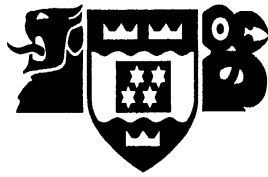


VICTORIA UNIVERSITY OF WELLINGTON  
*Te Whare Wananga o te Upoko o te Ika a Maui*



# **The impacts of Meta Data Management on Social Dynamics**

A Research Case Study presented to the

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by

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**Abstract:**

Meta data management practices often overlook the role social dynamics play in harnessing the value of an organisation's unique business language and the behaviours it creates. Using evidence from literature, interviews and cognitive ethnography, this research case sets out to explain the impacts of meta data management on social dynamics. The emerging themes (that is, newness, continual adaption, engagement tension, production tension, inefficiency and unreliability) represent salient factors by which organisations can be constrained in exploiting the worth of their meta data.

This research emphasises the critical importance of organisations having a deeper understanding of the purpose and meaning of information. This understanding is a strength for creating value and for exploiting the worth arising in networks and in the social dynamics created within those networks. This strength contributes to organisations' economic growth and is interdependent with their ability to manage complex phenomenon in a growing interconnected society.

## **Introduction:**

More than two decades have passed since Peter Drucker recognised in 1984 that society would need to transition from a condition primarily centred on the "T" in Information Technology. He said that what mattered was not technology, but a much deeper understanding of the meaning and purpose of information (Drucker, 1984, 1999). Drucker (1984, 1999) understood a new way of thinking would be needed for organisations to effectively redefine and manage information to gain an advantage in an increasingly complex society.

Marcus Aurelius (121-180 AD) said *"Look beneath the surface; let not the several quality of a thing nor its worth escape thee"* (Marcus, 1998). Organisations must look beneath the network of information to its meaning and purpose to find the exact nature of its worth and distinguish it from past sources of wealth creation. The value within the complexity created by our society's interconnectedness is enabling organisations to capitalise on their understanding of the dynamics of complexity. The ability to manage complex phenomenon is a strength enabling organisations to transcend complexity as a weakness and this know-how is what threatens to disrupt all facets of business.

The most significant advantage organisations have in managing complexity is their understanding of what is necessary to exploit it, create new solutions and transform with predetermined solutions (i.e. new information technologies and systems). To obtain such a future requires organisations to go beyond facades attempting to simplify the complexity our interconnected society creates and no longer be taken in by yesteryears' superficial technology centric paradigms. Attempts to manage complexity by reducing it to constituent parts are also a perpetuating obstacle that distorts organisations' holistic understanding of complexity.

In organisations, managing complexity can be their weakness. This disadvantage continues to erode their ability to exploit the worth that arises in networks and in the social dynamics created within those networks. Over time this weakness is compounded by an inability to anticipate complexity's emergent properties as organisations pursue transformations with predetermined solutions.

Managing the complexity phenomenon requires an understanding of the theories of meaning together with network theory, particularly when it comes to discoveries in semantics that make effective information and meta data management possible in our interconnected society.

Semantics are fundamental to natural language expression and explaining its meaning and semantics represent the mental states of people. Natural language expression is critical in the effective management of semantic meta data, delivery of predetermined solutions and maximising the worth of an organisation's information assets. Meta data refers to information that describes the various aspects of an information asset, to improve its quality, and ensure the asset conveys knowledge about an item without requiring examination of the item itself (Gartner, 2010; Haase, 2004; Madnick, 1996).

Semantics underpin our interconnected society and the meaning of information used in organisations. The understanding of semantic meaning impacts language in organisations and value creation from the use of information. The semantics in language not only deal with words people use, but are representations of meaning expressed in sentences (Steyvers & Tenenbaum, 2005; Bub et al., 1998; Griffiths, Steyvers & Tenenbaum, 2007). Semantics represent a source of social cohesion and are a stimulus for creative innovation. Semantics are valuable in the present moment and over time they reveal patterns in our lives.

Semantics also underpin the purpose of information within organisations. An in depth understanding of the reason for semantics in information is a human condition that connects organisations in an interconnected world. The span of semantics reaches organisations from every sector (i Cancho & Solé, 2001; Steels, 2008; Bub et al., 1998). Semantics ensure we learn more about ourselves, others and how people assign meaning to words processed in their minds (i.e. psychological and cognitive).

An organisation's understanding of semantics in meta data enables them to distinguish meanings about their language. This propels an organisation into the big data age to thrive in a changing world. The observation by Drucker (1984, 1999) on the condition of information provides an understanding of how the language network effects is a factor in a changing world. As people adapt to change and the complexity interconnectedness creates, opportunities arise for advancement.

One significant aspect of this opportunity is highlighted in economics. The World Economic Forum's (WEF) "Connected World Transforming Travel, Transportation and Supply Chains" report projected opportunities in an interconnected world will hover at 4 trillion dollars per annum until 2025 (WEF, 2013). This can be seen in one of three primary elements General Electric (GE) outlined in their "Industrial Internet" report. GE predicted a 10 to 15 trillion dollar opportunity centres on more intelligent designs that lead to productivity increases for people around the world (GE, 2013). Likewise, McKinsey and Company (2013) predicted, in their "Disruptive technologies: Advances that will transform life, business, and the global economy" report, a 5 to 7 trillion dollar opportunity centres on more intelligent systems that improve knowledge workers' ability to quickly come to sensible conclusions.

Organisations with an understanding of how to identify opportunities beneath the surface of information, create emerging solutions by exploiting the abundance of data or information in an interconnected society. This will continue to enable organisations to drive demand for their goods or services. Furthermore, the strength to create emerging solutions is accelerating what Drucker (1984, 1999) anticipated would occur in a world in which billions of people and things connect in an ecosystem. What Drucker (1984, 1999) postulated represents characteristics of complex systems. In our society a deeper understanding of managing complexity and their dynamics is what holds the future of value creation.

Furthermore, complex systems that involve people require intelligent, appropriate designs that anticipate what arises from within the network. Networked information is information that no longer exists in a vacuum or in silos and reflects complex systems.

As new predetermined solutions sprout up in organisations, the role social dynamics plays in effective information management has been overlooked. This oversight has created an ever-widening chasm of interpretation of business language or corpus. The meta data that predetermined solutions generate remains disparate, ambiguous and isolated on the machines organisations use. The more a business creates, retains and uses data the more risk there is in conflicting or inaccurate interpretations of that data.

The effective semantic interpretation of meta data is critical to a business's ability to make productive and accurate use of data and information.

Semantic interpretation is not only significant to business language, it affects learning during problem solving and planning. The semantic interpretation of business language satisfies a human need to be social. It facilitates interactions business units engage in every day as well as business connections. Organisations that implement meta data management best practices are well positioned to improve social dynamics and with it, group oriented analysis and sense making.

This research case identifies the phenomenon of social dynamics as it relates to economic significance for organisations with an ability to establish and grow networks. The implications that are shaped by an organisation's social dynamics and business language captured in meta data has economic significance. The emerging themes (that is, newness, continual adaption, engagement tension, production tension, inefficiency and unreliability) at play in this research case represent salient factors by which organisations can be constrained in exploiting the worth of their meta data.

## **Literature Review:**

### **Case Study Rationale:**

Organisations conduct business and workplace activities that focus on problem solving, planning and learning (Nelson, 2000). When implementing predetermined solutions people speak in a way that represents aspects of their organisation's business language. For instance, language like the following is used:

What customer segments are touched by {name of enterprise applications and systems}?

What transformations have been applied to customer segments?

What must each team (e.g. Marketing, Information Technology, Compliance and Risk) consider before applying {name of enterprise applications and systems} modifications to customer segments?

What are the possible implications on lead generation and what customer segments do they reach?

How can we isolate or take advantage of those systems that we want to modernise while tapping into new customer segments?

This dialogue typifies an organisation's business semantics spoken by workgroups as they interact in business activities for the delivery of predetermined solutions (Nelson, 2000). The language people use is complex and adaptive. The interactions between people using their business language is a distinguishable pattern which can be seen worldwide (Buchanan, 2007). A distinguishable pattern of language not only forms in organisations, but it can be seen formed in the many dialects of a particular language found throughout a country and worldwide.

The language used represents social dynamics and reflects the social phenomena of people (Halevy et al., 2009; Steels, 2008; Buchanan, 2007). Natural language is fluid and often fluctuates from a chaotic state to a state of harmony. In an organisation this fluidity creates a need for the establishment of a corpus business language – one which is common to that organisation. The corpus business language is affected by external factors and actors.



For instance, new global financial regulations that address financial crimes required new predetermined solutions (i.e. new information technologies and systems) to be implemented and in the process new business terms were introduced. The introduction of predetermined solutions that increase digitisation of information, also changed the business language. This condition is nonlinear, that is, the development of business language is not structured but is self-organising (Steels, 2008, Buchanan, 2007).

Understanding the role the corpus plays in nonlinear dynamics is even more significant for managing in our interconnected society. Often in today's complex business and IT environments, organisations that pursue the delivery of predetermined solutions overlook the role social dynamics plays (Watts, 2002, Steels, 2006). In particular, and the subject of this paper, as organisations pursue transformations of their businesses they often deliver predetermined solutions that over-generate meta data. The impact on social dynamics and the economic significance in the new and existing meta data, which is unique to a business, is often overlooked (Haase, 2004; Watts, 2004; i Cancho & Solé, 2001). This oversight occurs even though organisations can use semantic meta data to foster accurate workplace interactions, mould social behaviours and gain a competitive advantage.

Although semantic meta data is being recorded as people interact with technology, aspects of their business language captured in that meta data remains ambiguous and isolated on the machines they operate. The ambiguous and isolated information never reaches its full potential because it has never been redefined to find its meaning and purpose (Drucker, 1984, 1999).

