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The role of professional discourses in the organisational adaptation of information systems

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Abstract

This paper focuses on the role of professional discourses in shaping the contexts upon which the organisational role of information systems is constructed and adapted. It presents the results of an exploratory case study conducted at a Higher Education Institution in the UK during the implementation and post-implementation periods of a University-wide management information system. It analyses how different professional discourses explored tensions in the management of the information environment articulated around two major categories of issues, which acted as interpretative repertoires and discursive resources:

(i) representations of the information environment, expressed through the tension between information centripetalism and information centrifugalism;
(ii) models of information management approaches, expressed through the tension between a focus on controlling process and a focus on ~~controlling~~ meanings.

While simultaneously discursively exploring these tensions and establishing contacts across them through activities of organisational translation, different organisational actors reshaped and adapted the role of information systems from an initial centripetal agenda to a much more negotiated and distributed role.
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1. Introduction

The classic 'waterfall' and life-cycle focused model of the information systems development process is often defined in terms of analysis, design, building and, finally, implementation of information systems, as expressed in the well-known definition by three key authors in this field, Hirscheim, Klein and Lyytinen (1995, p. 2): "[…] *the analysis, design, construction, and implementation of information systems. These together constitute what we understand to be information systems development*" (original underline). This paper argues that the

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1   organisational adaptation of information systems is an important aspect of the development process beyond
    implementation and that professional discourses play a key role in the process of adaptation, by not only
3   reflecting but also shaping different perspectives on the organisational role of information systems.

    Although the theme of information systems evolution and adaptation is not often explored in some strands
5   of literature, as noted recently in the review by Nasir (2005), post-implementation studies and approaches are
    not new and various examples can be found in the literatures of social informatics (Kling, 2000), social
7   shaping of technology (Fleck, 1987, 1994), and information systems (Cooper & Zmud, 1990; Doolin, 2004;
    Horton, Davenport & Wood-Harper, 2005; Hussain, Taylor & Flynn, 2004; Kwon & Zmud, 1987; Magalhães,
9   2004; McLoughlin, 1999; Orlikowski, 1992; Saga & Zmud, 1994; Pollock & Cornford, 2004).

    The particular focus that this paper brings to this topic is an emphasis on the constructive and constitutive
11 role of discourse in general and, in particular, on the role of professional discursive practices in shaping the
    process of organisational adaptation of information systems. This is studied in the context of an exploratory
13 case study, through the perspectives and discursive practices of a group of middle managers at the
    administration and in academic and administrative computing service involved in the implementation of a new
15 set of management information systems at a British University.

17 **2. The organisational adaptation of information systems and discourse**

19 As referred in the previous section, post-implementation studies are not new in the literature of information
    systems. Cornford (1995, p. 45) points out, however, that the term implementation is often used with different
21 meanings: "*To a programmer or software engineer it means taking design specifications and writing programs.
    To an information systems analyst it means taking the programs and other components and setting them to work
23 in the real world*". Magalhães (2004) argues that its understanding should go beyond that to encompass an
    ongoing process of organisational learning throughout the use of information systems and it is this broader
25 and longer term perspective that is adopted in this paper.

    The literature of information systems implementation has often been categorised around a series of foci in
27 terms of the relationships between technology and its social context (Jasperson et al., 2002).

    A large strand of studies was dominant in the 1960s through to the 1990s and is centred on the notion of
29 technological determinism, fostering a view of information systems implementation as a planned and rational
    process with a strong element of linearity (Cooper & Zmud, 1990; Kwon & Zmud, 1987; Saga & Zmud, 1994).
31 This strand of literature views information systems as external agents which introduce changes in power
    relations in the work place by enabling different forms of exercising control. These studies emphasise that
33 information systems impact on existing power relationships and formal decision making structures, by
    changing the information processing capabilities of organisations (Anand & Mendelson, 1997; Carter, 1984;
35 Nault, 1998; Zeffane, 1989).

    Other strands of literature stem from a critical perspective towards the technological determinism view and
37 emphasise the notion of social shaping of technology (Davenport, Higgins & Sommerville, 2000; Fleck, 1987,
    1994; Horton, Davenport & Wood-Harper, 2005; Kling, 2000; Kling & Dutton, 1982). In contrast, these
39 approaches foster the view that information technologies are the result of social action. Kling (2000), an early
    proponent of social informatics as an area of study, refers to information technologies as "*sociotechnical
41 networks*" asserting that technology is socially shaped. He refers to ICT (information and communication
    technologies) implementations as an ongoing social process, where politics not only plays an important role,
43 but, more than that, acts as an enabler.

    The seminal study by Orlikowski (1992) adds an interesting dimension to previous approaches, by
45 considering that both technological determinism and the social shaping of technology are incomplete views
    and proposes a model, referred to as the "*duality of technology*" that combines both views in a dialectical
47 manner, based on structuration theory. She refers to the notion of interpretive flexibility of technology to
    characterise the way in which users constitute an appropriate technology through shared understandings and
49 meanings during its design and use.

