001, p96).

The mobilisation of expectations is frequently cited as an important element of IT adoption, and specifically within the discourse surrounding IT project management this tends to be portrayed as a critical factor. However, as Davenport and Horton (2008) argue, the power of project proposals often lies in their presentation of broad sweeping utopian visions that are inherently untestable, but which do often nonetheless mobilise support. The authors also suggest that utopian in fact means no place (‘outopia’): ‘A utopian technology is thus one that has no *material realisation* in a place or locality: descriptions in plans, contracts, formalisms, specifications, the writings of enthusiasts, come into this category. We find that urgent drive for material realisation of a technology vision is a crucial driver’ (p. 382). Thus, it may too often be the case that IT projects are framed from the outset in terms of unattainable visions.

It is in this context that ideology can be viewed as an important, although often unrecognised constituent. The study of the adoption and diffusion of complex IT remain under-theorised in research. This is especially the case in relation to the influence of ideology on trajectories of IT evolution and diffusion. In order to contribute to the research in this area, an analytical framework was developed that was then utilised to evaluate the development of IT in three UK universities. The longitudinal case studies were contextualised within the broader arena of MLE developments within the UK higher education sector. The intellectual framework developed and utilised to guide the research incorporated the insights from both Technology Action Framing (Orlikowski & Gash, 1992; Orlikowski & Gash, 1994; Iacono & Kling, 2001) and from Computerisation Movements (Kling, 1994; Iacono & Kling, 2001).

After outlining the nature and trajectory of development of the concept of MLE in UK higher education below, the remainder of this paper presents research based upon the use of the above framework to analyse universities within the UK higher education sector. From this several insights are developed.

### **3 MLEs, Information Infrastructures and UK Higher Education**

A Managed Learning Environment (MLE) is a broad term reflecting a form of information infrastructure within UK HE as a whole, as well as reflecting more localised instantiations. A MLE refers to ‘a whole range of information systems and processes (including [a] Virtual Learning Environment if it has one) that contribute directly, or indirectly to learning and the management of that learning’ (JISC, 2002, p. 2). MLEs incorporate a range of technologies that are implemented in order to create a standardised institutional platform. Through such IT, universities can integrate learning and managing capabilities – that is, through integrating learning technologies with a variety of administrative systems. MLEs can incorporate a number of standardised IT components, such as Virtual Learning Environments (VLEs), student record systems, financial management systems, procurement, admissions management, customer relationship management and so on. This integration of systems supports the ambition for integrated corporate intelligence within universities, an element that has been presented as a de-facto requirement for any university wishing to be perceived as efficient and effective (e.g. UK Joint Information Systems Committee [JISC], 1995). MLEs are also presented in ways that embed the assumption that all stakeholders will benefit – that is, managers, academics, learners, funders, and suppliers. MLE adoption is, therefore, a large scale and complex IT development, involving the integration of multiple systems within and, sometimes, between universities, involving a wide range of stakeholders.

This research paper presents an account of the adoption and development of MLEs in three universities in the UK, where MLE initiatives have evolved over time across and within the respective university settings. The research focuses in particular on the discourses and practices related to adoption before, during and after the promulgation of MLE visions into the universities that are discussed here.

Pressures for UK universities to think of themselves as modern organisations have been growing for some years (Barnet, 2000), and have continued to gain momentum. For at least the past twenty years there have been a number of national groups within the UK arguing that an essential requirement of modern higher education is the ‘widespread adoption’ of, and ‘full engagement’ with, internet technologies and related models of ‘doing business’ (Joint Information Systems Committee [JISC], 1995). Pollock and Cornford (2003) argue that IT tends to be seen as a ‘panacea’ to bring universities up to date, with IT adoption being viewed as a central strand of modernisation discourse within UK HE. In this context, IT based MLEs are described as the ‘lifblood’ of higher education institutions (JISC, 1999). Such views, beliefs even, resonate strongly with the discourse of modernisation that has been prevalent across the UK public sector for several decades, and indeed within Europe-wide movements such as e-Government. Grönlund (2002) notes ‘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’ (p.24). We can see strong parallels between this view of eGovernment, and a process that has gained pace within UK HE under the current UK Government. The current UK Government (at the time of writing) has accelerated the marketisation of HE, a process that has been described as being ideologically driven (Brown & Carasso, 2013). However, within UK HE sector the heterogeneous nature of the university has been identified as a barrier to technologically inspired progress, with non-standardised university processes, and necessarily pre-enterprise technology ready processes, characterised as ‘chaotic, parochial and self-serving’ (Pollock & Cornford 2001).

