POWER-RELATIONS AND INFORMATION SYSTEMS DEVELOPMENT

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Certificate of Original Authorship

I, Adam Hart, certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student:

Date: 10th October 2014

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List of publications produced during this research

The following double-blind peer reviewed conference papers were produced during this research. They are an original contribution and are germane to the arguments presented in this thesis:

> Hart, A and Underwood, J. (2010) Ed. Esteves, J. "Traversing the Edge: Using Discourse Analysis to Understand IS Power-Relations" Proceedings of the 9th European Conference for Research Methods in Business, pp. 175-182, 2010. Academic Conferences Ltd., UK.

> Hart, A. and Underwood, J. (2012) Ed. Lamp, J. "Power and discourse in information systems practice: a narrative research method." Proceedings of the 23rd Australasian Conference on Information Systems, pp. 1-8, 2012. Deakin University, Geelong, Victoria, Australia.

Where applicable these have been both been referenced in the body of the thesis and are also listed in the bibliography. The authors hold the copyright and provided a non-exclusive license to the conference organisers at the time of publication.

Thesis Abstract

Problems of communication in the interplay between the information systems professional and their clients have resulted in a preponderance of methods and frameworks of structured interaction that have failed to produce consistently successful outcomes, and in the author's professional experience are ignored as impractical to confront the chaos of the day to day micro level that shape outcomes. What seems to be more germane to understand in the problem of communication is the relations of power between participants. And, if we accept that perspective of power as a relation that is important to understand in analysing the problem of communication, we must necessarily choose to delve further than the mainstream IS literature where the power of A over B, or the power of A to enable B dominates, because such trajectories ignore three important aspects. Firstly, the entanglement of these IS researchers and authors themselves in a relation of power with power as an object which is itself party to rhetoric that seems to be concerned with ethical or partisan debate (cf. Lucas, 1984; Stahl, 2008, Rowlands and Kautz, 2013). Secondly, in treating power as an object, the network of possible complex relations where power could be said to happen is bypassed in favour of a simpler actor-centric model. Thirdly, and most importantly for this research, is the possibility that power must necessarily not only occur in the skills and techniques of the information systems professional (*techne*) but also in the interplay of knowledges (*episteme*) that are deployed at the times of communication with their embedded rationalities (cf. Bjorn-Andersen and Eason, 1980; Law, 1991; and Baunsgaard and Clegg 2013). Broadly speaking for us, power-relations are deployed in the potential interplay between discourses, where discourse defines the boundaries of potentially competing, simultaneously operating and conflicted epistemologies.

In order to accommodate these points, we determined to conduct an interpretative epistemological analysis of the possible power-relations that the information systems professional may be subject to. To do this we broadly sought to follow Foucault (1969) and conduct an archaeology of the knowledge, obtained by open ended interview, of the narrative histories of eight ISD professionals, who came from a diverse set of backgrounds and perspectives spanning project management, systems

programming, systems and business analysis, technology and business management, medicine, and systems infrastructure and networking.

The approach we took was firstly to excavate their narratives for significant epistemological elements, elements that seem to hold epistemological significance for the person, horizontally identifying shared and non-shared elements as well. These elements are then vertically transposed to a maximum available set of possible epistemological meanings independent of their origin in the narrative, with identification of groupings of lexical siblings and antonyms becoming the discursive formations. This allows us to express an opinion as to the operative epistemological power-relations in terms of which are superordinate and thus whose knowledge has a possibility of realisation and which are subordinate and have less possibility of realisation depending on the other formations encountered.

In brief, we found that those information systems professionals who know through discursive formation of Idealism, for example an ideal type of computer or database configuration, were subordinated in favour of those who know through Imperatives, for example the imperative of remuneration, profit or time commitments. Interestingly, many of the professionals had both formations present in their narrative, showing that more than one epistemological formation can be 'inside' or carried by one individual. We also found that information systems professionals who know through a Law type formation, for example, certainty of diagnosis, do not relate to the other formations, sitting superordinate, aloof and even ignorant of other formations. When different formations interact, it is possible that a traversal to another discursive formation occurs, or that the home formation is retained but it retreats or 'shrinks' away, so that it's epistemological rules are perhaps forgotten for a while (Grint et al, 1996) in favour of the superordinate rules of knowing.

We also found that there is a formation which distinctly marks boundaries between discourse, and that this was present in most instances, confirming the suspicion that discourses are multiple and in recurring conflict, creating the necessary possibility for power-relations to exist. Also, inspecting the behaviour or rules of the formations themselves, we also identified in the imperative formation epistemological strategies of trade-offs and adversaries, where other formations may also be that adversary (such

as knowing through evidence as in the formation of enquiry). The presence of the Imperative formation was found to be the most regularly occurring superordinate function with the exception of the Law formation. This implies that if information systems professionals unconsciously choose or are educated to know through Idealism, such as the ideal to 'love' computing and revel in its perfection, this means that their thought will be subordinated frequently by other the formations of Imperatives which surround them and which they will be required to absorb in an industry and organisational context.

Our research has therefore shown that epistemological power-relations is not only a theoretical notion but a reality that creates conflict and can disharmonise the best attempts of structured interaction by operating at a level beneath consciousness (Gutting, 2008), improving on the breadth of understanding in the IS literature on power. We do not support the ethical and partisan attempts to 'neutralise' power by relegating its status to an object level, but instead believe and have demonstrated that power as a network is a superior way to perceive power; unearthing the discursive formations of adversaries and tradeoffs, enquiry and idealism as a pathway to form an awareness of what is happening to knowledge. This has given us the discursive functions of forgetting, traversal and retreat, which has improved the understanding and potential use of Foucault's archaeological analysis of power-relations under conditions of multiple and contemporary discourse.

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Chapter 1 – Introduction, Approach and Contribution

Introduction

There is continuing discussion about the difficulties of Information System Development (ISD) professionals[1] and their clients[2] working together to develop successful systems. These difficulties can often be seen broadly as problems of communication that, if realised, may result in system 'failure' or some other deficiency. These difficulties of communication and the resultant perception of success or failure can be approached by either reference to the design of optimal handoffs between participants (Markus and Tanis, 2000:188) or by reference to the participant's communication network and sphere of influence (Abrahall, Cecez-Kecmanovic and Kautz, 2007; Underwood, 2008).

Attempts to overcome this perceived problem in communication have resulted in models requiring rigorous documentation that map steps in a process with pre-defined roles and with communication points articulated as 'hand-off' points. For example, the classic 'waterfall' system development lifecycle; the continuous interaction between developers and users as in 'agile' approaches; the frameworks that define maturity models of what optimal arrangements of communication are (The Open Group, 2013); or the emergence of arrangements of system and organisational interoperability (NEHTA Ltd, 2007). However, such models may themselves deploy inconsistent assumptions about people and the world (Beath and Orlikowski, 1994).

In the author's experience, and anecdotally from ISD professionals known to the author, these difficulties and failures have as much to do with the *power* of the participants as with the problem of communication between them. Therefore, our research interest is the power-relations effected upon or by the ISD professionals in a

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[1] An ISD professional is broadly identified by the authors as those who, in their career, have involvement in any part of the specification, management or development of solutions that interact within a commercial, governmental or institutional context using any information systems technology inter alia: applications, code, databases, user interfaces or networks.

[2] An IS client is broadly defined as an investor or customer of the ISD professional who pays for, specifies or uses the information system but has no specialised knowledge of their design, build or deployment.

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commercial, governmental or institutional context who, like the author, attempt to balance the needs of the various ISD participants in a network with the desire to satisfy their own need for technical purity, pragmatism or other form of logical correctness.

In contrast, the preponderance of the Information Systems (IS) research literature on power seems to start by considering the role of users in design and decision making (Lucas, 1984), moving then to an understanding of consultants' involvement (Bloomfield and Vurdubakis, 1994) and interest in studies of ERP systems (Howcroft and Light, 2006). Contemporary IS literature today appears to favour a return to earlier ethical concerns of the Socio-Technical School (STS) and Mumford via critical thinking in information systems (Stahl, 2008), perhaps choosing to be grounded in the Frankfurt school of thought, and the political assumption of a subjugated user. Calls for new directions for the study of power within the ISD research are there, but not overtly mainstream (Silva, 2007 or Underwood, 2009).

Most of the not very extensive information systems (IS) analysis of power seems to want to address this problem of power using a substance model, where ISD professionals hold the technical knowledge, clients hold the funding and authority, and the exchange between the two (A and B) is one of technical knowledge as a power object versus the authority to exercise power which is granted by virtue of being the funding body. In the main, this produces analyses with various checkmate or stalemate outcomes, primarily resting on a value judgment such as emancipation (Stahl, 2008) or the superordinate/subordinate placement of one franchise over the other, without recourse to a more fundamental explanation of the difficulties.

From experience, we started to question why it is the case that what are seemingly rational approaches to the problem of communication between ISD professionals and clients are discarded, modified beyond intent or avoided? What exactly then is our purpose and role, if in our own estimation, a seemingly rational model is not rational; what is happening, how do we make sense of this? If organisations are employing ISD professionals, at significant cost, yet management thought processes govern, control and manage information systems without utilising the models and mindsets so purchased, a contradiction is evident.

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For the author, this contradiction does not easily relate to the 'substance' IS literature on power which tends to be static, structural and somewhat simplistic. For example, the concerns of the aforementioned Lucas (1984) materialise from a political or social assumption that the ISD professional is controlling the user in some way, as do deconstructions such as Beath and Orlikowski's (1994) analysis of the simplistic and disempowering assumptions made about users in the then popular Information Engineering method. The substance view of power is also evident in work that, conversely, is concerned with the dominance of business organisations over ISD professionals, as represented by Rowlands (2007) or Rowlands and Kautz (2013).

Instead, this feeling or observation of a possible contradiction in a complex mix of competing interests led us to examine *power-relations* between participants, specifically their possible systems of thought and their possible exchanges or interrelations in information system development activities. In the case of understanding power, as you will read in the next chapter, the literature divides somewhat into those whose research seeks to understand power as a directly observable phenomenon, and those who perceive it as a network. Those who see power as a direct force of A over B instead of a dispersed force are those most likely to take a social stance on behalf of a user, community or other partisan interest. Since we were concerned about possibly *different* rationalities informing our competing interests, as highlighted by Bjorn-Andresen and Eason (1980), we must also worry about knowledge. Knowledge, or more specifically *knowing* (epistemology) is very important to our research, as information systems development is a knowledge intensive practice, and the possibility of different rationalities guiding how we know and its potential to provide an explanation for the contradiction we experience in our career is an attractive and plausible hypothesis.

To examine power-relations in a network of competing interests, where we did not wish to research the well trodden A over B path, the theory of Michel Foucault (1969), and his 'Archaeology of Knowledge', is suitable to inform and guide our research (cf. Underwood, 2009). This theory, which we will introduce briefly here and fully in Chapter 3, is concerned with the analysis of statements of participants as being both enabled and limited by epistemological structures called *discursive*

formations. In this theory, these formations are responsible for production of *possible* statements, and like collections of possible statements emerging from these rules of formation are a *discourse*, of which there are multiple (cf. Whisnant, 2012). What is possible and what is not, and that which is superordinate and that which is subordinate is the location of power-relations in our research, and not located within either A or B.

In this theory, power-relations occur at the level of structures that say how to know (*savoir*) not the level of what is thought of as known, what is already accepted as knowledge (*connaissance*). The flow of what could possibly be known to what becomes known and meaningful are the mechanisms, strategies and technologies of power-relations that we seek in our participants' narratives. The research project has arisen as a consequence of the author's extensive experiences in information systems development ceasing to make experiential sense under an input-process-output or essentially mathematical or logical mode or system of thought (a *discursive formation*). Competing modes of thought include for example, a focus of form over substance as is found in the notion of brand, or the general sense of fatalism we have observed in some ISD professional utterances when faced with management discourse's apparent illogicality. We have come to believe power-relations act structurally to resolve differences between discursive formations, where the dominated epistemology becomes a kind of subjugated knowledge. We contend that in information systems development practice, a logical discursive formation is subjugated. This leads to practitioners surfacing *connaissance* type constructs such as: injustice or natural justice, pride in technical complexity, rejection of improper use of technology, technology savant-ism, religion, fatalism and personality.

Since the author's theory and method seek to reveal the operation of power-relations as an historically shifting structure, that exerts dynamic and epistemological forces on information systems development, we choose in our research project to study power-relations using historical narratives *excavated* from participant ISD professionals. By seeking discursive evidence in the histories of IT practice, looking for epistemological friction and dynamism, we hope to gain an advantageous research perspective, opening the door to making sense of information systems as a multi-discursive practice both enabled and simultaneously limited by power/knowledge relations.

Approach

To inform our analysis of the contradiction where our focal point is the discursive research of power-relations, we determined to conduct an in-depth analysis of the career histories of eight ISD professionals. Part of our reason for doing this is that their personal statements are less likely to be moulded by the formality of an organisational or institutional setting, recalling that the literature speaks of power as a hidden or 'dark' force (Silva, 2007:165), which can act to silence or censor. The other part of this reason is that the theory we chose is geared towards analysis of historical systems of thought. So, since we are not about looking for power-relations between A or B, but necessary relations between knowledge, our territory of examination is not the territory of emotions, psychology and organisations. Instead it is the *territory of concepts* that interests us. We will examine the culture and thinking of our ISD professionals through the statements they make and do not make, not seeking an explanation as to why they are present or absent, simply that they are so. This quality is the *exteriority* of their statements. We started with no preconceived method because we had to shape one, which we published (Hart and Underwood, 2010 and Hart and Underwood, 2012). The construction of the methodology to accommodate this approach is described in Chapter 4. Critical to this is the ability to recognise and characterise discursive formations.

Contribution

What might we find by conducting this analysis? Using the insight of discursive formations, might we find that the thinking of an ISD profession is shaped by the performance of power? Is how ISD professional practitioners know and then act shaped by power-relations and revealed by an analysis of the discursive formations applicable to their experience? And does the absence of other discursive formations imply the disablement of other possible choices and options, also speaking to the effect of power?

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To enquire about power-relations, we need to conduct an epistemological investigation and interpretation of the participant's narrative, investigating power-relations as a dispersed network, not as substances or objects, which is discussed in the first part of Chapter 5. In the second part of Chapter 5 we then conduct an interpretative analysis of the discursive elements uncovered or more precisely *excavated* in the first part, looking for presences, absences and patterns of *formations*.

What might this research hope to tell us? Certainly we hope to detail our improved understanding of power; and answer our initial concern, the question of who or what is doing what to whom: is the 'business' discourse dominating ISD discourse or visa versa, where are the boundaries of such happenings, how can we know and see this? Since we are concerned with the discourse of ISD professionals rather than the discourse of IS research, our research may help clarify what information systems development is 'about'.

For Foucault studies, while we do not represent ourselves as experts, our use of the theory of discursive formations to explicate personal statements allows us to say something about the applicability of this theory to the examination of contemporary and non-official statements; about the possibility of people transitioning between different discourses; and clarifying the power-relations between different discursive formations.

Structure of this thesis

As we outlined in the introduction, our research project considers an examination of mechanisms and structures of power informed by the discursive archaeological theory and methods described by Foucault (1969). Firstly, in this chapter, we have introduced the topic of research, the structure of the thesis and the research question. Secondly we will examine the literature related to understanding the operation of power-relations in ISD and conclude that section with the rationale for leveraging the archaeological approach. Thirdly, we will describe the *archaeological* theory, extending the précis presented in this chapter. Fourthly, we will describe our approach to excavating and interpreting the texts. Fifthly, we will describe the narratives, and

our two-part interpretation of them. Sixthly, we will conclude this thesis with what we did, what it means and what we might be able to do about epistemological power.

In the next chapter we will explore the relevant IS literature on power and power-relations.

Chapter 2 – Literature Analysis

Introduction

To position our research relative to the body of information systems research on power-relations, this chapter describes the literature broadly by reference to their apparent philosophically anterior viewpoints. The first viewpoint, which appears based on scientific or 'instrumental' reasoning (cf. Bjorn-Andresen and Eason, 1980), views power as an object, one that can be named simply as 'power', then grasped, studied and fixed into frameworks of perceivable events, occurrences and actor dynamics. The second viewpoint of power, based on a postmodern agenda, is power located and operating across a dispersed network of relations, an integral part of the way experience and knowing is ordered, related, and entangled.

In the first part of our review, we will present foundational sociological thinking shaping the notion of power, specifically seeking to frame and understand power between individuals and society (where society may also consist of materials including technology), with the primary exponents cited[3] in the information systems literature being the work of sociologists Lukes (1974) and Law (1991).

We will then present the information systems related literature on power-relations and information systems in the following sequence:

1) Information systems studies seeking to understand the 'problem' of power from 'within' the perspective of the information systems practice as particularly represented by Lucas (1984), Markus and Bjorn-Andersen (1987), Howcroft and Light (2006), and Silva and Fulk (2012), with an interesting corollary provided by Rowlands (2007).

2) Information systems research arguing for a common theoretical power framework to understand power in IS, as taken up by Silva (2005 and 2007) in the IS literature.

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[3] Google scholar search conducted 22nd August 2012 has 6465 citations for Lukes (1974) and 680 for Law (1991) across all disciplines. In our literature review we encountered sociological references in the fields of Accounting, Critical Theory, Cultural Analysis, Education Theory, Geography, History, Information Technology, Information Systems, Information Systems Research, Legal studies, Organisational and Management studies, Philosophy, Politics and Sociology. However, we will focus on information systems and related research in this chapter.

Many of these lines of research directly approach the topic of power in IS as an object or phenomenon which, in accordance with scientific reasoning principles, if the correct theory or viewpoint or insight can be obtained, can be understood and potentially controlled or balanced out, seemingly stemming from an equity or 'natural justice' principle. A notable omission from this group, with the exception of Howcroft and Light (2006), is that they do not appear to include consideration of wider societal structures such as legal or governmental institutions that can exercise 'remote' authority over organisations or individuals in information systems development.

Other literature that is more in alignment with the theoretical premise presented in the first chapter, touch less directly on the topic of power, being more concerned with indirect structural influences. They have the following concerns:

> 3) Literature from the organisational and management studies school, seeking to examine IS as a significant organisational event that must be understood, as exemplified particularly by Doolin (2004), Bloomfield and Vurdubakis (1997), and Knights and Murray (1997).

> 4) Deconstruction of texts emerging from information systems practices as a way to understand structural issues. This has been explored particularly by: Beath and Orlikowski (1994), and Bloomfield and Vurdubakis (1994).

> 5) Reflection on information systems theory and practice as important for 'maturity' of the profession, involving a broad notion of 'power' as an epistemological mechanism. This has been addressed for example in the IS literature by King and Lyytinen (2004), and by Simonsen (2004) in the non-IS literature, for example.

Our research chooses to adopt the viewpoint of information systems as a practice that is structurally affected by inherent, dynamic and dispersed power-relations rooted in epistemology. We explain why in this chapter.

We broadly categorise these two schools of thought as a) *direct* studies of power, where power is an object, and b) studies that see power (and sometimes power/knowledge) as a *distributed network*, which is where our research is focussed. We note that those authors speaking in the latter sense have moved beyond positivist

reluctance to deal with the "illegitimate…'dark side of power'" (cf. Silva, 2007:165-166), and so consequently avoid such directness in favour of a more descriptive palette that allows a grasp of power's relative and indirect nature.

In this chapter we will explore the literature of both viewpoints, and continue in the next chapter to discuss the detail of the theoretical basis we have chosen for our research.

Opening remarks on the direct approach to the study of power

The direct approach to the study of power in the information systems literature, while mostly grounded in the sociological work of Law (1991) or Lukes (1974), seems to entertain the antecedent idea that power as an object or substance can be both observed and dealt with in the same literal manner as a physical scientific or engineering question (cf. Lucas, 1984); that power can somehow be fixed in a sequence, process or other predetermined model (cf. Silva, 2005); and that power is problematic because it causes some kind of disruption to rational or normative behaviour (cf. Bjorn-Andersen and Eason, 1980 and Markus and Bjorn-Andersen, 1987). We now cover the important papers on the direct approach to the study of power.

The power of A over B – Power Over

Lukes's (1974) thesis comes from a sociological viewpoint that defines the concept of power as a relation between person A over person B: "A exercises power over B when A affects B in a manner contrary to B's interests." (ibid. 34). This is a theory that conceives of power as not just a political process of assigning authority. Interests becomes the keystone for the definition, and Lukes's own view is that a radical interpretation of interests is warranted: "men's wants may themselves be a product of a system which works against their interests, and…relates the latter to what they would want and prefer, were they able to make the choice." (ibid.) By definition, consensual authority is not an exercise of power, that is when B fully submits to authority and it is in his or her interest (ibid. 32). Obviously the difficulty here is how to know what a person truly wants is what is truly in their interest.

This lends itself to interpreting the view of power in two ways:

a) power as a relation, a power-relation, between A and B, with Luke's intent to perform a satisfactory analysis of power-relations (ibid. 10)

b) power (as reliant on the concept of interests) not just as behaviourally based, but based on "social forces, institutional practices or individual decisions, which can occur in the absence of observable conflict" (ibid.24)

Lukes in passing also invokes notable social and political theorists such as Gramsci (ibid. 47), Ardent (ibid.28-29) and Giddens (ibid. 30), theorists who have not been used in the IS literature on power frequently, although Giddens's structuration theory has gained prominence in the IS literature on topics other than power.

Key points here for our own hypothesis are that:

1. Firstly, power is relational, that is, a relation between, broadly speaking, entities, where those entities in a Foucauldian view are in fact concepts and knowledges rather than people; and

2. Secondly that power can vest in entities other than persons, such as institutional practices, which are at a societal level.

Power Over *and* Power To

The other major sociological theorist who is frequently cited in the literature is Law (1991). His thesis also draws upon Foucault and also Latour in formulating a structural view of the operation power in society. Starting with the aforementioned Lukes (1974), whom he criticises for the restriction to 'power over' Law (1991:168) decides that the productive capacity of power, a 'power to' essentially effect some form of change or control (or other synonym for power), is also necessary as a consideration. It is necessary because "societies empower their members" with a "workably shared distribution of knowledge" (ibid.), and in this way relations ('power over') and capacities ('power to') are "indissolubly linked" (ibid.). Law balances the authorial notion of power ('power over') with an empowering capacity to do ('power to') without necessarily entering into the question of their relationship, perhaps resistance as such?

This position situates the notion power also as relative, between agents, at an individual level (ibid. 172-173). The question of institutional power, the capacity or storage until needed of power, by entities other than individuals is not addressed specifically. Presumably there can be relations between individuals and institutions, or an institution is also an agent? In this aspect, Law's work extends Lukes, focussing on the individual, their interests and relations with each other. But again the aspect of relations is reinforced: "Foucault's insistence that power is ubiquitous, an aspect of all relations, is surely right. Its strategies and methods deserve study wherever they are deployed, and that is everywhere." (ibid. 169).

Law's fundamental contention is that 'power over' (authority) and 'power to' (empowerment) each do something (an effect or a product) and also have something (a capacity to be stored), and that capacity can be used or not used (there is discretion to withhold) (ibid. 170).

The key question for Law is how individual relations can be temporally stabilised (between agents) to enable the conditions of power to operate (ibid. 172). Agents are constituted as a set of relations with power effects (power to/power over), and agents may include non-individual materials, such as texts, events, objects and processes (ibid. 173)

At this point (ibid. 174), without any signpost, Law introduces what we see as the language of the post-modern, with the notion of a *strategy*, which is how that power (its effects and discretion) is deployed, and also stating that agents, who are a set of relations themselves, are constituted *inter-discursively*. Law does not explain what he means by this here, but later on explores this aspect empirically (ibid.177-182). Due to limited space in his chapter, it is unclear what Law specifically means by discourse, or from what perspective he is speaking. Since our thesis utilises a specific interpretation of the notion of discourse, we are hesitant to draw easy parallels. However, at face value, similarities exist for he seems to interpret discourse as sets of (discretionary) logics, of which there are multiple – "the *two* logics are thus juxtaposed…the two lines of discursive reasoning" (ibid.181) – and where logic, strategy and discourse are synonymous, they generate, in a set of ordered relations, power effects, that is power over and power to, through the real world materials (texts, institutions etc.) which can stabilise (and persist) those relations of power (ibid.182, emphasis added).

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Law (1991) here has provided for us a comfortable 'platform of power' for Chapter 3, which encourages us to explore in detail his brief expose of what we believe is his use of the Foucauldian theory of discourse (in his words: 'logics'). In summary Law posits:

1. Power effects can be characterised as both authoritarian ('over') and empowering ('to'); power is pervasive, can be stored then deployed, or withheld (discretionary), primarily or exclusively through relations between peoples (the sociological);

2. Competing and thus multiple logics (as we understand it, discourse as shaped by systems of formation to be explained in the next chapter) exist and generate power effects (storage, deployment, discretion) through their relations. These logics are heterogeneous and involve non-human actors/materials (ibid.186). On this point also see Whisnant (2012:7-8).

3. Power is best understood empirically rather than theoretically (Law, 1991:176). We will take up this element in our methodology described in Chapter 4.

The 'problem' of power and information systems

In contrast to the treatment of Law and Lukes above which seek to outline plausible possibilities, the IS literature on power in the main takes an approach which is significantly more literal in its assumptions and methods, even when employing models such as actor network theory (cf. Silva 2005), which fundamentally is predicated on a less literal view of the world.

Importantly, this research strategy manifests through an underlying articulation of power as a 'problem', that is, the problem of power as an obstacle to be removed, a problem of power as an obstacle, much as a static object that can be removed through logical and/or economic rationalism, as opposed to our view of power as intrinsic element of all relations and for our research here relations between knowledges. Sometimes this 'removal' strategy uses an equity or emancipation argument as the motivation, where conflict is seen as counterproductive or inefficient: "As primarily a service unit, information processing has a difficult task that can easily lead to conflict

and dissatisfied users" (Lucas, 1984:58) and "Power imbalances can lead to problems in the organization." (ibid. 64). The first kind of problem is the problem of the power that IS departments may have.

Lucas (ibid.) tackles the problem of power and information systems through an inter-organisational and behavioural stance, following Lukes (1974).

His study of manufacturing firms is interesting in these respects:

1. The study is not about individuals per se, rather departmental *relations*;

2. The study mixes the individual and the organisational by taking managers opinion about other departments power and influence as a proxy for a organisational 'opinion';

3. The hypothesis is that IS departments, being the controllers of technology, should be powerful (defined by the ability to control behaviour) but were quantitatively found not to be so: "department managers outside of information services do not feel highly dependent on it; they also do not rate it as a powerful or influential department in the organization" (Lucas, 1984: 61-62); and

4. Because the other departments were ignorant of the IS department, this led Lucas to favour an explanation of saying the IS departments power is "concealed" and due to its historically poor customer responsiveness, any power they do have should be managed, controlled or diminished in some manner. (ibid. 64-65).

Lucas concludes by stating that power held by a technology organisation is a 'problem': "To the extent that power creates problems for information services and users, it is desirable to reduce the amount of power transferred to information services." (ibid. 64). This echoes Law (1991) above where power is a capacity. Also, where information services are more central to the mission of the organisation, greater power will accrue (Lucas, 1984:64). The historical lack of customer responsiveness of information systems is depicted as 'dysfunctional', and a 'dysfunctional' department should not have power over or to: "The information-services unit needs to become

more responsive to users; designers need to mitigate power transfers from users to the information-processing department" (ibid.65).

This study highlights in quite a transparent manner a feature of this section of the literature on power and information systems, which is a structural a priori. In this instance Lucas (1984) has been very clear about his bias of information systems as a (dysfunctional?) operation that needs to be managed because it is not user focussed: "A policy that encourages end-user computing, microprocessors, and distributed computing should reduce the actual power of the information-services department." (ibid. 65).

Another important study that takes its a priori from a defence of the 'user' is Markus and Bjorn-Andersen (1987). This study is a synthesis of elements of the literature to prepare a framework, describing four dimensions of power that can be exercised by information systems professionals. Again, coming from the perspective that power is somehow 'bad' and is an imbalance that needs to be corrected, the four types of power are the aforementioned 'power to', a capability or capacity to exercise power technically, conceptually, structurally or symbolically (ibid. 500-501). Interestingly, the symbolic or *representational* exercise of power enabled through the products or outputs of information system is similar to Law's (1991) statements around the power vested in materials such as texts (cf. Bloomfield and Vurdubakis, 1994 and 1997). Echoing Lucas (1984), the (past) trend away from centralised mainframe computing to distributed computing would assist users emancipation (Markus and Bjorn-Andersen, 1987). Emancipation recalls Lukes's (1974:19) one dimensional view of power that is a "…view of power involves a focus on behaviour in the making of decisions on issues over which there is an observable conflict of (subjective) interests…". The hypothesis is that being aware of these types of power exercise "can provide a foundation for the development of intervention strategies designed to increase users' and IS professionals' recognition of power exercise and hence improve the chances for outcomes acceptable to both parties" (ibid.503-504).

Howcroft and Light (2006), following "the well-founded tradition in custom systems development that conceptualizes systems design and implementation as a process of social and political contention" (ibid. 216) take up the power of information systems professionals in issues of package software selection, using the four types of power

covered above in Markus and Bjorn-Andersen (1987). Of specific interest to us is how power can be used to prevent observable conflict from arising (Howcroft and Light, 2006:218), using the symbolic form of power. In their study of selecting package software, they introduce the notions of how the benefits of the package software are an ideology stemming from forces external to the organisation, such as "trade press…professional associations…and with their [senior management] peers" (ibid. 231). This ideology that permeates management structures and the "power of management prerogative" (ibid. 232) mean that any participative goals for users of the package software in the selection were negated where "it became clear that the only form of user participation that interested the technical consultant involved input from senior management." (ibid. 233) We see similarities here with our own thesis on discourse and power, in their observation that "the role of ideology that equates technological adoption with progress and assumes 'better' technology was needed." (ibid. 232). For us, this equates to a discursive formation as mentioned in the introduction and as will be described in Chapter 3. In conclusion, the relation between the operation of power and the irrationality of software processes is highlighted: "Practitioners should be made aware of the potential for almost any project to be fused with issues of power in the process surrounding software selection and adoption, thus providing insight into why the rational process may not proceed exactly as planned." (ibid.233).

The role of rationality, and different types of rationality was also explored in an early paper by Bjorn-Andersen and Eason (1980), where information systems practitioners and technologists, being party to a posited fundamental logic of instrumental reasoning "which is deeply rooted in our thinking and indeed in most science" (ibid. 107) were predisposed to construct systems that facilitated corporate or bureaucratic rationality goals. Instead:

> "if we are to avoid the kinds of short comings illustrated by our cases, which we believe to be illustrative of most information systems, we have to challenge these design assumptions [rationality]…We might say the real challenge lies in the creation of systems which support and encourage creativity, discovery, judgement, intuition and playfulness. This may be achieved by…using

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methods which are not built exclusively on instrumental reasoning etc." (ibid. 107)

We see this usage of the concept of rationality/reason/sense making related to the notion of a *discursive formation* which we briefly touched on in the introduction, and will explore further in the next chapter.

Further alternate direct views of power in the IS literature – 1980 to 1999

In the introduction to this section of the chapter, about the direct approach to the study of power, we stated that our broad classification was related to the research assumptions that are 'anterior' to the paper. Jaspersen et al (2002) surveys these different assumptions or 'schools' of thought as regards the direct study of issues and problems of power in information systems.