Attempts by organisations to establish a state of harmony out of the chaos created by nonlinear language development, is less about IT and more about the social dynamics of people in workgroups (Halevy et al., 2009; Steels, 2008; Buchanan, 2007). It is about creating a state of uniformity, general agreement, unambiguity, while chaos represents unclear or ambiguous silo-based work patterns.

It is reasonable to infer that each person, left to their own devices, would settle on self-serving definitions which represent their own way of expressing words and objects. So too would workgroups who share common experiences, cultures, opinions and languages. Without a defined language or semantic interpretation of business language, interactions between workgroups can cause conflicts.

Over time, repeated interactions between people lead to increased levels of homogeneity due to humans' semantic memory (a person's ability to create associations from words and objects over time) (Atkinson & Shiffrin, 1968; Tulving, 1972; Martin, 1993). However, this conceptual homogeneity can be incomplete. To establish accurate workplace interactions and social behaviours, an organisation can develop meta data management practices and use semantic meta data to help define their corpus.

Often, meta data management practices focus on the non-trivial effects of the interoperability of information technology. For instance, the worth of meta data is often associated with the internal workings of software that enables it to consistently operate together on machines. This has been and is useful. The generation of more data and information through interoperability of information technology has enabled organisations worldwide to expand the reach of their operations (Drucker, 1999). By itself though, interoperability of information technology has not enabled many organisations to look beneath the network of information to its meaning and purpose. This is even more significant in our interconnected society as the social dynamics of people have made meta data more complex and more valuable at the same time. As more people interact with goods or services that include meta data, uncovering the exact nature of its worth is even more critical. One impact of social dynamics is that it expresses the meaning of the exact nature of meta data's worth that is beneath the network of information. This information enables organisations to create new value, wealth and to redefine what is meant by competitiveness (Drucker, 1984, 1999).

The social dynamics of people which are embodied in complex systems are adaptive and naturally occurring and would give greater depth to management practices. However, they are far more complex to analyse. This is likely to be the reason why social dynamics have been ignored in meta data management practices even though the research included in this case study would suggest that social dynamics is an important part of making productive and accurate use of information.

It is unreasonable to suggest that meta data management practices and semantic interpretation of business language will solve all confusion because the social behaviours of people are beyond the bounds of possibility. An understanding of how business language affects workplace activities can reduce the ambiguity which can lead to conflicts (Nelson, 2000).

### **Impacts of Meta Data Management on Social Dynamics:**

The ways in which people perceive and comprehend key policy changes or events in an interconnected society affect social dynamics (D'Andrade, 1995; Vygotsky, 1978; Steels, 2008). D'Andrade (1995) suggests the affects involve the degree of interdependence between complex units that include people, workgroups and different networks. Vygotsky (1978) suggests that natural language is a higher psychological function that plays a fundamental role in organising complex human behaviours. This complexity increases in society as everyone and everything becomes interconnected. The social dynamics of humans and activities that relate to commerce like shopping, reading, social interactions, and entertainment are increasingly digitally mediated and interconnected. This condition is fostering a greater intertwining of digitised interactions in society with the minds of people (Beeman, 2005; Eysenck, 2004; Buchanan, 2007). As thought processes and the physical world coalesce they consistently change together. The living systems in organisations are complex and self-organising where numerous outcomes are likely, particularly when they involve people (Holling, 2001).

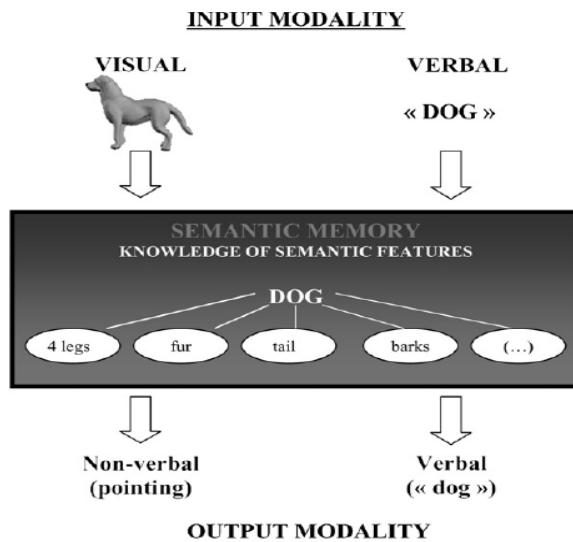
### ***Semantic memory:***

A critical factor in social dynamics is people's semantic memory. The semantic memory is necessary for people to use natural language. It is a highly structured knowledge network of concepts, words, images, their meanings and references about rules, relations, formulas, and algorithms people use in making inferences (Collins & Quillian, 1969; Eysenck, 2004; Tulving, 1972). People call on this network in problem solving, planning, and learning by retrieving words about concepts in the physical world (Joubert et al., 2010; Beeman, 2005; Martin, 1993; Tulving, 1972). The semantic memory plays a significant role in people's workplace activities including delivering predetermined solutions.

The interruption or loss of semantic memory is significant. Among other things Alzheimer's disease, dementia and aphasia has been linked to the loss of a person's semantic memory. A recent study has linked the cause of a significant loss of semantic memory to high abdominal fat in people beyond 30 years of age (Roy et al., 2013).

**Figure 1** shows that as people think about the word 'dog', naming it in a picture, their expression of the word is influenced by the inputs and outputs of semantic memory. Conversely, the inability of people to associate with words like 'dog' from their semantic memory affects their forming of words and expression of their meaning using language (Caramazza et al., 2003; Joubert et al., 2010; Reilly et al., 2012; Chertkow et al., 2002; Bub et al., 1998).

**Figure 1:** Criterion for expressing meaning using inputs and outputs of semantic memory



As people in workgroups interact within their organisation's ecosystem, external stimuli embeds a network of associations in the semantic memory. This enables common acquisition, retention, and transmission of information about meaning that represents words, concepts, and their classification.

#### ***Semantic interpretation:***

The interactions between social groups and the semantic interpretation of objects reflect the associations people assign to their shared opinions, culture and business language. In organisations, the formation of a business language and semantic interpretation is an aspect of human cognition which enables people to productively collaborate and understand the meanings associated with the physical world.

Meaningful business vocabulary and the accurate use of information hinges on semantic interpretation. Semantic interpretation for meta data management is interdependent with human cognitive ability, together expanding meaning for analysis (Beeman, 2005, Sowa, 2006).

Corpus is also interdependent in semantic interpretation. Corpus is instrumental in expanding meanings of words and ensures quality collaboration for intentional outcomes. Corpus is the representation of words used in natural language production and this plays a significant role in memory, social dynamics, cognition and growth of networks (Francis et al., 1967; Quirk et al., 1985; Steyvers, et al., 2005).

Meta data management practices must make an organisation's spoken business language inclusive and accessible to ensure it enhances human wellbeing. Meta data management practices that are truly holistic enable people in organisations to become more self-sufficient, empowering them to express language for doing business versus language expressed about business (Nelson, 2000).

The lack of management of disparate semantic meta data is an issue that organisations need to better understand in order to resolve semantic conflicts, and improve decision making and operational performance. This is a critical factor for information management as meta data management practices are a key tool for establishing resilient data governance, data integration, data quality, master data management and big data initiatives.

#### ***Data semantic acquisition:***

Eliciting the social dynamics and human condition from meta data management practices requires a people centred way of thinking that focuses on data semantic acquisition as an intervention (Steels, 2008; Eysenck, 2004; Madnick, 1996). Data semantic acquisition is an intervention technique that ensures the accurate interpretation of business vocabulary and considers the natural language used while conducting business. The intervention technique ensures the quality acquisition of business language and semantic representation of that language is meaningful to people. Madnick (1996) suggests data semantic acquisition is an intervention technique organisations can use to organise semantic meta data enabling them to improve decision making as they become dispersed geographically and functionally.

Haase (2004) suggests that semantic meta data is different from traditional taxonomies or structured thesauri in two significant ways. The first is that “it provides articulated patterns of reference, describing (even if only in natural language) how terms map to content” (Haase, 2004 p. 205.). The second is that “it provides operational rules of inference explaining how and when terms can be expanded to other terms” (Haase, 2004 p. 205.).

Essentially, by creating a glossary for business language that enables quality network effects to emerge, an organisation will shorten the time it takes for people to retrieve from their semantic memory their interpretation of a word. Data semantic acquisition is the intervention technique used to create the glossary which becomes the corpus.

Moreover, as data semantic acquisition establishes precise, high quality meta data in organisations, the intervention technique ensures value is likely to increase greatly over time. The intervention technique enables an organisation’s meta data to become valuable as the organisation’s meta data grows or as business user communities that use the meta data increases.

Data semantic acquisition assumes that not all meta data generated for predetermined solutions is created equal and that not all known facts about the meta data will be interpreted accurately to create the organisation’s corpus (i.e. business language). Furthermore, the intervention technique reflects human intentions to ensure representations of words are formed naturally.

The intentional human intervention of data semantic acquisition is an activity that ensures organisations establish more reliable and precise semantic meta data. The intervention technique ensures workgroups absorb, retrieve and recall associations that stimulate what is stored in people’s semantic memory.

The effects semantic memory has on workgroup's social dynamics is reflected in associations of their business vocabulary that are used to express the same meaning in many different ways. How business vocabulary is expressed can infer different meanings and this only exacerbates a highly ambiguous, unproductive climate when the digitised information remains disconnected (Halevy et al., 2009). The simulation of coherent associations networked together visually, ensures workgroups have accurate cues that promote symmetry on memory to decrease ambiguity.