As a UK HE sector policy vision, MLE has been portrayed as enabling technology for a networked UK higher education system. National policy documents have presented ideologically inspired visions of how a standardised approach to developing web based interactive learning can achieve organisational efficiencies. In particular, this vision of the IT enabled university carries with it an oft-stated potential for the significant reduction of the variable costs related to expanding the numbers of students (Follet, 1993; MacFarlane, 2000). It could be argued that the realisation of such a vision might in turn potentially enable a significant expansion in university provision without having to invest in a matched expansion of physical infrastructure. In addition, MLE proffers the potential, at policy as well as at institutional level, to realise that utopian vision of convenience and flexibility through seamless ‘any place, any time’ access to education for students.

The policy visions of a new standardised and systematic approach to IT adoption have also raised hopes for enabling the sharing of resources between well-resourced and less well-resourced universities. In this regard, MLE policy has aimed for standardisation of data transfer and systems across the sector to allow ‘seamless’ integration of HE systems (JISC, 1995, 1999). Attempts to realise this vision have involved numerous working groups striving for a high degree of co-ordination and co-operation between universities, vendors, HE bodies and staff groups in universities. This is a vision yet to be realised, and has, it may be argued, been somewhat overtaken by the realities of increased marketisation in parts of the UK.

The increasingly widespread adoption and diffusion of MLE across the UK HE sector can be viewed in terms of a CM, one imbued with visions of enhancing access to, as well as efficiency and effectiveness in, higher education. This we argue reflects tenets from an ideologically inspired, and some might say utopian, national vision over many years for the technological ‘transformation’ of higher education – through the wide scale adoption and diffusion of IT.

## 4 Research Methodology and Cases

The research involved three comparative case studies of MLE adoption and development. The universities were chosen following an evaluation of literature that suggested different types of universities in terms of age may have different trajectories of adoption and development (Social Informatics Research Unit, University of Brighton, 2005). Three in-depth longitudinal case studies of UK universities were undertaken, with active data collection over a period of three years, although a historical timeline analysis was developed for a ten year period. The three universities were termed ‘new’, ‘modern’ and ‘ancient’, reflecting certain characteristics that are widely recognised within the UK HE sector. Specifically, university N (or New) was one of the many former HE Polytechnics that were awarded the title university in 1992. University M (or Modern) was from a group that pre-dated 1992 but was not several hundred years old. University A (or Ancient) was one of several in the UK that can claim to have been universities for several hundred years.

The research methodology involved historical reconstruction of the nature and scope of engagement with the concept of MLE at three UK universities. The research for each case study covered a time period of approximately 10 years. Numerous sources of data were utilised to develop the case studies. Semi structured recorded interviews were undertaken with over 30 participants, who were each interviewed multiple times over several years. Each participant was identified as being closely involved in MLE related activity at different positions within the universities. A large volume of documentary evidence was accumulated, scrutinised, and analysed, including reports, minutes of meetings, newsletters, local policy papers, strategy and project planning documentation. The data also includes national policy discourse and the discourse of intermediate governmental agencies such as JISC. Initially, social actors such as Senior Academic Managers, Senior Service Managers, Educational Development Managers, IT Support and Management Information sections were identified as initial informants for each case study. An MLE and e-learning related web search of each institution indicated the relevant actors in each institution who appeared to be involved in MLE practices. These participants may have been part of a wider range of MLE related practices, and/or had been involved in related working groups, strategic initiatives or networks of MLE related work. Contacts were drawn from knowledgeable people from the research setting who had knowledge of the MLE policy landscape in HE in the UK. Lists of potential participants were compiled for each institution. Where there were areas of responsibility judged to be lacking, potential participants were researched and invited to take part in the research. Research was undertaken prior to interviews to learn about the research site, as well as to identify potential participants. As the interviews progressed, the research employed the idea of ‘snowballing’, in which further contacts were gained through asking participants who they thought it would be useful to interview. A large proportion of contacts were generated in this way. This element of the snowballing process was used as one indication of who were key players in later analysis.