Their purpose is to "mitigate the effects of a priori biases by applying metatriangulation to draw together the prior research that investigates power and IT". This spans 82 articles from 12 journals over 20 years (1980-1999). They start by categorising what aspects power and IS have been previously researched (ibid. 398). This comprises:

1. Impact of IT;

2. Development, deployment and use of IT; and

3. Organisation and management of resources.

A summary of the common themes of power and IS research is presented covering the following which is reproduced here (ibid. 400-402):

Theme	Sub-Theme
1) Authority	Hierarchical Authority
	Institutional Power
	Organisational Power
	Rational (including expertise)
2) Centralisation, Decision Rights and participation in decision making	Disciplinary Power
	Rational Decision Making power

	Resource Control
	Sovereign Power
	Systems/Structural Power
	Zero Sum Power
3) Influence	Behavioural power
	Interpretive
	Network Centrality
4) Politics	Organisational Power
	Pluralist
	Processual Power
	Radical
	Zero Sum Power
5) Other	Institutional Power
	Interpretive
	Processual Power
	Socially shaped power
	Structurally Constrained power

Common themes in these power conceptualisations are deduced, by declaring a number of "lenses" through which power can be viewed (ibid. 407):

- Rational – "Structural power that focuses on authority, information and expertise as bases of power…"

- Pluralist – "Power that assumes objective definitions of power and that conflict is the norm…"

- Interpretive – "Power is based on the ability to control access to and direct the construction of organisational realities, assumes that reality is socially constructed…"

- Radical – "Power and politics are outgrowths of social structures, such as class, racial, gender or institutional structures…"

Jaspersen et al (2002) desire to harmonise or reconcile these views by exposing the lack of a central all encompassing theory, but state by way of metaphor, that power is a *layered* set concept and that each research perspective is used to study a different

part of a (power) tree, where the leaves and branches are easily exposed and affected in the short term, while the deeper structural features are like the inner rings of the trunk and roots, which are not immediately affected by time and context but nonetheless present. (ibid. 423). "The process of reconciling these [layered] anomalies and paradoxes may stimulate researchers to build and test richer theories about these complex relationships." (ibid. 431)

Our research, while interpretative, is also related to what Jaspersen et al (2002) refer to as the 'radical' perspective, that seeks to examine deep power structures, albeit in knowledge: "[we] suggest power and political behaviours imported from a larger social context may be as important as the internal forms of power examined in the rational, pluralist and interpretative studies" and "In many cases characteristics of the academic research environment implicitly lead researchers to other power lenses…that seem to provide a simpler, less costly and less risky approach to investigating power and its relationship to IT impacts, deployment or development, management or use." (ibid. 413)

One dimension possibly missing from Jaspersen et al (2002) is a cultural aspect. A Thai cultural definition of power [4] is presented by Thanasankit (2002) for a requirements engineering purpose, where 'western' information systems development methods are possibly not universally comprehensive. Once again rationality and its forms arise as a question:

> "It can be suggested that to better understand effective systems development requirements, the RE [requirements engineering] process needs to deal with social and cultural practices as well as mathematical notations and representations indicative within the bounded rationality assumptions of Operations Research." (Thanasankit, 2002:129)

Here we see some quite sophisticated concepts still within a social context, and again the emergence of the importance of the idea of power-relations. Having more granular concepts than the English language for power, involving explicit declaration of who is

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[4] Interestingly Jasperson et al (2002:399) start off their review of the topic of power by explaining that the Inuit Eskimo tribe have 8 different words for the word snow, calling for clearer and more descriptive distinctions between the different conceptualisations of power.

the 'Pu Yai' (authority power-figure); who displays 'Kreng Jai' (considerate or awe heart) to whom; who must 'Bun Khun' (reciprocicity of goodness) to whom.

Following further on this cultural and direct study of power dimension using Thai culture as an example, Maguire (2006) further elucidates on the different types of *Kreng Jai* in the workplace, in the context of the kinds of issues it may cause and especially in the multi-cultural workplace:

1. Respect for elders – "It is the recognition that people need each other if they want to go on living, formulated in a system of mutual but unequal moral obligations".

2. Respect for, or Fear of the powerful – "saying Thai society is constructed as 'a network, connections, so if we would like to get things done, in Thai culture, we believe that we have to have more connections. And with the people who have more connections, we have to be Kreng jai to them'. Thus the person with less power is obliged to adopt the position of supplicant so that the more powerful person in turn feels obliged to behave in a generous manner befitting his or her station. Unlike the immutable respect for elders, this form of Kreng jai is superficial rather than sincere."

3. Respect for superiors – "Thai workers are likely to feel Kreng jai towards those of higher rank, and work efficiency may be hindered by a Thai feeling too Kreng jai to impose [disturb] on a superior."

4. Consideration for Foreigners – "This distance led to what they described as 'consideration', which involved the avoidance of imposition because boundaries were unknown."

5. Consideration for Thais – "Thais conceal their own feelings, their colleagues are often unsure about what might cause offence and have to exercise caution."

6. Self-effacement – "[the lecturer] often felt stress inherent in self-effacement, saying he often regretted feeling Kreng jai because he knew he needed to speak out to get things done" (ibid.)

The interesting part of this datum is that it is not only described in terms of hierarchical disparity, but also in terms of the remoteness of the relationship as

determining how powerful the effect of Kreng-jai is, and what degree self-censorship is practiced.

The circuits of power framework

A more recent effort to come to grips with power directly is by Silva (2005:48-69) who invokes Law's (1991) framework of power to classify IS "power" research by:

- Power To – a capability- what IT can do that is productive and enabling but is also disciplining – typically used to study the role of IT systems;

- Power Over – recognising the technical and political nature of IS development – IT consultants and expert power;

- Power Storage – standing conditions – power then can be used when needed; and

- Power discretion – power as decisions – different options to use stored power.

Each are said to have their limitations when applied to IS research. Specifically Foucault is (unfortunately) narrowed down to the panopticon analogy only, and is not seen as useful from the perspective of considering the uses of IT (contrast Wilcocks 2006 or Clegg 1987). Silva argues for an integrated framework following Clegg's 'circuits of power' framework, to integrate each of these four aspects of Law's power into "circuits of power", and also suggests that Actor Network Theory supports this view. We now will outline a brief précis of this theory.

A Circuit of episodic power (Silva, 2007:177) is defined as a provable or observable phenomenon usually in a relation of power with obligatory passage points. In an established power-relation, the dominant actor will establish passage points for the dominated to pass. These points are established by ANT translations whereby:

1. An actor submits to a superior actor due to their ability to solve a problem (problematization);

2. An actor targets a specific group of other actors (interessement);

3. They consolidate those alliances through the use of a script (enrolment); and finally

4. The enrolled actors become (willingly dominated) spokespersons for the superior actor and act on their behalf (mobilization).

This model is based on a view of power where interested individuals exercise or willingly relinquish their discretion for some perceived benefit, such as salary or position or 'face'.

Importantly to us:

> "The movement between each step is called displacement, which involves *discursive practices*. When displacement occurs, power is exercised" (ibid. 178).

Silva (2007) further explores the inherent epistemological bases of different interpretivist approaches to studying power, phenomenology, critical theory and structuration theory, in arguing for the relevance of the interpretative approach in studying power (ibid. 169). This echoes Law's (1991:176) statement that the question of power is essentially an empirical one. In the phenomenological study of power, the role of language and meaning in power-relations is critically important for a hermeneutic type analysis (Silva, 2007:170). Critical theorists rely on the principle that scientific knowledge is not totally objective, "aiming to emancipate human beings from values of control and efficiency" (ibid. 171) and "science has "inscribed interests of technological domination yet disguises this fact by appearing to be free from value judgement" (ibid.), but "critical theory does not provide a theoretical background to study [power]" (ibid.). Structuration theory, on the other hand, believes "it is misleading to separate social structures from agency because they exist in relation to each other" (ibid. 172) but "…Structuration Theory leaves the black box of technology unopened. This is problematic in understanding power in IS, as it is by virtue of power that technology is black boxed." (ibid. 174)

Silva (2007) instead proposes the circuits of power framework we discussed above. This has the benefit of avoiding "moral judgements" about the actors' moves (ibid. 176). This agnosticism is ethnographic in nature, and also does not specifically seek to reinterpret power as an object (ibid.). Silva and Fulk (2012:228), still focusing on the individual as a place of power, continue the argument for the relevance of the circuits of power framework, this time with a narrative interpretivist approach for the case of resistance to management control in a university ERP implementation. (Note,

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we will cover a structural study of resistance in an information systems implementation by Doolin (2004) below).

Overall, the circuits of power approach *does* choose to fix power into a framework, being the circuits, to establish a relation between the framework and the subject of study of power, the agent, via the passage points, and so we will note while perhaps useful as "a tool for categorizing and integrating the diverse findings of existing research on power..." (ibid. 245), this approach is part of the direct research into power, that may be suitable for studies which, unlike ours, do not seek to deal with broader structural issues such as institutions, or in our case, epistemology.

Concluding remarks on the direct approach to the study of power

For us, the forgoing researches that seek to defend a nameless 'user' or 'business department' and question the potential powerfulness of technology, to say: 'this power and technology, it's a problem, it needs to be controlled somehow…' provides four important points for our own research. Firstly, that these direct-approach documents represent a form of power struggle themselves, with tensions between emergent factions inside the documents. The user, the IT department, the expert, the professional; all being groups represented as vying for behavioural and organisational control over the other, with economic efficiency, equity or the natural managerial right stemming from ownership allowing an assertion that this situation is somehow unnatural or is a *flawed* situation, and technology is at fault, and furthermore the situation can and should be rectified, typically based on an equity argument, but possibly also an ideal framework argument. Secondly, that the *direct* approach to studying power, part of our literature grouping, as evidenced by these articles, require a side to be taken, a discursive stance to be held, and so is not helpful in the study of power itself to be entangled and thus invoking a power-relation while wanting to make impartial academic statements. Thirdly, that the interdisciplinary study of power and information systems, whether from outside the practice's formal organisation of knowledge, by sociological or organisational researchers, or from within the academically 'broad church' of information systems knowing, means that an understanding of power and knowing in relation to technology continues to be as a significant research question today as it was to Lukes (1974), "being seen as an important yet elusive concept" (Howcroft and Light, 2006: 217). Fourthly, that the

direct approach to understanding power seems to have made a strategic choice, in a Foucauldian sense, to engage with and deploy an *a priori* notion of power as an object, and object seen as an obstacle, which we believe may prejudice conclusions drawn from this approach due to the entanglement of this partisan 'object' with other partisan non-power 'objects', such as emancipation, which themselves we believe exist in a network of power-relations being sociological and political in nature.

However, we do believe that the part of the literature described above which deals with rationality (cf. Bjorn-Andersen and Eason, 1980) is usefully extended beyond the 'problem' of information systems and relations of domination of participants. Along with the 'relations' or network part of power already discussed, using the notion of rationality (which is our entry point to discourse) is helpful to bridge from the normative (direct) notions to the post-modern (indirect) notions of power-relations.

We will now continue by discussing literature that takes an indirect or *structural* approach to understanding power.

The indirect or *structural* study of power

A notable aspect of the indirect or structural approach to power and, what for us differentiates the foregoing research from what we about to discuss, is the perspective that power is not the absolute focal point of the research we are about to examine, and for us, should not be. While the 'deeper rings of the tree' metaphor previously mentioned by Jasperson et al (2002: 423) is attractive from a research view that seeks unity over relativity in the study of power, these next group of researchers do not take such suggestions as 'power over/power to' as a fixed and already proved focal point, fitting the evidence to the foci, but rather use the palette of available notions to mould their understanding of what is happening in light of observation, and even generating new notions. In very general terms this is done by taking an exploratory approach, guided by possibility and plausibility, which echoes Law's (1991:176) comment that power and its entanglement with agency and materials are "essentially empirical questions". In this way, the direct approach to power is distinguished from the indirect, less by seeking 'the answer' and more by seeking interpretations that demonstrate 'plausible possibilities'.

In our research too, we take the indirect path, since this is sympathetic with the main body of theory and our method, which we describe in Chapter 4.

We believe there is an interpretative choice to be made when applying sociological or indeed philosophical theories to IS research on power. A closer reading of Law (1991) suggests he is taking this exploratory approach, rather than being prescriptive. His essay commences:

> "Power is surely one of the most contentious and slippery concepts in sociology…I remain committed to the idea that a useful notion of power can, indeed, be retrieved from the "shipwreck of sociology"…my object [is] to distinguish four different themes in the sociology of power...My argument is that they are *all* viable…But it is also that these forms or uses of power should in addition be treated as relational products…But what can be said about the character of relations? How are they stabilised? I of course have no final answer to such global questions. Nevertheless…I press the view that the network of what we call 'social' relations is never purely social…it is also

simultaneously technical, architectural, textual and natural. *Indeed, the division between such categories is itself a relational achievement rather than something given in the order of things*. [emphasis added]" (ibid. 165-166)

It is these kind of statements that have failed to make their substance known into the more literal or direct research on power and information systems. Doolin (2004) takes up the case in his study of the implementation of a medical management system, starting by questioning the early efficiency and rationality arguments for the introduction of information systems, broadening the question:

> "Much of this [existing] work is based on conventional notions of power, which treat information as a resource to be deployed in the balance of power between organizational actors (cf. Jasperson *et al.*, 2002). Such a notion of power underplays the constitutive effects of information systems and the way in which they mediate and reinforce particular understandings of organizational reality. A *different* understanding of power, influenced by the work of Michel Foucault, has been proposed as a basis for explaining the role of information systems in facilitating a calculative form of control through computer-based surveillance and monitoring…"(ibid. 344, emphasis added)

His argument (ibid.) builds a case for understanding power, where the resistance of medical practitioners to a medical system ('casemix') is usefully explained by resistance against the system's foundational rationality:

> "The detailed information provided by the casemix system made visible the financial implications of clinical decisions. Using this information, managers could make stronger truth claims in their attempts to contain clinical resource usage. These arrangements encouraged an understanding of organizational reality grounded in economic notions of value and commodity…in this sense, the casemix information system can be viewed as part of an attempt to constitute [or dominate] doctors as subjects of a management discourse." (ibid. 358-359)

However, the resistance to such a constitution enabled by the information system is palpable:

"There was also reluctance on the part of many doctors to use a tool provided by management. Many doctors felt that the information would be used to justify management decisions on financial grounds, ignoring clinical issues. Established clinical values relating to patient care meant that the potential for management decisions based on casemix information would be perceived as an intrusion on the professional autonomy and clinical freedom of doctors." (ibid. 353) "The casemix system lost much of its significance, as clinical units and the idea of doctors as managers disappeared. This meant that the casemix information lost its potential to become the dominant view of organizational reality within the hospital. (ibid. 359)

Doolin's primary argument here concerns information systems as agents enabling 'calculative practices'. As a study of the shifting dynamics between the discourse of clinicians and managers as mediated by the 'casemix' system, and the resistance to the calculative practices that this system attempted to introduce, the resistance by doctors to being constituted (or objectified) so, and the success that the doctors had in nullifying this role and forcing casemix to be "relegated to a contract management role" (ibid. 359) is insightful. However, he is also indirectly saying two things of importance for us that we should focus on as directly relevant to our research. Firstly, that there are foundational or at least organisational realities grounded in *incommensurate* views: for the clinicians, efficiency was subordinate to clinical care, which carries forward remarks in the conclusion to the direct study of power above. Secondly, that these foundational realities can be described as *discourses*.

Seeking to explore Foucauldian notions of surveillance and resistance (ibid. 344), Doolin alludes to this connection between discourse and reality: "From a Foucauldian perspective, one of the more subtle power effects of organizational information systems is the way in which they reinforce a particular understanding of reality through the mobilization of constitutive concepts embedded in them." (ibid. 355) Whether these discourses are individual or conglomerates and where they are located is not discussed. Indeed, the notion of discourse is not explicated in this paper, but is a central concern to our research.

Echoing Doolin's calculative practices, and following on from their earlier study around the use of consultants texts to construct a shared reality (Bloomfield and

Vurdubakis, 1994), Bloomfield and Vurdubakis (1997:641) argue "that representational practices such as information requirements analysis, data modelling and the like, are conceived and employed as *technologies of control*." They state that these representational practices "create a "presence" for a particular set of "relevant" facts, defining their *range of possibilities* and rendering them visible to the participants in the organizing process… They [representational practices] can thus be seen as a means of rendering the "organization" into a stable, observable, or otherwise credible entity" (ibid. emphasis added).

Obviously, with any design activity, certain elements must be chosen over others – "Representing the organization constitutes an active process of differentiation" (ibid. 664). Here, it is stated, the elements that represent organisational order and unity are chosen over those that would speak otherwise (ibid. 665). This conclusion is based in part on a very interesting comparison of the movement between a soft systems methodology (SSM) rich picture representation and subsequent 'objective' or 'poor' (i.e. less rich) entity relation (ER) diagrams (ibid. 660-663). This comparison draws our focus to the tension between worldviews and the struggle for one to be made commensurate with the other, the possibility of one to be repressed and one to be dominant. Of course, this is a power-relation, not between peoples but materials, which is a technology of control.

This brings our interest to their line of inquiry, which asks: "What is the significance of these moves towards the containment of subjectivity?" (ibid. 662) where SSM gives way to formal conceptual and logical representations? This question is answered in terms of a dominant discourse, where "The attempts to transform the latter [unruly reality] in accordance with the dictates of the former [orderly world on paper] is part and parcel of the dream of rational administration." (ibid. 664) This again reinforces the existence the discourse of bureaucratic rationality of Bjorn-Andresen and Eason (1980) and the use by that discourse of the materials of information systems as noted by Law (1991) above.

Knights and Murray (1997) in their task to "examine the political character of IT systems development through…an empirical case study…conducted within the context of a sectorial analysis of the industry [financial services] in which it is located" also counterpoint the possible different discourse of managers, markets (business) and

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information technology through the mechanism's of control and relations of domination. A desire to avoid a study that adopts a prescriptive managerialism (ibid. 37) and wishes to empirically study the "difficulties, tensions and contradictions" that are "systematically related to complex sets of power, managerial and market relations" (ibid.) means adding to their analysis beyond a juridical form of power, the dimension of production of knowledge and/or managerial identity, whose necessary hierarchical relationship to the formation of managerial identity is contradictory to the free flow of information necessary for rational administration (ibid. 42-43).

A key choice (and a common one, in our own experience) highlighted in the case study is the prioritisation of product development over core administrative systems:

> "At Pensco the decision to prioritize product development over the renewal of core administrative systems had implications no manager was particularly keen to champion. It was something that less senior staff would, but for decisions from 'above' have been prepared to fight for; like R&D staff…their values differed substantially from those of marketing personnel. The result was that the development of products (sic) systems and the limited revamping of existing administrative systems was seriously compromised by the need to 'bolt on' additional processes to aging Pensco systems…Given the CEO's reorganisation of the senior management team and the marginalization of the two most experienced systems managers…it is perhaps not surprising that the substantial…cost of the CEO's decision to develop products rather than administrative systems…has remained largely hidden." (ibid. 49)

Deconstructing the reasons for this around their central discursive themes of managers, markets and messages largely rests on the notion of the self-producing managerial subject/identity (ibid. 51) which is reflective of the larger "modern economies of power" which effect control by "targeting of subjects and populations so as to be productive of subjective well-being through strategies of educational and material wealth." (ibid. 42) "Choices regarding [technology and system] use are conditioned by [self-produced] perceptions of labour and product markets, of technologies themselves and by the exercise of power within managerial labour processes." (ibid. 52) This leads to their criticism of the aforementioned prescriptive managerialism in the use of IT, which instead of helping "serves in part to reproduce, as it simultaneously

obscures, precisely the conditions that generate and sustain the problematical and precarious character of IT management." (ibid.). In a link with our own conception of discourse that we will cover in the next chapter, reflective of the character of discursive formations as collections of anonymous rules said from 'nowhere', they conclude with the character of organizational and extra-organizational political imperatives being "phenomena (discourse) [which] appear to take on a life of their own and the individual confront them as a constraining or facilitating reality…There are strong structural constraints on the use to which IT is put." (ibid. 53). Our thesis will deliver upon the stated objective of observing and understanding a form of these deep power structures through empirical study.

Deconstruction or construction

The foregoing demonstrated the potential of a structural study of power with three well planned and executed analyses. The value of deconstruction in a more general sense, rather than specifically with a focus on power, in revealing hidden structural elements in the practice of information systems development has been notably undertaken by: Orlikowski and Gash (1992), Beath and Orlikowski (1994), Levina and Orlikowski (2009) and Bloomfield and Vurdubakis (1994). Calls for the continued relevance of deconstruction to understand information systems practices are also made (cf. Chiasson and Davidson, 2012). For our purposes here, we select two that bear resemblance to the method we will articulate in Chapter 4, due to the textual nature of the research data.

Often cited[5] information systems focussed deconstruction of Beath and Orlikowski (1994) takes issue with a number of inconsistent and inequitable *a priori* features of the then fashionable information engineering method. These are revealed through a deconstruction which "facilitate[s] an in-depth examination of the specific content of a written document" (ibid. 351). Starting from questioning if "the persistent difficulties between IS and users…might not also be rooted in more fundamental organizational design choices such as the division of labour between users, the locus of control over information technology resources, and the allocation of investments in technical and work expertise." (ibid.), they progress to a deconstruction of IS methodology, where the documents guiding the methodology can be made to reveal the "dependence of that

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[5] Google scholar search conducted 14th November 2012 has 244 citations for Beath and Orlikowski (1994)

text on taken-for-granted assumptions that may suppress, distort, marginalize, or exclude certain ways of thinking." (ibid.) In other words, relations of domination between concepts expressed in seemingly natural dichotomies which uphold logical fallacies as expressed by tautological, ideological inconsistency, universal claims or other convenient assumptions (ibid. 353)

While this study echoes the concerns of Lucas (1984) in his efforts to protect the user from a nameless technocracy, instead of being overtly judgemental, deconstruction here is used to highlight inconsistencies in these *a priori* implicit relations between the *concepts* used in the methodology. And in this respect the study is similar to our own research as it emphasises:

1. Understanding the structural relations between prominent textual elements, for example: "The text creates and sustains—both implicitly and explicitly—a strict dichotomy between users and IS analysts, and in this it mirrors (and, we argue, reaffirms) the distinction and distance between the technical and social worlds that is evident in much IS literature." (ibid. 366)

2. Emphasising the importance of ignoring from where the text is spoken: "the primacy of the producer [of the text] should be displaced in favor of an emphasis on the cultural artifact itself". (ibid. 374)

3. Seeking to understand where these relations are 'problematized', for example: "The contradiction leaves both users and analysts in an untenable position: users submissive during the development process are expected to take charge at the end, while analysts in charge throughout the process are expected to yield to the users at implementation" (ibid. 372)

While these are the similarities, there are also significant differences. Where our research here will differ is in the fact that our concerns are local and epistemological (through archaeology), and with no 'home' judgemental goal of 'fixing' any assessed relations in IS development practices. Rather, we wish to understand how they have arisen, are reproduced and entangled in information systems development practices. We also wish to avoid any globalisation of the analysis that would lead us to construct texts along partisan research lines for the same reason. So, in this sense our research approach is not characterised as deconstruction per se, nor the related field of critical

discourse analysis. It is something different, which is aligned with hermeneutics, but decidedly archaeological, following Foucault (1969:17), hermeneutics takes the text as a text with no author, the text has no 'secret interior', but is understood in its exteriority, as we will subsequently explain in chapter 3 and chapter 4.

The "newness" of the deconstruction approach as noted by Beath and Orlikowski (1994:353) is still "new" nearly two decades later according to Chiasson and Davidson (2012) who seek to reinvigorate the method in textual deconstruction of IS artefacts as texts, where even an information system per se can be a text (ibid. 200). They position deconstruction as a post-structuralist endeavour that "consider[s] language to be unstable, though rendered temporarily stable by social and political forces" (ibid. 193) often associated with implementing the works of Jacques Derrida (ibid. 192). Of interest to us in the study of power-relations, is the spaces and silences where power-relations can operate, which they note can be a useful albeit esoteric approach (ibid. 200) to "expose dominated and supressed possibilities upon which every IS [information system] rests." (ibid.). In our research here these possibilities are not only excluded by action but by the epistemologies themselves.

Bloomfield and Vurdubakis (1994) too are concerned with the texts and the ways in which reading and writing of IT strategy reports, as general types of inscriptions "are used to represent reality in order to act on it, control it or dominate it, as well as to secure the compliance of others in that domination (ibid. 455). This predates their 1997 research on representation that we canvassed above, and, resting on the theories of Latour, they construct an interpretation of information systems development where the IT strategy reports themselves "function as intermediaries in defining and associating heterogeneous entities (humans, technologies, institutions etc.) and thereby construct the form and the substance of the relations set up between them." (ibid. 456).

These special types of information system texts specify the location of a mechanism which enables a social construction of a reality and which mediates a boundary, the 'interface':

> "Our argument is that IT strategy reports are to be understood to be located at the interface of what are construed as two different realms, the 'autonomous' realm of 'technology' and the 'social' realm of the business or

organization…we contend that IT is not known as such…rather it relies on various knowledge practices which objectify it as thing-like and therefore render it manipulable…" (ibid. 457)

Of especial interest to us in their research, is the analysis of the techniques that deploy partisan logic into the "community of address" (ibid. 461) through the act of reading to control the places of uncertainty and remove silences. Devices employed include:

1. Grounding the text in authority and appeals to rules (ibid. 458-459);

2. Absence of a theoretical basis or reasoned argument that could be critiqued (ibid. 459);

3. Using document structures that embed executive summaries which relate on paper action and brevity and form in opposition to detail and deliberation (ibid. 460);

4. Promoting further displays of commitment to the efficacy of managerial control through brevity of detail (ibid. 462);

5. Adopting vocabularies and reasoning (discourse) that are already known which "closely reproduces the knowledge practices and concerns of those who commission the services of management consultants." (ibid. 463);

6. Describing a reality where the text is reporting on a 'existing' problem which pre-dates the existence of the report itself (ibid. 464); and

7. Constructing the problem as manageable by restricting the report to a narrow frame to eliminate alternative readings "and therefore disagreements about the solutions", without explaining the totality of ambiguity present beyond the frame (ibid. 465).

These 'problems' are positioned or explicated by the consultants report as a current jagged gap in "organisational rationality" which needs to be smoothed out and mended through the IT solution or information system (ibid. 465-466). This mending or resurfacing is the logical knot tying the managerial, organisational and the technical system that the consultants report has woven together as the answer to restore a

smooth rationality. This is achieved through the "case by case suppression of the term identified as representing the irrational."(ibid. 469).

In our own experiences, this renders an information system to be objectified as a simple 'tool' that can be used to do controlled things, and forever disables the possibility of meshing system and organisational elements together in a cohesive 'system', perhaps the true meaning of information system. This is a consequence of the position that "These [management] concerns and their associated dilemmas are derived from a view of technology and organisations as constituting two distinct ontological domains." (ibid. 463) Thus, the ontological domain provides (either explicitly or implicitly) the terms in which the visibility of problems is constructed.

Power-relations and epistemological concerns

Continuing the idea of an ontological boundary described by the separateness of the rules of how to know a truth, King and Lyytinen (2004) turn to these considerations to the discipline of information systems itself. They speak in terms of "anxiety discourse" (ibid. 540) where the basis for the existence of the field is questioned or defined referentially to other disciplines. Separating the lesser issue of identity from legitimacy, "anxiety discourse is about the IS field's academic legitimacy" (ibid. 542), involves understanding what is socially salient:

> "Legitimacy defines what is regarded as appropriate or acceptable. Inevitably, it is a political issue involving the power to define and enforce the norm." (ibid. 541)

What is legitimate is that which is permitted to be legitimate, but it is also that which can be trusted; in this case the conformance to research method provides this quality. So, having debunked potential claims on the illegitimacy of the information systems academic discourse, they posit reasons for this anxiety, viz.: the youth of the discipline and the volatility of its foci as determined by a shifting academic frame; academic ethnocentrism that manufactures claims on what is legitimate scope and theory, "Those who can claim the mantle of [the right] theory band together to

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consolidate their power."(ibid. 546); institutional politics and hegemony, which defines what good is from without (ibid. 548).

The possibility of competing 'right' rationalities as also noted by Bjorn-Andersen and Eason (1980) above, in questioning the bureaucratic rationality assumptions of information systems developers (efficiency/effectiveness) is at the root of King and Lyytinen's (2004) argument that it is not for other 'superior' sciences to state how information systems is or is not valid. These are multiple competing rationalities and indeed multiple in their associated epistemologies.

So, here each of these mechanisms of power is epistemological in nature, defining what knowledge is good, what knowledge should be studied to be good, what knowledge is therefore legitimate, what the right theory is to deploy to enable a truth to be spoken, and that which is not, is dominated, a *subjugated knowledge*. King and Lyytinen (2004) show that knowledge and truth creation is not immune from power as a structural influence for those sciences that involve technology and organisations of people, namely, information systems. Importantly for us, the issues discussed by them are topics of power-relations not between people but between *competing mechanisms of how to know*, between disciplines or academies, which is where we focus our research. Additionally, they do not argue for an emancipatory erasing of power based on equity, but a resistance and strengthening of their own discourse. So, this is a revealing article into the stratagems and plays of power; there is no avoiding them.

Simonsen (2004) provides a comparable non-IS example of analysing epistemological influences in the field of geography. In this case it is a boundary or arc described by geographic (Anglo-American and European) and language (English and non-English speaking) considerations and the power-knowledge nexus established in an international academic space dominated by an Anglo-American hegemony. Her analysis within her field desires to "'decolonise' our imaginations and develop a genuine global space of critical geography" (ibid. 525) by understanding:

> "…the social and epistemological mechanisms that construct this power-
> knowledge system; a power-system based in institutional settings, language
> and publishing spaces…[that] is also a discursive field of power-relations in

which theoretical truisms based on Anglo-American interpretations and 'right' ways of being 'critical' more or less consciously enclose the writing spaces."

Her thesis represents some of the mechanisms of this 'knowledge hegemony' as writing that constructs "the master-subject of geographical theory as Anglo-American" (ibid. 526), being the 'first' world; the default position assigned to non-Anglophone writer as "outside 'the centre'" (ibid.); and how the need for writing in English and international recognition monopolises particular ways of being critical that ignore cultural richness and diversity (ibid.). A comparable critique within the schools of organisational theory was presented by Knights (1997), who explored what the "'demise of the episteme of representation'" (ibid. 1) meant to the disciplines own integrity in avoiding pluralistic concerns.

Closing Remarks

We began this chapter with an attempt to broadly segregate the literature for purposes of guiding the reader to which literature our research is similar to and to which it was dissimilar. In our review, we found that there was commonality between the two broad approaches, this may be due to leakage of notions from the indirect approach to the direct approach, and the over simplification or avoidance in the subtleties of the theorists who have been cited in the direct approach. In general terms: power is a relation or a network (cf. Lukes, 1974); such a network vests or can be stored or held as a capacity in institutions or even materials; (cf. Law, 1991) and that capacity can be productive in shaping or at least entangling itself in the formation of different rationalities and ideologies (cf. Law, 1991 and Bjorn-Andersen and Eason, 1980), which can also be grounded in cultural forms (cf. Thanasankit, 2002).

Some of the IS studies we surveyed here have problematized power as a thing to be eliminated or emancipated from for reasons of dysfunction or inequity (cf. Lucas, 1984 or Markus and Bjorn-Andersen, 1987 or Stahl, 2008). Since power is integral in relations of systems, practices, knowledges and behaviour, we argued this position is not helpful in the study of power. Other IS 'power' studies sought to categorise, in a biological manner, the different types of ways power can be known, with the intention of introducing superiority of choice (Howcroft and Light, 2006) or clarity through a kind of taxonomic ranking (Jaspersen et al, 2002 or Silva and Fulk, 2012).

We found continental notions in the IS literature not well understood or represented. One exception is a framework approach utilising actor network theory (cf. Silva, 2005), with emphasis on the power aspects of passage through the enrolment of actors, and the more organisationally focussed studies informed by a awareness and precision which are not from within the IS practice but from without (cf. Bloomfield and Vurdubakis, 1997 and Doolin 2004).

The question of language and representation is one way these researchers have gained access to deeper insights. Using language in this way by both deconstructionists (cf. Beath and Orlikowski, 1994) and constructionists (Bloomfield and Vurdubakis, 1994). The desire to resist ambiguity has led others, and us, down an epistemological path (cf. King and Lyytinen, 2004 and Hirschheim, 1992 and Hart and Underwood 2012).

We would like to focus our closing remarks in this chapter on the observations of one author whose perspective on power has been generally influential and may be read as supportive of our efforts. They also help us connect the literature presented here to the theory section in the next chapter. Clegg's (1987) retrospective on his own earlier 1975 paper illustrate concerns similar to our own: how is power to be located, how should power by analysed through language and narrative, how can the fact that power is hidden, be overcome (ibid. 62)? Further, how to avoid the potential for any analyses of language *using* language to be caught in an a priori of its own origin, entangled in the same power-relation we wish to study? (ibid. 69)

Clegg (1987) surveys three approaches, the conversational analyst approach where language reveals the internal order or language, the ethnographer, who sees language as a window on social reality, and the materialist who sees language as a media (text) outcome of a workplace that maintains, negotiates and reproduces social forms of domination. In the latter approach, there is no distinction between 'word' and 'world' they are one (ibid. p62-63). The question or notion of *discourse* is very competently progressed between the three approaches. Unlike Blommaert (2005:99-103) who does not appear to want to surmount an overall linguistic root of discourse, albeit with a positive appreciation of Foucault's *archive* and the intertwined role of power, knowledge and institutions (ibid. 100), Clegg (1987) successfully threads a progression between the linguistic notion of discourse, to a Foucauldian notion of discourse which we will use in our research (ibid. 69).

Indeed, while in 1987 Clegg remained to be convinced by *archaeology*, we begin our research with that theory and aim to convince the reader of the clarity that can be obtained by removing the centrality of humanist concerns through the process of treating research data as an archaeological *excavation* where the narratives are preserved as texts in their *exteriority*, which, as we will explain in more detail shortly, is knowing them within the integrity of their own *logics*, uninterrupted by our own discourse of inquiry into power:

> "One way it [research on power] might go further is to develop Foucault (1977) [Discipline and Punish] on power discourse analysis, although one remains to be convinced by Foucault's analysis of power…Without some *a priori* privilege being awarded to a theoretical essence (for example, 'class',

'elite', 'patriarchy') which orchestrates the arena of power, it is hard to see how power studies can escape being pluralist." (ibid.)