The strengthened semantic representations of simulated network associations enable workgroups to use their memory more productively to infer accurate relationships between application specific data stores. The network effects happen when multiple workgroups use their organisation's corpus (i.e. business language). This condition enables workgroups to quickly reconcile semantic meta data that fosters greater self-sufficiency, reduces semantic conflicts and increases the worth of an organisation's corpus. An organisation's corpus that has more terms to link to and that has more links created, will be in a better position to harness more value from their corpus by creating more terms and linking them in.

The review of literature has demonstrated that semantic interpretation of business language satisfies a human need to be social. It facilitates interactions business units engage in every day. An organisation's understanding of semantics in meta data enables them to distinguish meanings about their language. This propels an organisation into the big data age to thrive in a changing world. Consequently, the effective semantic interpretation of meta data has a profound impact on an organisation's social dynamics yet meta data management practices often overlook the significance of an organisation's unique business language. This research gap is explored in this research case.



## **Methodology:**

A cognitive ethnography framework was used on a specific project case study to learn about the impacts of meta data management on social dynamics (Williams, 2006). This was supplemented with interviews held with people who have extensive experience in implementing predetermined solutions in organisations. The method was selected because it ensures data-rich representative sample materials are collected in real world settings, for instance, the business activities of an organisation's community of practice. The method provides a holistic lens for continuous observation of the participants (for example, individuals, workgroups, society, etc), and it considers social phenomenon and complexity from the cultural perspective (Fetterman, 1998).

### **A Financial institution's experience:**

Providing some insight into the significant role meta data management practices play in social dynamics, the method includes a study of a financial institution's project to implement new global financial regulations that address financial crimes. This project saw the introduction of predetermined solutions to comply with the new Anti-Money Laundering and Countering Financing of Terrorism Act (AML/CFT). The Act was incentivised by the economic effects of financial crimes. A financial institution's licence to operate can be revoked if they fail to comply with the Act within a designated period. The legislation has affected every aspect of the banking business. The affects are global in nature and the changes even touch a nation's financial stability.

Governments have recognised the significance of having sound banking institutions that can supply capital safely in a globalised world. It has been estimated that AML/CFT finance crimes accounted for approximately \$275 billion dollars in lost profits alone in the United States of America. The criminal AML/CFT activities restrain foreign investment and affect international capital flows (International Monetary Fund, 2010).

“Money launderers exploit both the complexity inherent in the global financial system as well as differences between national anti-money laundering laws and systems, and they are especially attracted to jurisdictions with weak or ineffective controls where they can move their funds more easily without detection. Moreover, problems in one country can quickly spread to other countries in the region or in other parts of the world” (Patel et al., 2012 p. 172; International Monetary Fund, 2010; Hagan, 2011). This rapid spread is due to the interconnectedness of society.

The changes for a financial institution to implement the new AML/CFT legislation brought about a new language that altered social dynamics within the financial institution. This is a perfect example to show how meta data management impacts social dynamics because the change impacted every part of the business including customers, systems, processes and employees.

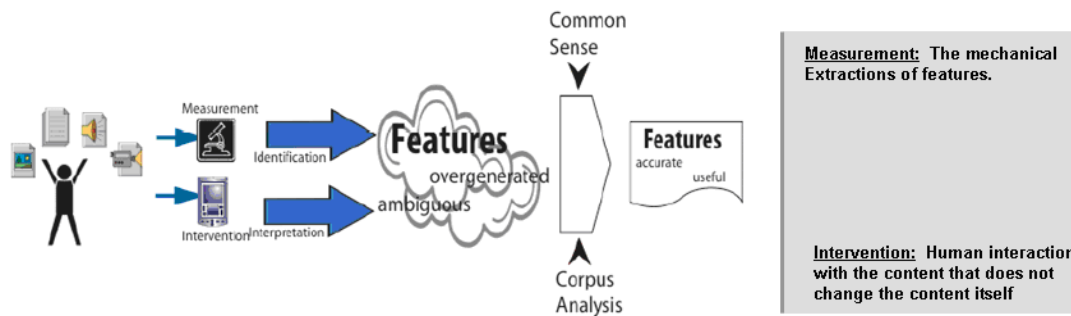
### **Conceptual frame:**

The method also combined conceptual frames based on meta data pipeline and context mediation services, to ensure the exact nature of meta data’s worth is distinguishable from past sources of wealth creation in organisations (Haase, 2004; Holling, 2001; Madnick, 1996). These frames were applied to the AML/CFT project to simulate the semantic memory of workgroups. The semantic representation is for a new AML/CFT business vocabulary. **Figures 2 and 3** highlight key characteristics of the conceptual frames applied to the AML/CFT project. The characteristics outline the practical application of data semantic acquisition as an intervention for meta data management practices.

**Figure 2** provides features of Haase’s framework (meta data pipeline process) and summarises the two key aspects of measurement and intervention that contribute to over-generated and ambiguous semantic meta data. The framework considers the processes necessary to help people with the interpretation and identification of distinguishable features of meta data. The framework applies a heuristic iterative learning process while people were establishing and expanding their organisation’s corpus. This heuristic process ensures people gain knowledge from their experiences. Heuristics was applied with the meta data pipeline process to distinguish context from independent meta data features and sources that generate ambiguous meta data.

Measurement and identification (as in **Figure 2**) of the raw meta data features were analysed to establish associations of interdependent features. This was done to ensure consistency and so that accurate features of semantic meta data uncovered its worth making the semantic meta data useful for people.

**Figure 2:** Meta Data Pipeline Process



(Haase, 2004)

The establishment of quality semantic meta data provides an organisation with an opportunity to better understand how people in their workplace respond to stimuli or events that emerge. Meta data management practices that adopt the conceptual frameworks and processes will continuously expand an organisation's corpus ensuring workgroups are better equipped for adaption.

**Figure 3** is an extract from Madnick's framework that reflects a key feature of context mediation services. It is Madnick's concept of data semantic acquisition that describes the intervention technique that was applied to this research case as part of meta data management practices to create quality associations. This service was combined with Haase's framework and processes to simulate associations representing people's semantic memory for the AML/CFT project.

**Figure 3:** Context Mediation Services

Context Mediation Services	
Data Semantics Acquisition	Alignment and organisation of context for semantic meta data for it to be managed.
Data Quality	Context Characteristics: accuracy, completeness, consistency, timeliness, source, and stability

(Madnick, 1996)

## Interviews:

The method also included interviews with a variety of industry participants. Interviews were selected as a means to collect rich data providing this research case with a holistic ethnographic analysis (Fetterman, 1998, Williams, 2006). The rich data was needed to enable examination of the participants' experiences and to interpret likely themes that emerged. The participants came from the software industry and consultancy firms with extensive experience in predetermined solution transformation programmes within organisations. Participants also included people from the banking industry who established a new corpus for the Anti-Money Laundering and Countering Financing Terrorism Act (AML/CFT).

The participant interviews were face-to-face and telephone based. Victoria University of Wellington, School of Information Management, were consulted on the descriptions of questions, which were reviewed for accuracy. The consent form, information sheet and interview questions used for the case are included as appendices.

**Table 1** is a summary of the characteristics of the 17 people who took part in the interviews.

**Table 1:** Participant Characteristics

Interviewees	Experience	Years	Roles	Where
2 of 17	<b>Direct Involvement:</b> Planning, strategy, integration, business process change, project management, capability development, governance, software development, enterprise applications and systems transformation delivery.	>20	Consultants Projects Team Members Senior Management	USA
6 of 17	<b>Direct Involvement:</b> Planning, strategy, integration, business process change, project management, governance, software development, enterprise applications and systems transformation delivery.	>10	Consultants Enterprise Architects Projects Team Members Senior Management	Australia
9 of 17	<b>Direct Involvement:</b> Planning, strategy, business process change, project management, governance, enterprise applications and systems transformation delivery.	>10	Enterprise Architects Projects & Operations Team Members. Senior Management Team Leaders	New Zealand
n=17	<b>Implementations:</b> Enterprise software, information technology and business initiatives.	>40	<b>Combined Roles:</b> Consultants Architects Senior management Team leaders Projects and operations	<b>Geographic Mix:</b> America, Australia and New Zealand.

The interviews caught the perceptions of a sample who were from America, Australia and New Zealand. This ensured a reasonable geographic mix. The combined sample has more than four decades of experience in the implementation of enterprise software, information technology and business initiatives. The interviewees' experiences were gained through their direct involvement in implementing predetermined solutions in organisations.

The interviews highlighted a few of the core issues arising in organisations that were documented. Careful observation and content analyses of responses to the eleven research interview questions (see appendices) were undertaken. The interview responses were aggregated for the purpose of identifying and understanding recurring themes that are impacting organisations' ability to address complex phenomenon. Five abbreviations were used, representing five recurring themes, and were placed next to participant responses. With constant comparison of the five themes, 22 sub-themes were identified from participant responses to the interview questions. This approach enabled discovery of a primary narrative and the creation of a visual representation of participant experiences, situations, nuances, and meanings needed to describe the key characteristics of the five emergent themes. Some of the exact comments from the interviews have been reproduced and included in this paper, particularly those that clearly represent the themes (Burns, 1994, Fetterman, 1998).