Data was analysed using Content Analysis (Krippendorff, 1980). This was undertaken using qualitative analysis, in support of which the research utilised textual analysis software (QSR) as a tool in the development of analytical categories, primarily to aid the exploration and interpretation of the data. A content analysis interpretation is valid to the extent that it measures the construct that the researcher intends it to measure, but validity problems can emerge from the ambiguity of word meanings and category definitions. Content analysis should not be considered to be objective (*ibid.*), as such a perception of objectivity implies that content is ‘contained’ in the message, waiting to be separated from its form and described. An alternate view is that that texts are open to multiple interpretation. Single researcher coding was undertaken, with the researcher interpreting how text would be categorised. The aim of the coding procedure was to construct the framing process across individual, group and macro levels. This included hypothesising the influence of macro level TAF computerisation movement frames at institutional framing, group framing and individual framing levels.

During the research there was a conscious awareness to avoid imposing MLE constructs on the data. In an effort to minimise such bias, first order constructs were developed on which macro level could or

could not then be inferred. Through this process emerged a web of players who were aligned through resource flow, the MLE TAF, or both. This analysis provided the basis for the illustration of the ‘MLE game’ through which the dynamics of MLE socio-technical alignment are interpreted. A brief synopsis of each case is presented followed by an analysis drawing upon two key technology frames constructed from the data analysis.

#### 4.1 IT adoption in University N (New)

University N is a ‘new university’, having acquired degree awarding status in 1992. This case study covers the period from 1998 to 2008. New University has a history of flexible delivery which is underlined by a commitment to open access and student centred learning. From its beginning the institution had established itself as a provider of open and flexible learning opportunities. Over the ensuing years, the university has evolved its conception of flexible learning which, together with developments in technology, a large increase in student numbers and an increasingly diverse student population, has resulted in flexible and online learning being a central component of the university’s learning and teaching strategy. In the 1980’s and early 1990’s the university developed distance learning programmes which were mainly paper based. By the late 1990’s online learning initiatives had sprung up but in isolated hotspots. At this point there was an attempt to create a separate e learning faculty that would coordinate e learning activity across the university. This attempt failed perhaps because of lack of general support. By 2000 MLE adoption was identified as being at the heart of the university’s aim to be a leading university offering flexible access to a changing student population, integrated into the university’s main systems and procedures.

Several respondents described how MLE first came to be high on the university agenda in 1998 when a senior manager (SM) joined the university, and who was described as being *very keen* on distance learning. A senior service manager described how SM was a nationally recognised educational thinker who advised government ministers but had views about learning provision that were unusual. SM was said to be, “*very keen on distance learning, who had some slightly, well not odd views, but specific views on it that didn’t match everybody else’s.*”

At this time there was a recognised need for a capture once, single source, central data system, but a view amongst senior managers that such a system did not exist. Furthermore, senior managers expressed the view that such an integrated bespoke system might not be affordable. A new, standard ‘off the shelf’ student administration system was implemented which was claimed to provide centrally directed standardisation, or consistency as it was often termed, across the university. There was, however, a widespread perception amongst those interviewed that the implementation was rushed, and that it had been imposed upon ‘staff’.