    More recent studies tend to emphasise this view. Cornford and Pollock (2003) and Pollock and Cornford
51 (2004), for example, studied the organisational adaptation of ERP systems at a UK Higher Education
    Institution, asserting that "[…] *implementation would not be possible without numerous ad hoc modifications*"

1 (Pollock & Cornford, 2004, p. 43). In the case studied by these authors, this involved managing the tension faced by Universities in terms of their similarity (an essential assumption of generic solutions such as ERP

3 systems) and their differences vis-à-vis other organisations, involving processes of translation of the technology into a local context, but, at the same time, reshaping the way in which the University understood

5 its identity. Similarly, Doolin (2004) studied the implementation of a large health management information system in a New Zealand hospital, initially intended to monitor clinical activity, where with time, the role of

7 the system was reinterpreted through negotiation between the initially sceptical clinicians and the hospital management. The view that technology tends to be reinterpreted in action is emphasised in other studies,

9 exemplified by Brown (1995, 1998), in the context of a large IT project at the National Health Service (NHS) in the United Kingdom, leading to the implementation of the Hospital Information Support System (HISS).

11 Brown concluded that legitimacy for the system was sought through the manipulation of multiple (and often radically different) interpretations, in order to adjust to the perceptions and requirements of different

13 stakeholder groups, through the control over the flow of information and the use of symbolic action. These actions were deployed in the context of the promotion of a new set of power relationships. As stated by Brown

15 (1998, p. 52), "[…] *the capacity of IT to coordinate, structure and control is contingent only*, *and* […] *actors often have such considerable discretion over their use of technology that making reasonable a priori predictions*

17 *regarding the consequences of a particular implementation is often impossible*".

These studies suggest, therefore, that post implementation development of information systems continues to

19 occur through the organisational adaptation of information systems in contexts of negotiated interaction. These views of the organisational context of information systems implementation provide interesting

21 correlations with those of Clarke (2005), who refers to technologies as "*implicated actants*", which are simultaneously the result of social action and impact upon action, through the discursive practices of social

23 actors. The discretion that organisational actors can exercise in the adaptation of information systems derives therefore from, it is argued in this paper, the ability to negotiate meaning through the exploration of discursive

25 resources. The role of discourse is, therefore, not merely representational, but constructive and constitutive of organisational life (Candlin, 1997; Wetherell, 2001a) and of the organisational role of information systems. As

27 Potter and Wetherell (2001, p. 198) propose, "*people use language to **do** things*" [original emphasis].

Bakhtin (1984, 1986) was an early proponent of the dialogical perspective of discourse and of language as

29 rooted in social interaction, often framed within social struggles. Bakhtin (1984, 1986) refers to the tension, expressed in the form of a conflict, between centripetal forces, focused upon the production of standardised

31 and codified meanings expressed in dogmas and accepted views of universal truth, and centrifugal forces that promote diversity and variation consubstantiated in different discursive genres. This tension relates to another

33 proposition made by Bakhtin that tensions between discourses lead to new meanings and meaning is thus dialogically constructed.

35 An extension of this perspective of discourse is suggested by Cohen, Duberley and McAuley (1999), who refer to the concept of duality of structure by Giddens (1976, 1984), as constitutive of the reproduction and

37 transformation of social structures, through the interplay between the structural and agentic dimensions of different discursive regimes, on one side, and through the interplay between different discourses, on another.

39 This view also informs the nature of power relations as circular (Foucault, 1980). As stated by Brown (1998, p. 49), "[p]*ower is thus not a thing and nor should it be thought of as an unexercised capacity*, *but as a matter of the*

41 *successful deployment of meaning. What is struggled for and against is a particular legitimated interpretation of rules*, *actions*, *events*, *motives*, *outcomes. Power is*, *in part*, *at least*, *expressed in and through narratives* […]

43 *which groups deploy to legitimate interpretations that they believe favour their interests*".

It is suggested that discourse analysis can lead to interesting insights on how the organisational adaptation

45 of information systems can take place by helping to identify the interplay between discourses by which adaptation takes place and is articulated. It can also offer an understanding of the contexts within which

47 meanings emerge (Grant, Michelson, Oswick, & Wailes, 2005). However, as stated by Anderson (2005), there is the need to further our knowledge of how organisational actors negotiate meanings. It could be argued that

49 a dialogic perspective of discourse can be of use here, by helping to identify and unfold how the interplay between different discursive regimes occurs in particular contexts. This paper explores therefore the role that

51 the discursive practices and interaction of a particular group of organisational actors played in the organisational adaptation of information systems through negotiated interaction.