### **Methodology limitations:**

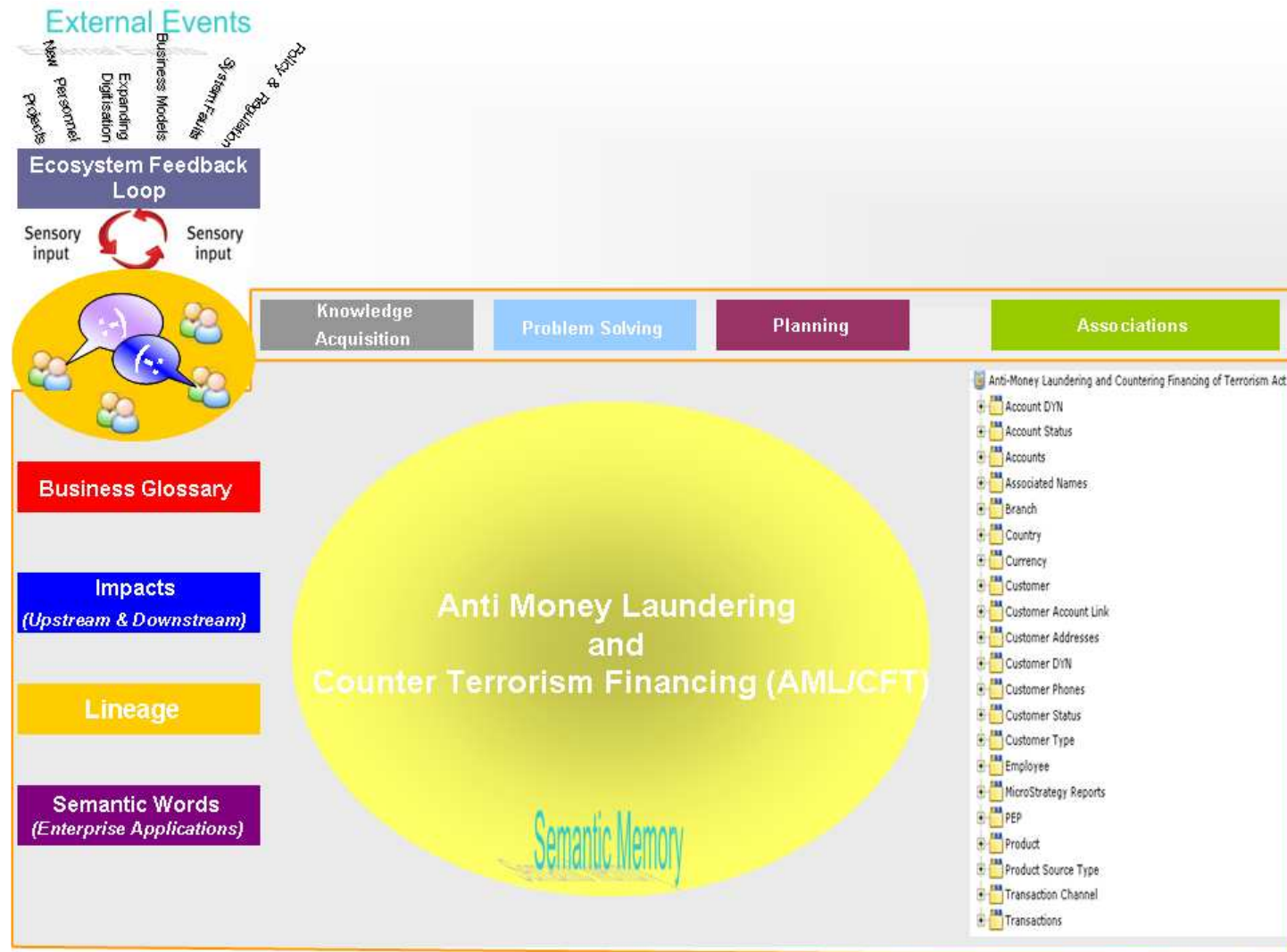
The primary limitations of using an ethnography framework to a research study are that it can become very costly and time consuming. The method should not be used to generalise findings for all organisations' projects, nor should the method be applied to the investigation of complex environmental phenomenon like climate change (Fetterman, 1998).

## **Research Evidence and Findings:**

### **Analysis and interpretation of conceptual frame:**

The conceptual frames of Haase (2004) and Madnick (1996) were applied to the AML/CFT project. Using these frames the associations in **Figure 4** represent many instances of AML/CFT words linked to each other with the rules, definitions and so on that are dispersed across an organisation's enterprise applications. In **Figure 4** a new AML/CFT language represents the common unambiguous vocabulary that reflects social phenomena of people in workgroups. Using the AML/CFT glossary, workgroups re-associate and re-categorise words in their semantic memory. Over time people in workgroups build up an organised network of associations in their memories that connect with the simulated words from the AML/CFT glossary. As workgroups express the AML/CFT business language, they are able to accurately associate with objects in their environment during problem solving, planning and learning (Steels, 2008, Nelson, 2000).

**Figure 4:** The AML/CFT Corpus



(Mayberry, 2013)

For organisations to exploit the network effects, the semantic memory space in **Figure 4** above must have explicit linkages between the resources (i.e. associations and people). An intelligent semantic representation links people, the organisation and the AML/CFT corpus. Without explicit linkages it is unlikely an organisation will be able to exploit the network effects.

***Intelligent semantic representations:***

One of the many possible models applied to the AML/CFT corpus creates a semantic network of associations tuned to particular problems to speed up analysis. The semantic network forms the basis of predictions that have the possibility to improve productivity. The semantic network connects people's business language and business activities (i.e. problem solving, planning and learning) with applications they use in their organisation. The network simulates how people naturally create mental patterns of meaning about business activities through the use of language (Steyvers & Tenenbaum, 2005; Sowa, 2006; Watts, 2004).

The network adopts the premise that people's ability to predict is interwoven with semantics and human intelligence (i Cancho & Solé, 2001, Steyvers & Tenenbaum, 2005). Harnessing this ability is about visually creating patterns modelled as a network which simulates how meanings of words reach people's semantic memory naturally. As conditions change in organisations over time, so to do the connections of words that make up the network in order to meet a given circumstance.

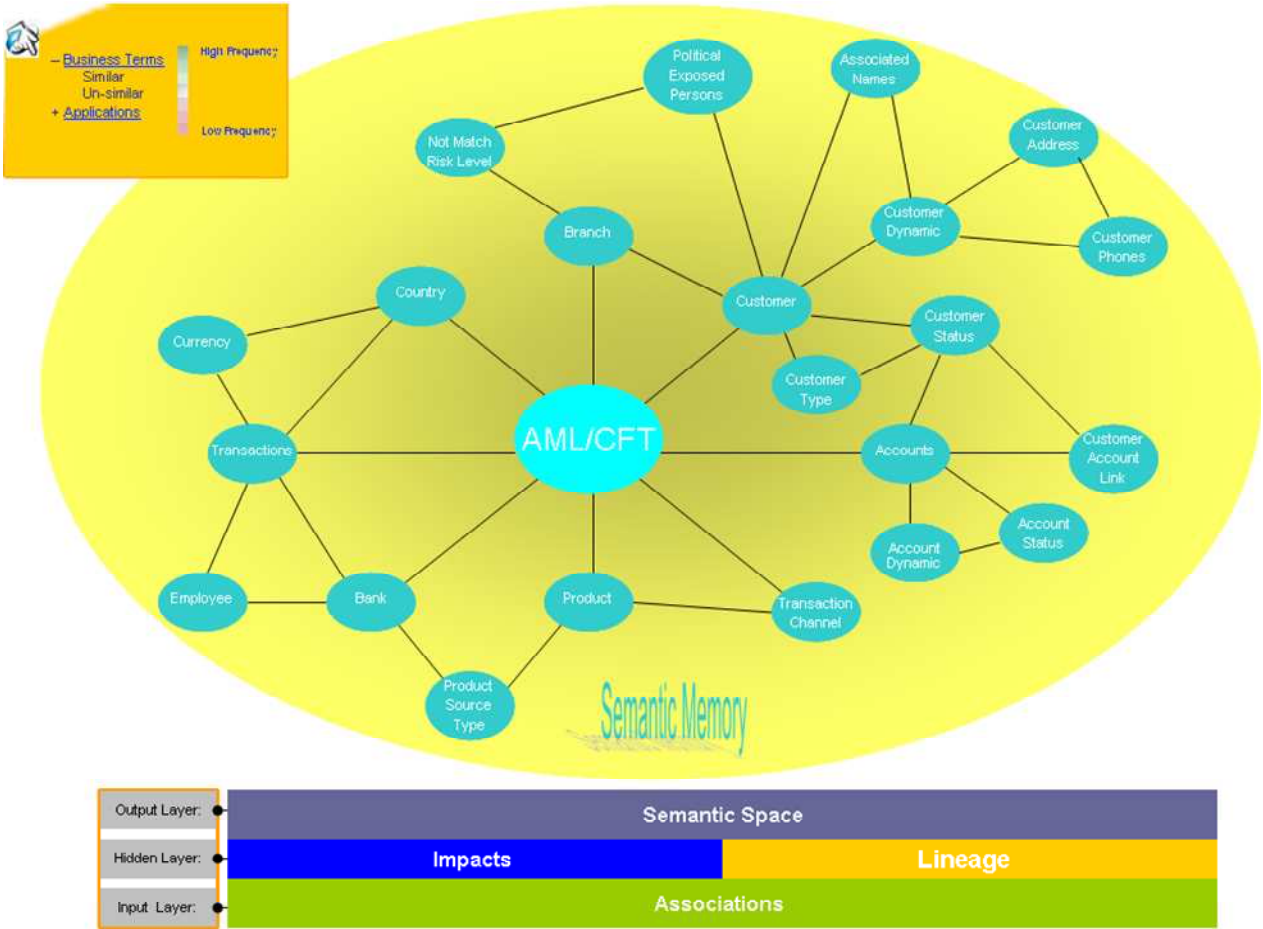
An organisation's ability to predict behaviours of networks based on their corpus will enable people to answer questions relating to business activities smarter. This is the next progression in value creation for meta data management practices. It coincides with what some organisations have already embraced, that is, as our society becomes increasingly interconnected it becomes a more complex system. This transition in thinking is in line with how over time, the World Wide Web emerged into a complex network that is interlocked into every facet of commerce, industry and the lifestyles of people (Fletcher, 2012).