At this point an organisational unit focused upon educational development was created within the University. This new unit was developed from teams associated with what was perceived to have been a failed project that had been run locally in one Faculty, and which was now made responsible for trying to develop an integrated MLE for the university. The new unit was resourced with a number of new staff, including an MLE manager together with five educational development workers, all of which were funded through a national government initiative that had been provided to develop a ‘knowledge economy’. In essence, the funding was used to enable this team to evaluate and implement an MLE for the university. As a part of the MLE project, an institution wide VLE was introduced at the same time as the new educational development unit was created. This VLE was purchased with the aid of government funding, both for support with provision of IT expertise, as well as for IT artefacts. This was seen by those spoken with as a first vital component of an MLE. The vision of providing ‘blended learning’ across the university’s provision, combining online and face-to-face learning, now became the focus for learning both on- and off-campus curricula developments. The objective expressed in the Strategic Plan was also to transform the pedagogy of the university through the use of digital tools embedded in the VLE. The educational development unit led the drive to first seek to embed an elearning system and

related practices across the institution. This involved a wide programme of scheduled and bespoke training sessions for staff in the use of and promoting the institution wide VLE.

For university N, MLE was, therefore, associated with a ‘push’ for e-learning as well as for integration of what had been separate and disparate systems in the past: this was viewed by senior managers as a transformational technology that would enable university expansion. As the MLE contained a student management system, it was anticipated that this could ensure data quality and quantity through creating a ‘master’ data set that was authoritative and accessible. This was said to be congruent with the benefits projected in national reports on MLE. This way of framing MLE is resonant of the ‘standard system’ MLE trajectory (see Table 2), which involves MLE development being led by a desire to provide an integrated student administration and learning system. This ‘standard system’ frame is also associated with a perceived alignment between dominant vendors and IT management within the University.

#### 4.2 IT Adoption in University M (*Modern*)

In the early 1990’s University M had implemented a new university wide intranet system. The underlying logic of the implementation was said by respondents to have taken account of the value of having local departmental and school administration, with a view to replicating and strengthening this devolution in the system implementation. This aim was expressed by one senior respondent involved in leading the system project from the professional services as an attempt to bridge the historical *‘tension between the efficiency and consistency of centralised provision and the effectiveness and specificity of local systems.’* In general the intranet project was seen as providing *‘the essential bridge between the operations of the departments and the administration’*, according to senior academic manager. This evolutionary, project-by-project approach was adopted because to create favourable outcomes such as allowing user confidence to be developed, allowing the approach to be gradually refined, and information access to be synchronised with local applications development as the adoption progressed.

An offshoot company was created as a national provider of e learning, staffed by university educational technology expertise. The company aimed to be an interactive bridge between universities in the UK and international study-at-home students. Also, a new educational development unit was created. At this time the unit was not technologically focussed or committed to e learning and the university had what was described as a piecemeal approach to elearning developments, with no centralised VLE.

The arrival of a new director of IT in 2003 marked a change in attitude towards IT strategy. A new institutional VLE was then planned together with a new centralised student administration system. The new director brought a different implementation paradigm based on top down, time specific implementation of standard systems *‘as close to plain vanilla as possible’*. The new director formed a close association with JISC in planning these new systems, drawing upon JISC reports that were disseminated across all UK HE institutions. This was viewed as creating a virtuous circle of legitimation and expertise. There was criticism of MLE at this point by several key respondents as it was seen as bringing elearning onto the campus at a pace that some stakeholders were uncomfortable with, the following view being typical of many, *“.... it is like being at the top of a downhill slope, once it gains legs it is difficult to control”*.

Also, there was a sense of urgency underlying the project, with the lead sponsor observing that, *“we have got a VLE, and I think it’s going to be one of the biggest projects that we have, that and the student administration service, which is a large computing piece underneath it, but these two have the potential for massive organisational change. And I have a feeling that there are a number of people in the organisation that haven’t grasped that.”* One striking feature of this case was the way in which a few senior managers sought expertise from the national body for IT in HE, JISC, and was very pleased with this ‘free’ resource provided by JISC, explaining that they had been invited in to talk about project management methodology and subsequently acted in a consultant role, offering on-going advice on project methodology. One senior manager spoke for others noting that that the relationship was a reciprocal one - a “virtuous circle” - with university M providing an exemplar of how the JISC MLE approach can



‘work’, it being noted that, “*they [JISC] were quite interested in what we were doing because we were taking ideas that they had, making them our own and implementing them. So they were very keen to understand how that had worked. This meant there was another case study institution that they could cite as evidence that the thing was working*”.