1   ## 3. Methodological approach

3   This study adopts a view of the role of discourse as constructive and constitutive, rather than merely representational. Potter and Wetherell (2001) state that the adoption of a perspective of discourse that
5   emphasises its constructive and constitutive nature implies the abandonment of a realist perspective and requires a concern with discourse as a topic in its own right, whereby the role of the discourse analyst is to
7   uncover how the discourse about situations, events, beliefs or attitudes is constructed: "*Take the idea of attitudes. If someone espouses attitude x on one occasion and the contradictory attitude y on another, the analyst*
9   *clearly cannot treat the existence of attitude x or y as an unproblematic guide to what the person actually believes. But it is possible to treat the account containing the expression of the attitude as the focus itself, asking: on what*
11 *occasions is attitude x rather than attitude y espoused? How are these attitude accounts constructed? And what functions or purposes do they achieve? It is questions of this kind that are at the heart of discourse analysis*"
13 (Potter & Wetherell, 2001, p. 200).
    A naturalistic inquiry approach seemed, therefore, appropriate to the research aims, where minimising the
15 manipulation of situations was sought, in order to study the complexity of issues involved, avoiding prior constraints to the outcomes of the study. The research presented in this paper adopts case study approach to
17 research design (Yin, 1989), following interpretive and constructionist principles. A qualitative research strategy in data sampling, collection and analysis, adopting Grounded Theory principles (Glaser & Strauss,
19 1967; Patton, 1990) was followed. Grounded Theory principles are adequate for discourse studies that are focused on the wider perspective of '*discourse as meaning-making activities*' (Wetherell, 2001a, 2001b) and has
21 been adopted in other studies (Clarke, 2005; Dick, 2004).
    The case study that is explored here took place in a single organisational setting and was centred on the
23 implementation of organisation wide management information systems at a University in the UK, henceforth referred to as the University. This institution was chosen because it represented what seemed to be a very
25 interesting opportunity, as at the time interviews started, it was implementing the new management information systems and, simultaneously, changing its administrative and technical structures, leading to the
27 centralisation of the control over its 'corporate' information processing activities under a new department, the Corporate Information Department. This was part of a wider trend towards clustering many administrative
29 processes at the Centre, leading, for example, to the abolishment of Faculties as structures that mediated between the Centre and the academic departments. It therefore appeared a particularly rich environment to
31 explore in depth particular issues inherent to focus of the research.
    The principal vehicle for data collection was qualitative interviewing, supported by the analysis of some
33 internal documentation, as well as official reports on the Higher Education sector in the United Kingdom. The interviews were conducted with 12 different middle managers belonging to the University administrative and
35 technical structures. The choice of middle managers was deliberate, as it was considered that it could lead to particular insights, due to the mediating role between the core and the Periphery of organisations that middle
37 managers often carry out (Clegg, 2003; Clegg & McAuley, 2005).
    The case study involved interviews over a period of around one year with these various managers. The
39 individuals that participated in the study had in common the fact that they were either directly involved in the implementation of the new management information system or for whom this new system had directly
41 impacted on the way they carried out their work. Their choice was driven by an initial exploratory study and the analytical framework that emerged from it. They included, for example: a senior manager at the registry in
43 charge of overseeing the development of the information strategy process; the deputy director of the department in charge of implementing the new system, its project manager, as well as two other managers
45 responsible for particular aspects of the systems; the systems manager at the Finance Department and a manager at Academic Computing Services, both bringing important perspectives, as they represented
47 dissenting voices in the process; the administrators in charge of systems at the Undergraduate and Postgraduate Student Offices and heads of administration and of IT services at two different academic
49 departments (one a heavy user of IT, the other less so). They participated in different areas of the administrative and technical arenas at the University, which intersected and sometimes clashed with each
51 other, as the following sections will demonstrate.

1   The data analysis process was inspired by general guidelines of the constant comparative method of the grounded theory methodology by ~~Glaser and Strauss (1968)~~. The approach to data analysis adopted in this
3   study is more aligned with its original formulation than with its subsequent reformulation by Strauss and Corbin (1990) which has a stronger emphasis on the formalisation and proceduralisation of the codification
5   process. The process of analysis, leading to the identification of key categories of findings, involved:

7   (i) firstly the identification and analysis of discursive practices articulated around tensions between information centrifugalism and information centripetalism and between a focus on process and a focus on
9   meanings, which will be explored in Sections 4.2 and 4.3, where the findings of the case study to the case study are presented and discussed in relationship to similar constructs (Bakhtin, 1984, 1986; Ellis, 1986;
11   Seadle, 1998; Yates & Sumner, 1997);
     (ii) further than that, explaining how these two different tensions are in turn inter-related;
13   (iii) and finally, how these inter-relations can be understood within particular aspects of interaction and negotiation, as a means to explain the role of discourse in the organisational adaptation of information
15   systems, which constitutes the focus of Section 5.

17 This study aimed at explaining and exemplifying how the interplay between discourses plays a role in the organisational adaptation of information systems. The research design that was followed seemed adequate to
19 the objectives of the study, as it should enable interpretation and exemplification, which Potter and Wetherell (2001) suggest is also often the aim of discourse studies.
21

4. The discursive exploration of tensions in the management of information
23

4.1. Background: the events leading to the implementation of the new systems
25

    The new management information systems at the University had their historical origins in the MAC
27 (Management and Administrative Computing) Initiative, funded by the UK University Grants Committee, which aimed at the adoption of a common system and of a common data set across the sector. This required
29 therefore, from the universities, potential significant adaptation of not only existing data processing systems, but also of information management practices and of administrative processes. Thus, the artefacts around
31 which discursive interaction and negotiation of practices took place went far beyond the new suite of systems, to include changes in the organisational structure, an university-wide information strategy, the definition of a
33 corporate image and identity through the Web presence of the University and the adoption of a "*corporate data model*" as a means to define and control new resourcing models in order to reorganise the distribution of
35 resources across the University.
    At the University, the introduction of the corporate information systems co-occurred, in effect, with a
37 significant and extensive reworking of its administrative structure and procedures, which led, amongst other issues, to the abolition of Faculties as mediators between the Centre and the academic departments. In terms
39 of the management of information, this resulted in the centralisation of administrative computing services into a single Corporate Information Department. This involved the transfer of a large number of staff that had
41 previously been in charge of IT at Central Administration structures into the new Department, with the inherent depletion of the various Central Administration departments of expertise in the area of IT
43 applications. This department was in charge of implementing the new fully integrated management information systems across the whole University.
45   The original intention at the University, as stated by the ~~management~~ information systems project manager, was that it would adopt a completely integrated system across all of its administration, including all aspects of
47 student administration, estates and housing, human resource management, finance and payroll, for example. Problems began, however, with the first set of package deliveries, as the company in charge of the software
49 development, a well established software vendor, began to realise that the requirements were far more complex to implement in terms of design than originally anticipated and that further development was required. The
51 difficulties experienced by the developer in dealing with the complexity of the task also meant that the University was delivered what was perceived as an incomplete product, but, to minimise further losses, it was

