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A Perspectival Punctuated Action (PPA) Approach to Policy Development in Information Technology and Systems (ITS)

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Abstract

The evolution of information technology and systems (ITS) architecture in recent times has magnified the complexity and multi-perspectival nature of the ITS management context. ITS developments such as e-Business models and frameworks, commercialisation of the Internet and creation of agile systems development approaches have highlighted the need to consider ITS management from a more diverse, inter-subjective and multi-perspectival point of view (rather than the more traditional positivist process reduction approaches). The Perspectival ITS Management Model (developed by Bunker 2004) provides a multi-perspectival insight into ITS management and the planning, control, policy development and processes that accompanies this management. The focus in Design Science (Simon 1977) also reflects the development of innovative and useful system artefacts (from a more traditional positivist process reduction orientation) and is consistent with the Perspectival ITS Management Model. In this paper it is argued that much can be learnt from using Simon's (1977) Design Science approach as a lens of process analysis in conjunction with the Perspectival ITS Management Model to study the management of ITS artefacts through the development of a Perspectival Punctuated Action (PPA) approach. PPA is explained and used to briefly explore the public consultation process in the development of a B2G online authentication framework.

Keywords

Information technology and systems management, perspectival information systems, design science, method artefacts, policy development, online authentication, punctuated perspectival action, Australian government policy.

INTRODUCTION

Much of Information Technology and Systems (ITS) management theory has emerged over time from the structural/functionalist paradigm as described by such authors as Burrell and Morgan (1985) and Crotty (1998). A great deal of the theory in this area has evolved from the management science literature that places a positivist orientation on the structure of the organization and the management of people and mostly addresses "within" organization issues. Generally, ITS management theory has advocated that better control of ITS management and planning processes can be had by more efficiently enforcing strategy. This can be achieved though human-defined goals, and their underlying policy and procedures throughout the organization (Earl 1996, Galliers 1999).

To this end Design Science has been concerned with the creation and evaluation of innovative artefacts aimed at achieving human-defined goals and is founded on two fundamental development activities – build and evaluate (Simon 1981). While at first glance these two concepts may appear intuitively straightforward, their operationalisation can be quite complex. For example, the performance of an artefact is highly reliant on implementation context. Failure to understand implementation context can result in artefacts that are inappropriately designed or that have undesirable side effects (March and Smith 1995). There appears to be a necessity in supplementing ITS management approaches with organisational perspectives in order to more effectively utilise, manage and control ITS within the organisation, and in recent times great strides in this area have been made (Galliers 1999, Newell et al. 2000, Newell et al. 2003). These approaches build on ideas,

however, that see subject/object reconciliation/integration in a reductionist sense. It should be acknowledged, however, that most organisational issues are subjective in orientation as they are driven by contextual factors (Galliers 1991). Our own very basic organisational experiences highlight to us that the ITS management policy, procedures and context, can greatly diverge from our rational, theoretical and objective understanding of them. Contextual issues that envelope each organization (and each organizational participant) blur our normative organisational picture, representing a situation where reconciliation/integration of subjects and their behaviour (you and me) and objects (ITS artefacts) must occur in order to make sense of our experiences in the long and short-tem management of ITS.

Reconciliation/integration of subject/object is not meant here in the reductionist sense. Useful reductionist views of subject/object reconciliation/integration within ITS management are evident in recently emerging philosophical approaches, which build on Churchman's Inquiring Systems approach (Churchman 1971). This calls on the philosophies of Leibniz, Locke, Kant, Hegel and Singer for the development of an incremental and interlocking view of systems which allows for ill-structured or "wicked" problem solutions in dynamic organisational environments.

What is meant, within this paper, is that subject and object should be reconciled or integrated in a transformatory manner. This is best captured by Haynes' (2001) Perspectival Thinking Approach. Haynes (2001) description of "Our thinking…" highlights the influence of our individual values that requires careful consideration when managing ITS within the organization. We should note that the reconciliation/integration of subject and object is also greatly influenced by time and context (Haynes 2001) and that both of these issues are handled within the technology transfer literature to great effect (Reisman and Zhao 1991, Robinson 1988). The primary goal of this paper is to demonstrate how an approach which combines the Perspectival ITS Management Model (Bunker 2004), developed with organizational transformation as its basis, combined with Simon's (1977) Design Science theory can be effectively used to analyse policy development in ITS management. This is illustrated by briefly examining the public consultation process in the development of a B2G online authentication framework.