During the late 2000s, an MLE coalition formed (Head of Registry, Head of Student Services and the new Director of Finance) within the IT Policy Group. This coalition was viewed as being controversial because they were said to have driven through a specific choice of MLE. Other senior managers talked of how the MLE brought by the university was shown to the rest of the project steering group very late in the tendering process, one noting that, “*as I say I was on a project board where we haven't decided what to buy, four months later on the same day, on the Friday, we showed the project board the singing and dancing VLE function with integrated data and goodness know what!*” In summary, the standard system frame (described further in Table 2) explained the way in which MLE coalition had worked to structure decision making in favour of their MLE trajectory. This trajectory was said to be far faster than those outside the coalition would have liked, but was viewed as being ‘*in line with national thinking*’.

### 4.3 IT Adoption in University A (Ancient)

There had been a programme of web based learning initiatives across University A since the early 1990’s. This continued throughout the 2000s, with what was viewed a rapid expansion of demand for software, systems and e-learning support across all Schools in the latter half of that decade. The increased demand had largely arisen independently of any central initiatives or strategies to expand use of e-learning, being led by enthusiastic teachers across the academic community.

Strategically, the focus of elearning activities had been to enhance the educational experience of campus-based students, whilst seeking opportunities to expand access to (and income generation from) provision at postgraduate and Continuing Professional Development levels. This was to be achieved through judicious choice of market-led developments of distance learning courses, which were viewed as being better aligned to the university’s research strengths. To promote elearning developments across academic units, especially larger and more ambitious units, the Vice Chancellor established an elearning fund to help support development.

An elearning strategy review in 2007 emphasised the need for interoperability (standards and specifications compliance), resilience, high quality, and re-usability to ensure that maximum value for money for the investments being made now was realised, both in the short and medium term. Although these needs were identified, the approach to MLE adoption at the university was not centralised. With regard to an MLE approach there was a drive for interoperability but there was no plan to replace existing systems such as the finance system to integrate with an MLE orientated student administration system or VLE.

Shortly after this, it was decided by senior managers centrally that a new institution VLE was to be implemented. The MLE manager observed however that they, “*could not envisage a point where the university could impose that upon the entire institution. So we support it, make it available, it's on offer to anyone who wants to use it. If they want to use something else and they can resource it within a department or a school, then that's what they do*”.

The focus of the MLE Manager’s work was then shifted towards undertaking an MLE feasibility review, noting that, “*we are implementing system x now, but associated with that is the feeling that next time we have to do something about our VLE and MLE we want to be sure that we are taking a decision calmly and in the fullness of time rather than because we didn't have much choice.*”

One large academic unit at the university had independently developed an active elearning unit and Learning Technology Section of its own, in isolation from the central university teams. This unit, comprising eight staff, who developed a bespoke VLEs and a bespoke Learning Management System to support its own undergraduate courses and postgraduate students. This system was talked of in high regard by all participants and was viewed a great success, both locally and centrally. This system had

been sponsored by a senior manager who led the academic unit – a unit that was perceived to have significant independence due to its large financial scale. The framing of MLE across the institution remained that of an autonomous frame, as described further in table 1.

## **5 Analysis and Discussion**

The frame analysis interprets participants' view of MLE developments in their university by filtering based on three dimensions that were developed through iterative cycles of analysis, as a pattern of interpretation common to participants across the case studies. These dimensions are: what participants thought a MLE was in general, how they critiqued MLE adoption locally, and their expectations of what MLE should be (or not be) at their institution.

Through the analysis an interpretation of two contrasting patterns of framing MLE developments was developed, that contrasted core values, business and technological assumptions about MLE, and that formed a basis for critique of the others. These contrasting frames demonstrated framing incongruence between perceptions of MLE amongst key stakeholders. The modern university in particular was judged to have had the greatest frame incongruence. This is very similar to the frame incongruence noted by Orlikowski and Gash (1992), with MLE development being found to be much more problematic here. The two ways of framing MLE that have been identified through this research were categorised as: first, 'The Autonomous Frame'; second, 'The Imported Standard System Frame'. Both frames are discussed in the next section of the paper. Following this discussion it is argued that 'The Imported Standard System Frame' is more aligned with what was perceived to be successful MLE technology adoption and diffusion than 'The Autonomous Frame'.