1   decided the delivered packages would be accepted as they were and further in-house work would be carried
    out.

3   This caused an immediate internal division, as some departments refused to adopt the new systems and
    started pursuing other options. This was notably the case of the Finance Department, which was a powerful

5   actor at the University, and had decided not to adopt the Finance package, once some shortcomings of the
    beta version of the software were known and not addressed by the developer. This decision was seen as

7   unilateral by other managers at central computing services at the University. It had, in effect, an important
    impact on the concept of an integrated University-wide management information system and on its practical

9   implementation, as noted by the ~~management~~ information systems project manager.

11 "We've already lost the 'piece of data being held only once' idea because we've got two systems and
    therefore we're bound to hold the same data to be able to function separately but we've worked hard in

13 trying to make them talk to each other as well, as much as possible to try and keep them integrated." (CI. 1:
    10)

15 At the eve of first set of packages of software gong live, there had been virtually no internal consultation
    outside the Corporate Information Department and the Finance Department regarding either the new

17 corporate information systems or the new finance system and very little was known of each. The lack of
    consultation was openly acknowledged by the staff at the Corporate Information Department, due to the

19 difficulty in considering and in taking on board the diversity of practices and views over what constituted an
    adequate management information system across the University administration.

21 Compounded with these changes, other wider reaching events took place, leading to the restructure of the
    administration at the University, namely, the abolishment of the Faculties as a structure mediating between

23 the strategic apex and the academic departments and the merger/take over (depending upon which manager
    referred to it) of Academic Computing Services by the Corporate Information Department. The

25 amalgamation of the two departments had significant implications for the political standing of both and
    for the balance of power in both departments. Traditionally, the autonomous status of Academic Computing

27 Service was emphasised by the fact that it answered to academic committees, within a relatively collegial
    structure. Its inclusion in the Corporate Information Department meant that it became part of the formal

29 administrative management structure and a line management chain of command.

31 "We will no longer be mainly responsible through committees but we will now have a parallel management
    structure which means we are responsible to the director of Corporate Information, [Alex Parson], who is

33 responsible to the Registrar and who meets regularly every week with the Pro-Vice Chancellors, the
    Registrar and the Vice Chancellor. There is now a fear that major decisions affecting what we do will be

35 made via that channel. We are afraid now that our efforts may be diverted more to the Administration."
    (ACS.1:31)

37 As such, the process of restructure was perceived as symptomatic of wider changes in the Higher Education
    sector by other organisational actors. In effect, this process was perceived as a reflex of a more profound

39 change in how Universities were perceived and, simultaneously, in how they wanted to project their image as
    institutions that were adapting to an environment that was seen as both turbulent and increasing in

41 competitiveness. The adoption of the term "corporate" to qualify both the newly formed department and the
    systems it would be managing is also significant and reflects the idea that the University should express its

43 identity and image in a homogeneous way, which should rise above local diversity and differences, borrowing
    the analogy of a large business corporation.

45 "I also think these mergers have a lot to do with the way Universities perceive their business—there is more
    emphasis on the fact that the University should be projecting itself as a unit" (ACS.1:35-36)

47

    This perceived change in nature was also viewed as bearing deeper implications in terms of how traditionally

49 work had been organised and of how different groups related to each other, leading to the reshaping of the
    administrative arena at Universities.

51 The events surrounding the implementation of these systems were therefore fraught with many potential
    tensions. These became apparent as interviews progressed at various levels of the administration and of

technical services and unfolded what appeared to be a complex organisational arena (Clarke, 2005; Strauss, Schatzman, Bucher, Ehrlich, & Sabshin, 1964; Strauss, Schatzman, Bucher, Ehrlich, & Sabshin, 1981). The discursive practices that constituted and embodied the information arena at the University and played a significant role in the organisational adaptation of information systems were articulated around two major categories of issues, which acted as interpretative repertoires and discursive resources:

(i) models of the information environment, expressed through the tension between information centripetalism and information centrifugalism;
(ii) models of information management approaches, expressed through the tension between a focus on control over process and a focus on negotiation of meanings.

The following sections of this paper will discuss these discursive categories in turn, through the analysis of particular incidents, such as the debates that occurred institutionally around the notions of "*devolvement*" and "*accuracy*", which exemplify the interplay that took place between different discourses. The paper will then conclude with a discussion of their inter-relationships in the context of the nature of the information arena and of the models of interaction and negotiation that constituted it, leading to the organisational adaptation of information systems.