As we will discuss presently in the next chapter, through Foucault's 'excavation' of discourses (that we read to be similar to Law's (1991) *logics* as noted above) and their epistemological rules of necessary conceptual relations, we aim to deactivate this *a priori* privilege.

Finally, the study of power rooted in attempts to untangle or explain power with the objective of controlling or neutralising 'inequitable' effects as undertaken by the information systems researchers who pursue the direct approach to power is insightful, but incomplete. This is so firstly because it is confusing to engage in a power-relation with the subject of study. Secondly, if 'power' is generally involved in epistemological processes where the supposed immutable clarity of a physical or mathematical science is not present, as we and the foregoing authors argue, then power as an indirect and structural feature in-other-things is absolutely intimate in the exchanges and relations between the broad elements of information systems: the technological, human, organisational and institutional elements.

Chapter 3 – Theory

Purpose

The purpose of this chapter is to explain the theoretical foundation of our research: what we have taken as its key ideas, why they are important, and what we understand by them, what makes this approach suitable to study power.

The archaeology of knowledge

The literature analysis in the last chapter argued there is greater clarity achievable by taking an indirect or structural approach to understanding power. We established that power is likely to be relational rather than an object amongst other objects (cf. Lukes, 1974 and Law, 1991); apart from a sovereign conception of power (power over), power is a capacity or force (power to) for doing or withholding (cf. Law, 1991); is validly located and revealed through language (cf. Clegg, 1987 and Bloomfield and Vurdubakis, 1994); is an epistemological mechanism of legitimacy (cf. King and Lyytinen, 2004); and such epistemological mechanisms are located in clusters or collections of *logics* (cf. Law, 1991:181). We proposed that the term 'logics' was close in intent to the term discursive formation, which we will explicate in this chapter.

This debate over a 'correct' legitimate theory that enables the soundness of a discipline's knowledge involves epistemological mechanisms that come to the foreground especially with reference to inner debates raging within information systems itself (King and Lyytinen, 2004) geography (Simonsen, 2002) and organisational theory (Knights, 1997 or Law, 1991). We note that these debates also involve worrying about the risk of pluralism[6] (cf. Hirschheim, 1992; Allen and Ellis 1997; Clegg, 1987).

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[6] As an aside, it is not necessarily an endorsement of theoretical pluralism to hypothesise clusters of different logics (systems of discursive formations) because the rules of discourse, being anterior to theory, is intended to unify our analytical terrain.

Concerns of power are not just restricted to the disciplines commonly associated with the social and the organisational, they have been raised in the physical sciences as well, for example, at the Princeton Plasma Physics Laboratory, where it is postulated that scientific consensus of truth claims is sometimes discursively, not always rationally, formed: "discrepant findings of two data analysis teams provided an organisational embarrassment…the autonomy of the analysis groups…was balanced against a need for organizational univocality…as the scientists producing this knowledge were constrained by the discursive norms prevailing within the laboratory [institution] and their larger professional community." (Kinsella, 1999:173) The implications of this study may be that "if the knowledge produced by the allegedly autonomous physical sciences can be shown to be socially constructed, then so can all knowledge…[and] a Foucauldian viewpoint may be especially useful for examining forms of control in knowledge-intensive organisations more generally." (ibid. 203)

Along with Willcocks (2006), Law (1991:169) also affirms the relevance of Foucault to the study of power:

> "Neither is it helpful to assume that power is a fluid which trickles down from the top. Foucault's insistence that power is ubiquitous, an aspect of all relations, is surely right. Its strategies and methods deserve study wherever they are deployed, that is everywhere."

Law's dispute with a disciplinary-only view of power however is that it makes it difficult to talk about how power is distributed, and as we discussed in the last chapter, here he prefers to say how 'power to' not only has an effect but is also a capacity, a condition (ibid. 170).

Instead of leveraging disciplinary notions of power, we will use an alternative and, we argue, equally relevant theory that can also be applied to the understanding of how power can be distributed as a capacity, broadly in the form of rules of knowing. Foucault (1969) postulated a synchronic method, called *archaeology*, used across historical texts, which is a method of analysis informed by his intellectual forebears Bachelard and G. Canguilhem who understood that "the history of a concept is not wholly and entirely that of its progressive refinement" (Foucault, 1969:5). This is

therefore an anti-teleological method that avoids an *a priori* view of humanist historical progressions and unities, and so equips us to explore, let us say, a *territory of concepts* that may instead be dispersed and discontinuous. Relations, systems of rules, and laws that specify how relations must be configured to make 'true' statements shape this territory. This is the location of power-relations in this theory.

This approach is called the *archaeology of knowledge*, and this is what we will use in our study of ISD professional's histories, to unearth or excavate these types of structural or indirect power-relations operating in the practice of information systems development.

We now propose to cover three groups of concepts that form the core of this theory. Firstly we cover the class of relevant general concepts which help orient us as to the direction of the theory being distinctions in knowledge, language, time and conditions. Secondly, theory specific concepts which are the theoretical subjects of our study, being texts, statements and discourse. Thirdly, theory specific concepts that help us adapt the theory, being system of formation, law and episteme.

Orientating distinctions

Knowledge: Connaissance and Savoir

In the introduction to this thesis we stated that a key distinction that is made is between knowledge that is accepted (*connaissance*) and the rules on how do we really know something (*savoir*). *Savoir* in the sense used here is epistemological. The concern of archaeology is *savoir.* (ibid. 202)

Language: Parole/Langue

Foucault uses Saussure's distinction between language as spoken (*parole*) and language as a system (*langue*), langue is the field of analysis where Foucault locates his efforts. This is consistent with the heritage of Canguilhem, and his predecessor

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Bachelard, with a focus on the logic of concepts rather than lived experience. (cf. Foucault, 1969:67, 76, 111, 134)

Synchronic/Diachronic

The archaeological approach is a synchronic method. It operates within time periods not across periods (ibid. 83), ignoring the notion of an era. Perhaps this is important to avoid the pitfalls of traditional histories which may 'invent' eras to explain historical shifts for which there is no real explanation. This does not means that archaeological objects which this method can unearth should be fixed for all time and are eternal, but dynamic and different at different times. This will become important later on in this chapter when we discuss the possibility of multiple contemporary formations operating synchronically.

Condition of Possibility/Condition of existence

Foucault sometimes refers to the *condition of possibility* or *condition of existence*. This speaks to the interplay of conditions of necessary-ness and sufficient-ness (ibid. 189) of the discursive rules in order for certain concepts and statements to be made, and for certain formations to become dominant over those whose conditions of possibility are not met.

Defining conditions of existence is a central concern of archaeology (ibid. 131); it separates what can be related and thus known from what is not related and thus not known. It is the seat of power-relations in this theory. We talk more about this in the section below on difficulties in studying contemporary formations.

Subordinate and superordinate

Following on from Foucault's conditions of existence, where one possibility is prioritised and realised over another, we believe that epistemological power-relations can say which knowledge outcome is superordinate and which is subordinate in their relations. This notion becomes central to the analysis to occur in Chapter 5 Part 2.

While relations are constructed by virtue of the interplay between the competing discourses, only one discourse shall remain normally visible and so viable, that being the superordinate notion, formation or discourse. The other remains in the 'shadows', 'in dreams', as in being the subordinate notion, formation and discourse. This does not mean to necessarily imply that the subordinate discourse is obliterated, and we are reliant on the fact that it will not, because, we hope that a narrative historical recollection will restore a state prior to the application of the epistemological rules and formations; but rather, at that moment of interplay the formations of the one discourse become superordinate in determining the effective operating epistemological circumstance.

Texts, statements, discourse

Texts is not a book or an oeuvre of an author, it is not they who are speaking, but a "regulated transformation" (ibid. 156) of an emergent set of relations, with their rules and resultant statements, spoken in anonymity. So, the key distinction that makes a text is it's removal from any speaker, stark in their exterior with no 'secret' interior inferred, and analysed from the view of the rarity of the statements it contains. Said another way, a text, being a sample of evidence from a discourse, is excavated like a monument (ibid. 155), the people who made it are unknown, and the conditions of existence which made the monument are not authored but are said from nowhere (ibid. 138, 231)

Statements are elements or 'units of meaning' (what produces sense), not equivalent to the sentence or speech act (ibid. 97), which cut across a domain of structures one would naturally think constitute a boundary of some sort (ibid. 98). Statements are revealed in their *exteriority*, they are said by nobody and from nowhere, and we are unable to infer a secret interior logic or meaning to them. As a consequence, statements are *rare*, (ibid. 135) there are not many of them, but few, and the few statements that emerge based on the rules of discourse are the product of the necessary relations between concepts that determine their presence or absence (possibility).

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Discourse is "the group of statements that belong to a single system of [discursive] formation" (ibid. 121). A discourse can also sometimes be called a *discursive practice*. In our research, we understand that:

1. Discourse <u>exists</u> or is produced through a collection of related rules (system of formation, covered next) enabling what is said and disabling, through knowledge/power nexus, what can not be said, or what is delimited (ibid. 46);

2. Discourse *is* a <u>boundary</u> or a frontier (ibid. 82);

3. Discourse <u>comprises</u> a collection of statements functioning vertically across the exterior of verbal performances, as units of meaning (ibid. 121);

4. Discourses are multiple not singular: "thus I shall be able to speak of clinical discourse, economic discourse, the discourse of natural history, psychiatric discourse." (ibid.) This agrees with our literature review with the multiplicity or juxtaposition of *logics* (cf. Law, 1991:181); and

5. The presence of multiple discourse invokes an <u>epistemological function or figure</u> (Foucault, 1969: 211) which we understand to mean power's capacity to invoke a condition of possibility. When different rules could exist, this function makes one superordinate and the other subordinate (subjugated) and maybe silent. This could be done via importing (ibid. 83) or as we alternatively describe, 'leaking' of rules.

Sometimes a discourse and its rules as a system are used interchangeably, however, we are focused on the system of epistemological rules that we will now discuss.

Discursive formation, system of formation, law, episteme

A *discursive formation* is a necessary relation between conceptual elements. As "archaeology finds the point of its analysis in *savoir* – that is, in a domain in which the subject is necessarily situated and dependent, and can never figure as titular" instead of the connaissance of the history of ideas (ibid. 202). A discursive formation is a concept necessary to deploy a viewpoint that "in analysing discourses themselves,

one sees the loosening of the embrace, apparently so tight, of words and things, and the emergence of a group of rules proper to discursive practice." (ibid. 54)

> "Discursive relations are not…internal to discourse: they do not connect concepts or words together, they do not establish a deductive or rhetorical structure…they are not relations exterior to discourse…They are, in a sense, at the limit [boundary] of discourse: they offer it objects of which it [discourse] can speak…they [discursive relations] determine the group of relations that discourse must establish in order to speak of that object, in order to deal with them, name them, analyse them, classify them, explain them, etc. These relations characterize…discourse as a practice." (ibid. 51)

A *system of formation* is a group of relations that act as a rule (ibid. 82), rules that produce discursive formations, which are characterised by the following:

1. Its <u>scope</u> is the relation between institutions, techniques, social groups, perceptual organisations and discourses (ibid. 80). "These relations are established between institutions, economic and social processes, behavioural patterns, systems of norms, techniques [and technologies], types of classification, modes of characterization…they [relations], define what enables it [connaissance] to appear." (ibid. 50);
2. It <u>operates</u> at a level anterior to statements, authorizing some statements over others (ibid. 81); from the theoretical choices available makes some strategic (ibid. 82);
3. It <u>implements</u> some rules and excludes others which make some concepts appear and others not (ibid. 82);
4. Is <u>located</u> on the frontier (or boundary) of discourse itself (ibid. 82), in the absence of the cogito (ibid. 138);
5. Is <u>defined</u> as "complex <u>group of relations</u> that act as a rule: it lays down what must be related, in a particular discursive practice, for such and such an enunciation to be made, for such and such a concept to be used, for such and such strategy to be organized." (ibid. 82); and
6. Can <u>transform</u> existing discursive practices or cause new practices to be <u>imported</u> (ibid. 83).

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A system of formation uncovers the necessary conditions of possibility that operate beneath the consciousness of individuals (cf. Gutting 2008) to tell us what is true, and how to know (*savoir*) or indeed how to learn, or what to learn, and what we cannot conceive of because those are prohibited by this system as an epistemological function. These rules describe a 'boundary' across ideas informed by power in a formative sense, a 'power to' that makes and sustains epistemological connections (relations), instead of other connections, in the network of power/knowledge, which recede and are silent. This arc can also be termed a *law*, for example, the law of clinical medicine is death, between all of the words written about life, life can only clinically be known through death, (Foucault, 1963:244).

A system of formation, as we proposed in the last chapter, has a meaning compatible with Law's (1991) use of the term *logics*, and is the set of relations expressed as a rule that mandates what relations must be held true in order to make *statements* as units of meaning. For example, it would be hard to talk about the flow of funds in a banking system without using the concept of the supply and demand for credit.

An *episteme* is a set of discursive practices that characterise all practices in a time period, so are synchronic as well (ibid. 211). For example, the need to classify in science of the 18th Century. Our study being at a local level within one discursive practice of information systems may not find an episteme, and this episteme may not concern information systems if that discursive practice is dominated by others such as bureaucracy, management and especially economics. An episteme is not a world-view, or a rationality, "…it is the total set of relations that can be discovered between the sciences when one analyses them at the level of discursive regularities." (ibid.)

Suitability of the theory to study power.

We have adopted these core theoretical elements (such as statements, discourse, discursive relation and system of formation) in order to give us a grasp on the 'territory of concepts' where we propose to study power-relations. This is under the premise that since information systems development is a knowledge intensive

practice, and therefore a discursive one (it does not involve chopping wood or burning coal, for example) then it is likely that a theoretical appreciation of these types of power-relations will aid us.

Foucault's archaeological theory is suitable to the of study power-relations in information systems for three reasons. Firstly, if one accepts the premise of power as a formative epistemological mechanism, it provides useable ideas that allow us to assess the rules and logics of discourses; discourses that are shaped by relations of power, not by 'natural' rules of scientific rationalism, sovereignty or justice. Secondly, by treating practitioner private testimony as anonymous text, we avoid the possibility of mixing disciplining censorship effects from the organisations and institutions where the individual practices information systems. So, while Foucault's aim was describing the shift in historical practices of the 18th and 19th centuries contained in paper documents, for us the strict governing of contemporary 21st century society (cf. Gordon et al., 2009) means we must seek other sources of less disciplined yet still historical texts. Thirdly, through a regulated transformation (Foucault, 1969:156) of such text, we are able to construct plausible (exterior) analyses without them being non-evidential interpretations. Lastly, instead of seeing power shape every event, as in a conspiracy, the theory indicates it may just form a reduced set of (rarer) structural relationships, adding to the level of plausibility, since the claims are few but not universal, being a notion of power which is anterior to language, behaviour, psychology, sociology or politics.

The perspective is not organisational, not computational, not grounded in the absence of an *a priori*, (our *a priori*, relying on Foucault, has already been stated, that power is structural and epistemological), but instead a perspective that stems from *savoir* in general, and assessed in the absence of a cogito (Foucault, 1969:168). We will not attempt an evaluation of the philosophical validity of the archaeological theory in comparison to critical theory, or other sociological approaches to the issue of power. The criteria for successfully applying this theory if we look at Foucault's first archaeology of medicine up to the 18th Century (Foucault, 1963), is a turn away from a general appreciation of medicine as rational science, by looking at the historical shift in medical descriptions, its character is decidedly non-rational, and by conducting a archaeology of medicine the place of the subject was understood not

through life but death, which is plausible and unexpected, one might think that the living should be generally understood through life. So, if we can derive some understanding of information systems practice by following a similar approach, it is probably sufficient at this time that it is different from what the literature has taught us (cf. Doolin, 2004) and can provide potential insight and clarity. Neither will we summarise or deconstruct the theory in its entirety, as that has been done in other places (cf. Gutting, 2005), and realistically this is information systems research not a philosophical critique.

A distinguishing feature of this theory therefore is the omission of the self as a focus of study, archaeology is a "method of analysis stripped of all anthropologism" (Foucault, 1969:17). Foucault removes the notion of the author from the analysis, and what we are left with is the text, which is to be analysed in its *exteriority*. So in this sense, we cannot legitimately refer to Foucault himself as an author, as we use this text, which is a "discourse about discourses" (ibid. 226), but obviously due to academic norm we do.

What we have more precisely referred to is a discourse that contains notions that enable us to determine the structures of power we aim to find in our ISD professional's texts. Being synchronic, the archaeological method presented here will not permit us to determine shifts in discursive relations across periods, but that does not matter, because our research question simply seeks to establish the presence of epistemological mechanisms of power (what and how) not establish causes (why) in shifts or transformations of relations.

About the potential difficulties of studying contemporary, simultaneous and subordinate formations.

Amongst the theoretical tools at our disposal, in the coming chapters we will centre on the key notions of discursive formation and the boundaries they institute as being helpful for our study of power-relations. While conditions of possibility work to create formations that satisfy the necessary and sufficient relations to construct valid discourse and thus knowing, which we deemed superordinate, they also work to

create formations that are not sufficient and not necessary to form relations between conceptual elements, and thus we suggested that subjugated or subordinate formations can exist.

If formations can be subordinated, it follows that their presence and detection, subject to power-relations, can prove problematic. If the operative reality is using only the superordinate formations, the subordinated formations must be engaged in a kind of struggle to be known. Thinking like this means we must be alert to the possibility of the subordinated, those formations whose conditions of possibility were not satisfied and remained 'dreams' or were 'forgotten' due to the exercise of power-relations; it also encourages us to construct a research method which not only seeks the operative formation but the hidden, repressed and recollected, and the power-relations expressed between discourse that is operative and discourse that is forgotten, sublimated or neglected. Similarly, if we allow the possibility of many contemporary discourse, such as medicine, information technology, project management, engineering and so on, which commonly interact together in contemporary society and under the umbrella of singular institutions and organisations, as opposed to potentially more discretely in the 18-19th Centuries which was the subject of Foucault's studies, we should be alert to the possibilities of formations within and between these discourses which form boundaries resolved by the epistemological power-relations that are the interest of our study.

What this means for us is that we are making a kind of assumption that the discrete and diachronic nature of episteme, as in the era of tabulation or cataloguing, which Foucault thought was the total set of relations possible across all discourses, may in fact be synchronic, with multiple epistemes occurring simultaneously. Thus, it may well be that formations that are not sufficient and not necessary when exposed to other systems of formations which are operating in accordance to rules of formation that belong to separate epistemes. Thus, while the need to classify information technologies into types, classes and taxonomies may be an important rule for the episteme that information systems discourse, law or librarianship belongs, the discourse of business may not have this requirement. When the two intersect, we suggest that power-relations act to resolve the necessary conceptual linkages to permit knowledge to surface and form a known 'operative reality'. Therefore, we have a

reason additional to conditions of possibility for thinking that subordinate formations could be in place but hidden due to the effect of the power-relations in operation.

Closing Remarks

In this chapter we have explored the theoretical insights that we will leverage to design the investigation into our information systems professional's narratives. We describe this design in Chapter 4. The ISD professional's narratives we have obtained as our research data are non-official statements which are different from the texts that Foucault had as his focus of archaeological investigation. In order to escape the necessity to use official documents, as we suspect these have been censored or cleansed somehow (Cf. Ch. 4 'Design of data collection'), we must take the theoretical aspects of archaeology and design an interpretative approach which takes account of the potential 'hiddenness' of power-relations, especially in light of the simultaneously occurring, or colliding, contemporary discourses. While Foucault had at his disposal many extant texts covering a large time period, we have chosen to study contemporary discourse, which presents the problem of how to excavate the text from the narrative, how to identify discursively relevant aspects from the narratives, and how to identify the interrelations between the discursive formations in order to reveal the possible power-relations in operation which is the focus of our ISD-oriented study, where the ISD professional is intermixing not only with the ISD client but many other professions whom we expect have their own discourses and discursive formations as well. We will describe a design to investigate these issues in Chapter 4.

It is also worthwhile distinguishing our approach from another approach called 'discourse analysis', to avoid potential confusion. While we note that this theory of Foucault's too could be labeled 'discourse analysis' or the 'power discourse analysis' of Norman Fairclough, as we mentioned above we believe it is more aligned with hermeneutics and archaeology. It is also notable that the term discourse analysis has a particular alignment to the discipline of linguistics (cf. Blommaert, 2005) which is not our intent or goal. The notable difference is that the text is taken to have an author, while in our approach, there is none, it is an analysis of competing knowledges said from 'nowhere' because we do not have to have a 'somewhere' as it will confound the analysis. Obviously, literally, there is a 'somewhere', that is the shared knowledge held in people's minds, but that is not our concern for the reasons stated (cf. Foucault, 1969:17).

So, while we have learnt that power is evasive or hidden to a degree, especially if one takes the indirect approach to the study of power, where power is not an obstacle to be removed or a discrete substance to be handled, but a network of dispersed relations, through the ideas discussed in this chapter we believe there is sufficient body of evidence to accept 'power to' as a relational and discursive force which resides alongside statements and discourse itself, co-existent and mutually necessary to each others operation, in a fluid exchange. Therefore discursive power is not a surrogate child or proxy of discourse, is not a circular relation, nor a relation of dependence or domination, because this type of power is a necessary and sufficient condition for the existence of discourse, and visa versa. In our thesis, power-relations (as we have come to know, discursive relations) are a product of multiple systems of formations (logics) that are necessary to create epistemological figures producing objects of truth encompassing said relations, where the epistemological objects that discourse encompasses can be economic, scientific, organisational, cultural, familial and so on. And in this sense, we believe that this type of power is a neutral and relational force, a 'power to' *relate and delimit relations of knowledge through rules (savoir) which produce knowledge (connaissance)*.

Chapter 4 – Approach to Data Collection and Analysis

Purpose

The purpose of this chapter is to detail the thinking for the design of the methodological components, the design of data collection, the evolution of the approach itself and the design of interpretation that is to follow in Chapter 5, Part 1 and the lexical and discursive analysis in Chapter 5, Part 2.

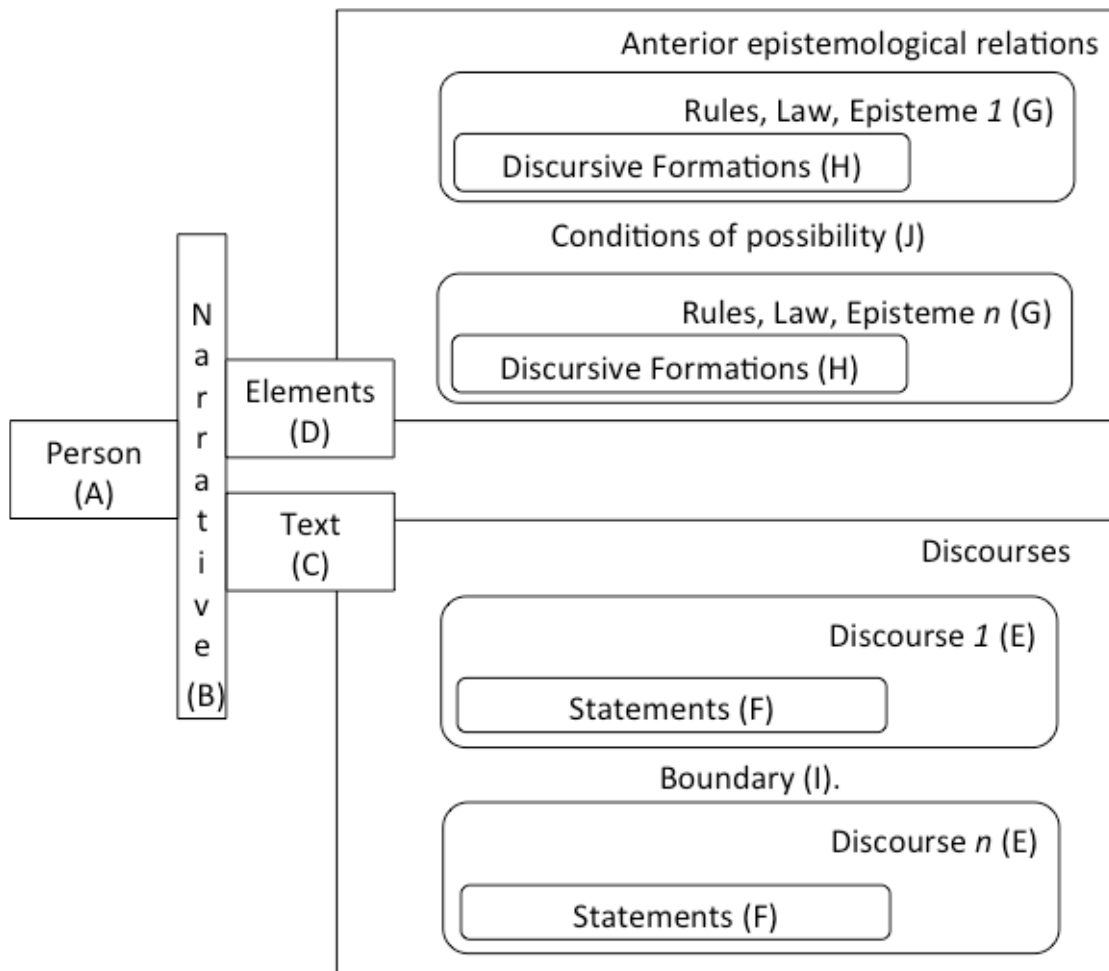## Design of methodological components

Figure 1 – Methodological components

With reference to Figure 1, in our research we intend the ISD professionals (A) contribute narrative recollections of their professional history (B) via open-ended interview, which we hope contains not only the recollection of the historical operative reality but also that which might have been possible but did not happen in the past, and was made subordinate, we suspect, due to the epistemological power-relations in action between self and other's carried or inherent formations, rules, law and episteme (G*1*..G*n*, H*1*..H*n*). We think of their narrative as a text (C), such that their narrative history (B) is excavated as a representative of discourse (E) instead of from the ISD professional as a person and 'author' (A). Although the retold narrative events occurred over time, the recollection and the discursive formations (H) we consequently infer are point in time, thus upholding the synchronic nature of archaeological approach.

In the anonymity of a text (C), a quality of exteriority is achieved, permitting us to understand discourses (E*1*..E*n*) and their statements (F*1*..F*n*) which, for purposes of our methodology (cf. Ch. 4), we extract elements (D) which we will use to access, analyse and interpret the anterior epistemological power-relations (G, H, J), performing the conversion from narrative to discursive text to anterior epistemological functions (G, H). Discourses have a boundary (I) which is a product of them being influenced by the anterior condition of possibility (J), that limits what can known and therefore be thought of at all, and consequently 'spoken aloud' or not. This enables us to characterise discourses and their formations as superordinate or subordinate. Therefore, the type of power-relations we are researching are discursive relations, being sufficient and necessary relations (or linkages) occurring in a 'territory of concepts' favouring sets of linkages over others. The discursive relations encompass the central archaeological concerns of formations (H), rules, laws, epistemes (G) and possibilities (J) as accessed via our ISD professionals narratives (B) viewed as texts (C) and excavated as elements (D), situated in statements (F) and discourses (E).

For our interpretation to come in Chapter 5 Part 1 and Part 2 especially, we will focus on the anterior discursive formations to help us understand potential epistemological power-relations in play. So, this schematic diagram and explanatory text we hope will help to orient the reader as to the situation of discursive formations in the broader

components which we have derived from thinking about Foucault's archaeology in the study of non-official discourses as opposed to the extant texts he had as his archaeological focus.

Design of data collection

The theoretical principle that archaeology is a method stripped of all anthropology guides us how to collect data to enable us to collect our data as if it is from a 'territory of concepts':

> "It [archaeology] does not treat discourse as a *document*, as a sign of something else, as an element that ought to be transparent, but whose unfortunate opacity must often be pierced if one is to reach at last the depth of the essential in the place in which it is held in reserve; it [archaeology] is concerned with discourse in its own volume, as a *monument*." (Foucault, 1969: 155)

This principle means the way we collect our research data needs to be designed to meet this principle by not disturbing the collection of the data by importing any of our own discursive relations into the collection, treating what we found as if from a yet-to-be-known discourse, hence avoiding prejudicing the data. To meet this purpose we did three things. Firstly, we selected an open ended unstructured interviewing technique, which resulted in a story or *historical narrative* unfolding, undisturbed by our own discourse. To determine authenticity of the narrative, we relied on these factors: our own judgment that the individual would be open and honest; being sensitive to the presence of heartfelt emotions in the narrative (Mishler, 1986); that it would be unlikely to sustain a fictional or ego driven story over a persons entire working career which may have misstated the truth of events; and the careful guidance to the participant to avoid relating any event which causes them discomfort or anxiety. The presence of heartfelt emotions was present in all cases through revealing and unexpected insights into personal events and motives. On this basis we believe that the data is a true representation of the participants experiences and beliefs.

Secondly, we obtained ethics clearance to select information practitioners who the author knew had fulfilled certain roles. For example, we thought there would be no point in interviewing eight IS developers, since we wanted to detect different discourses with the intent of suspecting that how they interact involves systems of formation. One participant would be sufficient to demonstrate the application of the archaeological method, since we are not here to prove any universal outcome but to prove we can apply a novel method and derive insight from its application. But interviewing more than one person may be more interesting and of course, if information systems participants are generally interacting with common discourses, could aid in corroboration of any commonality. Of course, maybe interviewing eight developers would discover eight different discourses, which is interesting in itself. But we didn't approach the problem like that in the first instance because we suspected that interacting discourses and hence discursive formations and power-relations may broadly be revealed by selecting people who operated in different levels and from different practices.

On that basis we selected our participants from ISD professionals who operate in the following capacities across multiple industries in the context of developing information systems:

1. D. who used to be a PC support and network salesman and now is a project director in his late 40's.
2. M. who used to be a government middle manager and now is a Analyst/Programmer in his mid 50's;
3. T. who used to be a surgeon and now is a health informatics expert in her mid 50's;
4. S. who used to be a finance analyst, information systems project manager, business owner of a software development company, and now a information systems architecture analyst in his mid 30's;
5. J. who is an information systems architecture analyst in his early 20's;
6. T2. who is a systems infrastructure engineer in his late 30's;
7. Y. who is an information systems java developer in his mid 20s; and

8. I. who used to be an electronic hardware engineer/manager, business sponsor and who is now an information systems project manager in his mid 30's.

Participant selection was undertaken step-wise by firstly taking the opportunity to interview IS professionals who were amenable to being interviewed and secondly, if we felt that sufficient coverage for particular discourses was already obtained (for example, D., M.) after analysing their narrative, then we sought to obtain IS professionals who intuitively might represent a different view, not knowing what we would find. Additionally since the author moved jobs during the research process different industries and organisations could be incorporated. Since we did not see that excavating discourse or epistemology would rely on demographic variables such as industry, age or gender, because we agreed to not take human anthropomorphic factors into account this was discounted as a selection technique also due to the opportunism we exhibited in participant selection.

The industries covered by these individuals in their development of information systems are: insurance, IT system integration, banking, telecommunications, property development and management, state government, wholesale credit, health care, federal government, small business, military, heavy engineering and mining, high tech. While normative interpretative studies may see industry segment as a relevant dimension, our study, due to the theoretical premise, does not. We are seeking to understand discourse and would not take an industry affiliation as a significant aspect of the participant's representations as an a priori. For reasons already explained we do not see the gender of participants to be relevant, at least in as far as we are proving a method to fix and understand power-relations, in their non-anthropological exteriority.

Other individuals were available, however were not chosen due to perceived unwillingness to articulate their recollections and to commit to a two and a half hour open-ended interview. All of the individuals were encountered and requested to participate by the author while actively developing information systems, that is, while on projects ranging in the AUD 10-100M range. Each of these projects were significant investments for their organisations.

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The third thing we did was interview the participants knowing that, according to the theoretical principle of examining our territory of concepts in the absence of a cogito (exteriority), we would acquire their narrative with this viewpoint. Thus, although the line of questioning was quite loose since the interview was open ended, due to the theoretical principle, we were alerted to prompt for explanations of actions or events that we hoped would peel away at the surface reasoning, the peripheral, the stereotypical and the clichéd. We invoked questions that sought to provoke the thinking of participants as to why events occurred or worked that way in order to obtain insights into their own framework or the mechanics of their own thinking, which of course, we viewed as representative of the systems of formation in operation. Interestingly, this included exploring the possibility of multiple systems of formation being collected in one individual's narrative.

As a possible point of comparison of narrative with a written extant text, we obtained permission for access to written project documentation for a significant project ($10M), which ran for two years (2008-2009). This documentation covered project and steering committee minutes and, while uniformly structured, was also written in a comprehensive manner. On review of this documentation we understood that the unexpected turn of events and insights available in the personal narrative histories had been 'erased', normalized to the management expectations sans conflict and edited due to the need for the minutes and other documents to conform to a discursive formation where outliers were suppressed due to the need to present a rational and linear movement of events to management, to represent a face to senior management where everything is under control or at least possible to control with certain actions, recalling Bloomfield and Vurdubakis (1994:463). For this reason these set of written documents are not helpful to progress our investigations and consequently are not used in this research.