### **5.1 The Autonomous and the Standard System Frames**

With the autonomous frame, a significant group of stakeholders tended to view the imported standard frame negatively. The same people tended to speak of a requirement for an evolutionary and autonomous view of MLE as being better for their institution, irrespective of what national level discourses might suggest. They contrasted their assumptions with various aspects of the imported standard system frame. The dimensions of contrast varied between institutions, groups and individuals, and reflected ideas about why the imported standard system frame should be resisted. These included resisting commercialisation, resisting perceived erroneous ideas that MLE creates efficiency, perceptions that standard systems tend to be 'clunky', that they can never be up to date due to requirements to await manufacturer updates, and that systems imported from other places (i.e. sectors or countries) could not work in their particular educational setting because they were 'different'. Using quotes from participants, Table 1, to be found in Appendix 1, details the elements of The Autonomous System Frame.

By contrast with The Autonomous Frame, The Standard System Frame was aligned with the notion of buying off-the-shelf systems from one or more vendors. In particular, the off-the-shelf systems comprised portal applications that were produced by a major US vendor who was, according to several participants, looking to get into the UK education market. In this frame, MLE was viewed as offering potential to combine and integrate multiple systems, including VLE, finance and other administrative functions. Functionally, while access to elearning was viewed as being important, access to perceived service efficiencies such as self-service administration were also viewed as being important, with content delivery and central databases viewed as representing the key to facilitating the needs of future self-managing student learners. The Standard System Frame elements that were identified are illustrated in table 2, to be found in Appendix 1.

Of the three cases, there was some clear areas of distinction in terms of the two frames identified. University N and University A were viewed as having greater degrees of frame congruence, albeit across different frames, than University M. These observations are now discussed further below.

## **5.2 Frame (In)Congruence and Ideology**

In the early part of the decade from 2000 there was a tendency in HE sector level policy discourse to focus on technical systems development, examining the ways in which universities worked in partnership with external companies. Such practices were regarded as adversely influencing MLE project focus in the UK, away from the more ‘desirable’ aim of identifying of generic business processes (Glenaffric Ltd, 2004). This latter aim was, so it was argued, perceived as desirable because it may be through the development of administrative applications that genuine and lasting benefits to the participating institutions might be realised (ibid.). This view is symptomatic of much of the national level discourse regarding the vision for MLEs within the UK HE community. The relationships between MLE initiatives and the off-the-shelf systems of major vendors, often framed as standard systems, had been and continued to be, throughout this research, associated with cultural resistance in universities. In tandem with this, the presumed benefits were often said to have been ‘resisted’ by university staff, who were perceived as being reluctant to embrace MLE in the ways envisioned, for example, by JISC. Apart from the large investment in time and money resources involved, this research found that there were some areas of perceived resistance to MLE adoption and development in the case study universities. First, there was resistance to the representation of MLE as a generic technology led system: that is, as an imported standard system approach that imposed a particular kind of management and pedagogical practice on universities. Second, there was opposition to vendors selling an ‘off the shelf’ system as an MLE, described as a ‘preconfigured thing’ by several of those spoken with in the cases. Frames in these instances could be said to be inconsistent with ideology.

Within the UK HE sector, the initial discourse about MLEs were considered to be misleading because they were perceived to be over simplified, too often focusing on learner interactions, and hence limiting the potential of the ideologically inspired visions. However, as the latter part of the decade was reached, there was a marked shift in thinking as the imperatives of efficiency gains were heightened by both a change of UK government, a change in the dominant ideology, as well as an economic downturn for UK HE. These changes would see greater concern being expressed in each of as a result of recession.