PERSPECTIVAL ITS MANAGEMENT (PITSM) MODEL (BUNKER 2004)

An important issue tackled by the PITSM model is the difference in the subjective (relativistic) and objective (normative) organisational views of the ITS management and the issue of their reconciliation/integration. This reconciliation is effectively expressed in the "Perspectival Thinking Approach" of Haynes (2001) that encapsulates a transformatory view of subject/object reconciliation/integration through the idea of "intentionality". The idea of intentionality or "reaching out into" (Crotty 1998) was developed by Husserl (1965) and Brentano (1973) as the basis for a phenomenological understanding of the interaction between subject and object. This leads us to understand that the individuals that create, implement, manage and study ITS tools and artefacts define and are defined by the tools and artefacts that they use within their context (values and assumptions) and this is expressed through assumed (objectively understood) and actual (subjectively understood) skills. We should also acknowledge that skills are defined as "technological skill sets" and also "outcomes, conceptual expression, building techniques and cultural context". Tools and skills have a mutual contingency (Ayres 1978) and are socially constructed (Latour 1993).

It is proposed that the Perspectival ITS Management (PITSM) Model (figure 1) can assist us to more effectively understand the management of ITS within organizations by actively encouraging ITS managers to view the process through the anti-reductionist reconciliation/integration of the subject/object under their control. As we can see from the model, there are three entities/roles defined (toolMaker, toolUser, Scholar/Inheritor), and all have a view of ITS management that is bounded by their own context. Each entity then looks to the reconciliation of the subject/object over time through their own "intentionality" (theory building, practice, theory testing) thus giving the study of ITS management a perspectival orientation that has been somewhat limited in other models and approaches. PITSM allows each entity/role (toolMaker, toolUser, Scholar/Inheritor) to have their own view of management of ITS artefacts (or tools). Each entity will also view every other entity through their own intentionality, and so for example, an ITS Management Scholar/Inheritor will study ITS toolMakers and toolUsers from a theoretical perspective, which over time will be affected by what the Scholar/Inheritor observes (reconciling the object of ITS with the subjects under study within the community of practice). The Scholar/Inheritor objective view of the creation and management of ITS artefacts (toolMaking) and the subjective view from organisational participants (toolUsing) could be reconciled/integrated in a transformatory manner to better understand the underlying ITS management issues (those relating to practice). This would be a different approach to use in understanding rather than attempting to reduce the contextual factors to a wholly objective view, which is more usual in positivistic approaches and methods in ITS management and research. The organization may be better served looking to acknowledge and utilise the subjective influences on ITS management style, in order to incorporate them into more effective outcomes (transformation), rather than forcing objectivist ITS management approaches on organisational participants (reduction).
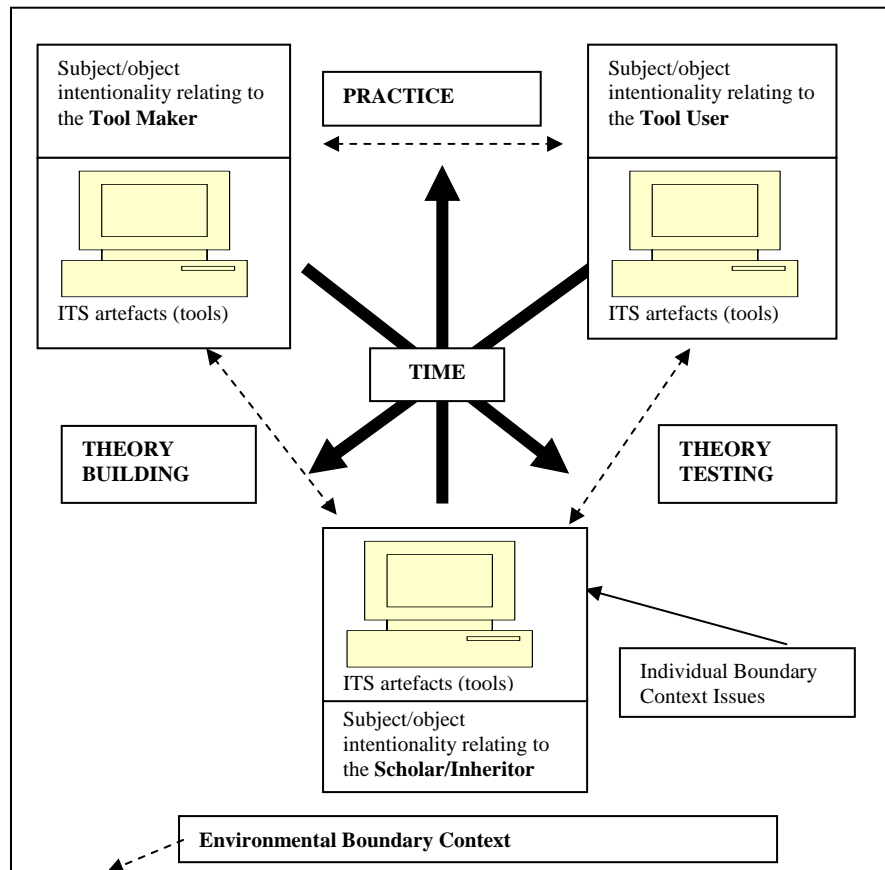
Figure 1: Perspectival ITS Management (PITSM) Model (Bunker 2004)
(Reconciliation/Integration of the Subject-Object)