We now wish to elaborate on the evolution of the approach before describing the interpretation as what you are reading in this Chapter 4 was not formulated before we examined the narratives, but in conjunction with their examination.

Evolution of the analysis approach

The analysis approach that we describe in this chapter and commence to use in the next chapter was not formulated before we stared to analyse the texts but rather in concert with confronting how to analyse the narratives as text, that is for us, discursively.

When the first narrative was recorded, it had to be transcribed to make sense of it, before we formulated the seven tests (Hart and Underwood, 2010) discussed below. All narratives were transcribed verbatim, and in replaying them the author relived his own experience of the interview.

When the first transcript was printed out, we were trying to find a *purchase point for the notion of discourse*. Setting the narrative for narratives sake aside and treating the document discursively as a text means that we strip the story of its bare human element, that is, the highs and lows, wins and losses, tragedy and elations. We used a pencil and circled and linked what we thought of as discursively significant words and phrases across the entire interview to seek commonality and differences without any thought to what their clustering meant. In this way we had significant clusters of narrative excerpts that were like and different.

By this process we are looking for commonality across the participant's text in what informs the professionals thinking process. Before we understood that these could be captured in elements, and not expecting these processes or rules to be immediately obvious, we scanned the first participants text lengthwise and certain statements seemed to be a) repeating and b) indicative of a thought process that was different from our own.

The thought process we were seeking evidence for was not a psychological or personality one, but one allowing us to understand how the professional's world was shaped and especially *known by them*. We were searching for signs of epistemology 'happening'. We used ourselves as a yardstick because there was no other intimate description available to us of something that hadn't really been researched like this. In this case we firstly examined our own thought process on how we know what we

know at work and then looked at how the professional appeared to know how they know at work. In this way certain excerpts became relevant and highlighted to us more so than others.

Supplementary to this process of relevance identification it was certain turns of phrase that alerted us, especially occurring in the story telling manner more so than in a factual description manner. There were two key initial findings from the first interview with D. that were the staring point.

A. "…they came in and the management said: 'We're going to get rid of this superannuation network, because you run superannuation systems on a mainframe', and this was about the way their brain worked, that was the intelligence;" (cf. Ch. 5 Pt.1 D. #3B); and

B. "Now you're [the interviewer] a computing man, that wasn't possible" (cf. Ch. 5 Pt.1 D. #4F).

The first example excerpt was an explicit boundary rule that can be seen as an immutable fact and thus is an assertion, a discursive truth (of which there are many systems of thought that produce truths not one) moreso than psychologically for example. The second example excerpt was an affiliation to a way of thinking and knowing; the fact that a computer cannot delete data itself is a truth about computing which is discursively significant.

This left us for the first interview with a collection of like and dislike narrative extracts for the first participant, D., that from an interpretative research stance, seem material to understanding his discourses. The naming of the elements that we deploy in Ch.5 Pt. 1 came about *after* the clustering because we sought a way to use labels that were discursively and thus epistemologically relevant. Thus each element can be put into a sentence as: "<participant> knows what they know through <element name>." Then we thought about what was the epistemological meaning so we could form a sentence like "D. knows what he knows due to relative measurement." for example, which is a sense-making kind of approach.

In the second and subsequent interviews conducted serially, the same process was undertaken, so clusters were identified based on sameness in the absence of any name or theme, the only difference being that because we had identified certain clusters in the first interview, we had the opportunity to compare the meaning for those subsequent clusters with the first participant. It was at this point the similarities and differences started to emerge, which is most noticeable with T., the medical and health informatics IS professional, and somewhat with J. and Y.. The names of the elements after this step-wise analysis are the purchase point to the analysis of discursive formations In Chapter 5 Part 2.

In light of this description of the evolution of our approach, we now proceed to explain how we came to design the interpretation. Then we will finish this chapter with ethics and administrative matters.

Design of interpretation (Ch. 5 Pt. 1) and analysis (Ch. 5 Pt. 2).

One of the challenges of excavating "discourse as a monument, in its own volume" (Foucault, 1969:121) is that we wanted to take almost an historical perspective of a person's recollection of events. While we were not prescriptive in the manner of recollection, most participants felt comfortable doing this in historical sequence. Since archaeology is intended as an historical method, we determined to interview each participant's history as a practitioner or party to information systems development. Their working histories range from 2 to 30 years. Due to the method employed, this means that we were then able to design our interpretation so as to view each historical narrative not as a story logically consistent within itself and its author/speaker, with self-made reasons for characters, actions and events; but as a text, a possible source to examine for discursive relations and their rules of formation. This is the root of our design choice to deploy archaeology as a "method of analysis stripped of all anthropologism" (ibid. 17).

However, when we first understood that the notion of discourse (that is, identifying that these theoretical objects of rules and relations we have been discussing) could aid us in the study of power, we were presented with a problem. How could we touch or

grasp discourse? We, the researchers, also being people, and being unused to looking at texts in the 'absence' of people, (while the theoretical objects are now certain enough), needed a bridge to identify and convince ourselves we had indeed located a discourse or discourses in our 'territory of concepts'. What became apparent upon inspection of a trial interview, is that we could posit some tests of the presence of discourse which would help us view each narrative testament discursively.

We formulated seven tests or indicators of the presence and conceptual location of discourse (Hart and Underwood, 2010). We will here refine and reflect on these tests in light of what we have said up to this point:

1. "The boundaries (edge) of discourse are known through friction or struggle (between surfaces)" (ibid.);

   This is broadly intended to suggest that a possible test of the presence of multiple discourses is the presence of conflict over what is considered true. Such conflict is an epistemological friction, which stems from the a priori that there is not one practice, not one discipline, not one system of formation, but many. Foucault was not the only one to consider this. Otto Neurath also with the ship analogy for continuing to rebuild the logical (scientific) integrity of a body of knowledge afloat on a sea of unknowingness perhaps also considered this (cf. Ulrich, 2006). There can potentially be many ships but only one 'pyramid', depending on the metaphor that reflects your research ontology. Ours is in tune with the ship analogy. This could be a simpler way of saying that discourse itself is known at the limit and by introducing the non-anthropological exterior, the limit is perceivable.

2. "Traversing or crossing discourses is difficult but possible" (ibid.);

   If there are multiple discourses then it must be possible that individuals have subscribed to one or the n others in their own inner thoughts. It must also be probable that these affiliations, deep though they are, can shift. The inversion of this is that in our interviews we need to be aware that we are probably encountering a multiplicity in the data, and not artificially treat what we find as a unity. A further refinement of this position is that it may be possible that

an individual shifts in their affiliation to this or that system of (discursive) formation.

3. "Discourses 'struggle to be'" (ibid.);

In light of the discursive power-relations that are a cause of subjugated knowledges, we may find evidence that some discursive formations or rules are subordinate and some are superordinate, particularly between discourse. This was certainly borne out in the narrative of J. (cf. Hart and Underwood, 2012). The subordinate discourse is subject to a relation of power.

4. "Argot as sign of a separate discourse." (ibid.);

Specialised language and jargon, or words used in a regular way forming a pattern is probably an indicator warranting further discursive examination. This is especially so if such argot surfaces from one historical moment in subsequent recollections out of immediate context as in the case of T. who we think used military terminology from past military work in a commercial context.

5. "Are there root elements common to all discourse?" (ibid.);

We do not now believe that the theoretical objects of our study, being the rules of discursive relations and groups of those rules in systems of formation, are commonly shared. This is because of the explanation given in test #3, where some discursive rules in their systems of formation are superordinate to others, hence supressing their epistemological function. So while there may appear to be shared understanding, rather one relation may outrank another (Hart and Underwood, 2012).

6. "Systems of Formation – relations that act as an inviolable rule" (Hart and Underwood, 2010); and

We explained the nature and purpose of systems of formation in chapter 3. However the compelling or inviolable nature of the system of formation is the 'unconscious' nature made discoverable by archaeology as noted in the introduction to this chapter (Gutting, 2008).

7. "The effect of the body" (ibid.).

Exposure of the body to a practice may result in adoption of a wider range of competing epistemological functions than the immediate practitioner's discourse might indicate. Thus, working in information systems development does not happen in a vacuum. So the other discourse, be they institutional, medical, economic, cultural, generational or otherwise as we will discover, are affected by the position of the body that carries the mind to be inscribed with the rules and systems of formation. So, working in information systems development in a bank may expose the body to different epistemological forces than developing information systems in a military context. This of course relates to the potential for multiple discursive formations to mix and perhaps invoke a superordinate or subordinate relation.

The need for the seven tests arose because we needed a method to convince ourselves that we had indeed located discourse. In addition, this contribution and the one to follow have enabled the application of the theory of archaeology to narrative histories, viewed as texts, and is a design that will guide our analysis in Chapter 5, Part 1 and Part 2.

From the design of tests applied to our initial participant D.'s narrative in 2010 we implemented a specific line of questioning (Hart & Underwood, 2012) when interpreting the narrative of J., where we ask ourselves the following questions to facilitate analysis:

1. Where is discourse(s) in this text? Are there any discursive formations?;
2. Does this text contain any discursive statements, and from what discourse does it come? [our theoretical subjects] Do they come from the same discourse?;
3. Are there one, or many discourses [and consequently, systems of formation] in operation?;
4. How are they [the theoretical objects of our study] related, separately and divisively or cohesively and together?;
5. Can we name them [the theoretical objects of our study] to relate them to commonly used ideas [notions]?; and
6. What are their [the theoretical objects of our study] boundaries, the limits of presence, and necessary conditions of existence?

The analysis in Chapter 5, Part 2 will leverage our ability to locate through interpretation the discursive objects by the seven tests; asking ourselves the six questions we can attempt to hone in on the evidence of the operation and mechanisms of our theoretical objects of research; and, in the exteriority and rarity of discourse, we will maintain the perspective of the exterior of the concepts without seeking to discover or interpret any 'inner secret' which, in our approach, is an erroneous approach. This method does not have a perspective on 'why' the discourse of information systems development is shaped as it is. It's thought of as a phenomenon.

Design of ethics & administration

Lastly, we note the following topics related to ethical and administrative research design considerations:

1. Ethical conduct - this research is conducted under the Human Research Ethics Committee (HREC) guidelines and clearance as granted by the University of Technology, Sydney. The clearance number is 'UTS HREC REF NO. 2011-099A'.

2. De-identified data collection, storage and security – The data, being audio files and transcripts thereof, have no link to the individual's identity. The data is held securely on a computer which requires a challenge/response logon. Only Dr. Jim Underwood and myself have access to the data. The data will be held for the required length of period under applicable Australian State and National guidelines, which is 7 years in the Australian State of New South Wales.

3. No harm through reputational damage – The key ethical design consideration is the fact that since permission was granted for the author to interview people known to him previously for the reasons stated above (cf. design of collection, above), then the risk to their reputations needs to be managed. This was done by ensuring that the participant felt in control of the interview such that if they felt uncomfortable they were at liberty to abort the interview and have the recording up to that point deleted at no consequence to themselves. This did

not occur, however. This was embedded in the personal consent form (cf. Appendix A).

4. Personal consent form – A personal consent form which explained the ability of the participant to abort the interview should they so wish, or to at any time in the future contact myself, or Dr. Underwood, and to request the interview and all materials be deleted with no consequence to themselves was prepared, discussed, agreed and signed prior to the commencement of the interview. This form also grants us their permission to use the data in the research. This was discussed with each participant, signed and is kept securely, separately from the data materials. A copy of the personal consent form template is shown in Appendix A.

5. Information sheet – An information sheet was provided to the participant after the interview was completed to provide them with more information on the purpose and hoped for outcomes of the research. A copy of the information sheet is shown in Appendix B.

Closing Remarks

The establishment of a research method to compliment and execute the discovery of the theoretical objects of our 'territory of concepts' has involved a number of choices. Firstly, by treating the participant's historical narrative as a text, we invented a platform for examining the epistemological mechanisms in operation. Developing seven tests of discourse has enabled us to take this step. After locating discourse in general terms, we can then orient ourselves to the examination of available statements (units of meaning) and the exploration of the likely mechanisms (systems of formation) whose rules establish the discursive relations that we are uncovering by this type of interpretation of the data. We will use a loose conceptual grouping (narrative elements) to organise the data in order to make the excerpts story-like in Chapter 5, Part 1; however upon analysis in Chapter 5, Part 2 this organisation becomes an investigation of the elements in the absence of the participants, seeking the power-relations in operation in and among formations and their discursive boundaries. This is possible by taking an exterior position relative to the human speakers, outside of anthropological, psychological or sociological discourse, and is

revealed by the experiences of our participants especially where boundary conflict is evident.

This chapter has explained the design of our research method that we have crafted in order to use the archaeological theory. Of course Foucault probably had a different approach, but that part of his work, how he actually went about writing his archaeologies, his own research design, is not available to us. Consequently the design of data collection and design of analysis relative to the theory discussed here presents itself as one of the benefits of the research. Our next chapter will present the data and initial interpretation itself, and then we move onto the final interpretation via discursive analysis (and conclusions) per the method described in this chapter.

Chapter 5, Part 1 - Narrative data excerpts and interpretation

Approach to Part 1

This part of the interpretative approach for each participant's text is described in four pieces. Firstly, we begin with a preface of each person's history, being a brief contextual statement about the participant with a chronology of their working life. Also, because we have worked with each of them in the workplace, we offer a further contextual statement about their personal 'features' and characteristics. These are contextual statements to orient the reader to the participant's working life and situation.

Secondly, after that introduction to the person, we start by choosing the elements from their narrative history that stand out as material to the strategic choices and thinking they exhibit in their working life, and provide our discursive interpretation that makes up their 'territory of concepts'. These elements are a consistent and notable feature of their narrative (a 'shard' in the archaeology metaphor), but since this data stands independently of the theory, such elements may or may not be relevant to the research objective. They have been chosen as discursively significant on the basis that we have internalised the theory over the course of this project. To illustrate these elements, we choose a number of representative excerpts from the interview, which is cross-referenced by the line number of the interview transcript.

This second stage is done more or less without interpretation to represent the data to the reader. Thus these elements represent both the data itself and the evidence we wish to present in support of our case. Where 'shards' repeat, we include the best examples that reflect the nature of that element. Because the narrative in all cases is chronological, albeit through the power of mental recollection, the elements may not be persistent for the whole narrative. Some may arise while others disappear. Some may be emphasised then deemphasised through prominent and repeated occurences. We feel that the narratives, while being a remembrance, do reflect the historical development of the individual and the complex forces they are involved in. So, as the

individual grew in capability and capacity, the topics and discussion too evolved. This is very helpful and what we hoped for in the design of the interviews conceived in Chapter 4.

Thirdly, at the end of each interview further interpretation of the elements and their significance to the research objective of studying power-relations in information systems development is undertaken, looking for evidence of discursive formations and statements in the 'territory of concepts' presented by the textual elements. This marks out the potential presence of discursive power-relations that we will further analyse and assess in Chapter 5, Part 2.

The last stage of initial interpretation involves the move to the next participant. When we move on to the next participant's interview, because each of them is involved in various aspects of information systems development, we could reasonably expect that their elements could be shared and related, and a degree of similarity should be observed. Thus, in addition to newly emerging elements from each interview, identification of these shared and related elements is observed, along with corroborating excerpts. We repeat steps one to three while looking for these shared elements. As we move to the interpretation in stage three, gradually increasing comparisons are available among participants.

We now proceed to investigate the narrative of each participant in order of their interview sequence as described in Chapter 4 (cf. Evolution of the Approach); building up an appreciation of the conceptual territory each operates with to make their strategic choices and moves.

About D.

When I interviewed D. he was a permanent staff member, second in charge to a CIO of a publically listed company. His title is 'Solutions Service Manager'. D. is about 45 years old. D. had started but not finished a business degree at two universities, and has a varied background including insurance, accounting , PC Networking, technology sales and project management. Subsequent to the interview he left the organisation involuntarily. D. has been in the workforce for approximately 25 years.

D.'s life and work signposts:

a. Various jobs post-high school (e.g.: Jewelry warehouse, [Government] Department 1985);

b. Start then switches Universities (Accounting), never completes;

c. Works for small life insurance company in accounting, swaps to IT, PC & Network support, company gets taken over, move away from PC's, D. leaves voluntarily;

d. Second job, larger life insurance company, gets sacked over fiber network implementation;

e. Third job, works for Transport company (briefly) on contract - $45K p.a.;

f. Gets new contract at [Telecommunications] on $80K p.a. D.'s job is outsourced;

g. Gets another contract at [Bank] as help desk operator $40 per hour;

h. Gets another contract for [IT Company] setting up a service desk for a Bank, asked to leave;

i. Contract job at [IT Company] - $53 per hour for a year, promoted to service manager, earns $114K per annum, runs a profit centre of $2.4M revenue, resigns when new boss appointed;

j. Gets a job with family friend, company goes out of business;

k. Gets a contract for [Large Event] catering firm as IT project manager for a scheduling/rostering system, earns $150K per annum, finishes when [Large Event] done; then

l. Gets a job at [IT Company] as a senior infrastructure project manager on $105-110K per annum permanent job servicing a [Bank], stays for 4.5 years.

D. presents as a rapid fire or action oriented kind of individual who is quick to want to get to the heart of matters and determine resolution. His manner could be deemed abrupt or impatient. You get the feeling that a larger game is being played somewhere else when you deal with him. However, he seemed almost painfully honest (or is it opinionated?) during the interview, proud to tell his story, and unexpectedly emotional at times. In the workplace, D. was apt to change the rules of the game quickly if something wasn't working out as anticipated. This extended to removal of the 'wrong' consultants and contractors for the job. Maybe his underlying assumption is that there is always a latent problem with other people (not ideas) and it's his responsibility to correct this.

Element 1 – Relative Measurement

The history of D. is prominent with benchmarks of salary, measurements of market earning capacity, and recollections of measurements.

A. "So I did that [first insurance company job] for 4 years from 1986-1990. I ended up supervising the PC support people. (I think we got to the 386 [processor] in those days…I used to know all the models). The assistant actuary actually bought one for $25K, then a few months later the price for one went to $17K and my salary at the time was $21K, it's a fairly interesting [comparison], you know how it was." (l.42-45)

B. "But then when I went to this bigger life insurance company they were more committed to LANs, they had about 20 people in the personal computing compared with 3 or 4." (l.58-59)

C. "I was the sole bread winner I was on $45K per year basically I had no money in the bank, credit cards to the hilt after returning from leave, stress levels to the hilt." (l.161-162)

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D. "They weren't happy, they thought I was over paid, they didn't understand computing etc., I was sitting at my desk one day. I'd gone from $45K to $35K, they thought I was overpaid, compared with truck drivers, they didn't see the value-add, I was doing support for their software system." (l.210-213)

E. "I get a phone call from [my agent, X who got me the job at], the second life insurance company, and he was a high end networking specialist, saying: 'look I've been rung by [contact of agent X] they have this contract at a large telecommunications company at $35 per hour.' I didn't earn that kind of money I was earning $14 per hour or something. So, I thought this is pretty good money, I went along and I got the job, so that was working for a very large telecommunications company." (l.220-224)

F. "On top of being sacked, brutally, and then going to a working [sic] on a low paid job for this scrappy transport company, it was a very humbling experience, but I guess I was grateful that I had an income stream, and it gave me a chance, and I got a phone call, and I got into a contract where I earned $80,000 in one year, so I went from $45,000 to $80,000 [in the new job]." (l.238-241)

 G. "So I went in on $40 per hour, which was good money for service desk position. The other people were on about $30,000 p.a. so there was a fair bit of tension. It was a 'quality experience' [sarcastic]. When I started I had a TPG PC, it was 75 MHz, it was in pieces, this was in about 1996. It was just a disaster." (l.267-270)

H. "[Insurance Company], I was working there for about a year as a techie, they [IT Company] said can you become this services manager to help us set up our [ERP] services…I'd earnt $114,000 that year to the dollar…it was the second highest stress job I'd every worked in, it was horrific." (l. 327-329)

I. "Actually when we got rid of the payroll manager, I had a joke with the General Manager, who wasn't a computing person, but he said 'I want you to be like an enema'. I think I was earning $150,000 a year which he wanted to pay me $110,000 per year so he'd been told he had to pay a lot more, and he [therefore] thought I was a superman and he listened to me." (l.372-375)

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J. "I spent a year to 14 months arguing whether they would pay me $110,000 a year or $105,000 a year. Meantime I was earning about $140,000 a year as a contractor." (l.399-400)

Element 2 – Pride

D.'s story features expressions that are possibly a sign of pride in his own superior competency.

A. "There was a guy (previously mentioned as a potential retiree) who was, as they say, '95 in the shade', but I didn't see me getting that job." (l.21-22)

B. "After 8 months they hired a guy to look after NSW…what they call a 'spreadsheet manager'…" (l.-333-334)

C. "I laughingly call a permanent job 'low paying temporary work'." (l.314)

D. "One of my nicknames was 'the immovable deadline'…[Another] Nickname that has followed me throughout my career since (please don't tell anyone) is the 'smiling assassin'…" (l.368-369)

E. "I set a time up with him…to 'open the kimono', my whole business model, some lucrative some not, but I was servicing people, and that was just the way it had to be." (l.336-368)

F. "I'm a person who generally enjoys my work because I come to work with a positive attitude, even at the [Government Department] in 1985. If I really don't like a job it's usually because I don't like the boss, so I leave. I often say there's two types of people, those who talk about leaving a job [due to dissatisfaction] and those who do leave their job…anyway that's a bit harsh." (l.386-389)

Element 3 – Boundaries

D.'s encounters with the structures of other forces such as management and politicking marks his journey as one of conflict with and traversal across boundaries or horizons. This signifies a willingness to traverse as well.

A. "…but projects: in terms of one of the challenges with white collar work you can go to work all day and feel like you haven't achieved anything, but with projects you actually build a *widget*. And real project management is you have an idea and you transform that into a system, and sometime you're given no more than an idea and you have to extract from peoples heads and getting them to work together so I mean it is very challenging." (l.36-39)

B. "When this other company took over the first small life insurance company I first worked at, that company were so mainframe focused. I'd put in a superannuation LAN and a word processing LAN as well obviously PC standalone, they came in and the management said: 'We're going to get rid of this superannuation network, because you run superannuation systems on a mainframe', and this was about the way their brain worked, that was the intelligence; there was a clear *commitment* away from personal computing so it was career death even if they wanted to fit me into the organisation after special projects was over, which was: 'Extract the IP out of D.'s brain'…" (l.51-57)

C. "It's a classic example of what looks like a crap job – there was OS/2 which was a dying technology, in theory it was if every time I wanted to scratch my bum I had to ring [Insurance Company.] [D.'s client]…it turned out to be one of the best jobs I ever had, I had 2 customer sites in Parramatta, one in Sydney, one in Newcastle, I was paid $53 an hour, I developed good relationship/friendship in Queensland who supported NSW while they were finding someone and I ended up becoming my own boss. My boss was in Queensland. I had one complaint in the whole time I was there. Generally I was loved….I had autonomy and full control over the server, the WAN." (l.319-325)

D. "He looked at my business I was running very successfully...and he said you've got these people paying [them] $100 per hour and only making $120 per hour on

them, and he said this is very bad business…I set a time up with him…to 'open the kimono', my whole business model, some lucrative some not, but I was servicing people, and that was just the way it had to be, if I had hired permanents I would have been a great loss maker with them sitting around. He spent the first half hour [of the meeting] talking, and I had called the meeting…[D. notes simultaneously a family friend previously approached him to run his services business for a distribution company, which subsequently went bust, but was less stressful]…so I'd had this offer on this table…but it was a bad career move in terms of me moving to this smaller company, but after this half hour episode, I resigned." (l.334-342)

E. "One of my nicknames was 'the immovable deadline'…[Another] Nickname that has followed me throughout my career since (please don't tell anyone) is the 'smiling assassin'… for a number of reasons. I got rid of 5, I got rid of my assistant PM, the payroll manager, the incumbent service provider for LAN support, 5 people I got sacked in getting the job done, and of course the vendor, [I] had an enormous amount of power. Actually when we got rid of the payroll manager, I had a joke with the General Manager, who wasn't a computing person, but he said 'I want you to be like an enema'. I think I was earning $150,000 a year which he wanted to pay me $110,000 per year so he'd been told he had to pay a lot more, and he [therefore] thought I was a superman and he listened to me…I went into his office with one of my best one liners, and I said to him: 'do you remember when I started and you wanted me to be like an enema?' well I said to him: 'this requires surgery'. And this woman, to give you an idea of her powerbase, she'd left twice, and both times come back on more money, but I walked in and said: 'she was sacked', and she was sacked." (l.368-378)

Element 4 – Computing

Especially earlier in D.'s history, the computing machinery (PC, mainframe, networks, databases) is a dominant feature on equal footing with people as an element in his story.

A. "At around the end of 1986, we're talking about PCXT being state of the art, 8080i processor, first PC had 20MB, 640K RAM, you know the deal." (l.22-23)

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B. "I thought computing, I'm pushing the memory banks here…at the time IT was more interesting – and I could also see - I certainly didn't see the Internet or anything [coming] – but I could see that there was an opportunity there, as opposed to the other area where there are a lot of other people in front of me. I would also say the paper work side [in IT] was fairly similar to the accounting paper work side – I sadly reflect that I did find interest in accounting – but, I have always found computing more interesting…" (l.31-35)

C. "So I put in synoptic chassis hubs with original blades you could put in these things and UTP, I think it was CAT4 in those days…and then we, they had for instance they had this superannuation server – It was a Epson 386 PC25 sitting under the administrators desk – this was how the backup were done for a fairly large life insurance company! – 'everyone off the server for an hour we have to do a back-up'." (l. 113-117)

D. "Well, I said [to them] I had another job, and the managing director at that time said: 'you need to get used to this idea that computing doesn't pay well, and you're not going to get the big bucks out there'…they seemed to have a hang up about the cost of IT. It's a fairly similar story that we see across the years." (l.234-236)

E. "I sincerely think [pause] I believe as a techie [stops]. In my [farewell] speech [at the Telecommunications company] I gave a comment – I don't think I'm a brilliant techie, I think I'm a relatively brilliant techie. And I did some reasonably leading edge stuff in my career as a techie. But I'm not intellectually brilliant, I was [brilliant] up to about 12 years old, but something happened in my high school career, and I was [became] above average. I consider myself to be smart." (l. 256.260)

F. "And users were complaining they'd put data in and then the data would disappear then reappear. Now you're [the interviewer] a computing man, that was not possible." (l.361-362)

G. "When the Chief scheduler and rosterer [sic], who was a smart guy with computing, rang me and said it, I said that's it, we make the decision [to throw it

out]…took about 4 conversations with the Managing Director to get the message across…fantastic we were going to screw over this person [scheduling/rostering vendor] who was screwing us over, then we went 'Oh Shit!, we have to write some software!'" (l. 362-366)

Regarding the elements

In examining D's history there is an interesting early shift away from an insurance and administrative environment (#4B) to a belief or even love of the 'machinery' of technology (#2C,#3B), and a strong identification with that machinery in the form of the jargon of the machine (#1A,#1G,#4A,#4B). That passion turns into a lucrative model where the search for greater economic return (#1) is coupled with a seeming maturity and independence (#3), a strong expression which came about during the pressure of the job (#3C) and the [major event] (#4G).

D.'s story is possibly one of seeking optimum conditions of work, wanting to be rewarded in hard monetary terms for not only effort but also for service and skill. This reminds us of Test 1 (cf. Ch. 4) – the struggle between surfaces. This could be constructed as being a relation between the concepts of a superior value proposition of D.'s worth as an IT practitioner and the debt or obligation that any employer owes to have these superior services. D.'s willingness to continue such service in his early career is made based upon hard economic return, but in the later years is also based upon the element of independence (#3). The competency or skills derived from the 'love' of the machine, and subsequently delivering projects with people *and* machines, is perhaps the root justification in D.'s discourse for why this basis exists. His appetite for a constant relative measure of the worth of his skills is an internalised relative-to-market measure. This ever present measure is treated as a proxy or shadow non-present cohort of peers, and disparity in equity to what he is obtaining is the type of event which preoccupies him.

Throughout his career the basis of his personal statement of value or worth expands to statements about the value or worth of software (#4G) and even other people (#3E). The market mechanism is intertwined within the love, expertise and facility in computing (#4E: "I am a relatively brilliant techie"), but such expertise has its basis in

and only exists when recognised and rewarded in hard 'cash' terms by market forces. This expertise itself seeks recognition when the conditions in which it finds itself no longer are favourable. The resistance to permanent employment and the struggle to find recognition in optimum conditions underline this mode. Without the market, D.'s skills and knowledge, developed only for a market, are possibly worthless. There is no love of knowledge of computing independent of its economic value per se. This is probably quite common, knowing to work to earn money. For the independently rich, knowing may be enough.

M.'s. narrative.

About M.

When interviewed M. was a contract staffer, working for a finance systems replacement project. He didn't have a formal title per se. M. is approximately 48 years old. He has a Science degree in mathematics, science and psychology, with 13 years of government service followed by independent contracting for Banks and Telco's. Subsequent to the interview he left that specific organisation and is engaged in further work as a contract IT business analyst for an automotive finance company. M. has been in the workforce for approximately 25-30 years.

M.'s life and work signposts:

a. Brought up by grandparents, grandfather a boiler-maker, grandmother a believer in science;
b. Catholic high-school education;
c. Melanoma operation, opts out of offer from University [X] Law, enrolls in University [Y] Bachelor of Science degree;
d. Holiday jobs, questions value of University, persists and completes;
e. First Job in the public service writing queries for [Government Agency 1], resigns because unpopular (Grade I/II);
f. Starts Bachelor of Arts at University [Z]., quits mid-way due to travel;
g. Second Job in [Government Agency 2], home loan modeling in Lotus 1-2-3 (Grade III/IV), TAFE course in IT;
h. Third Job [Government Agency 3], IT trainer position (Grade V/VI), small team management;
i. Completes Graduate Diploma in Computing;
j. Fourth and Fifth job, [Government Agency 4 & 5], Systems Analyst (Grade VII/VIII);
k. Starts then discontinues Masters in Information Science;
l. Sixth Job [Government Agency 6], blend of roles, the 'Country doctor', Grade IX/X;
m. Public Sector management course in recognition of effort;

n. Leaves public service due to money and under appreciation;

o. Becomes SQL programmer on contract for [Telco] and on call for old job on contract;

p. Travels to American VBA (code) conference;

q. Contract to [Bank 1];

r. Becomes team lead at [Bank 1] on a permanent basis;

s. Server migration issue at [Bank 1], loss of sponsors confidence, resigns; then

t. Contract for [Insurance 1], in a friendly team.

I suspect M. only works because he has to meet financial commitments. His interests when I met him lie in trivia and comics, dogs, horse racing, rugby league and rubbishing sloppy thinking. Highly intelligent, his wry observations of the world and considered opinions on seemingly everything are ready at the tip of his tongue. He could be easily described as erudite due to autodidactic practices. He exhibited no real dress sense and doesn't worry about that aspect in the workplace. He seems to have largely opted out of voluntary engagement with the larger work environment, plugs into the radio or podcasts while he works. Could be easily described as apolitical in the workplace, but paradoxically is interested in the intellectual side of politics in Australia as was evidenced in the interviews. He is a very dependable individual and a quick technical study, where I imparted some internals of the [ERP] API's and general ledger to him, he'd never seen it, but picked it up and ran with it no problems. I don't recall him ever coming to a team lunch, of which there were a few in our 2.5 years working together. On the other hand, I didn't go to his trivia nights either.

Element 1 – Judgement

The story of M. is dominated by judgemental thought about himself, his conditions, others and the world.

A. "And they [the government department M. worked in] were most famous for approving funds for jobs, and their most infamous ones was they funded a clown in residence for the ACTU, and they were granting funds to all kinds of strange people like 'dykes on bikes'…I just observed in my role where I started off which was in the

Approvals section with what came back from the Ministers office as approved…as it turned out there were people in that organisation who had connections to these strange community groups." (l.74-79)

B. "Quite different from my previous role…basically I left, and the project collapsed. One of the guys was sick of this boss and his nepotism…one of the guys left and asked me to come across. Stupid. Stupid. You think I would have learnt from the last time, fell into it again. This fellow was no better, basically he was an alcoholic. I didn't not enjoy that role, *but*, they started up a project and allowed me getting involved in documenting requirements and functional specifications." (l.204-208)

C. "With the public service I was right up there. Hence the fact I applied for this SQL job it's something concrete I know…in the end I probably sold myself a bit short because it proved so easy to get a job, they were just so desperate for people." (l.278-280)

D. "They had an IT team of 5 people who (exasperation) you know, the lead guy was a nice guy but a bit lazy, but a couple of other people were, you know, you wouldn't feed them. And they didn't really care either. And they hadn't been able to issue a (customer) statement for about 3 months. So I was assigned to tidy this up… Anyway, I gutted the whole thing and did it all in Visual Basic, which I'd learnt in America. And I was still in touch with this guy from the magazine and I was sending him emails. Within a matter of months, that team of four or five people had dropped down to just me." (l.296-304)

E. "And I thought, look, to that point I'd been working on the basis that I had the full support of the business head who was the person I valued and had a relationship with from the beginning, and that was the person who was really my customer - I held a great regard for this guy. There was nothing personal in it but I felt at that point I'd lost him [the trust of the business head]. So, I came home and said to the missus [wife] this had happened and she said: 'Look, you'll have to resign'. She'd been telling me for a number of months to resign anyway." (l.410-415)

Element 2 – Knowing

M. is worried about what to know, what not to know, what others know, and the precision or competency with which he and others know.