4.2. Models of the information environment: information centripetalism and information centrifugalism

Contrasting models of the information environment were found in the tension articulated around information centripetalism and information centrifugalism.

At the University, information centripetalism manifested itself through a trend towards the concentration of control and coordination of information handling activities at the Centre, to be achieved through a focus on the standardisation of processes and on the definition of levels of access to information by the newly formed Corporate Information Department and by the Finance Department. This found particular expression in:

(i) the definition of a blueprint view of the organisation, introduced by the information strategy and implemented through the new management information systems as a means to create an institutional map of the administrative information arena (Clarke, 2005; Strauss et al., 1964, 1981);
(ii) the definition of a corporate image and identity through the formulation of rules to guide the monitoring and policing of the generation, dissemination and use of corporate information; and, crucially;
(iii) the attempt to define meaning, through the definition of a "*corporate data model*" as a key to the production and manipulation of new resourcing models and correlated coding structures, which allowed the reorganisation and redistribution of resources across the University.

Conversely, centrifugal models of the information arena, embraced at the extinguished Faculty Administration level, at academic departments, support structures such as the postgraduate and Under-graduate Student Offices, and service departments, such as Academic Computing Services, emphasised diversity, local processes and practices, and correlated knowledge, ensuring the capability to reinterpret meaning as a means to make sense and regain ownership over local practices.

The tension between information centrifugalism and information centripetalism is particularly emphasised in discourses deployed in the negotiation of "*devolvement*" as a key to define roles in the new systems. The various interpretations of the notion of "*devolvement*" conceptualised different notions of the role of the various actors and acted as a vehicle for the definition of what constituted legitimate action in systems intervention.

These roles were articulated by the Centre around the distinction between "*normative responsibility*" (as defining rules) and "*functional responsibility*" (as working within the rules and being accountable for complying with them). This is patent in the following quotation by the deputy director of the newly created Corporate Information Department which was driving the implementation process:

1   "[…] there is an issue of who is in charge of what bits of an integrated system, again, there's different levels
      of responsibility which I find get in the way, like people who are responsible for the functional, actually just
3   doing , and there's normative responsibility who say 'this is how it ought to be'. Now we confuse both of
      them in this place so we have some people who believe they are responsible for things who are doing it just
5   at the lower functional level." (CI.4:25)

7   "*Devolvement*", in this case, was seen as a way to define and ensure accountability—in this discursive
      context, responsibility equated to accountability. As stressed by the MAC project manager,

9   "I don't necessarily think that people are going to be losing responsibility because they are still responsible
      within their department […] responsibility is not going to be taken away because it will only be done with
11   the approval of the central department because when it comes back to it they are responsible for the data
      and responsible to the Registrar—making sure that the data on the system is accurate, so I don't think there
13   is a sense that they are going to lose that responsibility" (CI.1:30)

15   The distinction between "*normative responsibility*", as an attribute of the Centre, and "*functional
      responsibility*", as an attribute of the Periphery, acted as a means to distance elements of the Periphery from
17   the ability to make decisions over how the systems would be operated.
      This was counteracted by actors at the Periphery of the decision-making processes by claiming the roles of
19   both requirement definers and systems validators and, thus, placing normative responsibility back in the
      corner of the 'user'. The following quotation by an administrator at the Undergraduate Student Office
21   illustrates this

23   "It is our responsibility as end-users of the system to find the changes/improvements we want on this
      Central University database and that the system operates efficiently. It is the Department of Corporate
      Information's responsibility to put that into practice, in the sense of technical amendments to the software
25   and the programmes and then come back to us and say 'we've done this—is it better for you?' and then we
      enter into negotiations like 'well, that's very good but can you just make one final change and that will be
27   fine for us' […]." (SO.1:25)

29   In this other discursive context, the notion of "*devolvement*" was focused on maintaining local autonomy
      and control over administrative processes and resources at the Periphery. This was defended by an
31   administrator at an academic department, where "*devolvement*" equated to maintaining local practices and
      associated knowledges:

33   "[…] the other way to do it is, rather than having Academic Computing Services in the Centre, that
      becomes devolved and resources are devolved to each individual department […]" (DIS.1:18)
35

      In the information arena at the University, shifts in the control over information systems and processes
37   were, therefore, accompanied by a tension between discourses that emphasised standardisation and
      codification of administrative information processes at the Centre and discourses that emphasised diversity
39   of practices and meanings at the local level. In the discursive sphere of centripetalism, "*devolvement*" equated
      to defining accountabilities over who was responsible for operating different aspects of the new systems. In the
41   discourse of centrifugalism, "*devolvement*" was represented as a way of guaranteeing local autonomy and
      control over the operation of the system. Its reinterpretation corresponded to an attempt to change where the
43   locus of control over the new information systems should lie and to redefine what constituted legitimate action
      in information systems interventions.
45   The tension between information centripetalism and information centrifugalism can be related to other sets
      of tensions between centrifugalism and centripetalism present in the literature. Mintzberg (1983) suggests that
47   there are key tensions that influence principles that affect organisational structures and groupings. These
      tensions are identified with the actions of different organisational groups. Ellis (1986, p. 116), on the other
49   hand, commenting from a different perspective, suggests that the widespread use of IT leading to the
      proliferation of computer based information systems in organisations has led to the concurrent development
51   of two opposite effects in organisations: *"the centrifugal effect of the rapid, but often uncoordinated growth in
      the use of"* [computer based information systems and] […] *centripetal efforts to coordinate and control the*

information handling function […]''. In a different context, Seadle (1998, p. 7) refers that one of the three key tensions faced in the provision of information and library services lies in the [perceived] need for "[…] *centripetal administrative solutions to centrifugal information services needs*''. Yates and Sumner (1997) stress, in effect, following Bakhtin (1984, 1986), that centrifugal forces tend to be triggered by both changes in social structures and technological evolution and expressed by the emergence of new vocabularies and discourses.