DESIGN SCIENCE APPLIED TO ITS MANAGEMENT

Design Science is gaining greater appreciation and recognition as a core element in information systems research (Nunamaker et al. 1991, March and Smith 1995, Burstein and Gregor 1999, Gregg et al. 2001, Hevner and March 2003, Hevner et al. 2004). In an information systems context, design science research involves the study of innovative design artefacts for the purpose of understanding, explaining, and improving the performance of information systems. A designed artefact can take many forms beyond computer-based systems and can include instantiations of organisational structure, work processes, information systems, strategic plans, and public policy (Hevner et al. 2004). Design Science looks at objectively defined artefacts and places them in a subjective context.

From a behavioural science perspective, ITS research is viewed as a branch of the social sciences (Hevner et al. 2003, 2004). This view has developed from the traditional natural science perspective where the primary goal of research is to test and validate theories about the design of ITS. The evaluation and validation activities of research methods in the behavioural science paradigm include the familiar means of case studies, experiments, field studies and surveys. These are the traditional research methods used by ITS researchers to identify and test theories. In contrast, the design science perspective in ITS research seeks to evaluate the utility or quality of the system artefact. System utility and quality must be clearly defined in order to undertake this evaluation. For example useability, functionality, completeness, consistency, accuracy, reliability, and performance are all potential system quality attributes (Hevner et al. 2004). However the overall goal of the evaluation is to not only assess system useability but also to provide guidelines for incremental improvement of the system artefact. Relevance is determined by how well ITS research addresses business needs while rigour is achieved through the appropriate application of foundation principles and methods.

Simon (1977) described three interrelated decision-making activities in his book *The New Science of Management Decision*: intelligence, design and choice. Intelligence is a critical function directed towards identifying a problem or some deficit relating to an earlier design choice, or absence thereof that is less than satisfactory. Intelligence alerts a decision-maker to the need for action in response to some new threat, opportunity, or to the need for change if a required objective is not being achieved. It is argued that this activity

is analogous to the Inheritor/Scholar role in PITSM model (Bunker 2004). Design, is the combination of alternative actions that can be brought to bear to change an existing situation to better achieve desired objectives. Design includes an understanding of the medium, methods and processes available to the decision-maker as well as the potential implications and trade-offs between different design choices (and aligns with the PITSM toolMaker role). Choice is the act of selecting a design alternative that will achieve desired objectives. Choice includes an appreciation for how competing alternatives will fit with other design choices and includes an appreciation of how the current conditions are likely to affect design alternatives (aligning with the PITSM toolUser role). These three interdependent decision making activities are illustrated in figure 2.