A. "…you know, but when you're standing in a lab dropping weights in lab for 2 hours or timing them or, you know, pipetting some chemical into something else, um, that that's just fundamentally…I found that at that point in my life very boring…" (l.21-23)

B. "So…they taught us PASCAL on the old punched cards, you fill in the lead pencil on the card, and, feed them through a feeder, and I suppose to some extent that coloured my view of computing as a bit of a laborious, boring thing" (l. 28-30)

C. "As for my own philosophy…what informs my own view of the world is that very much science is the one reliable means to knowledge. You can have people sitting around, and this probably comes from observing the Nuns…prattling and talking platitudes and all this as much as you want, but their views are only as valid as anyone else babbling platitudes. Science at least gives you a means to some concrete truth." (l.131-134)

D. "That process of discovery, the joy of creating a macro and then learning that within the macro you had your program structures, so I would do things for myself but also for the course, get someone to write a macro to flash up a word in blinking text then changed the word through an iterative loop…those kind of playful things that are also instructive. So, yeah, that joy of getting in depth into something like that…and some satisfaction, I got a lot of good feedback out of that role that things seemed to be going very well". (l.163-167)

E. "One night, I was sitting right at this table in this spot here studying this stuff [Masters of Information Science]. And there was a cricket match on TV, Australia versus South Africa, and it was quite interesting, and I just said [to myself]: 'look, I'm not interested in doing this stuff, this is boring me, I don't think it'll get me ahead because I've seen all these people with no qualifications get ahead, I don't think

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there's a return in doing this course'. I closed the book and quit the course and I've never studied anything else formally. That was 1997." (l.223-228)

F. "And in fact at this time at that place they had their own internal management training group come in, and a lot of it, there was a lot of rubbish in what they had. But there was one thing they had that was interesting was a model of personalities, that divided people up into 'knowers', who were people who just makes up a decision and it's this, (and you know a knower can be very wrong but they'll still know the next time). There are thinkers who consider things 'Ooo, these are the options, what would be the best course', and then there are Feelers. And it was after that that I recognised in myself I've always been a feeler, I've always done things instinctively on feeling, you know the whole university thing. Oh : 'I would *feel* more comfortable going to [University]'. Choosing to go into the public service: 'Oh I *feel* that's kind of the easier option for me at this point'. And similarly, with the job at [Bank 1]. Things just no longer felt right. And that was the point I had to quit." (l.428-437)

Element 3 – Boundaries

An element as first excavated in D.'s narrative. Unlike D the boundaries are described by Knowing (Element 2) not people or organisations.

A. "Funnily enough, I'll just go back to that other agency, because it's probably my greatest employment failure or whatever you like …And various outsiders [also] applied for that job [the one M. had been acting in]. That woman who couldn't do the timesheets, she got her job. I'd been acting in that role. I didn't get my job. I was third for the job I was acting in. A woman from outside got it [the job M. was acting in] and another fellow was next on eligibility list [M. was third], and when I said to the job convenor, 'well what's she like at computing etc.?', he said: 'she's very very good, she owns a commodore 64', so I thought 'OK, fine'. As it turns out they rang me within a fortnight of leaving there to come back and help out because they couldn't work out how to do certain queries, I declined doing that. Ironically…I subsequently found out that the woman with the commodore 64, when she turned up and they said: 'here's the computing system, get in and start learning', she said: 'no,

you need to train me first, I'm not just operating it, I require training'. So I take quite great delight from that." (l.101-109)

B. "That was probably one of my favourite jobs I ever had…you conduct the course, at the end of the day your job is done there's no threat of projects and so forth and delivery dates hanging over you as I am experiencing in my current role, and look, it was very good. And there was some management component but I must say I've never been a great manager of people and I now realise that's not for me." (l.151-154)

C. "There were a number of blunders…as part of that process [of becoming the team lead] I became permanent, they wanted me to turn permanent to take that job. I looked at it as a real advancement and I felt it would be really a major step for me and it was, *however*, things started going wrong. One of the things that went wrong was it was a system I didn't know. It was in an obscure language. For me to manage something I need to feel that I know it pretty well. Otherwise people can bluff you et cetera. I just really didn't know. So I always felt that residual staff that were left there, the team of three or four, were having a bit of a lend of me at times." (l.324-329)

Element 4 – Relative Measurement

An element as first excavated in in D.'s narrative.

A. "Anyway, I was going so well thinking as you do, I'm so much better qualified than these other people who were on the administrative stream, outperforming them, I should be getting rewarded in some way here?" (l.233-234)

B. "It was at the course that I found out someone was going on leave at a higher level, one of the admin people who was Grade XI/XII in the admin stream, and they were promoting this fellow who was on the same level as me to the higher role, who everyone regarded as a complete deadhead, and I thought to myself: 'if they really appreciated what they were doing even though he was on the admin stream they would have worked out some way to pay me the [higher] money [too]'." (l. 239-243)

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C. "I developed a system in VBA [spreadsheet programming language] to run their investments module, it was a great application, and [I'd] done all this stuff. And I thought: '…you were paying an outside agency to do this', which they had before, paying hideous amounts to an outside agency. And I picked up all this stuff and getting paid this [lower pay], you're not appreciating me." (l.257-260)

D. "As a person in the public service I think you often talk yourself down and you think to yourself: 'all these people working at [Another Bank] or what have you they're super intellectual and extremely efficient', et cetera. So I probably had quite a bit of trepidation [moving to private enterprise]." (l. 275-278)

Regarding the elements

M., in common with D., participates in the relative measurement of his worth and skills, as measured by lack of parity in monetary return (#3.A-D) or government job grade ranking. The hard currency of job grade is swapped for the hard currency of money in the private sector, both done as relative measurement against peers. While expressing a motive of inequity, the exterior effect is the same as D., skill for reward. Both also chose contracting as the mechanism to achieve that outcome in the private sector, to maximize return, perhaps keeping a form of organisational belonging at arms length. Where private sector discourse disrupts a public sector employee, swapping of relative measures is perhaps caused by frustration at stymied hierarchical progress (#2E).

Interestingly, while M. engages with the joy of learning new technology, unlike D., he seems to profess no especial love of the machine or computing that is independent of the joy of knowing in general. It is through *enjoyable knowing* (#2D) that M. derives his satisfaction (#3C). However, M. is selective of which knowledge is acceptable, that which is boring (#2A-B), and which found its ultimate expression in rejection of a masters degree which was a pre-requisite for civil service promotion, which he traded for a private sector work model (#2E). This is different to D. who rejected business and insurance studies due to inability to progress, maybe saw computing as a new thing with less obstacles to progress, whereas M. rejected the knowledge on the basis of the innate level of interest without regard for the material gain of knowing.

M. does not necessarily seek to know for material gain, it is a by-product of knowing something the market values, and which M. himself undervalued initially (#3D) Consequently knowing computing is just a type of useful knowledge, he is not 'in love with' computing.

M. dominates his knowing with judgments. We are uncertain why this is. In contrast to differentiating types of knowledge in boring/non-boring, useful/non-useful, judgment dominates impartial knowing, and is indiscriminate applying to others (#1A-D) and himself (#1E). Whether this is disadvantageous to him, or he could ride through the problems, doesn't seem to occur.

About T.

When I interviewed T. she was permanent employee, working for a government agency in the health sector as a specialist advisor in the field of health informatics. T. is about 52 years old. Her background is in general surgery, which she practiced in Russia, followed by a masters degree in health informatics and experience in that, all in the health sectors. T. continues to work for the same government agency in a similar capacity. She has been in the workforce for more than 25 years. T. immigrated to New Zealand then moved to Australia.

T.'s life & work signposts include:

a. Completes Bachelor degree as a Surgeon in Russia;

b. Member of surgery team in local hospital;

c. Patient dies, inadequate description, disagreements;

d. Attends to large number of patients from local farming collective;

e. Disagreeable interaction with bureaucratic processes including information collection;

f. Completes Master in Surgery specialising in cardio-vascular surgery. Starts PhD but doesn't complete;

g. Uses ambulance to transport insulin. Conditions deteriorate;

h. Obtains position in [elite] hospital, conditions better, but not "real" medicine;

i. Migrates from Russia to New Zealand. Change in law, looses medical accreditation rights, poverty;

j. Gets job as interpreter in hospital, starts Masters in Health Care Management;

k. Gets job working on maintenance of directory of health care providers at [Health area #1];

l. Writes transcripts for local radio stations for community health messages because doctors too busy;

m. Gets job at [Health area #2] as a co-ordinator of their medical directory;

n. Early innovation of data collection using Internet, works closely with software developers, this becomes prominent [IT Solution], using ICT9 standards; then

o. Using New Zealand successes, approached to help establish national medical and patient directory in Australia. Migrates to Australia to work for [Government Agency].

T. presents as a kind hearted genuine person without apparent artifice. It was a pleasure to work with her. She has had a difficult life in the main compared with the other participants, a thing I didn't know when I worked with her, but has triumphed nonetheless. She doesn't fit particularly well with the organisation culture that surrounds her and really strives to do her best when she determines what that focused goal is, seemingly regardless of that culture. Strong willed and plain speaking when doing her best, she otherwise appears indifferent or unfocussed. She is earmarked as somewhat eccentric, unfortunately behind her back. I think she's aware of this however and is indifferent. She had the strong support of her general manager, who disregarded that and focused on the merits. This does not mean she is not ambitious or cunning, and she has developed a strong international reputation in her health informatics chosen field.

Element 1 – Duty

T. is driven by her duty as a surgeon, a duty to heal.

A. "So if some one comes to the hospital you cant just say 'sorry, come next time'… you have to see everyone, so sometimes it was over 100 patients a day…no matter how many patients I saw, my salary was exactly the same all the time…so it didn't matter I thought [to myself] 'My God!, I am saving lives here' and then I have to collect all this [statistical] information…I didn't have any incentive [to collect that statistical information]." (l.54-57)

B. "I didn't like it [manual statistical data collection], personally I didn't see any value…we were so tired, it was so hard, and the way it was collected, the statistician who would come over…I'm a surgeon I kind of have respect to myself, and saving life and sometimes killing people, and I do know if I save them, and usually we were very, very tired." (l.64-67)

C. "What I did, I had a diabetic person, she was dying, and I had friends in Moscow, I said 'can you give me insulin', and they said 'yes, send a car…'. I asked the [ambulance] driver to get the insulin, which he did, and they said 'how dare I send an ambulance!', but I said 'it was an emergency situation…'. Was very upset". (l.136-139)

D. "So I was organising for the Doctors to go on the radio, they would come with soundproof material [to set up the temporary recording studio] and they used my scripts for the interview so radio people knew what to ask and the doctors knew what area to talk about. I also wrote advertising for them about health related advertising [on the radio]…this was volunteer work. I was a Doctor and other Doctors were too busy to do this, so I said 'I can do it…'. I was very popular with poor people because I was one of them." (l.206-210)

E. "But he died because of complications and this is a huge huge mistake in surgery, the thing that no one ever forgives, that's why we have a rule, it is better to operate than to not operate." (l.18-19)

Element 2 – Efficiency

T. applies the principles of surgical efficiency in new contexts.

A. "My goal was at that point was population needs analysis…I was looking at the hospital admission data and seeing for what conditions they were hospitalised for and I was looking at geographic distribution for which conditions they were going to GP's surgery. And, if the Doctor knew the patient has diabetes in the GP surgery, how come this patient ended up in the hospital with an amputated leg? Something like that. So quality of care between primary and secondary interface, plus needs analysis within our geographic area." (l.266-271)

B. "And there was not a single initiative I missed. I applied for all of them and I could justify why I needed that money, unlike other places, 'give me as much money as you can and we'll use it as best as we can'. No, I was saying I had that many of this and that many of that, and how I will be using this money, And, there was a lot of money.

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And also, if we managed to save government money due to efficiency…the government would give us money back…and I used some of this money for information technology, and that's why I was buying these codes [embedded clinical and other data codes], and also to upgrade systems, paid for the Internet connections, which was great…and I established competition [between data collectors in surgeries]…" (l.297-304)

C. "I couldn't do individual health, because I wasn't registered [in NZ], but I think working on communities and improving communities health is probably even more rewarding, the feeling you get is more rewarding. You save thousands of people if you get something right. You get money for that." (l.319-321)

Element 3 - Boundaries

An element as first excavated in in D.'s narrative. Similar to D., these boundaries are described by people, organisations and additionally, institutions, such as the NZ medical registration board, or the community of surgeons.

A. "That's life in Russia, it's still happening. Because, to get this [kind of support or services] role you have to be good acquaintance of general manager – the big guns, they are untouchable…we couldn't do anything." (l.77-78)

B. "So I was working at this hospital, it was getting worse and worse, and all our support services were getting even worse. They became *rude*…before they were at least respectful, and at one point they were so offensive I said I can't work for this [hospital] anymore…what I did, I had a diabetic person, she was dying, and I had friends in Moscow, I said can you give me insulin, and they said yes, send a car…I asked the [ambulance] driver to get the insulin, which he did, and they said how dare I send an ambulance, but I said it was an emergency situation…was very upset." (l.134-139)

C. "I had never seen such…even here [in Australia], it was like Hilton hospital or something…whatever you want, no one would ask why you need this medication, in 5 minutes you had everything…and they were very nice, very respectful. Yeah, great

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times. But, it wasn't real surgery. Keyhole surgery started, and they trained me in that…but I left." (l.145-148)

D. "And I was still trying to get registration, but it was really, really hard and they said it will take you 5 years…and I will not be a surgeon but a GP. I probably don't want to do this [be a GP]." (l.166-168)

E. "So I went to the Uni. of [X] and to do Masters of Health Care management. The reason for this is I changed sides. I was always envious of these office managers, they were paid more, no responsibility and were just telling people what to do. So I said [to myself] I'll go on the bright side of the healthcare job [profession]." (l.170-172)

F. "So I spent the first three months and I was hoping to get extension…but my direct manager hated me…I think I made lots of mistakes myself in communications, in my mind I still saw myself as a surgeon, as a respected person. In my mind I was still who I am. But in my position, my government income supported position, poorly clothed; I was wearing very cheap clothes from second hand shops, but I thought they were good clothes, it's only now I can see that people can see. Even the bags [I carried], I had lots of giveaways from my poverty, if you have a D. Jones bag, I was having the warehouse bag, it was a bag, it was doing the job, I didn't care. The outside world treated me like a poor unemployed whose trying to grab something, get the job, grab something. In a way they [the staff?] were using this, but inside in my mind, in my world, I was a respected educated surgeon and a good surgeon, so I didn't loose respect for myself. And when I went to the meetings, usually with the doctors, I dared to talk to them as equal, and they didn't like it. Doctors were OK, but they [non-Doctors?] were looking at me, freaking out saying 'my God, the dog can talk!' that was what their reaction was. And she [my manager] didn't like that…if she guided me through this I would have behaved better. But I didn't know." (l.189-200)

Element 4 – Certainty

In contrast to M. who worries about what to know, T. knows that which is certain.

A. "My Professor, he was working on ulcers…now we know the majority ulcers, peptic ulcers, only now we know they are caused by bacteria…pelorius…this was a discovery…so the theory was that ulcers are caused by stress…also I was working on how problems in tissues that starts with microcirculation…and this is true, if no supply to that part of the body, gangrene develops" (l.102-105)

B. "At the same time I was studying computers as well because I realised I have to learn excel spreadsheet, all this kind of stuff. Over there [New Zealand] I realise that I have a competitive advantage even if I never become a health care manager…everyone who was studying with me, and they were senior managers, and to get in was difficult…they go through a list so if you're 'S', you miss the cut-off…So, the competitive advantage was I wasn't afraid of statistics and mathematics and computing. All the rest were trying to be as far away from those disciplines…" (l.172-178)

C. "Then, when I started analysing the files, I realise that collection is a problem, no standards…when I was talking to people [who submitted data], they said were using exactly what our system has, the menu, the reference table, it's not our problem. And then I started talking to the software developers, 5 companies that produce this type of software and I gave them requirements on standardisation and what I want." (l.246-249)

D. "I knew exactly what are the standards, for example: for clinical coding, for primary care were the RET(?) codes and for secondary care hospitals ICT9…I said to them that's what you have to use, and they were national but they were not adopted by primary care at all…[prior to the embedding of the standards in the software they were not used]…because they did not understand the value, 'why do we need to collect? What's in it for me?'. What I did, the first thing I did was to [focus] on quality, completeness number one. Standards was the second, it wasn't their fault, it was only the systems." (l.259-264)

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Regarding the elements.

T.'s discourse is one of duty, efficiency, certainty. A duty to heal, a duty to not stint when those demands that are placed upon her are excessive (#1A), or conditions are not ideal (#1C). That medical knowledge is certain (#4A), is very unlike M.'s quest for the truth, the broad and deep truths are already known, so the quest is instead to seek certainty of diagnosis. Also unlike M. there is no judgmental element in T.'s discourse, the duty to enact the ethos of surgery is always brought to bear even if T. is not recognised as such by external institutions (#1D), or in fact 'over-rewarded' for her skill (#3C).

The power of T.'s discourse is one to preserve her role and function as a surgeon in the face of the boundary opposition of: statistical data collectors (#1A-B), bureaucracy (#3A-B), accreditation institutions (#3D,#4E) and management (#3A,E). Through rules of the preeminence of this duty in her surgical discourse, a translation to a new context of statistical population level health ensues. Given T.'s resentment of the statistical data collectors previously (#1A-B), perhaps her resentment is not related to their purpose but their superior authority to in fact force T. to collect statistics which are unnecessary to her medical discourse (#1B), an authority which was acquired, not through hard study and expertise, but cheaply, through a type of hegemonic acquaintance, and thus is rude to her (#3A-B).

The information systems gathered and developed for T.'s reimagined medical purpose are the population level surgical instruments of healing. This brings T. to comprehend the use of an information system as an efficient population level 'surgical' instrument (#2C). Regardless of whether it is individual or population level 'surgical' practice, certainty is always the goal and presumably the measure of success in her duty. The power of her discourse is to usurp the information systems discourse, or at least co-opt it to her discourse's purpose.

About S.

When I interviewed S. he was a contract staffer, working for a Financial Services IT department on IT strategy work. His title is Analyst. S. is about 32 years old. He has a UK degree in Econometrics and has worked for four or five banks in his career which is a mix between mostly Finance and some IT work to-date. S. continues in this same role today. S. has been in the workforce for more than 10 years. S. immigrated from the United Kingdom to Australia.

NB: Due to a technical issue with the recording device the first 30 minutes of the interview was lost, so the second half of the interview only is used (about 40 minutes). We feel this is still representative because in that time we gathered useable text (387 lines) as much as for a 'full' interview (D:490 lines, M:520 lines, T:374 lines, S:387 lines, J:483 lines, T2:260 lines, Y:492 lines, I: 516 lines).

S.'s life and work signposts include:

a. Graduates from UK University in Economics and Econometrics;
b. Graduate finance analyst position then finance analyst job in UK [Bank];
c. Migrates to Australia, Analyst job in Sydney [Bank];
d. Job as a finance analyst/manager at [Another Bank] in Sydney developing synthetic prime brokerage platform, manages team of 60 ICT developers;
e. Annual conference in Oktoberfest – 100 staff flown to Munich for a week, gets new boss at [Another Bank];
f. Gets his bonus and permanent residency, then leaves [Another Bank];
g. Job as finance analyst/owner for own software company in Sydney developing Anti-Money Laundering (AML) solution, agrees to shelve due to 2009 global economic downturn; then
h. Re-joins Sydney [Bank] as an IT Analyst.

S. talks extremely quickly, his work on presentations using power point is blazingly fast. His opinions are not ill considered even if they are coming out at a million miles

an hour. For a younger man much of his hair is peppered with grey. S. did some work for me and I was astounded at his proficiency. Always upbeat and chirpy, nothing seems to phase him and he has a healthy sense of irony about the banking environment, where he has always worked. He is highly rational and maybe also somewhat fatalistic when political resistance is encountered in the workplace. For someone who held a global, demanding and senior position at a young age (managed 60 IT developers), he seemed very happy to work solo producing PowerPoint presentations when I met him. He strongly identifies with the concept of 'Analyst' which he explains to be analytical/quantitative, befitting his studies. For such a young, capable individual he appears unfortunately 'over it' or maybe somewhat burnt out.

Element 1 – Structure

S. seeks to structure the phenomenon he encounters.

A. "I guess from the experience I had at [Bank] I wanted to make sure that I was going into an environment that was a bit less emotive, a little bit more structured a little bit more professional than [Bank] had been at that time. I actually had a friend that went to work for [Another Bank]. In my mind [Another Bank] has a very good brand out there in terms of professionalism and that sort of stuff." (l. 3-6)

B. "He's a very [stops]. It was just a very strange environment in terms of how the power those guys have over what happens whether it's logical or illogical in terms of [stops]. Both from a business perspective and from a technology perspective." (l.197-199)

C. "And it's an environment where, it's like the Roman gladiators fighting each other in the office all day. It's not an environment I'd like to work in again." (l.202-203)

D. "We always got on really well because he's [S.'s business partner] very *regimented* in what he does [*I: this is his 5 years in the Army?*] Yep. Very kind of. [stops] I always had a lot of respect for how he operated, quality of his work, all that kind of stuff." (l.234-236)

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E. "I wanted to get into an environment where, and I don't think to make a lot of money or anything, but to be in an environment where I enjoyed going to work, happy to get up in the morning, go there, rather than Sunday night before you go to school feeling: 'Ooooh, I don't want to go to school'. We had a few conversations about that and decided to kind of do something [business together]" (l.239-242)

Element 2 – Resiliency

S. is resilient to non-ideal and ambiguous conditions.

A. "I actually met with a gentleman called Geoff who heads up an area called 'GEF' [laughs, irony] which is global equity finance in [Another Bank] Equities area. And the way he explained the job to me was that he wanted me to be more of a, a stroke between a business analyst, a project manager and a kind of business development manager. Which really pricked my ears up a bit." (l.21-24)

B. "They go in there, make money as quick as they can because they know there's no longevity in the business [specific product line], then they're all sacked and down the tubes they go. There no long term view in what happens in the technology, and that's why [Another Bank] is this 'Federated states of, eh, [Another Bank]'" (l.49-51)

C. "There was no job description you had to find out and make it what you wanted it to be. You're on the team, you're fighting for these guys over here, and you had to do some business analysis, you had to do some project management, some business development, you had to make sure the products were well represented, whatever. Just general 'everything'. I did everything. My job changed on a day to day basis, as would everyone else's." (l.83-86)

D. "This was 2009. Things went pretty pear shaped then [Global Financial Crisis]. We're trying to sell, uh. Even though it was a niche product, there were about 6000 organisations that are caught under the [Anti-Money Laundering] Act in terms of they provide designated services. At that time it was just like talking to a brick wall. There were a number of organisations that needed a solution but were just waiting cause

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they kind of realised the regulator's not coming to start fining anyone in the middle of the GFC so the heat went off the market kind of thing." (l.281-286)

E. "So we've done that [AML solution] and what we're planning to do [now] is release vertical, industry specific vertical CRM applications. Ah, so I guess our value proposition is: 'Every industry has it's own nuances to track, so instead of getting an out of the box CRM, we're going to develop industry specific CRMS which maybe for doctors or dentists or physios, automated sales. So, there's a lot in industries we've researched that there is some opportunity in, so effectively we're going to brand that specifically for each industry and have a hosted version of that for each one." (l.331-336)

Element 3 – Boundaries

An element as first excavated in in D.'s narrative. Similar to D. & T., the boundaries are people and organisationally drawn.

A. "So I'm new boy on the block [at Another Bank] and I'm going: 'Hi guys', and they're saying 'Who the hell's this guy'…The business had grown quite considerably. Geoff had started the business about 4 years before with three guys. He actually came from the accounting area, went to the boss of the area, said: 'I wanted to start up an equity finance business'. They said: 'OK, you suggested it, you run it'. And he'd built it from nothing to this $400 million mega-industry in 5 years, so he was like the golden boy." (l.42-46)

B. "And [for the old banking hands I met on the first day] I think there was a real: 'I've done the hard yards at [Another Bank] and I'm not telling you anything, you have to swim on your own. So if you sink or swim I'm not having anything to do with you, sounds like you're gonna sink, so get away from me as quickly as possible.' So I thought: 'Right. OK'" (l.78-81)

C. "So I was walking him [the business sponsor] across the street and I said: 'OK, what were gonna do today is blah blah blah, look at this and look at that', and we're getting into the lift, and I'm explaining him the functions of the system that we're

going to demo to him and he [the business system sponsor] said to me: 'You're not scared of me anymore are you?' and I was like: 'Nah, no, I'm not, I kind of understand where you're coming from. No, I'm not scared' and he goes 'Fuck' and started muttering under his breath again." (l.184-189)

Element 4 – Business

S. is immersed in the rules, argot and logic of business.

A. "So it wasn't trading the actual underlying equities, because they already had that but there's a synthetic side to that. So if you wanted to hedge your equity positions you'd use our system. So this whole massive kind of, you had to do your whole trade life cycle, pre-trade trade, post trade. You had to do all of the collateral, the statement-in, you had to do all your margin calls, reporting, integration into the risk platforms. It was a whole distributed set of systems. It wasn't a: 'let's introduce this one application that'll get in', it was: 'Let's develop all these new applications and it was all developed in house cause there's no real off the shelf products for these kind of things and they build a lot of it for competitive advantage kind of thing, speed to market, execution that sort of stuff." (l. 96-103)

B. "The business didn't really care about you or the development or anything, they just wanted results. It was completely based around results. Whether it was the right way to do something compared with the quickest way, obviously the quickest way was better, because that meant that you could just come back because once it's in production they could come back and say: 'it's your problem just fix it." (l.130-133)

C. *I: in this job you were part of the management team?* "Well, yes and no, because unless you are an executive director, your just fucking at their beck and call. Right? So, those guys [at Another Bank] they just rule with an iron fist and if you're not working out, you're gone. There's no real kind of one warning, two warnings, you're just out the door." (l.143-147)

D. "What kept me going? My visa. I was still on that 457 Visa and I was employed by [Another Bank] so I couldn't leave. Or an 802. [Another Bank] sponsored me for

permanent residency here which I ended up getting from [Another Bank], but I had to stay there for two years. So, I stayed there for two years and soon as the two years were up and I got a bonus I was like: 'skedaddle', so I left." (l.216-219)

E. "We had a look at the overseas competitors [for Anti-Money Laundering software], obviously very large organisations. So we decided, they [competitors] are million dollars plus for a license, completely out of step for a small organisation. So we had a few conversations with a network of contacts, and said: 'Well that seems like a pretty good idea'. Weir (?) used to work for one of the overseas banks and they are going to get one of the big players in. Small investment houses and brokers…there's a whole raft of smaller banks and credit unions…that can't afford a million dollars, let's try and get a small SME [Small and Medium Enterprise] offering out there. We did some research, asked around, seemed like a good idea so kicked off doing that." (l.248-255)

F. "We had a good idea who it was we wanted to target in the market and we'd spoken to the vast majority of them, and we weren't getting the traction that we needed, so we went and put this back to the investors, and everyone's like: 'Nah, we're not putting any more money in' and we were: 'Yeah, actually you're right'. So we just shelved it [the Anti-Money Laundering software]." (l.294-297)

Regarding the Elements

S.'s resiliency to ambiguity and non-ideal conditions (#2A-E) is in direct contrast to both D. and M, who really churn out of their jobs if it doesn't match their discourse. S. identifies strongly with the notion of an 'analyst' in his own job (cf. About S.). The evidence gathered suggests that at its core, the discourse of analysis is to structure and restructure the situation (#1A-C) and thus enable resiliency to changes in conditions because there is always the possibility of structure, or restructure, and adaption, rather than T.'s certainty. When S. obtains sufficient experience, he enacts resistance to these conditions, he takes control, again unlike D. & M., and starts his own business which will be more structured, with a like minded colleague (#1D-E). But his business like any other is subject to the same rules and forces (#4D-E).

The power or at least aggression (#3C) of the business discourse, it's rules and prohibitions (#4A-C) enable considerations of restructure and resiliency to be superior characteristics that, unlike our previous participants, D. & M., enable S. to survive in situ, although he is imprisoned by his own choosing for a time (#4D). While not in the interview recording, in common with I. below, S. communicated to me his desire to live in Australia is a strong motivator to escape, in his assessment, the oppression of the United Kingdom.

The business discourse is comparable to T.'s medical discourse in terms of it's pervasive horizon. D. & M. in contrast to T. and S. are somehow 'inside' or wrapped by the superordinate business discourse, which has now emerged in the story of S. Their boundaries however are experienced in common. Resiliency and structure in the discourse of S.'s business compensate for the absence of certainty that exists in the T.'s medical discourse.

About J.

When I interviewed J. he was a permanent employee, working as an IT Analyst in a financial services organisation. J. is 23 years old and continues in this job today. J. has a Bachelor of Computing in Business Information Technology. J. has been in the full-time workforce for 2 years. His parents own a small business making chocolates.

J.'s life & work signposts include:

a. Interest in computers from an early age of 6;

b. Acts as PC support in primary school;

c. Becomes aware that software development is not his strong suit in high school;

d. Enrols and completes Bachelor of Information Technology as a necessary pre-requisite to getting a corporate job. Avoids software development mostly;

e. Works during University course as an IT test analyst;

f. Gets "sucked-in" to the Apple marketing, adopts the latest devices in personal life;

g. Starts as an IT graduate in a bank;

h. First graduate rotation in IT contact centre project; then

i. Second graduate rotation as IT Analyst. Chooses this as his permanent preference.

J. presents as a happy go lucky young man, but in conversation strong and yet considered opinions will surface quickly, often off topic. He is a great team player and is very quick on the keyboard and a friendly and articulate individual. His actions can be interpreted as ambitious, certainly he is following a plan of some kind, for example he purchased and moved into an apartment at age 23, expressed very strong opinions about the types of organisations he would consider working for. We can take this to mean he is considers himself highly independent. But his main mode of operation as a very young man is outgoing and friendly. For example, when I bumped into him on the train with his female friend of the same generation, he quickly

included me in the conversation without hesitation. A highly sociable man with strong opinions and some anger or at least 'attitude' with it.

While we analysed J. in Hart and Underwood (2012), here we reprise his narrative to align with the interpretative analysis approach taken for the thesis.

Element 1 - Computing.

An element as first excavated in in D.'s narrative.

A. "In terms of my confidence around the whole computer thing, at high school it kind of dipped a little bit when I started programming. So even to this day I'm not a strong programmer at all. And we did software development in the mid to late stages of high school. And I was really good at the information processes and technology type subjects but terrible at this software development." (l.40-44)

B. "I get frustrated using (I know it's getting quite specific, but) our work computing environment XP, Windows 6 (sorry) IE 6 [Internet Explorer 6] I think its quite ridiculous. I understand the complexity and all and I understand it's not as simple as just installing a new operating system with active directories and all that kind of stuff. But for me I'm very frustrated in the sense that I have to use a crappy old technology." (l.323-327)

C. "Obviously you can teach it [programming/coding] but there's something that you need, to have, for it to work well. And I know that I do like that, and that why I guess I'm in the business I guess, strategy type roles, not so hands on. Although in saying that I used to view myself as a technical computer person. I guess it's more to put things into reality, I'm probably not the techie but I understand the windows, the operating system environment very well, but just not a strong programmer" (l.50-54)

Element 2 – Pride

As excavated first in D., J. takes pride in the speed and efficiency aspects of his skills, and expects this in others.

A. "I think my interest as I get older is to do more the mainstream stuff that everyone else is doing. But a lot faster than most people. My Mum and Dad when they watch me on the computer just go: 'This is too much I get nervous when I watch you because you're so quick'. So I'm quite confident in doing things quicker than most but I've kind of hit the point where I'm more towards now reading and learning articles now whereas I wouldn't have done that a few years ago [during University]." (l.126-130)

B. "I was doing stuff but I felt I could have been doing a lot more and I feel quite awkward when I see the team around the place because I feel that they think I'm pretty shit to be honest because I didn't contribute as to what I could." (l.299-301)

C. "And we walked to the room with a bunch of 10 other people...and someone goes: 'Oh, is this your assistant' and the guy said: 'Yeah, he is my assistant' which I obviously didn't like because I wasn't his assistant doing his crap. So I said: 'No mate, I'm not your assistant.' I gave it to him in front of everyone. I did that because I thought it was important to just not take shit." (l.310-313)

D. [*I: Whereas you said before you're the kind of guy that likes to get hold of something and execute it...what is holding things up?*] "No stuffing around, no arguing over little things, debating over little things that in the great scheme of things isn't...Literally overpowering personalities that want to take over the situation and not do things in a team like manner. Going off and having your own agenda...to get ahead, to look good, to appear in control, to be powerful, it's a real arrogance thing I think. It's not just my view as well, it's shared among a lot of people." (l.357-363)

Element 3 - Business

An element as first excavated in in S.'s narrative.