In the particular context of the University studied in this paper, the trend towards centralisation of the strategic apex allied with the tendency towards standardisation of its technostructure, in charge of defining the rules and procedures, as well as the systems that regulate the organisation, represented in this case by the Corporate Information Department and the Finance Department, emphasised a model and a discourse of information centripetalism, whereas the focus on professionalisation of the operating core, represented by the academic departments, allied to the collaborative emphasis of support services, central offices in charge of student administration and Academic Computing Services, and, particularly, with the strive towards autonomy of middle managers at support services, emphasised a model and discourse of information centrifugalism. Both acted as means to establish what constituted legitimate action and intervention in information systems. The interplay between these two different discourses around "*devolvement*" led to the reinterpretation of meaning in relationship to legitimate action.

4.3. Models of information management: a focus on process and a focus on meanings

The tension between information centripetalism and information centrifugalism, as models of the information environment, is related to another discursive tension between information management perspectives focused on control over processes and those focused on negotiation of meanings, although they are not necessarily equivalent or correlated in an automatic way. Information centripetalism, articulated around the control of the information environment by the Centre, requires a focus on the codification and standardisation of processes of handling information and of data structures to ensure the pre-determination of meaning. Centrifugal perspectives, on the other hand, are more congruent with an acceptance of diversity and the need to negotiate multiple inter-relations in situated contexts, where meaning becomes emergent.

A key example of the interplay between discourses focused upon control over processes and those focused upon negotiation of meaning lies in the discussion that took place around the implementation of the "*corporate data model*" and in the deployment of notions of "*data accuracy*" in the process of negotiation that ensued.

The adoption of a "*corporate data model*" was an example of codification of data structures to ensure the standardisation of administrative data across the University and was core to the corporate information systems.

"We're holding a definition of all the things that people need, like we have a student defined, we have a year defined, department defined, things like that. […] The rationale behind the corporate data model is to actually define what the information is and have a data administrator responsible for pinning down what the definition of the data is, and then holding the data only once, so people can access it."(CI.4:12)

The new "*corporate data model*" required as well the standardisation of processes and procedures across the University administration. Both the Corporate Information Department and the Finance Department concentrated on defining approaches to information management focused on the standardisation of processes and procedures. Approaches to information management focused on process fostered an assumption that the definition of processes and procedures was, in effect, a means to ensure adequate meaning and information accuracy. For the administrators that adopted this approach, a focus on standard processes and procedures, rather than on the variety and multiplicity of local information, allowed the establishment of a homogeneous and consistent way of making sense of the complexity of the world of the University.

"From my point of view as an administrator the focus is on the process because it's not my responsibility to achieve targets, it's my responsibility to show that we may or may not achieve targets and to show that you need processes that will give you the information and enable you to present it in a particular way." (DIS.2:13)

On the other hand, at central support services, such as the Postgraduate and Undergraduate Student Offices and at academic departments, administrators argued that establishing the "*accuracy*" of what was being presented through the new information systems was vital. They asserted their positions by establishing their focus of action on assuring that the meaning of the content of the information systems was accurate. The simplification introduced by the funnel effect of centripetalism and standardisation (Boisot, 1998) was presented as detrimental to both information richness and accuracy.

"I think the core information is important, though. I don't think it is just a process issue, because we are dealing with individual student places, I would say. Obviously, the purpose of having procedures is to try ensure as much as possible that the information is correct […]." (SO.1:28-29)

Administrators at the Periphery responded therefore to centripetal attempts to control processes and standardise meanings by asserting their position and emphasizing their role as key to ensure accurate meanings. In the area of student administration, which had an important impact in the allocation of funding to Universities, this was done by developing rhetorics around notions of '*accuracy*' and of its importance, establishing themselves key holders to information accuracy, in a context where '*accuracy*' was in many instances established through negotiation (in different academic committees, for example).

"[…] at different times in the process, the same information belongs to different people. Different people are responsible for the integrity of that information and I'm sure altering it, or taking it to the next stage. […] Then at the higher levels, different people have the authority to look at that information again in a different context". (ASO.1:10)

In financial administration, the Finance Department was the point of origin of budget definition which was organised through the finance codes, and change in the meaning of financial information often occurred through dispute, rather than negotiation.