The data semantic acquisition process is critical. Like the World Wide Web, data semantic acquisition plays a supporting role in the currency of an organisation's corpus. It ensures the meanings people assign to meta data contribute to the development of an organisation's corpus. This serves to keep connections in a network current and ensures a network expands. For instance, as meta data for conducting business activities enters the network, the network's behaviour will initially assign priority to new words and create new connections or "nodes". Adjustments will occur to neighbouring nodes based on what people investigate in the moment.

**Figure 5** is a prediction of the hierarchical semantic representations of the AML/CFT corpus. A pattern forms that augments human intuition.

**Figure 5:** People centred intelligent semantic representations



(Mayberry, 2013)

The network is supported by three features described as input, hidden and output layers. The layers within the structure are visually linked together with nodes. The nodes reflect connections in a network of words that can be activated between similar associations. The input layer represents associations between nodes, their specific rules, given weights and strength of connections between nodes in the network. The hidden layer is an internal representation of behavioural patterns from the input layer. The hidden layer of interlinking nodes, connections, given weights and rules creates the patterns that supply semantic representation frequencies for the output layer. The output layer forms the visual patterns simulating how activation spreads across connections in the network as it predicts people's answers for business activities (Rumelhart & McClelland, 1986).

By bringing together the representation of semantic associations to form patterns, nodes and links, an undirected network is formed. These semantic representations can empower people to accelerate retrieval of information. A graphical model reflects patterns matched together based on impacts weighted in the hidden layer.

The more a term is used (frequency) in the meta data for enterprise applications across the entire organisation, the more likely that term will be the predicted answer to people's questions. This is represented by the proximity of a word to the node in the network.

In **Figure 5** which is a network of behaviours specifically for the AML/CFT hub, 'Customer', for instance, appears as a node that is connected in close proximity to the hub indicating that its frequency of use by people throughout the organisation is high. Hovering over the word 'Customer' will show all the synonyms for 'Customer', in the form of nodes, that people use in the organisation such as 'Account' or 'Customer Segment'. These are aggregated into predicted use with respect to the node and will be different depending on the hub. Where the hub is 'Finance' and people hover over 'Customer', the likely synonyms would be 'Debtor' or perhaps 'Purchaser'.

One business glossary (e.g. AML/CFT) can be networked as a primary hub to other primary hubs or topics with nodes and connections at any time (Griffiths, Steyvers & Tenenbaum, 2007). These semantic associations are significant in acting as a priming instrument for the network of connections.

The prediction network facilitates the activation of semantic similarities. The activation process is a simulation of what people see in their minds. This, in turn, reflects a node in their brain and as people interact with the visual representation, the meaning spreads through the network. The nodes nearby provide people with a sense of sentimental experience akin to the semantic relationships they intuitively create between meanings of words they use naturally while in workgroups.

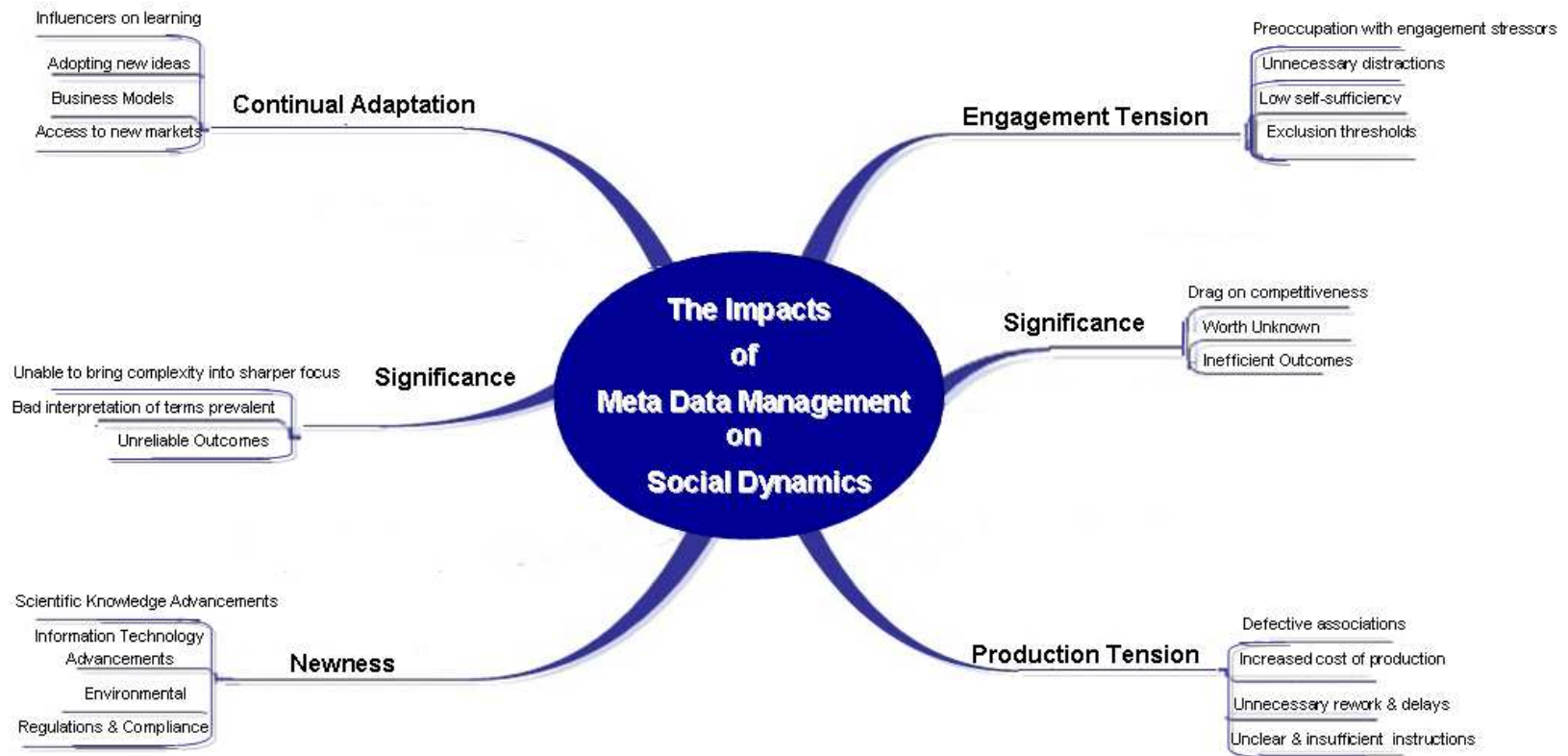
The combination of semantic memory and prediction through the use of semantic representations serves as an enabler to improve people's wellbeing. As people express their lives with language, the meanings they give to the world are optimised in a network to free them up to focus on more pressing matters. This availability of energy, albeit incremental, can make people more self-sufficient in the workplace or in society.

### **Analysis and interpretation of interviews:**

The impacts of meta data management on social dynamics have many different interdependent actors and factors. Content analysis of the participant responses as described in the Methodology: Interviews section (page 21), identified five recurring themes and 22 sub-themes representing the many interdependent actors and factors. These are presented visually in **Figure 6**.

The interpretation of the themes (newness, continual adaption, engagement tension, production tension, inefficiency and unreliability) suggests impacts of meta data management on social dynamics involve, but are not limited to, complex phenomena arising from human interactions in our interconnected society (Buchanan, 2007; i Cancho & Solé, 2001; Holling, 2001; Steels, 2008).

**Figure 6:** Interdependent themes from content analysis of interviews



(Mayberry, 2013)

The major themes intersect with broader trends enabling organisations to manage complexity in our interconnected society for competitive advantage. The interviews and observations suggested the impacts of meta data management on social dynamics are a microcosm of the deeper weakness of organisations' inability to adapt.

The analysis suggests events organisations must adapt to are endless in our interconnected society. This was particularly evident in the comment from Participant 5 below.

*"There is a large list of events. Any event will require a change to meta data."*

- Participant 5

Events arise and fluctuate and no one person or organisation can control this. The events influence the common themes uncovered in the interview responses. Each theme provides a better understanding of the future challenges and opportunities facing organisations. The characteristics of each of the key five themes represented in **Figure 6** above, can be stated as:

#### ***Newness:***

Newness is a factor shaped by actors that introduce new innovations to advance information technology or scientific knowledge and to enable transformations for intentional outcomes. Likewise, actors often introduce new business processes to complement the implemented predetermined solutions. Actors in governments introduce new regulations and compliance policies. These in turn, influence actors who often respond by introducing new technology and business processes for governments' expected outcomes.

The newness is also often introduced by actors incrementally in organisations. Such events often arise through a new product or service offering that requires some sort of new information technology functionality. Catastrophic events, either human or environmental, fluctuate the intensity of newness and these events can quickly come at actors from all angles. Participant 7 confirms many of the events that create newness in their comment below.

*“New technologies, business models, paradigm shifts in the market or changes in customer expectations – all these require some sort of new response.”*

- Participant 7

The condition of newness correlates with the next theme of continual adaption.

### ***Continual Adaption:***

Continual Adaption is a factor shaped between actors' attempts at adapting to successful competitive advantage. Organisations transform in different ways to overcome the advantages another actor or actors have gained. In the process, the transformation becomes the organisation's strength they then use to exploit a competitor's weakness. The factors that contribute to continual adaption encompass actors' discrete projects or programmes that produce deliverables for an intentional outcome. Participant 12 identifies that project or programme deliverables cannot be fully understood without meta data management.

*“Without meta data management you can never get to the point of understanding what can be delivered.”*

- Participant 12

The intensity of continual adaption will be accelerated by actors when they combine new business models with the introduction of new leadership. Actors often simultaneously pursue the integration of predetermined solutions to address the expansion of online channels or to capitalise on opportunities in new markets. As Participant 4's comment below illustrates, actors' adaption is continuously being influenced through learning. The primary sources that influence their learning is industry analysis, discussion forums, and academic and journal publications. These sources were considered critical in shaping the new ideas that actors bring into their organisations.