A. "I see myself moving around not every year but 4 year cycles. Career? Progressing up the hierarchy is key. Making my own team hopefully at some point. People management." (l.289-291)

B. "Once I finished Uni., like I travelled for 5 weeks but it wasn't a priority for me, it was getting that job, getting my foot in the door to a big organisation that was my priority." (l.257-258)

C. "Maybe it's the prestige of a corporate environment as well." *I: has it measured up in terms of prestige?* "Yeah, I think so. I think it's generally well received in a social situation. Because everyone recognises top brands. Personally at this point in my career I wouldn't go to a small organisation, I wouldn't go to a small development house of 100 people, or a consultancy firm of 100 people. For me I see that as a career limiting move at this time. I don't know why I feel like that." (l.275-283)

D. "I learned heaps at Uni., it was awesome. But in terms of the whole experience, and the social aspect as well, it wasn't my cup of tea. But I did learn a lot and it actually launched my career as such, now going to the workplace." (l.199-201)

Element 4 - Social

J.'s passion for the social is enhanced by the digital experience of the social.

A. "I won't go on the computer at night because I'm sick of sitting down. I need to get out. I play quite a lot of sport. So when I play sport that's the release for me…it almost consumes you. I feel that the internet consumes me. I would say it's somewhat of an addiction to be honest…[*I: what are you addicted to?*] Continually being up to date with things [is this FoMO[7]?]. So I'm not a massive Facebook buff, I'm not the

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[7] Apparently called Fear of Missing Out (FoMO)

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type to write a status update, but I'm the type to look what other people are saying. For instance I guess it's: when I wake up, check the news, check Facebook. Obviously breakfast, go to work on the train, I'll do it again, when I'm at work its different, lunch time in there checking again, when I get to the train station after work, check it again, then at night. It's never-ending really. And I haven't thought about it really but when I'm saying it back [to you] it's 'Shit!'. It's a lot of internet access really…you feel out of the loop." (l.164-173)

B. "Most [people at work] would be approachable. Some would be not so approachable, they would be blunt or rude. I find most people quite friendly, which is nice. I also enjoy the diversity of the [current] workplace...there's Aussies, Indians, Pom's, South Africans. There's a whole range of people so everyone can get together. But, I think I would categorise it into approachable and friendly and knowledgeable, generally, and maybe rude, blunt, not approachable." (l.335-339)

C. "Yeah. But usually I don't give those people the time of day. But when you're at work you have to deal with people like that, it's part of the job. You just get on with it, but. If I meet people outside of work that are like that I won't hang out with them simple as that." (l.367-369)

D. "I just think that it's unnecessary. I think that you can still be friendly, still be approachable, still be in control, without telling people what to do, and being so overpowering in the way you address things. I don't think you need to be arrogant, I don't think you need to be overpowering to get ahead. You obviously need to be smart and knowledgeable, be a good people person, but I just think it's so unnecessary." (l.376-379)

Regarding the Elements

J.'s discourse is entwined with competing tensions between the need for the social (which we will also cover in Y. below) and business. The social leaks into the business discourse by reveling in the prominence of brand (#3C) and by seeking to express opinions on the necessary shape of business (#4D). Unlike S., who at the beginning of his second banking position, soon abandons the importance of the brand

and instead resists the strictness of the institutional rules, J. revels in the brand of business as it compliments his social discourse, he is able to represent who he is in social situations. We feel that the business discourse he finds himself in is in a power-relation with his social discourse. This comes out as a work/private dichotomy. (#4C.)

Unlike the last four participants, the boundaries and conflict or friction (Test 1) are not overtly prominent (cf. however #4B), perhaps due to J.'s short length of time in the workforce, or perhaps due to the different nature of J's social element (#4A) that avoids or does not to adapt well to conflict (#4B).

What is digital is what is new, and what is new is what is digital (#1B). J.'s digital proficiency, expressed at this time in the exercise of computing knowledge, leaks into his team work (#2B-D). J. has a long heritage of being fast in relation to computers (#2A), but his computing discourse excludes the programmatic (#1A,C). J. sees his future in hierarchies and team management (#3A), which is the proper place of business discourse at his stage of career, unlike S. above, who progresses to a harder kernel of irrefutable and aggressive business logic (cf. Interview 4 S. #3C, #4B-C).

While we have approached the analysis of J. differently this time than in Hart & Underwood (2012), and benefiting from a broader set of participants, the conclusions are similar in that business dominates the social. Perhaps brand as an element of business discourse (#3C) irrupts the social rule of identity (cf. #3B,D), which Y., a contemporary of J. as we will see below, does not have as an imperative.

About T2.

When I interviewed T2. he was a permanent employee, working as a senior IT infrastructure manager in a financial services organisation. T2. is about 42 years old and continues in this job today. T2. has been in the full-time workforce for approximately 20 years and has worked for three companies in that time.

T2.'s life & work signposts include:

- First class honours in Electrical Engineering in Perth University;
- Takes IT graduate job in Canberra government department, starts on help-desk;
- Moves himself away from help-desk and works on IT Unix type projects;
- Acts in a higher position for 2 years, then downgraded, gets job in non-IT security field in project management deploying high-end workstations;
- Moves to back to IT infrastructure role in same organisation;
- Wife wishes them to move to Sydney;
- Gets a job in Sydney for a shipping company in IT infrastructure;
- Works in an Australian shipping hub;
- Physically relocates to the same job in their UK shipping hub in same organisation for infrastructure consolidation work. Relocates back to Sydney; then
- Works for [Bank] in infrastructure.

T2. presents as a considered and insightful individual, whose opinions are not easily meted out but when spoken have weight due to the depth of consideration. He is rational and open to reasoned argument, and has a strong delivery ethic. He is not reticent interpersonally and deals with the irony in life with humour. When I last met T2. he had been promoted to a senior position after 10 years of service in the same organisation. During the interview he mentions that if it were not for his wife he would still be in the same job he started as a graduate. And he's been in technical

infrastructure roles for most of his career, which he strongly identifies with, of course. So, we can take this to mean that he doesn't like change greatly. Only incorrect thinking as regards his infrastructure bailiwick seemed to bother him in the workplace.

Element 1 – Computing.

An element as first excavated in in D.'s narrative.

A. "I did general IT support then project management with more, I guess you call it more business facing stuff. So essentially for much of that time I was Unix administration and Unix projects." (l.8-10)

B. "…my entire career and the direction it went in, so whatever it is 20 years or something, down to this day was decided by one person who didn't even know who I was...he decided what part of IT I would do. I only knew him later...so he decided I would go into infrastructure, he needed 20 [graduates] in one place and 20 in another. I had thought I would go into application development or security, but that wasn't to be. I didn't mind. Looking back, that major [decision] I find it quite entertaining...this guy decides I'm going to do infrastructure." (l.13-18)

C. "Eventually they created some [unclassified] code and then I need to work out what to do with this [supposedly non-ANSI compliant] code...it's completely outside of my area [coding]...after three days of looking at this one page of [sample] code you realise this code is not ANSI standard, but could be made to be." (l.126-129)

D. "…and I have a lot of respect for that CIO…I still sort of see him often - well he wasn't CIO he was infrastructure manager or whatever he was - but I think looking back on it that [pauses] um competition [between geographic based hubs] like that, to get the most out of his team was ultimately very ineffectual…so that was quite interesting, that whole thing." (l.223-226)

Element 2 – Pride.

An element as first excavated in in D.'s narrative.

A. "It was general IT work...Although I graduated from the University of [X] with first class honors, my first job was cleaning keyboards, that didn't last forever." (l.7-8)

B. "Some of these guys [engineers] were technically good, but they weren't actually that technically good, but they were good, they were good." (l.104-105)

C. "I always wanted to be right, it was always very important to me to always be, to be right, but I'm not pretty [much] like that anymore, and if I wasn't right it...you know if there's this pressure building up for weeks on an issue and you're right you get this flood of endorphins running through your body and you remember that flood for many many years, but then looking back...there would be better ways...but its not wanting to be wrong, also...It's something about my personality, I just don't want to be last at anything...it's not about winning it's about not loosing" (l.113-118)

D. "The implications of it not being ANSI standard is that they would be right, I would be wrong, and we shouldn't have bought that hardware. It was just that." (l.132-133)

E. "It's a very small thing and you built this massive thing [in the old Government organisation] underneath it to defeat [nullify] it, whereas these people [in the new Commercial organisation], the most exciting part of their day, is to implement this thing, which is quite old fashioned. When you saw that mind set [in the new organisation], it was sort of depressing." (l.153-161)

Element 3 – Boundaries

An element as first excavated in in D.'s narrative. With D., T. and S, the boundaries are described by people and organisations, with M. it was knowing. For T2. the boundaries are also along the lines of technical knowledge.

A. "I got that promotion...more security related. How things work in the government, if you are at a certain level in one area [even for] a day they have to transfer you to my old area, any other area at the same [thus higher] level. Back to IT related. This job I got [the promotion in] was security related IT, but I wanted to work in infrastructure related IT, so that sort of sorted itself out." (l.90-93)

B. "So it was non-IT related, but it was still technology related, they had a program management office, major projects, so that was my first invocation into project management and all that kind of stuff. There was a lot of non-IT projects that were technology projects. It was really outside your comfort zone, you're dealing with a lot of things that are technical in nature that are not IT, so I had to deal with there really technical people who didn't want to be managed, date, time and deliverables and all that kind of stuff, and generally those sort of people when under pressure, or some of them anyway, will treat you like an idiot... so that sort of conflict started occurring." (l.56-62)

C. "If they changed a few lines it [the non-ANSI code] would run on any new hardware. At the end they were pissed off with me and they didn't want to talk to me, but I got a new job in Sydney." (l.135-136)

D. "It was really easy to hate these people [in the London Hub], *no* not to hate. It was really easy to *disagree* with these people, because then you had your mates and your hub and you get closer together and these guys [in London] are idiots. Looking back on it…you can really, [pause] yeah, see [long pause]. It's very easy to disagree with someone you've never met who you really don't understand because it brings you closer to someone else you are working with on a day to day basis, and…so even if what you are saying isn't technically right it's easy to do that because it gives you a

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more warm and fuzzy feeling to be closer to these [Australian hub] people." (l.184-192)

Regarding the Elements

T2.'s story is the first one to contain only repeating elements from the foregoing participants. He has three from four elements in common with D. with the exception of business, which is absent. This is consistent with T2.'s profile, being a career technical infrastructure person, it is expected that the rules of business are less material to his reality. However some of the 'illogicality' that T2. observes (#1B,D) in his environment of computing could be the ingress of the rules of business discourse.

T2's story also continues the element of Pride that we have seen in D. and J. This is a pride in being technically right and T2. provides a very clear depiction of the meaning of this (#2C). Complementary to D. and J. whose pride came from their own expertise or proficiency, T2.'s pride is more about not being wrong, which is not related to T.'s mandate of certainty, and not part of S.'s resiliency to uncertainty, a hallmark of the business discourse.

The boundaries persist (#3A-D), but, in common with M., they are described along bases of knowledge (what is right or not wrong), rather than people or organisational constructs. The deep technical 'warfare' between security technology and information technology (#2B, #2D, #3B) resulting from T2.'s insertion to a security technology discourse (the primary purpose of that organisation) is particularly interesting. This means that discursive boundaries can arise amongst knowledges that, from an encyclopedia or biological classification mindset, are not divided. If the real world data supports this view, then we question efforts to harmonise taxonomically related knowledges, such that computer security and infrastructure are not branches of the same discipline based on a fragment of real-world data excavated here.

Y.'s narrative.

About Y.

When I interviewed Y. he was a java developer working for a large systems integrator. He has undertaken small team management in the past but on this occasion was working as team member. Y. is about 27 years old at the time of being interviewed, and has been in the workforce for approximately 5 years, mostly in the software development arena for asset management software.

Y.'s life & work signposts include:

- Undergraduate work experience as a sales analyst/accounting for [large systems integrator];
- Graduates from University [X] in Sydney with Degree in Computer Engineering;
- Considers Masters but Bachelors thesis experience deters Y.;
- Joins an asset management software company;
- Turned off by the culture; then
- Considers options, joins same [large systems integrator] as in undergraduate work experience.

Y. is well regarded by his client as the go-to person to resolve complex issues related to feasibility or rectification of issues with the [ERP] asset management system he is expert in. Although in the instance I met him, he was a team member, he has team leadership experience. Y. is flamboyant in his dress sense at work, especially on casual Fridays, and was derided by his team mates on some occasions. He seems to have a very well informed opinion on multiple topics. He is very technologically switched on and in social settings is constantly checking his smartphone.

Y.'s narrative.

Element 1 – Pride

An element as first excavated in in D.'s narrative.

A. "The thing about computer science is there is no compulsory subjects, the students have free will to just choose anything that interests them. In computer engineering you have to do physics, you have to do math's, you have to do probability and some finance as well, so it gives the added electrical engineering subjects and telecommunications. So that's why. Computer science is also three years not four years like computer engineering. Then I had to do a thesis so it's a lot more rigorous degree in computer engineering." (l. 28-33)

B. "Yes. Just a higher UAI. [I: how much?] By quite a lot actually…Computer engineering requited 92, computer science 80 something. Or 75-80. It's also shorter. So its more of a [stops]. Some people start off by doing computer science then come over to computer engineering." (l.37-39)

C. "Because it was asset management, it was a lot of [mathematical] analysis and some IT work. They did say you'd need a math's degree or some knowledge in mathematics, and I had to do a sort of IT exam to get in." (l.64-66)

Element 2 – Boundaries

An element as first excavated in D.'s narrative.

A. "And also to be honest, the managers, they didn't come around and communicate too much with the employees as well, so that also bottled up that culture as well, the managers are very crucial to setting the culture of the company as well, they would just stay in their room come into work and just leave, they wouldn't go around and say 'Hi' to everyone, so…" (l.128-132)

B. "As a developer you're only coming halfway. You're not there from the start. So, I want to voice my opinion on how to do the solution and design as well. Otherwise you're coming in halfway and looking at a design that's already finalised…what

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happens if you want to change that design will that affect other systems in the design as well?" (l.242-244)

Element 3 - Social

An element as first excavated in J.'s narrative.

A. "The overall [University] experience, I enjoyed the first two or three years very much and then its sort of, I started to begin to lose interest, I wanted to start working and partying." (l.46-48)

B. "I didn't like the culture of the small company, because it was just head down, work 24 [x7] …and most of the people kept to themselves and they didn't talk too much. After 6 months, this was doing my head in." (l.68-70)

C. "I didn't think something so slight would spread around the whole workplace (expresses frustration). There was no repercussion or anything on this, and I stood back and thought: 'Well…I didn't know you can't make a slight error in this place'. And that's not a real good thing to have as well, it'll probably stress people out," (l.170-172)

D. "Mainly just jumping into a product, a project with no real prior experience, not just the one I first started, after the first few months they just threw you in the deep end and said: 'Learn it, develop it'. I thought: 'What *is* happening?'." (l.201-203)

E. "Well, no, basically like I said before I was put in the deep end and said 'You'll need to do this' and develop the thing so…I think it's more the relationships you develop with everyone, because you would need to communicate more with people and I do like to communicate with people, I don't like to sit down the desk and work away, I do like to interact with other people that's why I enjoy that because you do get to interact with different people from various cultures and they do want to talk with you as well and they do want to give you your opinions as well." (l.319-324)

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Element 4 - Diversity

Y. embraces the new and the different.

A. "I was really interested in statistics, probability. So what happened was I tried to look for a course at Uni. that had everything combined but there were not many degrees except computer engineering that had the flexibility. There are other science degrees like math's but they don't have…with computer engineering you can have a fair few electives [at University X]. When I did computer engineering I did quantum computing, physics, chemistry, math's subjects along with all my computer, programming IT systems subjects" (l.2-6)

B. "So, mainly mathematical and also just to see how…just getting data and analysing that…I did do that before at the internship role with [large systems integrator], the sales analysis role. So I was quite interested in that even though it had nothing to do with IT, it was still very interesting." (l.81-83)

C. "I wanted something that they can give me some offer of personal development as well, so I didn't think Microsoft would be like that, I actually thought I would be a small fish in a big pond kinda thing. That was my concern when I went to [large systems integrator] for internship, but it actually proved me wrong. That's how I got into my first one [job]." (l.91-94)

D. "before I got into the second [job] at [large systems integrator], I actually got a job offer from Google as well…[I: you did?] I did have a friend who worked there and they said the culture is good, but the work is very demanding and sometimes there's not much [room] for progression as well. [I: what does progression mean to you?] Just personal development and getting promoted and things like that." (l.99-101)

E. "Because [ERP] it'll have its financial management, asset facilities, everything, so you do get to learn different aspects within that so that's why I wasn't too concerned about doing the statistics side, because I know I can always go back to that, I know that there are roles available in [large systems integrator] that I can probably get some statistics and mathematical analysis work. I want to spend my time with [ERP] and

get everything out of that first then maybe go back to mathematical analysis." (l.183-187)

F. "I had developed quite a bit on projects, with Maximo [a type of ERP] and things like that, I have learnt a lot of new things without going to professional/formal training. Business analysis, business development, design…I'd…I'm not concerned about that [lack of training] because I have been developing whilst on projects, so, that's not a concern for me." (l.213-216)

G. [*I: How long will you remain a Developer?*] "Probably a couple of more years, 2 or 3." [*I: what kind of things do you think are you missing?*] "Mainly leading, team leading, and I'll get more projects under my belt, project management and analysis work and then I think, yeah, I've been doing development for 3.5 years, so I *do* want to get out of that phase and go into more leading projects and project management and more business analysis marketing." (l.352-355)

Regarding the Elements

Y. in common with J. constructs his world socially. In fact, he appears to undertake problem solving socially as well, such that though he has undertaken technical education (#1A-C), when confronted with a technical problem, he reaches out to the people around him to achieve solutions (#3E) as opposed to addressing it technically (#3D). This form of inquisitiveness and desire for personal development (#4D) may also indicate a possibility to span boundaries (#2B, #4G), in contrast to T2., who solves problems through his own efforts (cf. T2. #1C). Also in common with J., Y. is only somewhat aware of hard boundaries (#2A-B).

However, Y., in common with D, J. and T2., shares the elements of pride. This is a pride in the superiority of his education and, in common with D, J & T2. missing the element of computing, which is subordinate to the social (#3A), but also subordinate to a newly appearing element, that of diversity (#4B). It is odd for a technical practitioner's narrative history, for someone who has undertaken Java development for 5 years, whose primary job function is IS development, to not have any grain of that in their story, where other IS focused practitioners (D., J., and T2.) *have*

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expressed this. We can plausibly say that the element of computing has been subsumed into diversity of experience (#4G), which is part of progression, personal development and growth (#4D).

Y.'s propensity to change and embrace a diversity thus marks his story as one somewhat similar to J. yet with a different set of rules as to what constitutes success. Diversity and the social are intertwined. Diversity marks his journey from choice of university course (#4A) through to choice of employer, where diversity (#4B,E) dominates the hard won elite knowledge (#1A-B) of computer engineering. The theme of 'personal development' is the expression of the rule of Y.'s discourse to grow horizontally (#4F-G) not vertically in depth for his chosen profession, as T2. has pursued with his infrastructure, even if it was randomly assigned to T2.. The fact that T2. and Y. share a common educational thread (electrical and computer engineering) makes this comparison all the more stark.

Since the element of the social has emerged in J. and Y.'s narrative, and they both do not profess any specific love of the machine like D., this is a possible epistemic generational shift. Has the computing or technical machine been replaced by the social machine? Y.'s interview was sought for purposes of obtaining this comparison or corroboration as it was a noticeable difference. However the element of pride is a constant cross-generational theme in common with many research participants (D., M., J., T2., Y., I.).

About I.

When I interviewed I. he was a contract employee, working as a management consultant in a project management capacity on an ERP implementation for a diverse heavy engineering firm. He had a team of 10 people, responsible for testing, data quality and integration. I is about 32-35 years old and continues in that position today. He had been in the workforce for approximately 12-15 years. I. has immigrated to Australia from Ireland.

I.'s life & work signposts include:

- Undergraduate work experience as a production planner in [Hi-Tech.] industry;
- Graduates from University of [X] in Ireland with B. Eng. in Manufacturing Systems (Business and Engineering combined);
- Returns to same [Hi-Tech.] company post graduation. Senior Manager;
- Leaves [Hi-tech.] company. Travels to Australia. Works for local government municipality as project manager for administering council works;
- Returns to Ireland. Works for global software media distributor;
- Return to Australia. Works for [chemical plant] company. Implements [ERP] Warehouse management;
- After implementation, inadvertently usurps job of national warehouse manager at [chemical plant] company; then
- Leave and gets a job as a management consultant.

I. presents as a friendly, 'firm but fair' type individual with a broad and deep knowledge of engineering and information system, including multiple ERP systems. He is a strong negotiator and a stickler for the rules (for example, document management on projects). I. has been in technical management roles for all of his career, but he is hands on with it. He has a remarkably mature outlook for his relatively young age. Goal oriented and no nonsense he is friendly outside of a work

context. He values hard work and, in common with D., is willing to change a situation without much emotion involved to make something work, including doing the job himself. In the work place he exhibited significant patience and probably plays a long game in order to get the right outcome. He is a 'family man' with strong ethics centered around looking after his family. I only ever saw him quite annoyed once, when I unintentionally disturbed his self-view of his superior expertise.

Element 1 - Pride

An element as first excavated in in D.'s narrative.

A. "I had a bunch of friends who were students in name or title, but I don't think they ever attended at all. Interesting mix. But met some pretty talented guys, they've gone off and done some pretty cool things in all sorts of areas." (l. 36-38)

B. "It was, the points, it was all points basis, it wasn't medicine or actuary, but it was reasonable high standard to get in there so." (l.53-54)

C. "But anyway, the [University] placement was the kicker for me out of University, because in Year 3, I was the first person to, eh, get into [Hi-tech.] from the University." (l.70-71)

D. "I guess very quickly, the production planner [my role] was like the pivotal role in that environment because literally that person or that role [I.] had to dictate what the whole factory was doing on a day to day or week to week basis." (l.98-100)

E. "Worked for some really clever guys at [Hi-tech.]. That was is a big influence. I think when you work with really clever people, as well as powerful people, but probably I enjoy working for clever people more than powerful people, They don't often, they're not necessarily in the same person. Some very influential and powerful, well err, clever guys and in [hi-tech] probably more so than anywhere else, those [clever people] typically ended up in powerful roles." (l.189-193)

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F. "It's a pretty neat operation, because one of the things we had to do was to configure [ERP] to enable I guess the whole order to cash process for embroidery [of corporate uniforms]. It's complex, incredibly complex actually. But we actually got there in the end." (l.346-348)

Element 2 – Business

An element as first excavated in in S.'s narrative. I. has been in the discourse of business from the beginning of his career.

A. "They [Hi-tech.] got rid of all the motherboard manufacturing, moved it offshore, and they introduced this thing called SECC, which was basically a cartridge, the processor was sitting in a cartridge, much like a mobile phone, a little bit smaller maybe, and it plugged into the motherboard. So they brought in that technology, they moved away from the in grid array which they subsequently went back to. So it was a huge investment, and I'm not privy to the reasons why they moved away from it or back to the PGA, the pin grid array option." (l.165-170)

B. "…so if I told him [Managing Director of software media distributor] I needed to do something he'd say: 'Well yeah tell me if they come back and they don't like it, just tell them I said [to do it], and if they challenge it, it's a dictate right'. Obviously you don't want to go in hard like that so there's a change management aspect." (l.312-315)

C. "I think clients keep you on your toes. I think if you're not client facing people get lazy and people get, people accept poor standards, whereas if you've got a client who is paying for a service, typically they'll have a reasonably intelligent guy that's got appropriate requirements in place to make sure he gets that service." (l.321-324)

D. "Well, because of, a lot of it [warehouse system] was data driven. Because people had a conceptual view of what the impact might be, I was probably a bit closer to the data in terms of, well: 'Your lead time is gonna reduce from this to this, your availability on the shelf is gonna go from this to this' and 'I've got all the models and I've developed it with the other guys' and therefore there's fact and science behind it.

So if you translate availability into greater sales on the basis that something's going to be on the shelf rather than not being on the shelf. You can't sell it if it's not on the shelf, so therefore. But that's a big jump for people to make, because they might say 'Well, maybe they'll buy another product instead. They might just come back next week and buy it'. You never really know and a lot of it is a strategic decision. So, that [experience] was really good." (l.371-378)

E. "But it [the warehouse] was underperforming and I wasn't *asked* to get involved but just by my nature I started to effectively mange the warehouse manager, and probably managed him out in a way. It wasn't my intention but the guy was never going to deliver anything good for the organisation." (l.411-414)

Element 3 - Boundaries

An element as first excavated in in D.'s narrative.

A. "Well, there's always conflict between quality and output. That happens everywhere. And often, it's similar to my current role, where you've got opposing parties and opposing priorities." (l.124-125)

B. "It [University degree] was a combined [degree], because I don't see myself necessarily as having a very engineering constructed brain, combined course kind of looked at business and engineering as a combined course… So, it was preparing managers if you like who had a good understanding of manufacturing processes." (l.10-16)

C. "The University of [Y] provided most of the initial resources, so all of the management layer were from the University of [Y]. And then you had some guys coming in. You'd even see some conflicts there between the different Universities. These guys were 25-30. They were young guys in powerful positions. You could see the U. [of Y], the University of [Y] guys almost clubbing together against the University of [X] guys, and mostly in engineering or technical roles." (l.150-154)

D. "Again, this B.Eng manufacturing systems. It had both. But really I'm more on the management side rather than having the technical, that's just how my brain works I guess." (l.184-185)

E. "Got a real taste for travel and that probably led to me saying: 'I need to leave this organisation [Hi-tech.]' because I looked around and all of the people I'd been working with in the motherboard era were starting to put on weight and heading towards middle age at a very young age, and that kind of frightened me a little bit and I said: 'No, let's get out of here'." (l.207-210)

Element 4 – Resiliency

An element as first excavated in in S.'s narrative.

A. "And that path, that was pretty [stops]. I was a driven enough fella at 22 or 20, 19-20, I thought I'd be at a certain [stops], and if I was to replay all of this to that 21 year old, I think he wouldn't be sitting on the chair, he would have fallen off, over some of that paths that this thing [career/life?] has taken, but necessity demanded I get a job and take a job, so I took a job at a company called [software media distributor]." (l.269-272)

B. "Whereas at [Hi-tech.], even though it was a progressive company, it was so large that for organisational control purposes they had to have very defined job definitions and job specs. And stepping outside of those [job specs] was not necessarily good for your career because you'd be stepping on someone else's job definition. And therefore conflict and therefore, you know. So, within this [software media distribution] company, job definition wasn't all that important." (l.279-283)

C. "And then kind of went and did every role in that [software media distributor] company, and the good thing about that company was it was back to being internally [driven], we held our own destiny. We didn't have white papers to consider, we didn't have the global virtual factory footprint to try to move, we could do as we liked pretty much. Bit of a cowboy operation , and its all about cost recovery in those businesses, and some of those practices were a little bit enlightening for me, in terms of some of

the ethics involved in cost recovery, because some of the costs that were recovered were never incurred in the first place. So that was interesting. But pretty quickly you find out that some of these things happen in business, and while it certainly wasn't ideal and it challenged me a little bit, you roll with some of these things, and I did." (l.290-297)

D. "Started [the chemical plant] job on the Monday, and pretty quickly I realised they had no financial authority to proceed with the project, at all. [I: From the CFO?] Yeah, CFO, yeah yeah. There were a lot of approvals in principal but no signature on the dotted line. And we were looking for, maybe 2 or 3 million. Without necessary payback. Now when you ask a CFO for 2 or 3 million without any payback or return it becomes difficult. It's a hard discussion. But for me it was great. I ended up being part of the discussion [with the CFO]." (l.357-362)

Regarding the Elements

For I., the technical love of the machine emerges in his pride in mastering complex things (#1F), but, like Y., I. does not appear to see technology as his native mode (#3B). Instead, it is resiliency which has the upper hand in his personal history (#4A).

For I., the discourse of business (#2A-D) is the backdrop against which he applies his resiliency and navigation of ambiguous conditions, creating rules which form a loose type of certainty (#4C). So, although having similar elements to our other 'business' participant, S., I. is not dominated by the rules and mores of business.

Instead the law of resiliency is preeminent, which governs his perception and enables leveraging of the business discourse. Since I. is sensitive to this, he navigates these formations successfully and to his advantage (#2B,E) , as opposed to rejecting or being rejected by them as D & M, for example, who rather seem to bounce around instead of exploiting them (excepting I. in #3E). This contrast is stark, instead of running away, his resilience overcomes pride in technical correctness to determine the rules of what is a truth (cf. #4A.). Also in contrast to T., who seeks certainty, and remains in that search, I. (and S.) are resilient to adverse and ambiguous conditions. Truths are defined in terms relative to approximation (#2D).

But I. can be challenged in his technical pride (cf. About I.) and, in common with T2., pride is there, albeit less obvious. When I. speaks of the 'clever, talented people', it is clear he includes himself in that category (#1C). These clever people are also powerful, and "err…clever" (#1E). This may indicate some kind of presumed natural hierarchy or order.

Closing Remarks to Part 1

From the eight participants, we have observed and excavated the following elements from their narrative that appear significant to our study of power-relations. Here we list them with a brief description that we will elaborate on in the next chapter:

1. Relative Measurement – to know through measurement against others;
2. Pride – to know through correctness by what is already known;
3. Boundaries – a point of conflict against disagreeing knowledges;
4. Computing – to know through the technology of the machine;
5. Judgement – to know through applying rules of correctness such as ethics outside of the instant knowledge;
6. Knowing – that which identifies what to collect and possess in quantities by regard for its intrinsic interest, rather than its pragmatic usefulness or end purpose;
7. Duty – to know what is correct through a kind of honour or obligation;
8. Efficiency – that which is the most direct is correct;
9. Certainty – only knowledge that is certain is correct;
10. Structure – to know through a structured process is the pathway to know;
11. Business – that which meets business imperatives is correct;
12. Social – that knowledge which is networked is corroborated and more valid;
13. Diversity – that which is not the same as what is already known is knowledge; and
14. Resiliency – that which doesn't break under duress is more correct.

We ended with excavating the following element pairings per participant:

D. **Relative Measurement(*)/Pride/Boundaries/Computing**

M. Judgment (*)/Knowing/**Boundaries/Relative Measurement**

T. Duty/Efficiency/**Boundaries**/Certainty(*)

S. Structure/**Resiliency/Boundaries/Business(*)**

J. **Computing/Pride/Business(*)/Social**

T2. **Computing/Pride(*)/Boundaries**

Y. **Pride/Boundaries/Social**/Diversity(*)

I. **Pride/Business/Boundaries/Resiliency(*)**

For each participant we feel that in this initial interpretation we can hazard an opinion of the element that seems to have the superordinate role in their world, helping us with understanding the relations of power in operation. We were also able to derive a view on some of the rules of discourse in play. The element which we interpreted as having the most influence on their strategic choices and moves is denoted above with an asterisk (*), and is reflected in the each section entitled 'Regarding the elements' (cf. above). The elements in bold denote the repeating elements we excavated from each participants narrative.

In the second part of this chapter to follow, we will conduct an analysis of this part's interpretation, with a focus on understanding the situation and placement of the elements we have found and suggesting discursive formations that may condition their possibility.

Chapter 5, Part 2 – Lexicon of elements. Discursive formations

Approach to Part 2

In the last chapter we unearthed the discursive elements that were apparent from our participant's histories. This initial interpretation was done without regard for the theory, except in as much as the theory guided us to their potential existence. Now, in Ch. 5, Part 2 we want to explore the epistemological objects or formations, which are said to be anterior or co-productive of these elements, and which comprise the necessary relations between the conceptual elements first elucidated in Ch. 5, Part 1, relations that are required to know or say something.

Recall that these elements were excavated from the participants' narratives. That is, their story was prominent with these elements as constituting some sort of reality-of-how-to-know fundamental to their experiences. Because we observed many like 'shards' from our participants, the elements may not be simply episodic or transitional, but we believe their relations and intersections mark the place of associated epistemological functions expressed for us as power-relations. Understanding the elements in this way means we suggest they are a valid entry point to further exploration of the epistemological territory and boundaries of formations and their rules.

The formations which we will express in this chapter are the conceptual linkages that our participants have within their system of thought that enables them to have certainty, and probably helps define or create our hypothesised boundaries (cf. Ch. 4, Test 1) beyond which they are uncertain themselves or uncertain that someone else is using similar rules, and thus create conditions for power-relations to be invoked between fundamentally different sets of logics or discourses.