"There are constant disagreements I suppose about certain accounts where departments might believe they have a greater freedom to spend money on what they want as opposed to what the Centre thinks the money should be spent on. There are lots of particular accounts, perhaps the major area for disagreement is—a lot of academic departments have ranges of what they call discretionary accounts where a lot of money, perhaps what an academic will generate, money comes into the University in some ways, goes into this account, then the department then feels that they can spend that money however they want. The Centre sees it as University money and if necessary that money can be hived off if there are times of financial hardship and this happened a few years ago, where money was taken out of these accounts because we needed it centrally and that caused some disquiet." (DF.1:13)

Making sense of and rearticulating the meaning of financial information often required the translation of the central finance codes into local codes that were meaningful within the scope of departmental local practices and action.

I have actually put together a separate departmental financial code which would go on the end of the University's finance code and I didn't get any help from the University in constructing those codes, but they have accepted them and we can use them. I feel that there is actually quite a big bridge that's between the central administration and ourselves when it comes to introducing new systems." (DIS.2:8)

The new codes and data structures, incorporated in the '*corporate data model*', devised by the Corporate Information Department and the Finance Department, aligned with the strategic apex, at the Centre, were, in effect, underpinned by new resourcing models and constituted a vehicle for the reorganisation and redistribution of resources, particularly financial resources, at the University. As such, they were not considered neutral. Data structures and models could significantly alter the meaning of administrative and financial information, leading to the reallocation and redistribution of resources.

"[…] academic departments perceive that the Finance Department are juggling the figures. My department is seen as not having an axe to grind when it comes to the producing of Corporate Information—one of the Pro-Vice-Chancellors, it's his perception, not mine. This is a representation of the academic departments. It

1　is his belief that the new department is a vehicle for getting more neutral information, because we don't have the best of interests that are associated with the previous owners of information." (CI.4:28)

3　"We [Corporate Information Department] are perceived by the senior academics as being more neutral, for example, than the Finance Department, so this department isn't very old yet, but we are likely to be asked

5　to run the new formula for funding departments and the Finance Department currently run it, but the academics in particular are suspicious that the Finance Department are manipulating the figures to come

7　up with a set of figures they [the Finance Department] consider acceptable." (CI.4:9)

9　　Different areas of the University were in charge of different areas of activity and different scopes of intervention and were therefore likely to make different use of the same information, thus potentially

11　informing its meaning in varying and diverse ways. Perceptions of accuracy and discourses on accuracy depended, therefore, upon the specific lenses that were adopted and the formation of meaning around

13　particular contexts and situations. The exploration of discourses around 'neutrality' and 'accuracy' of information was key to the allocation of resources across the University. By aligning these two discourses

15　administrators at the Periphery of decision-making processes were able to gain control over areas of work that involved the operation of the new management information systems. These incidents provide a vivid example

17　of the Bakhtinian (1984, 1986) proposition ~~whose~~ meaning is dialogically construct often in the interplay between centripetally codified representations and centrifugally oriented discourses of diversity.

19

5. The organisational adaptation of information systems through discursive interaction and organisational
21　translation

23　　The discursive interaction analyzed in this paper was represented through the notion of tensions between forces, rather than simple opposition between different and antagonistic poles. The key point of the analogy of

25　tension is not just that it represents coexisting forces, rather than exclusive and antagonistic states, but also, and perhaps more importantly, that it can represent differing elements of relative balance and imbalance. The

27　tension between centripetal and centrifugal forces, for example, is borrowed from physics, where these forces can be determined in a relatively precise way. However, as stated by Seadle (1998, p. 10): "*Balance in the social*

29　*world produces more irregular orbits than in the natural. But the analogy holds roughly true* […]". These different states of balance and imbalance correlate with notions of power relations as circular (Foucault, 1980)

31　and as "[…] *a matter of the successful deployment of meaning*" (Brown, 1998, p. 49), as discussed in Section 2.
　　The analysis of the discursive practices of these middle managers at the University administration and

33　technical services suggests that it is characterised by a level of complexity that is better expressed through the adoption of the image of coexisting (rather than exclusive) forces (rather than states) and form, in their

35　intersections, tensions. As stressed by Cohen, Duberley and McAuley, (1999, p. 481), in the context of the relationship between Centre and Periphery in public sector research institutes, "[…] *the central concern is not*

37　*to expose or explain the fundamental antagonism between these dimensions*, *but to investigate the more complex ways in which they co-exist and interact* […]". Significantly, rather than being sidelined by centripetally

39　oriented changes in new administrative structures, procedures and systems, embodied in discourses of information centripetalism, middle managers at the Periphery of the decision-making process played a key role

41　in mediating and exploring these discourses, thus shaping new meanings and introducing nuanced perspectives on the organisational role of information systems.

43　　For example, in the interplay between discourses on the '*corporate data model*', key to the allocation of resources at the University, the focus of action of those in the Periphery of the decision-making process was in

45　renegotiating meaning, through asserting the importance of "*information accuracy*" and aligning it with the notion of "*neutrality*", and devising local codes to translate and complement the central codes. This required a

47　discourse focused on establishing control over accuracy of meaning, in answer to the discourse of control and standardisation of processes, emanated by the newly formed technostructure (Mintzberg, 1983) the Corporate

49　Information Department and the Finance Department, and the strategic apex at the University.
　　In doing so, they claimed not only control over areas of operation of the new systems and of redistribution

51　of resources, but a role that involved more than the mediation activities often attributed to middle managers (Clegg, 2003; Clegg & McAuley, 2005). They engaged, in effect, in "*organisational translation*" (Cohen et al.,

1999), not only mediating across discourses, but, much more than that, framing different interests across different discursive regimes through the establishment of new meanings and understandings. This allowed, for example, the translation of the central finance codes in order to make sense of them in the context of their activities and was key to renegotiate meaning that affected the redistribution of resources.