*“Articles from publications, journals or discussion boards introduce hot topics of the day or flavours of the month that people are bringing into the organisation.”*

- Participant 4

The factors of newness and continual adaption are events that are unpredictable and uncertain. They contain many variables that make it difficult for business outcomes to be known in advance. The emergent properties create a new way of seeing the world that actors must quickly then marry to their predetermined transformations. This condition consistently shifts actors' mindsets and takes on a dynamic associated with the next two tension related themes.

### ***Engagement Tension:***

Engagement Tension is a factor shaped by the interactions between actors that engage in workplace transformations for intentional outcomes. Participant 10's comment below illustrates actors' preoccupation with engagement stressors in an environment stems from mismatches in the interpretations associated with their business and technical terms. This factor erodes an interactive workplace environment.

*“If I had meta data then I would not have to go to application or system support teams to understand the data I'm dealing with, I could take care of it myself.”*

- Participant 10

The actors participating and contributing to the delivery of intentional outcomes often find out far too late that terms do not match how they are used in their enterprise applications, systems and business processes. This condition fosters a climate in the workplace of fluctuating tensions between actors that engage in the interactions to complete business activities (i.e. problem solving, planning and learning).

The engagement stressors are obstacles associated with actors' inability to be self-sufficient when they are delivering on predetermined solutions. The unclear, ambiguous, misunderstood and misalignment of terms are obstacles actors encounter that transition into low self-sufficiency. The engagement stressors shape the quality of decisions actors make in the delivery of predetermined solutions.



Actors frequently make assumptions that their business terms present on application screens are present and consistently used everywhere across the organisation. However, it is not unusual for projects or programmes to introduce different terminology or business language for their predetermined solution. Participant 6's comment below illustrates this difference in terminology which represents the differences between the old and new terminology in an organisation.

*"I would have spent less time on unnecessary meetings, running around finding people to provide clarity about business terms, wasting time going to two different people only to walk away from the conversations more confused than when I arrived."*

- Participant 6

The meanings behind terms are often different to actors in various workgroups. The actors' differing definitions are not always understood by other actors in workgroups and many are not aware of how actors in various workgroups use their terms. Many organisations with legacy applications or systems are still conducting business activities today with terms built by actors that are no longer in the organisation. Actors recruited to replace former incumbents are not always in a position to truly understand the meanings for legacy applications or systems and how they are being used in those systems. Under this condition actors find it difficult to understand the old and new worlds when events of newness create undue confusion, frustration and unnecessary tension.

Participant 16's comment below illustrates the tensions between actors that ensue when they are not "on the same page" or "on the same wave length". This condition even happens when organisations have a good IT and business strategy that is well thought out and has been communicated well. Unclear terms contribute to tensions in an interactive workplace often arising after actors are well into delivering a predetermined solution. Actors' preconceived assumptions turn out to be inaccurate creating more tension contributing to disagreements.

*"I would have spent less time sifting through a bunch of documents that do not represent what is in the physical environment".*

- Participant 16

These tensions create unnecessary distractions that actors must navigate. The distractions create artificial barriers that affect some actors' participation and contribution. This is often the result of perceived feelings of embarrassment. Actors encounter these obstacles in meetings or otherwise in work delivery, and they contribute to the unnecessary asking for clarification of terms.

Participant 3's comment illustrates obstacles, like ambiguity, that make things tougher for actors. They frequently have to chase people up only to find out they were following false leads. Many interviewees suggested accurate meta data management makes it possible to pinpoint issues associated with terms.

*"I would have found the answers without going on wild goose chases"*

- Participant 3

Many of the participants suggested actors often invent terms on the fly in meetings and others interpret terms incorrectly and then pass the incorrect interpretation along to other actors that did not attend the meeting. This factor is associated with the continual adaption theme (i.e. the primary sources that are influencing actors' learning are industry analysis, discussion forums, and academic and journal publications).

There are conditions of exclusion thresholds that actors feel when only some actors in workgroups understand the meanings of terms in meetings. Isolation arises at an intellectual level as the workplaces' fragmented social structure causes actors to simply go silent in meetings. Actors drop out of discussions in meetings. Afterwards they open up to other actors "at the water cooler" to point out they did not understand what was going on in the meeting.

The need for actors to discuss the meanings of terms and how they are used requires increased resources for a predetermined solution – more time and effort to produce little value. The wasted time by actors trying to understand the data and how it links together combined with political discussions that distract actors creates Production Tensions.

### ***Production Tension:***

Participant 9's comment illustrates production tension that arises when actors encounter defective associations between business terms when they are implementing predetermined solutions for intentional outcomes. The defective associations arise in meanings of terms, rules, definitions and how they are accurately used across an organisation's enterprise applications or systems. Production tension is a factor that makes a predetermined solution not fit for purpose.

*"You would not think two terms that sound and look alike can mean something totally different. It makes it hard to move on to the next step when rework slows down progress."*

- Participant 9

The production tension creates rework, unnecessary meetings, delays and uncertainty that waste time. Actors are often given unclear and insufficient instruction by other workgroups largely due to defective associations. This creates levels of uncertainty for actors delivering predetermined solutions. Actors cope with this uncertainty by manually digging into the code, rules and documentation of enterprise applications or systems and rewriting the original instructions. This process helps to build their confidence that the quality of what they are delivering is meeting expectations. However, the process calls into question the skills and ability of the original instruction writer because of the discovery that meanings of terms and references were unknown or inadequate.

As a consequence of production tension, actors are often responding to delays in development, unnecessary bugs in code, unexpected results, dissatisfied customers and panic. The climate even in an interactive workplace often becomes charged and increases pressures and stress on actors responsible for delivering predetermined solutions. There is often a lot of going back and forward to clarify the use of terms. Production tensions often require actors to go away from meetings and ask around for answers. Participant 14's comment below illustrates there is a lack of awareness that other actors have a totally different interpretation and understanding of terminology. Over time production tensions lead to expectations not being met often when it is too late and organisations have to compromise by reducing their delivery scope or timing.

*“There is a difference between requirements versus what is implemented and there is a difference between what is implemented versus what is needed.”*

- Participant 14

In the long run production tensions increase the cost of production for predetermined solutions. For instance, many organisations spend more time on each one of their projects or programmes trying to understand what and how applications or systems use terminology. Participant 17’s comment below illustrates the consequences of actors having little or no guidance on terminology meanings, nor where they are being used across different applications or systems.

*“If you don't know what your data means it makes it difficult for people to know what a piece of data is and where it comes from and what processes use it.”*

- Participant 17

Any guidance is often out of date or inaccurate. With nowhere to get an accurate answer, actors must learn terms all over again for every predetermined solution they implement. Many of the participants mentioned they have, over the years, had to hold similar meetings where the same questions on terminology are discussed time and again.

Production tensions lead to the delivery of predetermined solutions that do not meet intentional outcomes. Consequently, production tension and the next theme of significance are related.

### ***Significance:***

Significance is a factor shaped by predetermined solutions that establish cumbersome headwinds that create drag on competitiveness. Often participants suggested without proper meta data management practices predetermined solutions introduce inefficient and unreliable outcomes. Organisations either partially commit to meta data’s value or do not commit at all showing a lack understanding of its worth.

Often organisations only recognise the value of meta data when it comes to one off projects that introduce predetermined solutions requiring conversions or migrations. After the conversions or migrations, organisations often lose interest in meta data management practices and move on to the next project.

There are instances when separate lines of business introduce a meta data management project to understand complexity and its dynamics. Often this is done in isolation and does not involve the entire organisation and the true value reduces or erodes over time. Organisations that establish meta data management practices under a separate line of business, create siloes of information that is not fully complete, holistic or kept up to date making it unusable.

The significance of meta data's worth to an organisation arises far too late in delivery of predetermined solutions. Often participants suggested meta data management practices are not seen as a priority for C-Level management who tend to view it like they do data quality processes. Most C-Level managers think they can live without meta data management practices and often wait until the last minute when specific events or episodes create strong headwinds where their predetermined solutions prove inadequate, inefficient and unreliable.

It seems that many organisations do not have meta data management practices as part of their delivery processes for newness events. Without meta data management practices, the inefficient and unreliable predetermined solutions implemented in organisations will impact their ability to bring into sharper focus the complexity created by interconnectedness.

Moreover, inefficiency and unreliability will not go away and will continue to be burdensome. While C-level management sets strategic direction, objectives and vision to recognise the invaluable benefits of predetermined solutions, they are doing this activity while inaccurate interpretations of terms are prevalent in their organisations. Over time this permeates into cumbersome and confusing processes slowing any momentum gains down quickly. Participant 1's comment below reveals the significance of meta data management and the need to recognise the value that it has to offer.

*"In general I think meta data management is an integral part of progressing as a society and it will shape and increase the speed of change."*

- Participant 1

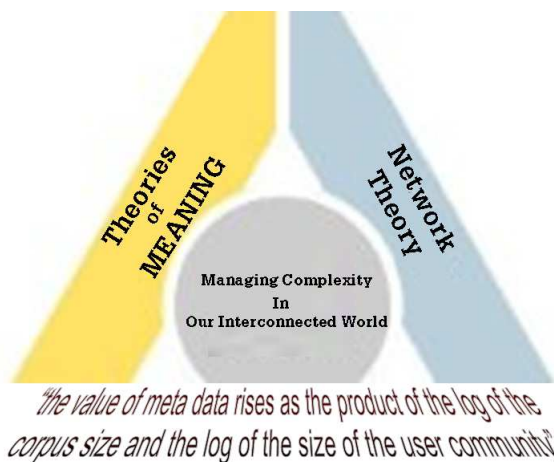
## Implications:

### Managing complexity in an interconnected world:

The research evidence – the themes, the interviews and the literature review – highlights a way that organisations can exploit Metcalfe’s law. Metcalfe’s law suggests, among other things, that expanding the network increases its worth (Haase, 2004; Gilder, 2007; Metcalfe, 1996; Cisco, 2013). This has implications beyond understanding the impacts of meta data on social dynamics in an organisation. There is economic significance in exploiting Metcalfe’s law and capitalising on the worth of semantic meta data. Networked meta data has a direct and material impact on an organisation’s future competitiveness.