While intelligence, design and choice are interdependent roles in Simon's model, decision-makers experience each role as a separate form of action. In practice, each of the three roles is engaged in a way that brings that particular activity to the fore while the other two activities are forced into the background. To quote Boland (2002: p. 3), " ... we attend to any one aspect from (or in light of) the others. While one aspect is in focal attention, the others are held in a subsidiary, or tacit, way. So that while the three are thoroughly interdependent, they are not simultaneously in focal attention, and we can therefore think of the three aspects as taking place separately and sequentially in management action." Each activity, in itself, is a complex decision-making process with each role containing its own intelligence, design and choice activities – phenomena Herbert Simon referred to as being "wheels within wheels."
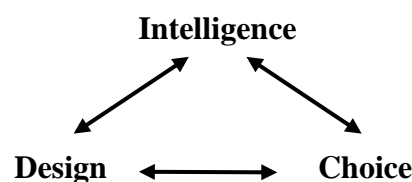
Intelligence

Design ⟷ **Choice**

Figure 2: Interdependence of intelligence, design and choice in management decision-making

DECISION MAKING (SIMON 1977) IN DESIGNED ARTEFACTS AND ALIGNMENT WITH PITSM MODEL (BUNKER 2004) – A PERSPECTIVAL PUNCTUATED ACTION (PPA) APPROACH

While software and hardware are regarded as the core "working" artefacts in ITS (Orlkowski and Lacono 2001, Weber 2003), there are other artefacts that are also important components in the creation of innovative ITS. These artefacts are *constructs*, *models*, *methods* (March and Smith 1995, Hevner et al. 2004) and *better theories* (Rossi and Sein 2003). *Constructs* define the conceptual vocabulary of a domain, *models* contain an expression of how constructs are related, *methods* provide a description on how to perform a specific task, and *better theories* are derived from experimental like proof of concept or method during the design construction phase. The focus in this paper is on the application of Design Science and PITSM to the development of an online B2G authentication framework – a method artefact. The following section establishes the theory of Perspectival Punctuated Action (PPA) based on distinct decision-making configurations of intelligence, choice and design by extending Boland's (2002) articulation of Herbert Simon's (1977) decision-making theory and combining this with the Bunker (2004) PITSM model.

Simon's model can be overlayed on the Bunker (2004) PITSM model to align the characteristics of both thus providing us with a Perspectival Punctuated Action (PPA) view of ITS management that expresses the assumptions behind "intentionality" (theory building, theory testing and practice) and "decision making" (intelligence, design and choice) simultaneously (see figure 3). Boland (2002) draws on Karl Weick's ideas of sense making to illuminate how individuals might punctuate decision making into sequential patterns of actions to produce plausible and coherent understandings of a given situation.

In so doing, Boland is able to disentangle the circular pattern of influence depicted in figure 2 to produce six distinctive ways that a decision maker can punctuate decision making action into specific sequences of intelligence, design and choice. In each of these punctuations one action happens first which then serves as the beginning of a narrative episode of acting in the world. Each action sequence reflects a sense of moving forward, making sense of a new situation or existing context, and then some form of adaptation as a consequence. If we combine these sequences of decision making with the intentionality of theory building, theory testing and practice contained within the Bunker (2004) PITSM model then we begin to develop a sense making approach for ITS management. We call this the Perspectival Punctuated Action (PPA) approach. While the decision process encapsulates one of the three choices for the sequence of events (intelligence/design/choice) the intentionality perspective of the toolmaker, toolUser and Inheritor/Scholar will be dependent on the decision