Here in Ch. 5, Part 2 we firstly propose to revisit the elements by outlining a lexicon of their possible interpretation, epistemological siblings and antonyms. These are the potential power-relations between our summary labels for the elements unearthed in the 'territory of concepts', between which we speculated in Ch. 5, Part 1 that they

could take a superordinate or subordinate role in an individuals system of thinking, and speculated that they also have the potential to clash between different systems of thinking, creating a condition of their own possibility. In this we also want to identify related or 'sibling' elements, and possible antonyms in the unearthed elements, for their further use in the analysis of formations.

Secondly in Ch. 5, Part 2 we explore the clusters of relations between the elements, their differences and boundaries (cf. Ch. 4, Test 1). These clusters of relations are our possible discursive formations, and the relations between *different* discursive formations may help us describe the boundary between discourses, which is where we first thought to find epistemologically seated power-relations. Denoting the lexicon and formations will mark a shift from the world of the individual which we covered in Part 1, to the world of formations which may be anterior to individual statements, which we cover here, in Part 2.

Lexicon of elements.

This section presents the lexicon of elements in the order that they are excavated in Ch.5 Part 1. The lexicon of elements is doing two things for our analysis, firstly defining what we understand by the elements in the absence of the narratives and secondly establishing the potential power-relationships between them, again in the absence of their narrative source.

Relative Measurement.

To know by 'weighing' ones worth and measure not as a physical thing but as an achievement, a possession or a position. This is an element which seeks to know by collecting and comparing things about me to other things which are similar to me. The outcome from this type of thought process is a stratification or 'ladder' type of outcome whose trajectory is the establishment of both a relation or boundary within which relative measurement should occur and a measure of worth within that boundary.

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Are the elements here marked by economic or monetary system thinking, mixing with a concept of worth or value of experience, skills and knowledge? Since money is a store of value has it been necessarily conflated with the value of the individual's experience, skills and knowledge? If so, this value is set against the values of others' knowledge. The measure of superiority of worth is the monetary return which is the external evidence or vindication of knowing, and one which seeks out regular calibration.

Lexical Siblings: Pride.
Lexical Antonym: Certainty.

Pride

Pride here refers to the righteousness of experience, a sense of correctness in knowing, and a correctness in knowing which is informed by experience. 'I know because I have experience and I also take pride or value in my knowledge and experience'. Of course, many of the professionals we interviewed do have extensive experience. However, if our ISD professionals know what they know, pride enters into the elements because they may not be able to otherwise demonstrate how they know what they know independent of that experience (cf. Knowing), thus their 'pride' in experience as a central epistemological pillar, since knowing in this ISD profession may be seen as a matter of negotiation and exchanged opinions (cf. #D3E). This general pride in knowing does not appear to be an elapsed-time based or generational aspect (cf. J#2A) but what knowledge is prideful may vary wildly.

Maybe our commercial 'knowledge worker' ISD professional (cf. D#4E) has a central purpose to know that which is correct without having access to a basis external to experience to unambiguously say why that knowledge is certain. This would be consistent with commerce's rejection of academic formality.

A belief in knowledge that is correct within the person's experience marks the reputation of the individual who holds that knowledge (cf. J#2B). This may speak to a formation whose modality is moral and wisdom based (cf. D#2D, Y#1A-C, I#1E, T#2C) rather than of Certainty. Pride in experience needs the validation of appropriate

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level of compensation and in that this type of knowing provides a type of validation in terms of relative measurement. Maybe the thinking is "If I am paid such and such, what I say must be right."?

Lexical Siblings: Relative Measurement.
Lexical Antonyms: Resiliency. Certainty, Knowing.

Boundary

Boundary has a special meaning for us in the territory of concepts. As we discussed in Chapter 3, statements can cut across what we might think is a natural boundary of some sort (Foucault, 1969:98), this boundary could be a discourse and the boundary has rules (and markers, cf. Computing) which are the systems of formation (ibid. p82). We will assess the notion of boundary as a formation in the next section of Ch. 5, Part 2.

Lexical Relation: NA.
Lexical Antonyms: NA.

Computing

We previously (cf. Ch.5, Part 1) stated that by computing we meant 'love of the machine'. Perhaps we should instead say 'love of knowing the machine' or 'love of how to know the machine', how to know the computing machinery in its intimate detail and complex ways. By machine we mean all technological elements of ISD such as: code, networks, hardware and software, et al what ever their origin or use. The participants' epistemological closeness to the machine also places them in a relation of trust (cf. D#4F), and one which must be protected or defended on occasion (cf. T2#1C, D#3B).

Perhaps the computer is a special object in our territory of concepts. A kind of focal point for some which counterpoints the human and the machine. In the minds of those sympathetic to it, the computer is an anthropomorphic object (cf. D#4F), and the rules of knowing it also anthropomorphic. And there can be those who are unsympathetic

to its plight. The love of the rules of knowing the computer machine could also be a boundary 'marker', for some it looms large in what is necessary to know, for others, it is an expense to be managed (cf. D#3D), a tool to be used (cf. T#4D), even for those enamoured of it, an annoyance (cf. J#1B).

Lexical Siblings: Pride.
Lexical Antonyms: Social.

Judgement

Judgement occurs only once in our participants' narratives, in the narrative of M. (cf. M#1A-E), and while it could be seen as analytical, it is also opinionated. However it is possibly an element rooted in a fundamental complaint against ignorance (cf. M#1D) or unknowing, informed by an acute contextual awareness. The judgemental faculty also bends in on itself (cf. M#1B), and in its latter form adopts the importance of business performance as its yardstick (cf. M#1D-E).

Noting M. was in government and dealt with computing not as a primary element but a tool, there may be a legal or legislative logic informing this element. Does this bring judgement into the realm of the epistemology of law making? If M. knows primarily through an element of (natural?) justice then the injustice of ethics is counterpoised with Resiliency (cf. I. #4C), and goes some way to explaining the retreat of M (cf. About M. and M. #1E).

Lexical Siblings: Efficiency, Business.
Lexical Antonyms: Resiliency.

Knowing

In comparison to D., M. is almost 'egoless', hence his retreat or withdrawal (cf. Ch. 5, Part 1 - About M.). In epistemological terms egoless-ness may mean willingness to forever enquire, to worry about this, perhaps a rule to never admit of a static correctness, a disbelief in 'prideful' wisdom. If this is the case, then M.'s knowing is a type of genuine scientific interest to enquire how we know (cf. M. #2C), albeit

superimposed on an ambiguous Business context. In M.'s case, unaccompanied by the necessary resiliency of thought to remain a player.

Lexical Siblings: Certainty.
Lexical Antonyms: Pride, Business.

Duty

Duty appears only once in the narrative of T., and this is what is known to save life. Duty informs efficiency of data collection using technology (cf. T#2A-C). Although it is not in Chapter 5, Part 1 excerpts, T. said as an aside that the name of her undergraduate qualification translates from Russian to 'The Art of Healing'. A duty to heal is superordinate to other considerations of position (cf. T#3B). Duty is also an imperative, it is the necessary and sufficient law to heal, imposed by the medical discourse upon its members.

Lexical Siblings: Business.
Lexical Antonyms: NA.

Efficiency

Efficiency appears only once, in the narrative of T.. The use of technology as a tool of efficiency driven by duty however relates to an imperative. An important imperative such as that experienced by S. and I. with the business imperative for performance and profitability (cf. S#4B, I#2E). While knowing's trajectory echoes the famous statement by David Hilbert "We must know. We will know." (Smith, 2012), this is a never ending enquiry element. Efficiency must not contemplate an endlessness to know, it is finite, direct, pragmatic, non-theoretical and linear to outcomes. While we would consider that ISD professionals should be interested in efficiency because of the practices of efficient coding, for example, the narratives suggest that they are more apt to deploy rules of knowledge, computing, or pride, such as perhaps elegant code (cf. M#2D) or standardised code (cf. T2#1C), or 'right' code (cf. T2#2D) as their conditions of how to know what they know.

Lexical Siblings: Business.

Lexical Antonyms: Knowing, Computing, Pride.

Certainty

Certainty for T. is not only that which is based on fact but that which works to enable efficient execution of her duty. Certainty is the necessary element of that-which-is-known for the very serious duty of saving lives, for which there is usually no time for opinion or judgement, and results in strict laws (cf. T#1E). Part of the certainty is derived by a descriptive precision of case notes (cf. About T. c). Unlike the mechanism of Judgement that has time to enquire and debate Certainty says either 'I know' or 'I will find it out' by the most linear efficient method possible.

While these are rules of surgery, the interesting thing for us is how the same mechanism has been applied to the use of ISD to derive certainty through data (cf. T. #4C). Certainty also prohibits generalities and wisdom. It is specific and precise, setting itself against prideful experience. Certain knowledge has no historical element it is correct in the moment (cf. T. #4A).

Lexical Siblings: Knowing.

Lexical Antonyms: Pride. Judgement.

Structure

The Structure of an environment for S. is somewhat the assessment of any experience's depth of order. S.'s narrative is the only one where this is a markedly prominent element. S. #1A-C in fact relates to the one experience at [Another Bank], and S.#1D-E relate to his business venture. The experiences in S#1-A-C triggered a traversal to S.'s business venture, which was not successful (cf. S#2D). Nonetheless, the experience of what promised to be a professional brand (cf. S#1A), which became a lawless or at least chaotic environment (cf. S#1B-C, S#3B-C), made a relation of knowing that which is to be *avoided* due to lack of structure, and a traversal into that business venture with a like-organised individual (cf. S#1D), a venture which is self-defined, and thus whose structure can be controlled.

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The structure here refers not to the end product, because the software outcome is the same as any other. Instead it is the structure of the process on the journey to develop this software product. In this, S. is similar to D. in his love of the machine. S. loves structure. And, when the surrounding experience does not conform, that was sufficient to impel him to move away from the lack of structure. For that moment of his business venture however, structure was superordinate to all other means of knowing, yet due to business imperatives, unfortunately still subordinate (cf. S#4F).

Lexical Siblings: Computing.
Lexical Antonyms: Business.

Resiliency

Between S. and I. who both seem acutely aware of the imperative of business, resiliency in one sense could be a kind of intermediary between an imperative of what-must-be-known such as Business, and a beloved element such as Structure (cf. S#1C) or Pride (cf. I#4A,C). In T.'s case, she does not need Resiliency as she has Certainty. Also, Resiliency is not resistance. We can characterise M.'s rejection of formal study as resistance, even though his aptitude for formal study is proven (cf. M#2E). Resiliency for S. and I. appears to be the capacity to know that although what is happening around them does not conform to a pre-thought ideal, it is possible to derive and in fact create knowledge from those circumstances nonetheless (cf. S#2C, A).

Resiliency is a capacity that D. and M. in particular do not exhibit since they seem prone to remove themselves from less than ideal situations (cf. D#3D, M#1E). Interestingly, government appears to have effective policy mechanisms (cf. T2#3A-B, M#3A, About M.) to address the disagreeable outcomes characterised by S as "roman gladiator" (cf. S#1C, S#3B). That which knows through diversity may also be resilient because the diverse embraces change and progression, which is what S. obtained (cf. S#2C), albeit at an unstainable cost.

Lexical Siblings: Diversity.

Lexical Antonyms: Certainty.

Business

The etymology of business is "[Old English *bisignis* (as BUSY, -NESS)]" (cf. Australian Concise Oxford Dictionary, 2009). For our three participants, S., J. and I., business assumes a larger but related meaning. Above, in Efficiency and Judgement, we represented Business as their lexical sibling, saying that a quality of knowing through Efficiency and Judgement relates to the imperative that business provides. This is illustrated by the Business imperative of a continual need for performance, improvement and results (cf. S4#B, J#3A, I.#2C,E).

While such a relation may seem sensible across all economically developed countries, what is interesting for us is that only some, not all, of our participants have an epistemological relation to Business or a sibling element. The self-assessment of self against an anonymous peer and cohort via Relative Measurement is not an imperative type relationship per se, as the experience of truths through relative measurement are instead a relative of Pride.

Lexical Siblings: Judgement, Efficiency.
Lexical Antonyms: Pride.

Social

Unlike relative measurement, the Social is not anonymous but is a friendly and approachable entry point or even social barrier. The Social, unlike relative measurement, is not in competition either, it either accepts or rejects (cf. #2D). It must know through connecting at every opportunity (cf. Y#3E), which itself is an imperative type system of thought (cf. J#2D, J#4B, Y#3B). This entry point or barrier may also speak of a way of knowing that does not separate knowledge from the context in which it is crafted or discovered (cf. J#3D). So, it is judgemental as regards this 'face', and if M. sees there is natural or ethical type thinking about justice, perhaps there is social justice as well (cf.J#2C)?

The experience of the social can also be inseparable from the context or even imperative of the digital (cf. J#4A, About Y.). However, Computing is anti-Social, being machine-centric. Computing knows through Pride in the computing machinery, not the humans who need to use them. Whether this machinery is used to facilitate Social connectivity is subordinate.

Lexical Siblings: Judgement, Business.
Lexical Antonyms: Relative Measurement, Knowing, Computing.

Diversity

Diversity for Y. is a diversity in what can be known through maximising exposure to the new, which promises progression (cf. Y#4D). In common with embracing the 'love' of the machine (cf. D.) or structure (cf. S.), Y. embraces diversity of experience while J., his contemporary, does not seek diversity as much (cf. J#3A). However, it is not a restrictive imperative as such. That would be contradictory to its purpose of discovery, because if the diversity finds itself in a happy place, it will stay (cf. Y#4E). But it might also seek new knowing, perhaps outside the workplace. So diversity is not knowing by an imperative of churn or change. Nor is it necessarily distinguishing of what class of knowledge it seeks (contrast Y#4A to Y#4B). Diversity is a kind of enquiry into the possibilities of what-can-be-known, without a targeted goal or strategy or imperative. While in Ch. 5 Part 1 we said Diversity is intertwined with the Social, from the lexical view, it is subordinate, at least for Y.

Lexical Siblings: Knowing, Resiliency.
Lexical Antonyms: Judgement.

Remarks on the possible grouping of lexical elements

In Chapter 5, Part 1 we excavated the elements from our eight participants and compared those elements against the others from that same individual, noting repeating elements. In this first section of Chapter 5, Part 2, we have considered a

lexical analysis of the elements among all participants, founded on the selection of individuals that all have been participants in development of information systems.

In this analysis we have identified related elements which are possibly from the same epistemological family or species, and denoted them as 'siblings'. We have also denoted other elements, which while related, have a negative or opposite type of relation.

By analysing the meaning of the same or similar elements among participants above, we observe five groups of discursive elements:

A. **Boundary Markers**. We have excavated two boundary markers, the Computer element, being the non-human element in the excavated elements and Resiliency, acting as counterbalancing or transformative type element between elements, perhaps necessary due to the imperative type elements, where separate types of ways to know must necessarily co-exist. This recalls Test 1 (cf. Chapter 4).

B. **Imperatives**. That which drive or impel knowing through a relation with a mandate, real or otherwise, the nature of which is imperatives. We classified Judgment, Efficiency, Business and Social elements as of the imperative type.

C. **Enquiry**. That which seek and explore knowledge itself and worry about how we know. We classified Certainty, Knowing and Diversity as such.

D. **Idealistic.** That which knows by virtue of a relation of dependency with some notion of an ideal. We classified Relative Measurement, Pride and Structure as Idealistic.

E. **Law.** That which does not require relations with another element in order to know. We classified Duty as the only such element due to it being necessary and sufficient in itself. Religion is of a Law type, for example.

The lexical analysis of elements provides us with a way to proceed with the next step in our analysis, that of understanding the types of relations occurring in and between these groups these elements, being the discursive formations, our hypothesised seat of the power-relations in information systems development.

Aligning the formations of our participant's elements also reveals an interesting series:

D.   Idealism + Boundary Marker

M.   Imperative + Idealism + Enquiry

T.   Imperative + Law + Enquiry

S.   Imperative + Idealism + Boundary Marker

J.   Imperative + Idealism + Boundary Marker

T2.   Idealism + Boundary Marker

Y.   Imperative + Idealism + Enquiry

I.   Imperative + Idealism + Boundary Marker

The formation of Idealism and the pairing of Imperative/Idealism groups is characteristic of nearly all of our participants, excepting T., and is mostly accompanied by a boundary marker. What does this mean? There are five observations we can make.

Firstly, that the presence of this particular combination represents a location of epistemological power-relations, a tension between the ideal that 'I must know because of the ideals (experience, remuneration, structure) I know' and an imperative which is equally compelling saying something like 'I must know like this, because this is the reality of the situation'. Secondly, that again in the majority of instances that these pairs are accompanied by a boundary marker, which may either act to resolve the epistemological conflict or help to mark its presence. Seeing the quality of resiliency in this way, not as a personal value but as an attribute of a discursive boundary is quite helpful to further identification and study of multiple discourses. Thirdly, that where these pairs occur in the absence of what we said are boundary markers, the formation of Enquiry is present (M. & Y.). Fourthly that D. & T2., being the most technical, may have the group of Idealism as an imperative. Fifthly, that T. does not follow the series of combination of formations, showing that the analysis is not biased in favour of the imperative/idealism pair.

Before we finish with the lexical elements in themselves, it is worth while noting that at least two groups of elements which might be expected from the profession of ISD

are missing from this analysis. Firstly, Creativity might be expected because the design of new ways of using ISD requires previously untried combinations, presumably enacted by Creativity elements. Enquiry may be said to be a surrogate for Creativity in the discovery sense, however, none of the participant's who evinced a 'love' of the machine, being a boundary marker of Computing, had an Enquiry aspect to their narrative. Secondly, Process might be expected because the profession of ISD operation or development is typically organised by projects or catalogues or lists, for example the ITIL framework, the CMM framework, the TOGAF framework are all example of list type knowledge which no one spoke of. We will address the topic of absences in more detail in Chapter 6, but now we move on to further explore the relation of these groups of elements by reference to the concept of discursive formations.

Determination of discursive formations, their operation, rules and trajectory.

In Chapter 3 we said that a *discursive formation* was a set or group of necessary relations that act as a rule, such rules being said to be a *system of (discursive) formation*, that permits some objects to be spoken of and others not (Foucault, 1969:82), essentially creating their condition of possibility. In practical terms for us, these formations are both the necessary relations *and* the rules. In the foregoing lexicon we decided that a lexical analysis of all the elements excavated from our participants' narratives would assist with discovery of the possible discursive formations that may be anterior to these elements, which inform their functions: being their operation, rules and trajectories. These formations make possible the discourses that our participants unconsciously deploy in their profession of developing ISD solutions (cf. Gutting, 2008). This may mean any formation present behind the rational thoughts of the participant in a silent space where considerations of what is necessary take place before thought and speech occur, being the epistemological relations of power that are the subject of our inquiry. Such imperatives act to silence what is totally possible and enable only that which is probable under the operation, rules and trajectory of the formation in play at that point.

While we uncovered six possible groups of elements, which for us point the way to the location of formations, what also need to be considered are their potential interactions, being the power-relations between separate knowledges, logics (cf. Law, 1991) or for us, discourses. In this section we cover an analysis of likely discursive formations using the six types of elements explored above; their possible boundaries; and their relations or interconnections between discursive formations, all together representing and locating the epistemologically based power-relations of interest.

About the formation of the Imperative group of elements
Elements: Judgment, Business, Efficiency, Social

The formation of imperatives specifies that in order to know, there must be a relation between that which is of first order necessity and that which is not, a relation of priorities, leading to binary knowing type processes. The relation is evident in the reactions to statements of *adversaries* (cf. D#3C,D#3E,T#1C,T#3F,S#3C) or in statements of *tradeoffs* (cf. I.#3A, M#1E). Since this is a more meaningful way to understand the formation driving the imperative group of elements, we will use these terms instead.

In the first case, the adversaries are deploying a rule which says that, for example: the mainframe (D#3C), or profitability (D#3E), or misappropriated hospital equipment to save lives (T#1C), or not speaking back to your superiors (T#3F), or even the use of fear (S#3C), has a far greater precedence than the 'other', which for some of our participants, is the Ideal with which it is counterpoised. In the second case, the adversarial approach is brought within the boundary of an individual's own discourses, where tradeoffs and silent internalised 'devils advocate' style thinking procures censorship or "valorisation" of one possibility over another (cf. Lamont and Molnar, 2002:180).

Does the A over B type pattern of not interpersonal or social but epistemological power polarise knowledge through this imperative group of elements, elements which are made by adversarial or tradeoff formations? Do these formations operate through the making of polarising choices, producing what is known through a network of binary choices created by the formation? The search for a truth without a relation to

seeking or discovery as exists in the formation of Enquiry, is not encompassed in the discursive formations of adversaries or tradeoffs. Indeed, is the formation of adversaries or tradeoffs necessarily invoked only in relation to oppositional statements from another formation, but otherwise a latent epistemological function if unopposed?

About the formation of Enquiry group of elements

Elements: Certainty, Knowing and Diversity

Enquiry is an epistemological formation that at its core seems to operate by seeking to know through a survey or discovery mode (cf. M#2D, T#4D) to obtain a comprehensive understanding of subject (cf. T#2D, Y#4F). In addition, Enquiry seems to have a basis of knowing grounded in collecting, relating and synthesising conceptual elements (cf. M#2F,T#2A). The trajectory of Enquiry seems to be a 'limitless' or unbounded horizon, which self-observes, forms opinions about what it has discovered and worries about the continued validity of what is found (cf. M#3C, T#4A). Through a process of assimilating evidence (cf. D#4F) which adversarial or tradeoff formations do not necessarily deploy, Enquiry can indeed become that adversary, and at the place where the rules of the adversarial or tradeoff formation intersect with the rules of Enquiry, a boundary is created, enacting a power-relation.

This adversary or tradeoff formation implements rules that *balance, moderate or modify* what can be known through the formation of Enquiry, irrespective of the completeness or thoroughness of enquiry's thought (cf. T#1E[8], M#2A,B, Y#3C).

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[8] This interesting excerpt (T#1E) is quoted in support here:

"Case history was definitely done by doctors. Though I didn't want to write it, I had to. My professors told me a long time ago that every note I make I am not writing for myself or the patient but for court. There is a huge chance that every single step your care can be challenged by patients or relatives and be taken to court. Oh, there…so [an example of] what happened, I admitted a patient and did all investigation and diagnosis that he had gut blockage that he needed urgent operation. This was at the end of my shift. I gave all my notes to the next surgeon at the end of the shift, who happened to be the chief of the department…and explained that he needed urgent surgery. I left…to look after my son at home, he was 6. For the whole week I was at home with my son. My manager, he thought the diagnosis was wrong, so he didn't follow whatever I wrote, and he decided to wait, he didn't operate for three days, but then he did operate after 3 days. It was a very rare thing, he had a melanoma in his anus, and this melanoma caused metastasis internally, which blocked his system. So, the guy would have died anyway, he was young man 32, but he died because of complications and this is a huge huge mistake in surgery, the thing that no one ever forgives, that's why we have a rule, it is better to operate than to not operate.

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However, in the narratives of our participants at least, Enquiry does not seem to intersect, compete with or even 'notice' Law or Idealism. Unlike the latency of the formation of adversaries and tradeoffs, the formation of Enquiry recalls the 'gaze' of the clinic (Foucault, 1963).

About the formation of Idealism group of elements
Elements: Relative Measurement, Pride and Structure

In a similar way that the formation of adversaries and tradeoffs may in fact manufacture 'polarities' in relation to encounters with the formation of enquiry, so the idealistic group of elements seem to find themselves encountering the formations of adversaries and tradeoffs. Whether through profitability imperatives (D#3D), remuneration imperatives (M#4B) operational environment imperatives (S#1B,C), agenda imperatives (J#2D) or standardisation imperatives (T#2D), the formation of idealism encounters a separate form of knowing that confounds it's epistemological bases, making a boundary where power-relations are necessary to resolve the difference.

In the experience of our participants, the formation of Idealism is prone to be subordinated in favour of the imperatives type elements they encounter, and retreat or 'shrinking' occurs (cf. D#2F, D#3D, M#1B, S#1E, J#2D, T#3C). Rather than using the functions of epistemological resiliency, or processes such as exhibited by Enquiry, being accepting of rules of balance, moderation or modification, Idealism doesn't know these capacities. In the absence of an Imperative, or in the presence of the boundary object of Resiliency, this retreat or 'shrinking' does not occur (T#3F, Y#3C, I#4C).

So, when I came back [from leave] there was a huge, huge outcry. There was an internal investigation, during this they said the diagnosis was right, but while I was describing his examination, you weren't specific enough. It was at night I was tired. I wrote standard terms and so if someone else was reading, they would either have to do it [the examination] again, because it wasn't 100% clear…the description wasn't 'colourful' enough…usually we use…you know AJ Cronin? We were joking that before writers were writers, they were doctors, because that's what we have to do, describe it like a piece of art. For example phlegm or puss or poo, you need to describe like strawberry jam or cream, like different shades, more colours…so it's kind of a bizarre thing that we do" (Interview with T. lines 8-28)

About the formation of Law group of elements

Elements: Duty

Law sits above other considerations and strangely is only a feature of T.'s discourse, which is grounded in the duty to heal. Recalling that each of our participants' narratives stem from a history of organisational life involving at some time commercial ISD development practices, we see that T. stands apart from these types of histories. In Ch. 5 Pt. 1 we understood T.'s use of ISD as a surgical tool to conduct population level healing (T#2C). This involves a Law which none of the others seem to have acquired. This law is something beyond an imperative, it is more absolute in nature, and provides the strength to maintain the law without the balancing, moderation or modification effects on knowing that the adversarial or tradeoff formation invokes.

For example, in contrasting T1#E (cf. Ch5. Pt2. Footnote 8) with I#4C it is interesting to observe that the ethical considerations of I. are moderated in favour of the situation, but in the situation of T., no modification is obtained, the law is preserved. We can see that at least for the formations we have unearthed from our ISD participants, the formation of Law sits outside of these other formations and does not interact with, leverage or even recognise these other epistemologies.

About boundary marker group of elements

Elements: Resiliency and Computing

We speculated that Resiliency, characteristic of S. and I.'s discourse, and Computing, characteristic of D., J., and T2.'s discourse, are elements that mark discursive boundaries. In our recent discussion of adversaries and tradeoffs, enquiry, idealism and law, we have expressed an opinion about how these are intermixing or not. At the beginning of this chapter, we decided that certain elements and their associated formations came together through the expression of sibling relationships, being close together in their epistemological operation, rules and trajectories. We also decided that among the elements and their presences in our participant's narratives, that there could be antonyms, or those elements opposing, at the level of formations, their

operational epistemology. Relations of siblings and antonyms were cross referenced to the participant's narrative.

While proceeding with an assumption of epistemological boundaries, and hence separate discourse or logics, is supported in the literature, for our purpose, we do not seek to propose that boundaries just exist because of our own research frame. Instead what has emerged from the data and analysis is the following relationships between discursive formations:

- Idealism becomes counterpoised by adversaries and tradeoffs in a relation of 'shrinking' which includes a retreat or some kind of hiddenness or an adaptation resulting in a traversal to another formation. The presence of this relation is the computing element. Bearing in mind that the computing element is not the knowledge of the computer, but in fact the 'love' or intense admiration of it. In the presence of such a type of knowing, we may seek to discover an epistemological boundary.
- Enquiry becomes counterpoised by adversaries and tradeoffs in a relation of resiliency. This relation seeks to *balance, moderate or modify* what becomes known as a result of an enquiry formation. While scientific enquiry externally to the lay person may seem absolute and inviolate, in a profession it may be subject to the same types of relations (cf. T#1E Ch.5 Pt. 2 Footnote 8; Kinsella, 1999).

This leaves us with the formation of Law as expressed in the element of duty, and the formation of adversaries and tradeoffs as expressed in the group of elements we called imperatives. While the formation of law seemingly sits outside of the main discourses of our participants, we speculated that the discourse of adversaries and tradeoffs may be integral to the polasrisation of methods and systems of knowing. It recognises the computing object as one requiring management or control of some kind, but those in possession of the rules of the computer do not valorize or recognise the sovereignty of its rules, seeking instead to 'shrink' away from it, seeking new conditions of possibility. While our study has not conceived of boundary objects per se, objects or, more exactly for us, formations with associated operations, rules and trajectories have

been addressed in some non-IS literature (cf. Akkerman and Bakker, 2011) as dialogical phenomena, with mechanisms of "identification, coordination, reflection, and transformation" (ibid. 132). However, as discussed, we see these markers as discursive and epistemological in nature, not dialogical.

Concluding Remarks.

In Chapter 5, Part 1 we unearthed the elements of discourse that each participant held to be material to their considerations, strategic choices, options and working life trajectories. By taking a lexical approach to these elements in Chapter 5, Part 2 we assigned the elements to a proper role. That role is the element's participation in how to know, and also importantly, how not to know or what is not a possible way to know. By identifying siblings and antonyms across the spectrum of the lexicon, we were able to determine groupings of elements which became our candidate formations, and also interpret the possible relations between groups.

If, in general terms, ISD is conceived of as an activity of a productive industrialised society, and an undertaking of a more or less young but functioning profession, while there may be different forces in play, we might have reason to expect to find a kind of unified set of epistemology. We did not find this. What we did find was a mix of relative tension in the main identified by boundary markers, and relative and opposing tensions between the formations of adversaries and tradeoffs, enquiry and idealism occurring at the level of how to know. We found that the law was aloof from these tensions.

The nature of these tensions and indeed the formations and manner of the formations' interaction and their resolution surprised us in four ways. Firstly, we would not have expected to see the idealist formation emerge quite so strongly in a 'rational' profession such as ISD , nor that the idealist epistemology shrinks away from or even notices the rules of adversaries and tradeoffs. Secondly, we did not expect that the enquiry formation would permit a moderation of findings. Thirdly, we did not expect that the other formations do not interact with the formation of Law. Lastly, that the presence of common pairings of counterpoised formations between most participants,

while not necessarily expected if we take into account the personal diversity of their backgrounds, ages and career entry points into developing ISD solutions, is also consistent with encountering and sharing a commonly occurring set of *opposing* formations, nevertheless occurring in one body! This means that for most our participants, the mechanism of power-relations of interest lies further afield in this network of formations we have presented, rather than the direct A and B power over or power to type analyses we covered in Chapter 2, where power is treated mostly as a communication substance exchanged between people.

Through the exploration of formations, their relations and boundary markers, this chapter has seen the analysis of a network of epistemologically based power-relations emerge from our participants' narratives, and specified their location, rules, operations and trajectories.

Chapter 6 – Summary and Conclusions

What we did.

Is the successful undertaking of a profession in information systems development in organisations essentially reliant on solving a fundamental problem of communication between those who 'do' technology and those who 'use' it? Motivated by our experience and professional anecdote, we instead have considered the possibility that power-relations could be at work to shape, enable, disrupt and confound the 'communication' trajectories, well meaning and otherwise, of the information system development efforts, and especially the knowledges deployed, and have considered this with respect to the systems of thought that we think our participants may have deployed in their profession of ISD.

The foundational literature on power, such as Lukes (1974) or Lucas (1984), and their followers, is literature that seeks to come to terms with problems of power by considering power-relations as a substance that is possessed by actor A, entitling or enabling them to somehow co-opt actor B to their conscious intent or scheme. This concrete substance model has a fundamental notion, saying technical knowledge, in our case, information systems development knowledge, is an object which can be subject to either power 'over' (an authority, a sovereign) or power 'to' (a capacity, an energy). Considering power in this manner assumes a white space (Connellan, 2013) of some kind of institutional, societal, organisational, sociological or psychological frame as explicating the communication habits and behaviours of ISD professionals, a space where one of the relevant objects is power, but there are many others.

Instead of this path, we have chosen to conceive of power as a dispersed, pervasive, not passive network of force or influence that has, "beneath the level of consciousness" (Gutting, 2008), shaped the discourse or systems of thought that is applied by our participants in their information systems development work. The force we believe that shapes thinking is discursive formations, formations that possess boundaries where power-relations operate to resolve contradictory systems of thought. We have done this because the substance model of power must necessarily

assume an authority or sovereign of some sort who determines what is just and right, meaning that the study of power using this model cannot be independent of the force it is studying. For example, critical studies in information systems espouse their rights by an a priori emancipation principle (Stahl, 2008), but who is stating who needs emancipation? If, in fact, that a priori of emancipation is correct, that is an assertion of a power-relation itself between an ethical or political system and a technical knowledge system, which is an implicit research assumption of necessary subjugation and domination. And typically under this frame power, especially as held by technical authorities, is 'bad' and in turn this brings us back to the arguments of Lucas (1984) and concerns about the holders of technical knowledge exhibiting power over their clients.