Value comes from the social links between an organisation’s people, emerging from their interactions in workgroups while they use their corpus. An organisation’s networked semantic meta data that is grounded in its connectedness suggests “the value of meta data rises as the product of the log of the corpus size and the log of the size of the user community” (Haase et al., 2004). This measure of value as it relates to an organisation’s connected semantic meta data, is a factor that contributes to their competitive advantage. For instance, the model in **Figure 7** reflects two primary theories used in the research case, their association with economic significance of meta data and our interconnected world.

**Figure 7:** The economic significance of meta data



(Mayberry, 2013, Adapted from Haase et al., 2004)

As our interconnected world establishes new connections and expands, events become more unpredictable in nature and organisations will continue to struggle with anticipating opportunities and challenges. The themes uncovered in this case (newness, continual adaption, engagement tension, production tension, and significance), and discussed above, play a significant role in shaping the connectedness of an organisation's corpus. This connectedness helps an organisation manage complexity in our interconnected society.

Hackett (Forbes, 2013) describes managing complexity as an extreme manifestation of various motions, dynamics and reactions of unanticipated business change. He suggests this is exposing the weaknesses of organisations that have not embraced an understanding of the complex phenomenon and their dynamics. He goes on to suggest that understanding how to isolate what arises in our complex, expanding, and interconnected society is fundamental for competitive advantage (Gilder, 2007; Cisco, 2013; Drucker, 1999).

The current growing interconnected society is sparking new innovations around semantic meta data that will further empower organisations to exploit Metcalfe's law. This advantage will be a strength for organisations as they create holistic components of complex systems involving people. New revenue streams could drive future business opportunities in new markets as characteristics of networks drive the interconnectedness and digitisation of data in society. For instance, Internet.org is a partnership with Facebook, Ericsson, MediaTek, Nokia, Opera, Qualcomm, and Samsung. They seek to expand the interconnectedness of our society beyond the 2.7 billion people that are connected today (Inc, 2013). Likewise, Google is pursuing an initiative called "Loon For All" that has a similar focus to expand the interconnectedness of our society.

The implications of the world's next 5 billion connections in our interconnected society will have profound network effects that some organisations are already positioned to exploit because they have looked beyond the meta data to the social dynamics. The connectedness of 5 billion additional people creates new business opportunities centred on understanding complexity and their dynamics.

This condition will accelerate stronger tail winds for organisations that already are exploiting Metcalfe's law. On the other hand, organisations unable to exploit Metcalfe's law will experience stronger headwinds impacting on their competitiveness.

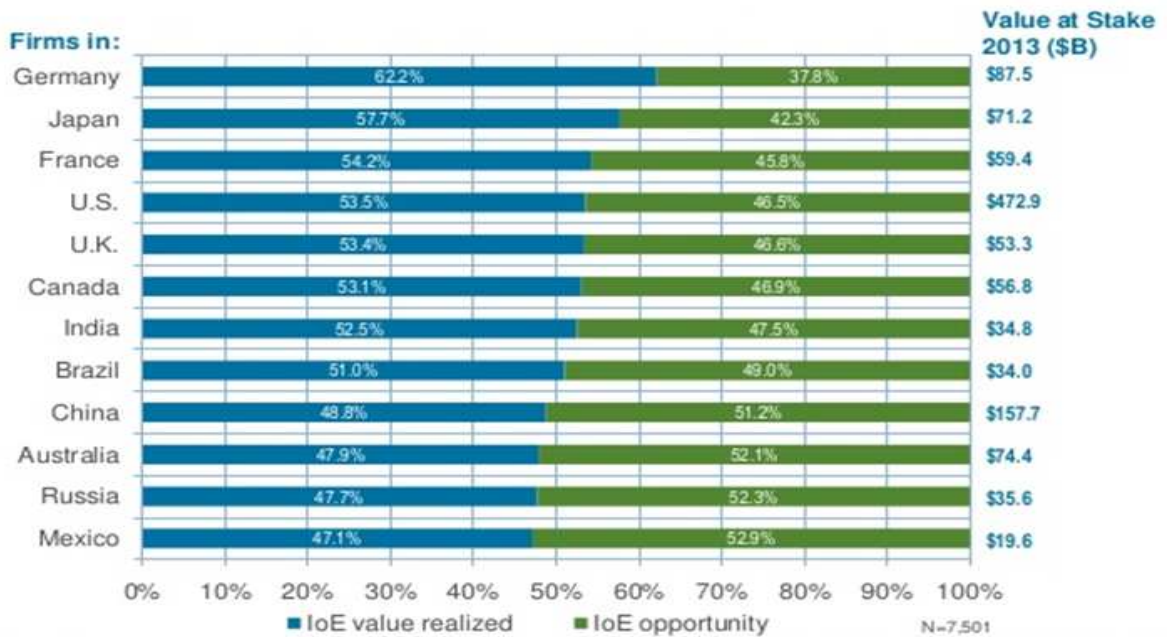
Cisco's (2013) "Internet of Everything Index" suggests organisations with the know-how to exploit Metcalfe's law have the potential to capitalise on \$14 trillion dollars in revenues over periods from 2013 to 2020. The future and present worth of Cisco's \$14 trillion dollar estimates represents 12 of the biggest economies that account for 70 percent of the world's gross domestic product (i.e. America, Australia, Brazil, Canada, China, France, Germany, India, Japan, Mexico, Russia, and the United Kingdom).

Although many organisations have an objective to embrace complexity and the value interconnectedness causes, organisations around the world in advanced and emerging economies are still unable to capture its full value. Cisco's (2013) Internet of Everything Index (IoE) suggests approximately \$544 billion of \$1.2 trillion of potential gains will go unrealised in 2013 (see **Figure 8**). This example illustrates opportunities left open for any competitor with competence and capability to exploit the value of interconnectedness.

What will be needed to capitalise on unrealised or potential gains highlighted in Cisco's (2013) IoE index are people with elevated thinking skills to redefine information use within our interconnected society. Addressing this gap is fundamental for any organisation's future to create new value, wealth and to redefine what is meant by competitiveness (Drucker, 1984, 1999). In addition, organisations that operate their businesses solely on a 19th-century model that aims to sustain competitiveness through lower cost differentiation will need to move beyond this outdated tradition in order to exploit the value of interconnectedness (Drucker, 1984, 1999)



**Figure 8:** The value interconnectedness causes that is untapped



(Cisco, 2013)

Evidence in this research case suggests organisations are not prepared to understand complexity and respond to their dynamics. Many organisations are unable to enquire beneath the surface of the network of connections. This disadvantage prevents organisations from exploiting Metcalfe's law and their semantic meta data to enable people to be, among other things, self-sufficient. The inability of people to be self-sufficient is a factor impacting their semantic memory as it becomes necessary for people to continue to use natural language. Moreover, semantic memory and natural language use are significant for organisations' adaption to the themes outlined above in this case. Enquiring beneath the surface of networks enables people to come together to interact with one another on business activities and remain on the same wavelength. An organisation's networked meta data, in essence helps organisations to enquire into and understand the very origin of their social dynamics and the world around them.

People centred, intelligent semantic representations contribute to the connectedness of an organisation's business language (Buchanan, 2007; Holling, 2001; Eysenck, 2004). This underpins an organisation's ability to foster a climate and culture of self-sufficiency, increased productivity, as well as the avoidance of assumptions. It helps focus attention on implementing predetermined solutions for intentional outcomes. The intelligent semantic representations enable people to enquire openly into events arising while conducting business activities, to achieve social progress, make discussions more focussed, and make the objectives of meetings clearer.

The necessity to manage complex phenomenon will persist as the interconnectedness in society expands. The evidence in this case suggests there is no single solution or person in any organisation that can deny the magnitude of our expanding interconnected society – the complexity and their dynamics are posed to radically alter value and wealth creation in our society. Physical things and billions of more people are factors that will accelerate and intensify fluctuating conditions of complex phenomenon in our interconnected society. Despite these extreme conditions some organisations are positioned to exploit Metcalfe's law as a strength against the deep weaknesses of competitors that are unable to exploit it.

## **Conclusion:**

This research case provides evidence that the growing interconnected society is redefining what is meant by competitiveness. The research has shown organisations with a deeper understanding of the purpose and meaning of information have a strong advantage over their competitors. This advantage is their ability to create value and to exploit the worth arising in networks and in the social dynamics created within those networks. This strength is contributing to their economic growth and is interdependent with their strength of managing complex phenomenon in our growing interconnected society. Inherent in their ability for managing complexity is their understanding of what is necessary to exploit it, create new solutions and transform with predetermined solutions. Evidence from this research case shows the themes identified (that is, newness, continual adaption, engagement tension, production tension, inefficiency and unreliability) need to be considered by organisations as factors that impact social dynamics and can constrain the ability to exploit the worth of meta data.

The next progression in value creation from meta data that needs to be considered is the ability for an organisation to predict behaviours of networks based on their corpus. This progression will enable knowledge workers to answer questions relating to business activities smarter. One model developed in the research case was the creation of a simulated semantic network of associations. The semantic network forms the basis of predictions that have the possibility to improve productivity by connecting people's business language and business activities within their organisation.