One of the influences upon IT adoption found in this research was the way in which that MLE adoption brought together professionals from a variety of practical and professional fields, who brought with them a wide range of frames – some of which conflicted. National level discourse for MLE presented a vision for a form of national information infrastructure in UK HE, an infrastructure that would, it was reported, reap benefits in efficiency and effectiveness across the sector. The pressures upon universities to engage with this utopian vision remained relatively benign however, with some cases choosing to engage, such as University M, and University N, and others not, such as University A. However, a change of perspective was identified across the case studies, as changes took hold in the national level HE sector – changes that have been described as representing the ideologically driven marketisation of HE in parts of the UK (Brown and Carasso, 2013). In the course of the study it was noted that national level MLE perspectives shifted from being informed by an ideological influence that was relatively benign for a sector, where working practices were heavily informed by collegiality and sharing, to one that was perceived to be more competitively oriented. Paradoxically, there were still hopes being expressed for possible efficiency savings to be gained through cooperation, for example through initiatives such as shared services.

During the latter stages of the research in the late 2000s a shift in framing was identified amongst participants in the research, as the prevailing views of MLE amongst those spoken with shifted away from the sense that it was an ‘unsorted’ idea, fundamentally at odds with the values and beliefs in UK HE settings. Gradually, greater levels of frame congruence were identified as perceptions of MLE in general shifted. These shifts occurred in a context of changing ideology, where a market view of HE became much more prominent, and realised in government action. Where previously there seemed to be some concern in University M and University A that MLE might undermine academic autonomy, this shifted in University M, to framing that gave primacy to institutional survival. This view had been a part of the

framing of MLE in University N all along. In parallel, there arose a sense of greater ideological dissonance between UK HE institutions and prevailing ideological influencers upon HE, as market oriented policies were trailed and then implemented. University A had a predominance of autonomous framing, and this institution was furthest from adopting MLE to anything like the extent found in the other two cases. In University A, MLE developments were restricted to elearning, and to specialised post graduate courses where the university had research strengths. At the same time, there was a sense of certainty exuded by those spoken with about the future success of the institution. Such certainty was far less evident in both University M and University N.

Those social actors in the case studies who aligned with the imported standard system frame tended to be involved in the flow of MLE resources (expertise, funding and artefacts) between institutions, and several were significant actors in the wider MLE arena: both with vendors and public sector agencies. Advocates also tended to be part of broader networks across HE, either vendor sponsored or agency sponsored, where the standard system approach was endorsed. On the other hand, participants who viewed MLE as an autonomous development tended to value in-house expertise. Standard System advocates tended to predominate on the managerial and administrative areas of the university. At University M there were also significant groupings of social actors for whom the autonomous frame was significant, with advocates from the learning side, usually as academics. However this was not the case at University N, where all groups were found to be aligned with a national, JISC based view of MLE. Across the three cases, it became clear that advocates for MLE were involved, to varying extents, in a global arena of system development, in which resource flows, expertise and legitimation maintained the momentum of IT diffusion, in pursuit of utopian visions.

For those feeling at greatest risk from such ideological shifts in the sector, it was perhaps of little surprise that they exhibited greater levels of congruence between perceptions, expectations and apparent realisations. With such alignment, advocates in the adopting organisations and in the major sponsors created a ‘virtuous’ cycle of mutual legitimation and, consequently, the necessary flows of resource and influence. This focus on maintaining outward facing networks amongst advocates seemed to influence the control of critical discourse in favour of maintaining the salience of the TAF within the university. Key organisational players aligned with each other and with global networks, which took on greater importance, whilst organisational practice was more about frame maintenance than mobilisation of internal stakeholders (excepting key resource gatekeepers). This occasionally resulted in the view that development was being imposed from above, and was revolutionary. This clashed with professional groups who valued personal and institutional autonomy in making technological choices.

## **6 Conclusion**

One issue identified in research has been the need for a shared understanding among social actors of the goals, purposes and institutional vision for the adoption and diffusion of technology to be sustained (Pollock & Cornford, 2003; Hsu et al, 2013). There has also been recognition that the long-term sustainability and institutional embedding of IT adoption activities depends on the support, confidence and direction of senior management, as well as technical specialists.