In an alternative consideration of power, explored through archaeology of our participant's knowledge, we established that a *discursive formation* is a necessary relation between ideas, thoughts or concepts that is produced by the rules called a *system of formation*. They are the rules that create the possibility of saying anything (or hold the power of capacity, as in 'power to'), and are the rules to delimit what can be related. In the words of Gutting (2008):

> "The premise of the archaeological method is that systems of thought and knowledge (episteme or discursive formations, in Foucault's terminology) are governed by rules, beyond those of grammar and logic, that operate beneath the consciousness of individual subjects and define a system of conceptual possibilities that determines [and delimits] the boundaries of thought in a given domain and period."

A key differentiator in this approach also is that these rules do not come from anywhere, and they have no secret origin. So in our research we have not considered the question of where the rules 'are' or where they 'come from' (Foucault, 1969:138, 231). This would be a consideration if we chose the substance model of power, but for researching power as a network, a dispersed force, is in fact counterproductive.

From this essential a priori division, of knowledge as a power substance on the one hand, and power as possible networks of epistemological relations which determine

knowledge on the other, we determined how to apply the archaeological method with respect to the working experiences of eight ISD professionals. They are not cut from the same cloth, that is, we did not interview eight similar types of professionals, we wished to explore the possibility of different and competing discourses operating under the broad semantic church of information systems development. And, because archaeology is an historical yet synchronic method, we took working-life narrative histories of eight participants and, guided by the seven tests of discourse (cf. Ch. 4), excavated and then examined the discursive 'elements' that arose from their narrative.

The first part of this examination involved an outline of the person's working-life history and their external profile, and then moved onto providing revealing narrative data excerpts from the narratives that are indicative of their system of thought, that is, their discourse. The organising method for the narrative excerpts is an 'element', and each participant revealed at least three or four elements, which for them is the 'lattice' or notable epistemological elements of their system of thinking, what makes sense to them, and how they know what they know. At the end of presenting the narrative data, we considered what the elements might signify, and how they loosely compare with other participants thinking.

The second part of this examination required us to contemplate the meaning of the elements independent of their professional origin, in the manner of a lexicon of elements. We provide a definition of each element, but then also relate them to their conceptual siblings, and their anti-concepts, or antonyms. In this way we are able to group like concepts and distinguish unlike concepts, analysing the epistemological boundary of their formations. We were then able to state the possible subordinate or superordinate relationship between the boundaries, which is the power-relations between discursive formations. We provided four possible types of formations that we analysed. While Foucault chose to examine official discourses which were available in the published texts of the disciplines and historical periods examined, we instead suspected that there are other discourses operating alongside these official statements. The novelty of what we have done is to access these alternative discourses through what we did by successfully eliciting unofficial narrative histories of ISD professionals and assessing them for the presence of discursive formations and epistemological power-relations.

What does it mean?

The precision with which we can cite as evidence the narratives of our participants as illustrative of the formations, the epistemological power-relations, that they have been subject to in their working-life depends on the meaning we ascribe to their stories. Foucault himself decided to use extant historical texts, which is especially evident in his first archaeology (Foucault, 1963). As we discussed (cf. Ch. 4), we choose to excavate a contemporary strata of working-life and commercial history through open ended interviews of ISD professionals, defined in a broad sense as those who have in some material respect participated in the development of an information system. We chose to do this to extract a raw and vital narrative, pruned of artifice, which would have the maximum chance of revealing to us potential epistemological power-relations.

The first thing that surprised us was that it was possible to cite as evidence in this epistemological game a few, not many elements, as epistemological functions operating each participant's system of thought. While we did this through the prominent and the repeated, we could also say this is part of the way those individuals make sense of the world, as to how they know what they know is revealed through their rules and systems, that which is meaningful to them. That these elements intermix with the complex reality about them is not of concern, that the elements are part of the participant's epistemological functions is. Critical to the meaningfulness of this research is the fact that these elements provide some form of 'strata' that we can base subsequent analysis on. The elements themselves being an entrée to the discursive formations is also important. So, we note that the majority of the tests of discourse and facilitative questions that we suggested previously (Hart and Underwood, 2010 and Hart and Underwood, 2012) have been reinforced and enhanced and by the mode of lexical and discursive formation analysis expressed in this document.

Secondly, from the elements, that some were repeating and duplicate, and others unique, helped us separate some participant's system of thought from others. The fact that all are ISD professionals has ended up not being material to our study and becomes the second surprise. Of course, it would be sensible to assume that people in

the general vicinity of information systems development activities would share some common body of knowledge 'rules'. We have demonstrated this is in fact not the case across a heterogeneous professional population, where such heterogeneity is defined outside of organisational boundaries, but within a normative boundary of information systems development. Boundaries of gender, age, demographics and personality have not been considered in the archaeological method, determinedly, as the conversion from a narrative to an element is an hermeneutic one, producing a text for subsequent analysis, as already discussed, that text being considered independent of the conditions of it's origin, which means independent of the white space of personal characteristics of who made the narrative.

What are these elements? The way we have described them is certainly independent of the aforementioned: gender, age, demographics and personality. Rather, we hope they relate to how to know. For example, T. knows that which is certain, D. knows that which confirms his meritorious standing, M. seeks knowledge that supports judgement, S. is resilient to knowledge that is ambiguous, J. knows through the social and so on. These elements all pertain to a system of thought that is at once private and intimate, yet, as demonstrated, shared, not only amongst participants, but also through a network of relations amongst these epistemological elements themselves, their allies, their enemies and their ignorers.

Thirdly, since we synthesised the elements through the lexicon, we were able to derive meaningful representation of four possible different types of discursive formations, being Imperatives, Enquiry, Idealism and Law, with some elements representing the possible presence of boundaries, as in Computing and Resiliency. Imperative formations are exhibited in statements of tradeoffs and adversaries, which balance, moderate or modify the statements of the interacting formations, and become the power-relations in question, and cause the reciprocating formation to 'shrink' away. Such shrinking does not mean that the knowledge is invalidated, but that it may be temporarily forgotten or subordinated while the possible conditions under which it can exist are not present. A possible term that we could adopt for this phenomena is the 'disciplining of the irrational'. A subordinate discourse becomes irrational. Those with the element of resiliency can cope with this phenomena, holding their own system of thinking and the other in a potential pluralistic system (S. & I.), while

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others retreat or shrink (M. and D.), others are so deeply entrenched in their own formation as to be invisible (T2.), and others, being attached to the superordinate discourse, are oblivious to the other formations entirely (T.).

In this way, we observe that the conceptual landscape of our participants is possibly, "beneath the level of consciousness" (Gutting, 2008), changed by the subordinate or superordinate relations with other systems of thought that they encountered. Considering that all of these people are intermixing in the same or similar information systems development field, it is notable to state that their epistemological basis for doing so is markedly different, and fraught with problems not related to communications but at a much deeper level of operation.

Research applicability and future opportunities.

How applicable are these findings to other types of qualitative research on power-relations? If we use Gordon et al, (2009) as a comparative example of a type of textual analysis with the goal of understanding power-relations, we can note the following similarities and differences. Firstly, that our approach is less observational. We have taken an interpretative approach which sees the narrative data treated hermeneutically, as a shard of discourse, while theirs, being ethnographic, is supplemented by their own observations along with formal and informal interviews (ibid. p78). Secondly, while we chose to extract elements from the text without expectation as to what may be there or what the outcome could be, thus taking a risk, they extracted and codified elements based on an a stronger a priori notion of forms and structures of power (ibid. p81), and it could be argued that even the type of authoritarian organisation being studied, a police force (ibid. 83), is well used to exercising forms of domination using power, having the backing of the law, while it may not be expected that information systems professionals do. Thirdly, that we have worked on a deeper association, not of words, but of the meaning and knowing that a text could provide, where theirs is positioned as linguistic, following Fairclough (ibid. p87), and also frequency or at least occurrence based analysis, where the frequency or occurrence becomes important to the interpretation (ibid. pp81-82). Lastly, through the subordinate and superordinate interpretation of relations, we have identified a

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more precise site for power-relations embedded in discursive formations and their interactions, whereas they have located power in relations of domination and embedded ethics. We understand that linguistic based frequency analysis of textual data using NVivo software (cf. QSR International, 2012), for example, as was done by Gordon et al, (2009), could be a common contemporary interpretative technique which blends qualitative and quantitative methods to provide plausibility of narrative based research. In our case, we believe that the richer approach which we have taken should not rest on frequency as an evidential method because some of the most insightful observations have not come from frequency but from excavating unusual relationships which could not be seen otherwise. However, this should not prohibit other studies to take the findings from this research and seek to repeat the results using a different research approach such as theirs (ibid.).

This methodological discussion leads us to the considerations of how widely these research results could be extended, or not, to other professions, organisations and contexts. We believe the method we have constructed is not just applicable to information systems professionals, but potentially any organisational or contextual arena where parties could be thought to be in potential epistemological conflict, especially mixed teams such as consultants and their clients. This is because the potential for multiple discourses and the method we have constructed to analyse such relationships is not dependent on any particular discourse being present. Indeed, the elements we excavated in Chapter 5, Part 1 (with the possible exception of Computing) are not germane to information systems and do not seem to necessarily bear strong technology characteristics. However, the extensibility of the method is reliant on the ability to surface a deep, historical sense-making kind of text from an individual. In this case, the author had developed some trust in the individuals so this could occur. In other research contexts, these transparent and unadulterated texts may not be capable of excavation due to self-censorship type dynamics; in which case the method would not work and the textual type frequency analysis undertaken by Gordon et al, (2009) may be more achievable, and, although their study played out from an initial six month period to two years, trust may have been earned in the ethnographic tradition. Furthermore, since much of our evidence and plausibility has come from the core long form and rich narrative data, which is not suitable for short from research journal articles, an opportunity exists to form a condensed

representation while preserving the shift from element to discursive formation to power-relations. However, since the potential difficulties in researching power overall recalls the comment that the preference exhibited in the literature is to study power through less costly and risky means (Jasperson et al, 2002:413), seeking more efficient means to undertake power research may in fact be counterproductive.

While we included two members of generation Y, and with the youngest participant having two or three years of work experience, we did not see any inhibition to be capable to extract an historical narrative which was useful due to shorter tenure at work. However, there is also an opportunity to further corroborate this research by undertaking the same research with generation Y participants only, seeking to investigate our belief that epistemological conflict is not aligned to those normative attributes, but is truly discursive, in the Foucauldian sense. We also observed that the Social occurred uniquely in generation Y participants, and while it is possible that the Social is substituted for Judgement or even Knowing in the Generation X participants, the Social being a collective type Knowing, further research could prove useful on this question.

Since some of our ISD professionals in a sense have subscribed to a subordinate discourse as the formation of Idealism in particular highlights, it could also be interesting to research the necessary role of subordinate discourse in maintaining power-relations, for without a power 'partner' in the network of knowledge and their relations, could superordinate knowledge even exist?

As previously stated in Chapter 5, Part 2 (under the heading "Remarks on the possible grouping of lexical elements"), both Creativity and Process elements, which could reasonably be expected to be present in the narratives, given the normative constitution of the ISD professional, were absent. Were they not detected because they are common to relevant official and unofficial discourses and thus not displayed at the limit, at the boundaries? Were the official historical texts that Foucault accessed less censored in some way, unlike our discarded project documentation (cf. Chapter 4, "Design of data collection"), such that discourses are truly erased in contemporary official statements? Are Creativity and Process masquerading and hidden as another, or are they genuinely missing from all discourses, which would be very troubling?

Further research opportunities exist to understand and explicate this surprising finding.

What can we do about epistemological power?

We have attempted to get to the root or kernel of discourse, and, via formations which we discovered using an analytical approach that takes rich and broadly defined ISD narrative experiences, we understood those narratives through their epistemological footings, stripped of the central notion of an author, so treating the narrative as a text, which is as a shard of evidence in the archaeological process. In this last section we will explore what could possibly be done about these systems of discursive formations, these complex set of relations that act as a rule of how to know (savoir), that delimit what thoughts can constitute valid knowledge (Foucault, 1969:82) and whose boundary interactions we have studied to determine their conditions of superordinate and subordinate positioning.

If we recall Foucault's first archaeological analyses, he understands the clinical practice of medicine in the 18th century 'to know' (savoir) through institutions whose:

> "…balance of experience required that the gaze directed upon the individual and the language of [clinical] description should rest upon the stable, visible, legible basis of death. This structure…constitutes the historical condition of a medicine that is given and accepted as positive…It is when death became the concrete a priori of medical experience that death could detach itself from counter-nature and become *embodied* in the *living bodies* of individuals…The sense-perceptible, which cannot be exhausted by description, and which so many centuries have wished to dissipate, finds at last in death the law of its discourse;…It is understandable, then, that medicine should have had such importance in the constitution of the sciences of man--an importance that is not only methodological, but ontological, in that it concerns man's being as an object of positive knowledge." (Foucault, 1963:242-244).

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This law says that in medicine a truth can only be known through death, and it is primarily or even exclusively through the study of the dead that life is known, that people can be healed, and we suppose only through dissection and the study of the objectified dead bodies shall it be possible to know and gaze at the living. Tracing back the texts of medical description and the institutions that enshrine this discursive law demonstrates the relation between medical knowledge and its epistemology of death, and it is such a relation that allows the medical professionals of that time to know and speak a truth. Of course, this also means that the truths which can be spoken and known from people viewed as alive, functioning and conscious bodies are subsumed into a corpus of knowledge that is less valid and has less veracity (for example, psychology versus psychiatry), establishing both the boundary and the condition of possibility of clinical knowledge from an historical period that may indeed continue until this day.

What then is knowing or truth as it applies to the discourses we have excavated in today's simultaneous and contemporary organisational context? Truths informed by logics (Law, 1991), or as we prefer, systems of discursive formations, are a discursive property of a resolved, operative or superordinate power-relation. In the same way as medical knowing must take account of descriptions of the dead in order to be, beneath the level of consciousness, recognised as valid, accepted or understood knowledge, we have seen that the elements of certainty and imperatives form a kind of law or primary organisational facet through which truths are examined and upheld, or withdrawn and dismissed (usually in silence). The methodology we have adopted permitted us to breach that silence, understanding the difference between operative reality and the possible realities that could have been, by understanding subordinated formations. If Foucault's archaeology says anything, it probably says the history of the 'human' sciences is a desperate struggle for the concrete, singular and positivist 'truth', blind to the fact that such a perfect, geometric and symmetrical singularity is provided not by the presence of the singular truth but by epistemological relations of power. Through our research we have come to believe that *the resolution of multiple formations to the operative formation is not necessarily performed by Cartesian reasoning alone*. If there were a singular truth, power would not be necessary and not sufficient to make one truth superior to another, and, unless we deny that

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epistemological power-relations exist at all, we must say that this struggle bears much resemblance to the discipline of information systems development, that, similarly, some think stumbles along in the blind belief in an ultimate or superior ideal of a technical truth, being like "Pollyanna" (cf. Oliver, 1988):

> "…the above discussion indicated ISDs are inappropriately using the techo, our systems rationalist, model. They exercise power, but do not know they are exercising power, and do not behave in ways expected of people who are conscious of the power dimension. There is something of Pollyanna in the techo view, with ISD's living in a fools' paradise, believing they are contributing to a better world in the sense of making it more orderly, efficient and predictable. Others around them see the computing specialists as very much involved in power politics, building their empires, and inadvertently making the world more restrictive, linear and dull." (ibid.)

For us, whether the client or the ISD professional is right or wrong does not matter. We cannot argue either way, from the perspective of discourses, that just 'are', where rules emanate from nowhere, this is unimportant, and is the direct study of power which we eschewed in Chapter 2. What we have observed, rather, is that in the conflict over a discursive truth, over what is known and that which is silently unknown, the boundaries that arise due to this necessary difference result in the boundary functions of a) forgetting, b) traversal and c) retreat.

Thinking there are multiple discourses which each contain epistemological rules of truth-making, we can see that forgetting, traversal and retreat are consequences of the necessity to attempt to externalise, irrupt or operationalise a truth which is in contrast to another truth-making system. Yet are not all true within their own discourse? We could say that the ISD professionals we have understood in our study who seek to remember their truth and externalise and speak their truth under a multiplicity of discourses calls to mind two helpful Greek notions, parrhesia (truth-telling) and anamnesis (unforgetting). For that which is forgotten under the yoke of epistemological power-relations, unforgetting could be a mechanism to draw the courage to not forget; for that which retreats, truth-telling will allow a safe voice with

the same discourse; and for that which traverses (cf. Hart and Underwood, 2010), not forgetting in the moment a power-relation is deployed will allow the retention of authenticity and identity.

The notion of truth-telling became a central concern of the latter Foucault, and is related to his thematic of care of the self. In Foucault (1984), the concept of parrhesia is explored as an alternative strategy to the positivist truth, where telling or speaking a truth is preferred, and, for us, under the conditions discourse, a viable strategy. "The word parrhesia designates the right to have one's say in the city affairs" (ibid. 34) which subsequently in the 4th and 5th Centuries "appears much less as a right to be exercised in full freedom than as a dangerous practice with ambiguous effects" (ibid. 35). In the practice of parrhesia there is the truth speaker, and the other who the truth is spoken to and who acts like a sounding board of sorts, drawing out the latent truths. There is not an element of Christian confession herein, but an aspect of challenge, search and, indeed, archaeology, or at least a tracing of why we believe what we believe, a dialogical 'examination'. As this pertains to forgetting or traversal, we could see the possibility of that process of exchange between the truth teller and that to whom the truth is told to being useful to retain the 'own/self' discursive formations of choice in the face of the kinds of subtle relations we have studied herein.

Is it possible to not forget under conditions of power-relations? The original Greek concept of anamnesis says there is a pre-existing, latent, kind of 'globally' accessible set of moral, existential, metaphysical and mathematical knowledge available to all humans which can be accessed or awakened if we can experience moments of unusual clarity and insight which opens the window to such knowledge (cf. Uebersax, 2012). For us, applying this notion to discourse, and especially as it applies to the discursive function of forgetting under conditions of power-relations, we have coined the term 'unforgetting' to reflect the potential to recall those formations that were once dominant and now are dormant in some manner. We might also like to think that unforgetting applies to the latent knowledge within discourses, which in discourse's exteriority may potentially bear some commonality with the latent knowledge but within the boundaries of a discourse. A discourse exposed to alternate discursive formations may forget it's own discursive formations and adopt that of the greater condition. To unforget would be to recall discursive formations of the native

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discourse, not to deploy in apparent falsehood the rules of the alternate discourse, for thought to have a state where Idealism is *not* subordinate to Imperatives, Law or Enquiry, but just is.

One method to not forget 'own/self' discursive formations which we have briefly hypothesised and experimented with is the dialectical method styled after Seneca's "Moral Letters to Lucillius" (Seneca, 1917). We explored a set of narrative scenarios and situations predicated around the business notion of shareholder value. We published this as a kind of digital experiment, found at http://unforgetting.co (Hart, 2013), which we hope to learn from, and is still in train. Part of the objective of this textual experiment is to see if we can intersect with the simultaneous discourses in play and narrow any observer's epistemological vector down to a central set of formations, in this case, those formations creating the discourse of the mercantilists and traders, the discourse of commercial globalisation, teams and brands. But they could be of any discourse. In this manner a power-relation with other discourses and their antecedent formations may be possible to grasp, thus providing a possible approach for either cementing or avoiding the function of forgetting and traversal.

The idea of attempting to intersect and operate on anterior formations possibly extends and compliments the communications theory of critical discourse analysis. Specifically, the notion of discourse colonization (Leitch and Roper, 1998), that "involves the expansion of one discourse at the expense of another" (ibid. 205) and, for that theory, relates not to the touching of the epistemology of various discourse, but rather the linguistic mechanisms of discourse, as occurs in media advertising, market research, graphic design and public-relations professions (ibid 204). This is an important distinction in our approach to power and discourse. The theory of communication and linguistics (cf. Blommaert, 2005) sees power and discourse as a people-centered problem of communications, genre, linguistics and language, in contrast to concept-centered knowledge and the epistemological which we have adopted, albeit both seeking to invoke the power/knowledge connection (Leitch and Roper, 1998:206):

> "Fairclough, drawing on Foucault [cf. Archaeology of Knowledge,
> 1968] considers that participants are capable of shaping and reshaping

these [subject] positions. [Subject] Positions are not completely pre-determined or fixed and are open to challenge and change. The power to mount such challenges is not, however, equally distributed amongst discourse participants. Revealing the power relationships between discourse participants is, therefore, an important component of genre analysis."

Forgetting and traversal seen from a subject position and people-centered viewpoint is contradictory to the archaeological method of treating texts as anonymous in a territory of concepts. Discourse colonisation seen from our epistemological perspective is not just the function of the language of one discourse colonizing the other:

> "For example, in New Zealand, as in many other countries including Britain and Australia, the discourses of business and of the market have been increasingly used to rename things and people within the discourse domains of education, health, labor relations and the environment. Thus students have become the 'products' of the education system, hospital patients have become 'clients', and both people and the planet have become 'resources'. The purpose of discourse colonization is to transform both the discourse practices and the broader socio-cultural practices associated with the colonized domains." (ibid. 205)

Rather, we would say that discourse colonisation is about the discursive formations and their resultant concepts from one system of formation having a condition of possibility which exerts a power-relation from, say, the discourses of "business and of the markets" (ibid.) to the own/self discourse of, say, "computing", rendering the latter's formations not necessary and not sufficient, thus effecting the functions of forgetting and traversal which we have observed, especially in the narrative of D.

Forgetting and traversal are not nihilistic in the sense that extinguishing one being for another being could be argued but is not our question. We do not

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see *seinsvergessenheit,* (from the German, literally 'oblivion of being' or 'forgetting of being') as the consequence of discursive forgetting. Nor can the way we have obtained the insight that forgetting is happening make it anything deterministic or teleological in nature. Instead, since we have spoken about the exertion of a power-relation to resolve an operative reality, the act of forgetting and traversal place themselves as necessary responses to a multiplicity of discursive formations that are illogical and unsustainable when dynamically placed together, as we have seen in contemporary organisational discourses and their relations. However, based on our conception of discourses, which leads us to think about knowledge-for-itself could mean knowledge and it's formations could be argued to have being. The greatest struggle of coming to grips with the notion of archaeology and viewing narrative 'as text which came from nowhere' is to not just see it as an analytical trick, ignoring the people-centric to obtain insight only to return to the secret interior of peoples, but, in preserving exteriority, to ignore the question of 'where is it (knowledge, discourse, discursive formations)'. The worrying question is that of course there *are* people and a complex network of structures that do operate as a collective with shared, albeit irregular, non-uniform epistemological mechanisms, but of course we do not speak of a collective consciousness:

> "The analysis of statements operates therefore without reference to a cogito. It does not pose the question of the speaking subject, who, in speaking, exercises his sovereign freedom, or who, without realizing it, subjects himself to the constraints of which he is only dimly aware. In fact, it is situated at the level of 'it is said' – and we must not understand by this a sort of communal opinion, a collective representation that is imposed on every individual; we must not understand by it a great, anonymous voice that must, of necessity, speak through the discourses of everyone; but we must understand it by the totality of things said, the relation, the regularities, and the transformations that may be observed in them, the domain of which certain figures, certain intersections indicate the unique place of the speaking subject and may be given the name of author. 'Anyone who

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speaks', but what he says is not said from anywhere. It is necessarily
caught up in the play of an exteriority." (Foucault, 1969:138).

In this sense, the archaeological approach is also phenomenological as the texts, the discourses, the discursive formations, the systems of thought are 'nowhere'. What we have seen, however, is that this means an argument for knowledge-for-itself to have being and existence could be mounted. The notion that being has to be somewhere to have being could be questioned. Where this could lead to is uncertain, but is a line of further enquiry.

While forgetting and traversal are related and we have discussed them as almost synonymous, forgetting is slightly different from traversal as we have come to believe traversal moves one to a new formation, whereas forgetting means the formation is not erased as a way of thinking and knowing but is temporarily dislodged as a way to know. After the power-relation or network shifts it may be possible to 'remember' the same formation if those rules of thinking are still useful, and still make sense.

This leaves us with the function of retreat. In the face of relations of truth which seek to exert epistemological power, we might think that a parrhesia truth-telling process or an unforgetting process could have the potential to disrupt those trajectories we have researched. With respect to retreat, these will likely be ineffective and nonsensical. It is precisely because in the function of retreat we have the ideal expression of a response to power exerted by an awareness of the pitfalls of forgetting and traversal, (which itself is a kind of 'permanent' forgetting anyway). In retreat, we see that epistemological power fails to be effective to influence and shape the native and in some sense, secret, private or hidden 'own/self' system of formation, whose identity and own formations, however obtained, is preserved, recalling the notion of existential authenticity and a pathway for a hidden freedom of thought, much like the Christians who were persecuted by the Romans for their beliefs hid theirs, as we have seen in the narrative of M.

Unfortunately, under conditions of multiple and contemporary discourse, the function of retreat, which is a form of discursive censorship, extinguishes the potential to externalise its own knowledge (connaissance) and it's own formations (savoir) to the

operative reality in the presence of disciplinary power (such as today's management discourse, the 21st Century Romans). For us this finding is expressed in the discursive formations and their relations that we have excavated. Idealism in particular is a formation that is subject to disciplinary power, and, if many of the discourses have idealism as a formation, as our narrative data suggests, disciplining of knowledge that is irrational and illogical, and ISD as a profession could therefore be easily seen by other discourses as "restrictive, linear and dull." (cf. Oliver, 1988). While for some this begs the question of what the relation could be between a profession and a formation, nonetheless we believe these power-relations in general and their effects are phenomena worth worrying about in ISD. For example, the body of professional knowledge known as TOGAF (The Open Group, 2013) and the formation of 'dull' idealism that this type of knowledge seeks to externalise is likely to be treated by the formation of (management) imperatives as not necessary and not sufficient to constitute valid knowledge, thus a condition of possibility is not met when exposed to the other formation, and a power-relation invalidates this type of knowledge (connaissance) outside of its own 'lustreless' discursive boundary. Dismissed as dull and not useful, it sulks back in retreat inside its self-defined boundary.

Application of the research to the effectiveness of ISD Professionals

While pragmatically it may be difficult to see epistemologies in the workplace we can outline some stratagems for the ISD professionals. Firstly, is that if we accept the functions of forgetting and traversal as happening with IS knowledge, then it is plausible to think that such an effect could be resisted. All too often in meetings a superordinate way of thinking is evoked to counter an IS way of thinking. Even being aware of this mechanism could be helpful to 'strengthen' the rules of formation in IS practice. Secondly, wrapping IS thought inside a superordinate concern such as economics while retaining the integrity of the IS part of knowledge and epistemological rules should be an effective way to counter power-relations so long as the 'wrapper' itself is not contradictory. Thirdly, the 'weakest' formation of Idealism which seemed to be central to the concerns of some ISD professionals could be replaced with the formation of Imperatives. If ISD as a practice evolves its own imperative that could counteract the currently superordinate power-relations that say ISD knowledge does not have an imperative and it is therefore 'anything' the other

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knowledges and discourse wish it to be. An alternative yet complimentary strategy is to have a quality of resiliency which allows knowledge to retain integrity against power-relations on the border while seeking its own goals. Some of the most effective ISD professionals in our investigation had this quality in their thinking.

Effectiveness itself probably stems from a discursive formation of an imperative. In terms of the sum total of ISD practice's evolving knowledge about itself, it is unfortunate that much of this knowledge in the author's experience, and is, at least in the workplace, erased or removed due to a power-relation with superordinate formations. In the case of contemporary and simultaneously occurring corporate organisational discourses, it is a hard reality that many of the profession's thoughts are simply not accepted in the workplace, not just due to issues of interpersonal communication, and hopefully an awareness of these epistemological functions we have investigated can go some way to helping overcome this difficulty. However, in alignment with the indirect study of power, we do not see power as an obstacle to be overcome, but rather an influence to be recognised and leveraged. Awareness of how one's own discourse and knowledge is dealt with by others not of your discourse is helpful, and even perceiving the diversity of discourse within the ISD profession due to boundaries is helpful. The effort to understand can only make the ISD profession more sympathetic to understanding and harnessing the effect of power-relations on ISD knowledge evolution.

As we have seen, the formations of adversaries and tradeoffs, enquiry and idealism and the corresponding boundary functions of forgetting, traversal and retreat have shown us there is something happening in ISD that is beyond a problem of communication between the ISD professional and their clients. Certainly, our investigation here has described the possibility that under conditions of contemporary and simultaneously occurring discourses, such as exist in the modern organisational workplace, ISD for us is not only about one truth, but about many truths that circulate among discursive formations which are resolved by relations of epistemological power to make an operative reality, that is, the knowledge which is deemed to be certain at that point in time. As we have shown, our archaeological approach to this investigation could be fertile ground for further study, perhaps even to help address the ISD professions 'anxiety-in-itself' (cf. King and Lyytinen, 2004).

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Appendix A – Personal Consent Form

PARTICIPANT CONSENT FORM

I, _____(insert your name) agree to participate in the PhD research project "Power-relations and Information Systems (IS) development" being conducted by **Adam Hart**, a PhD student in the Faculty of Engineering and Information Technology (FEIT), School of Systems Management and Leadership, University of Technology, Sydney (UTS).

Adam's phone number is ▨▨▨▨▨▨ and his email is **adam.c.hart@student.uts.edu.au**. His supervisor is **Dr. Jim Underwood** (Senior Lecturer, FEIT, UTS, Sydney) who can be contacted on ▨▨▨▨▨▨ or emailed at **jim.underwood@uts.edu.au**.

I agree that Adam has explained to me that the research will undertake an in-depth investigation into structures and relations of power that operate in IS development practices, with the objective of describing and understanding the operation and effect of power during IS development activities.

Adam has explained to me that during the interview I should not relate any information I feel would have a reputational impact on my current working life, or that I feel causes me discomfort, embarrassment or emotional distress. **If such does occur I am *not* to feel compelled to continue**. I will simply inform Adam, and all interview materials up to that point will be immediately destroyed and the interview terminated with no consequence to me.

A one-page information sheet is provided outlining the research in more detail overleaf. This will be provided after the interview to avoid introducing bias.

It is noted that all interviews will be audio recorded and transcribed into written form (without your name being written down at all), treated and archived in confidence,

and in accordance with the privacy and confidentiality principles of the University of Technology, Sydney and applicable legislation. Only Adam and Jim will have access to the original data.

I am aware that I can contact **Adam Hart** or **Dr. Jim Underwood** if I have any concerns about this research. I also understand that I am free to withdraw my participation from this research project at any time I wish, without giving a reason and without consequence.

I agree that Adam Hart has answered my questions fully and clearly. I agree that research data gathered from this project may be published in a form that does not identify me in any way.

_____ ___/___/_____
Signed By

_____
Position

_____
Organisation

_____ ___/___/_____
Witnessed By

Note:

This research has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research that you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer (ph.: 02 9514 9772, or e-mail, Research.Ethics@uts.edu.au). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

PARTICIPANT INFORMATION SHEET (COPY FOR PARTICIPANT AFTER INTERVIEW)

This information sheet is provided for purposes of outlining the research entitled "Power-Relations in Information Systems Development" in more detail. Because the research method is unusual, more theoretical background is provided herein.

Research background

This research is an application of discourse theory (Foucault, 1972) that is an alternative yet methodical way at looking at how the world works and why decisions get made the way they do.

This theory doesn't agree that events are shaped due to leaders or groups of influential persons, and disagrees that history and our actions are always progressing towards a glorious and better future.

Instead this theory says that events are shaped by competing "discourses", where discourses are collections of different types of rules that are linked to each other like a network, and that these networks are deep structures in society, and are driven by rules which we do not normally control, see or use consciously every day but they exist to determine our actions.

These rules act to tell us how do we know what we know, what is true and what is false, and affect how we learn new knowledge.

The places and instances where different sets of these rules engage (for example if medical knowledge and economics interacted) is where power "happens", and it works to resolve differences, make something true and another thing false, and it is this aspect of power that the research wants to understand.

Research Purpose & Benefit

The reason we want to research this phenomenon is firstly to apply the theory, secondly because we believe that power has a material effect on information systems development success or failure (and the definition of that) more so than the existing body of information systems literature tells us.

If participants in information systems development are more aware of this phenomenon they can possibly use that knowledge to their advantage, to determine a more informed course of action compared to if they weren't aware. This may better align to what they think is the right thing to do. These better courses of action are characterised as "resistance" and "emancipation".

Interview Technique

Individual working life stories (narratives) are collected, with the least and minimal amount of disturbance by the interviewer, to avoid the researcher ascribing their own bias to the statements of the participant during collection.

As a result the participant will mostly be prompted to discuss their own work history, and this will take some time to get the right tenor and to cast one's mind back to what one was thinking at the time as opposed to a contemporary interpretation of a past event ("what I recall I was thinking" is a good mindset). As a result the interview is expected to take about 2 to 2.5 hours, including **breaks and refreshments**. Your patience and contribution is very much appreciated.

References & Contacts

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Dr. Jim Underwood (Senior Lecturer, FEIT, UTS). Phone: ▒▒▒▒▒▒▒ email jim.underwood@uts.edu.au.

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This research has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer, (ph.: 02 9514 9772, or e-mail, Research.Ethics@uts.edu.au). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

[END OF DOCUEMENT]