In order to achieve that, different administrators switched across different discursive regimes. For example, it was not unusual for local administrators to occasionally defend centripetal positions, when that allowed the reinforcement of their positions within their departments, while arguing with the Centre for the devolvement of ownership of their working practice, as exemplified by the comment below from a manager in charge of the administration at an academic department.

"I think the departments have far too much autonomy, because if you go visit several different departments you'll find that they are doing the administration procedures for similar tasks in quite different ways, there's no standard for doing anything, nobody tells a department they should be processing things or filing things or doing things in a particular, it's up to them to decide for themselves as long as they respond to what comes through the centre or the faculty, then the university seems quite happy. [...] As an administrator I would prefer to have much more input about what's the best way of processing information, but, I mean, we have changed things in the office over time." (DIS.2:)

This was made possible by the occupation of different locales or social worlds (Clarke, 2005), where different ideologies were expressed through the various discursive repertoires that were identified in this paper. In doing so, these actors established connections across different discursive regimes and discursive tensions. The interplay between discourses was therefore marked by both tension and connection. Organisational translation was key to negotiating new meanings and can be, as Anderson (2005) suggests, the mediator between changes is meaning and changes in action and in practice.

Through these incidents, a progressive adaptation of the new management information systems took place, from an initially intended centripetal drive, focused on centrally defined processes and data structures, to a much more negotiated regime in defining local responsibilities, rather than just accountabilities, and in deciding what constituted legitimate action in systems intervention and what constituted accurate information processed through the system, by negotiating its meaning. Similarly, the new information systems became a vehicle through which meanings around the University administration, especially those focused on resource distribution, were negotiated and new discourses were articulated.

The tensions and connections between the discourses of the middle managers at the University can be seen as an example of the interplay between the individual agency of managers and of wider structural changes across different discursive regimes in large professional institutions (Cohen, et al., 1999; Giddens, 1976, 1984). The University administration information arena that was studied represents a force field where these discursive tensions and contacts were both informed by and informative of action and interaction though the translation and negotiation of legitimate meaning, action and practices.

6. Conclusions

This paper proposes that information systems development is carried on after implementation through their organisational adaptation and that the discursive practices of involved organisational actors plays a constitutive role in this process. In the context of the case that was studied, this occurred through the exploration of different discursive tensions, through processes of negotiated interaction where different organisational actors made claims to power. While doing so, different actors, especially those that were initially at the Periphery of the decision-making process, also engaged in activities of "*organisational translation*" by framing different interests across discursive regimes, through the establishment of new interpretations of the role of the management information systems. In this sense, these actors also established contacts between forces and agentically acted as a vehicle for the social reshaping and adaptation of the organisational role of information systems, from an initially intended centripetal drive to a much more negotiated and devolved agenda. The management information systems, originally presented as driven by a centripetal and process control oriented agenda, became, through discursive negotiation and translation,

1 adapted to other agendas that privileged concerns focused on information centrifugalism and the negotiation of meanings.

3   There are various implications of the research for practical approaches for information management in general and, more specifically, for the management of information systems. It is difficult for a single system to

5 satisfy completely different perspectives. Different organisational groups can try—and succeed—to adapt information systems to suit their particular worldviews, agendas and actions. There is scope for the

7 reinterpretation of the organisational role of information systems through discursive interaction. This paper discussed, for example, how the reinterpretation of meanings around notions of '*devolvement*' and '*accuracy*'

9 allowed administrators at the Periphery to reclaim power around areas of control over processes that, at first, it appeared that they would have lost, by asserting themselves as key holders of information accuracy and

11 establishing different understandings of what constituted legitimate action and practices involving information systems.

13   These implications bring out clear messages for the information manager and the information systems manager, in that success and failure in the implementation of information systems can be the result of a

15 process of discursive negotiation. In this context, effective information managers and information systems managers are those that not only understand the underlying premises and assumptions of the discourses that

17 are uttered around implementations and the particular agendas that they foster, but, more importantly, can mediate proactively between discourses, by adopting the role of organisational translators and framing

19 different interests across different discourses.

    Discourse analysis is a powerful approach to explore how processes of organisational adaptation can take

21 place, by providing insights on the contexts and premises around which discourses are constructed and deployed and, simultaneously, how, in turn, they inform the reinterpretation of meanings on information

23 systems and their role. This paper provides a contribution for understanding how organisational actors negotiate meanings, an area where, as suggested by Anderson (2005), we need to further our knowledge. In

25 this particular case study, the negotiation of new meanings occurred by simultaneously exploring discursive tensions and establishing contacts across them by activities of organisational translation. Further work is

27 required in identifying how the interplay between different discursive regimes occurs in other contexts, especially exploring a dialogical perspective of discourse and examining in more detail the interplay between

29 social structure and agency.

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35 (1985); Maybin (2001); McCracken (1988); McFarlane (1984); Rudestam and Newton (1992); Thomas (2003); Von Wright (1971); Ward and Griffiths (1990).

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