In the UK Higher Education arena, researchers have for some time pointed to the need to broaden analysis beyond the way academics interact with technology to examine the way that a heterogeneous range of key university advocates influence local IT configuration through their interaction with the wider arenas of IT (Dutton, Cheong & Park, 2004). This research has identified the ways that frame congruence, or incongruence, can be significant in influencing participation in IT adoption and diffusion processes. While these processes can be classed as ‘economic and political processes in building alliances of interests (amongst, for example, supplier firms, technologists, potential users, funding bodies, regulators) with the necessary resources and technical expertise, around certain concepts or visions of as yet unrealised technologies’ (Williams & Edge, 1996, p10), there is, it is argued, much more to it than this. Such processes take place within, and against a backdrop of ideology. The extent to which informing

frames are congruent with the prevailing ideology would appear to be influential in the IT adoption processes reported here. Further work to explore these dynamic interactions would be beneficial.

One of the strengths that we have identified with a TAF perspective is in helping to draw attention to a perspective that views ideology, social actors and artefacts as being tightly coupled, and in helping to identify the ways in which expectations can be mobilised. Thus, computerisation movements can be better understood if this mobilisation is deconstructed to reveal assemblages and alliances that promote and sustain. As one advocate observed, being a member of a network offered free expertise but came with a price – that price being the desire to demonstrate ‘success’ through material realisation; that is, it could be argued, in realising utopia. Where frame congruence occurs, this urgent desire for material realisation of IT can, at times, seem to be unstoppable.

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## APPENDIX 1:

Perceptions of MLE in general	Critique of MLE locally	Expectations for MLE at their university	Institution
Extending learning beyond talk and chalk for a community of learners	a 'go away and get on with it' system.. mechanised, automated learning'	Not automated Better access to information	Ancient
Mind set about inter/extra institutional systems joining up rather than a thing. Should be an 'information environment'	Suppliers trying to sell a 'thing' to us	Should be an information environment, led by pedagogy	Ancient
MLE perspective depends on who you are, for management more about business process, for teaching more about how students get to learning	Standard system poor compared to innovative evolutionary bespoke system	Continuous process of innovation Not locked into particular trajectory	Ancient
An extended VLE	Doesn't save money	Should not be on campus e learning,	Ancient
The vision of everything linking up and it being an enterprise wide piece of software	One giant database approach: 'Doesn't work anywhere, especially in education which needs flexibility at interface and doesn't suite systems thinking.' 'MLE is a red herring'	Seamless linking.  Working towards single log in.	Ancient
'MLE is a framework which your systems fit into. Next stage from VLE'	'Should not be seen as a piece of software'	MLE should be a process of learning to apply technology to improve education process, not a forced implementation	Modern
'Tying in all the systems relating to teaching and managing the learning process. Very much to do with distance learning for business, an off campus delivery system'	MLE is for business off campus, distance learning. MLE as threat: 'Top of a downhill slope. Once it gains legs it is difficult to control'	MLE should be used for distance learning not on campus	Modern

Table 1. An Autonomous Frame and Information Infrastructure Adoption

Perceptions of MLE in general	Critique of MLE locally	Expectations for MLE at their university	Institution
'The switch to the learner pulling down rather than it being shoved at them.'	'separation of content and teacher now essential'	Modularised content delivery system for educational market	Modern
'A computerised system to support all aspects of the business. Trying to think of all areas of the business that can be delivered online.'	Separate, bespoke systems are inefficient	'It's about joined up business processes and also about thinking about how that can increase your business.'	Modern
'I usually talk about VLEs'	'I only talk of systems' 'Is it just a term?'	One centralised VLE and portal	Modern
System x is much closer to the MLE concept.	People giving up ownership of local system Lecturers worried about becoming obsolete	Integration for student portal	New
MLE is integrated suite of products delivering flexibility	VLE more of a stand-alone tool that doesn't integrate	'Ideally what I would like to do for each system in the university is identify for each piece of data in the university where its master system was.'	New
Managerial system to enable online delivery of student services Product solutions	An attempt to create stand-alone e learning faculty	Full university wide roll out for student Portal Equating on and off campus learning Underpins expansion	New

Table 2. *An Imported Standard System Frame and Information Infrastructure Adoption*