The research and evidence has shown that people, society, and nations are operating in a larger digitised information ecosystem of loose boundaries that are interconnected and dynamic. Peter Drucker (1984, 1999), as well as many others cited in this research case, corroborate the practical observations, particularly that the purpose and meaning of information underscores the characteristics of complex systems. This research study shows that the implications for organisations that look beneath the network of information find the exact nature of its worth to distinguish it from past sources of wealth creation. The impact of meta data management on social dynamics and the behaviours it creates should be considered as critical success factors when creating new value from an organisation's unique business language.

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## Glossary:

Actors	Those knowledge workers in organisations who are participating directly or indirectly in delivering predetermined solutions. This can include decision makers.
Anti-Money Laundering and Countering Financing of Terrorism Act (AML/CFT)	<p>Global legislation requiring financial institutions to focus resources on deterring and detecting financing of terrorism and money laundering.</p> <p>The Act was prompted by the economic effects of financial crimes.</p>
Big Data	“Big Data is a term describing the storage and analysis of large and or complex data sets using a series of techniques including, but not limited to: NoSQL, MapReduce and machine learning” (Ward & Barker, 2013 p. 2.).
Business Glossary	Corpora that represents language about an organisation’s business.
Business Language	The language about business that people use within an organisation during problem solving, learning and planning activities.
Complex Systems	A holistic system of interconnected dynamic components. The characteristics of complex systems are that they are adaptive, their behaviours often fluctuate and they are continually changing. The behaviours of complex systems often emerge as random or chaotic in nature.
Context Mediation Services	A service involving conflict resolution, data semantic acquisition, and quality growth processes that expand an organisation’s corpus.
Corpus (plural: Corpora)	Large collection or body of digitally recorded written and spoken data about business language.
Data Governance	The practice of governing all aspects of data related initiatives including procedures, policies, and standards to ensure an organisation’s use of information is fit for purpose.
Data Integration	The data production process involving data related competencies and capabilities organisations use to turn data into meaningful information.
Data Quality Process	The data production process involving data related competencies and capabilities organisations use to ensure information is trustworthy and fit for purpose.
Data Semantic Acquisition	The intervention technique ensuring accurate interpretation of an organisation’s business vocabulary to produce quality semantic meta data. This technique helps to establish a meaningful corpus for an organisation.
Ethnography	A research strategy used in social sciences to study cognitive activity and specific episodes in real-world settings of communities. In particular, “traditional ethnography is concerned with the meanings that members of a cultural group create, cognitive ethnography is concerned with how members create those meanings” (Williams, 2006 p. 1.).



Heuristics	The hands-on approach to learning, "Heuristics" means simple rules of thumb to assist in decision making or problem solving by experimental and especially trial-and-error methods and the evaluation of feedback to improve performance." (Data Science Association, 2013 p.2.)
Intelligent Semantic Representations	A visualisations instrument representing people's mental understanding of language for their corpus.
Interconnected Society	The condition of people in society connected and interwoven together with everything in our environment.
Master Data Management	The practices, processes and tools to master complete views of organisations' data assets.
Meta Data	The data that describes or explains information about other data or collections of data.
Meta Data Management	The practices, processes and tools or instrument an organisation uses to manage meta data.
Metcalfe's Law	A scientific law to exploit economic worth of an organisation's networked meta data. <a href="http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Metcalfe_s_law.html">http://www.princeton.edu/~achaney/tmve/wiki100k/docs/Metcalfe_s_law.html</a>
Natural Language	Human spoken or written language acquired naturally.
Network Theory	A collection of dynamic objects interconnected to each other in the same manner. Network thinking or science is applied in various areas such as engineering, physics, social science, biology, medicine, economics, computer science, and so on.
Participant	An interviewee.
Predetermined Solution	An information technology and system solution that was decided on or determined in advance by organisations for transformation with intentional outcomes.
Semantic Interpretation	The understanding of natural language either by human or machine.
Semantic Memory	The semantic memory is in the human brain and enables people to communicate with language. The semantic memory stores information about words , images, their meanings and references about rules, relations, formulas, and algorithms people use in making inferences.
Semantic Network	The mental representations of information using patterns of interconnected nodes and arcs. The semantic network connects people's business language and business activities within an organisation.
Semantic Representation	The mental representation of language.

Semantics	The meanings within language.
Social Dynamics	A social phenomenon representing the ability of people to respond and deal with change within environments. Inherent in social dynamics is language people use and their behaviours while conducting business.
Themes:	
<i>Newness</i>	Theme shaped by actors that introduce new innovations to advance information technology or scientific knowledge. Actors in organisations introduce new technology to enable transformations for intentional outcomes.
<i>Continual Adaptation</i>	Theme shaped between actors' attempts at adapting to successful competitive advantage. Organisations transform in different ways to overcome the advantages another actor or actors have gained.
<i>Engagement Tension</i>	Theme shaped by the interactions between actors that engage in workplace transformations for intentional outcomes.
<i>Production Tension</i>	Theme shaped when actors encounter defective associations between business terms when they are implementing predetermined solutions for intentional outcomes.
<i>Significance</i>	Theme shaped by predetermined solutions that establish cumbersome headwinds that create drag on competitiveness.
Theories of Meaning	The assignment of semantic content for expressions of a natural language. This also includes meanings of words by virtue of local facts pertaining to the psychology of language uses as they relate to other cognitive systems within environments in which words are used (Stanford Encyclopaedia of Philosophy, 2010). <a href="http://plato.stanford.edu/entries/meaning/">http://plato.stanford.edu/entries/meaning/</a>

## Appendices:

### Human Ethics Committee Consent Form:



## Participant Consent Form

**Research Project Title:** The impacts of Meta Data Management on Social Dynamics

**Researcher:** Torrance Mayberry, School of Information Management, Victoria University of Wellington

I have been given and have understood an explanation of this research project. I have had an opportunity to ask questions and have them answered to my satisfaction.

I understand that I may withdraw myself (or any information I have provided) from this project, without having to give reasons, by e-mailing [torrance\\_mayberry@vuw.ac.nz](mailto:torrance_mayberry@vuw.ac.nz) by the Aug 30, 2013

I understand that any information I provide will be kept confidential to the researcher and their supervisor, the published results will not use my name, nor my place of employment and no opinions will be attributed to me in any way that will identify me.

I understand that the data I provide will not be used for any other purpose or released to others.

I understand that, if this interview is audio recorded, the recording and transcripts of the interviews will be erased within 2 years after the conclusion of the project. Furthermore, I will have an opportunity to check the transcripts of the interview.

Please indicate (by ticking the boxes below) which of the following apply:

- ☐ I would like to receive a summary of the results of this research when it is completed.
- ☐ I agree to answer the interview questions.

Signed:

Name of participant:

Date:

## Human Ethics Committee Information Sheet:



## Participant Information Sheet

**Research Project Title:** The impacts of Meta Data Management on Social Dynamics

**Researcher:** Torrance Mayberry, School of Information Management, Victoria University of Wellington

Meta data management practices can either negatively or positively influence the social dynamics in an organisation. As part of the completion of my Masters of Information Management, this study is designed to examine the development of meta data management practices and their affect on social dynamics.

Learning more about their impact can help organisations foster uniformity, general agreement, and unambiguity during problem solving, planning and learning, influencing knowledge acquisition. It is hoped that this case study will also motivate future research into the phenomenon of IT data related projects and their impact on the social dynamics in organisations.

Victoria University requires, and has granted, approval from the School's Human Ethics Committee.

I am inviting work groups directly impacted by the AML/CFT project and practitioners to participate in this research. Participants will be asked to take part in a half hour interview. Permission will be asked to record the interview, and a transcript of the interview will be sent to participants for checking.

Participation is voluntary, you nor your place of employment will be identified personally in any written report produced as a result of this research, including possible publication in academic conferences and journals. All material collected will be kept confidential, and will be viewed only by myself and my supervisor Tony Hooper, Programme Director Masters of Information Management. The case study will be submitted for marking to the School of Information Management. Should any participant wish to withdraw from the project, they may do so until Aug 30, 2013, and the data collected up to that point will be destroyed. All data collected from participants will be destroyed within 2 year after the completion of the project.

If you have any questions or would like to receive further information about the project, please contact me at [Torrance\\_Mayberry@vuw.co.nz](mailto:Torrance_Mayberry@vuw.co.nz) or telephone +64072212515, or you may contact my supervisor Tony Hooper, Programme Director Masters of Information Management at [Tony.Hooper@vuw.ac.nz](mailto:Tony.Hooper@vuw.ac.nz) or telephone +64 4 463-5015.

Torrance Mayberry

## Interview Questions:

S/N	Interview Questions
1	What are your thoughts on the significance of meta data management practices in your role?
2	What difficulties arise when work groups are unclear about business or technical terms?
3	What do you think would help people recall the accurate interpretation of business or technical terms better/quicker?
4	What events do you think introduce new business or technical terms in organisations?
5	How do you think social dynamics in an organisation are affected by business or technical terms (semantic interpretation of meta data) that are ambiguous or unclear?
6	Think about a time when you have attended a meeting where there has been ambiguous or unclear business or technical terms. What were the dynamics like in the meeting?
7	What process was used to provide clarity? What could have avoided this situation?
8	Now think about a time when you were involved in a project where all team members were clear about the interpretation of business or technical terminology for applications (meta data). What were the dynamics like in the project team?
9	What meta data management practices do you find useful in avoiding miscommunication during problem solving, planning or learning?
10	What do you think about meta data management usefulness in helping work groups accurately diagnose or discover operational problems?
11	What would the impact be on your work if you had accurate business or technical terms for enterprise applications at your finger tips in your organisation?