sequence itself i.e. the order in which the sequence of events occurs. These perspectival punctuated sequences are described below.
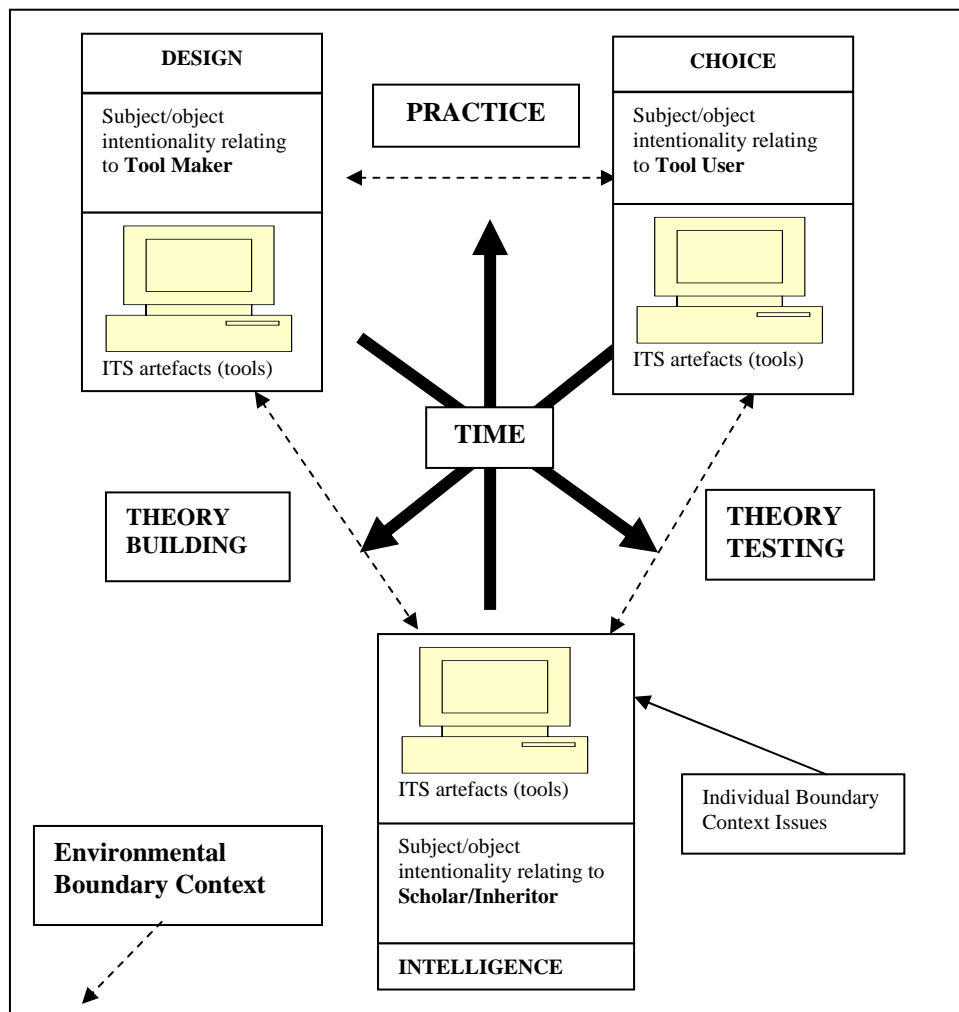

Figure 3: Perspectival Punctuated Action (PPA) (Incorporating Simon's (1981) Decision Making Factors)

1.   Rational Goal Seeking (Intelligence➔Design ➔Choice)

Intentionality –– Theory Building ➔ Practice

This punctuated sequence corresponds with the classic view of rational goal seeking behaviour and relies on the application of judicious intelligence to inform and guide organisational action. This is an instantiation of Herbert Simon's basic decision-making model where intelligence recognises the need for intervention, design provides alternatives for consideration, and choice selects the best option (or one that satisfices). Significantly, Boland (2002: p. 4) sees this sequence of punctuated action as leading "to a finer and finer attention to problem representations that grow increasingly irrelevant to the human condition. Welfare policy, education policy, transportation policy and most public policy issues seem to fall prey to the traps of this form of punctuation." This sequence also represents a classic perspective of problem solving whereby the Scholar/Inheritor's intentionality (theory building) is transformed into practice.

2.   Happenstance Rationalisation (Design ➔Choice ➔Intelligence)

Intentionality – Practice ➔ Theory Testing

This activity punctuation begins with an action or a given environmental state that constrains, at least to some extent, the possibilities for future action. This initial action or state is accepted in whole or in part as intelligence is applied to refine what has occurred, or to justify the initial choice action. This sequence of punctuated action can lead to the premature acceptance of choices that, in turn, leaves intelligence action to reinforce this happenstance through some process of rationalisation. For example, a manager may have difficulty in ignoring the sunk costs associated with some pre-existing organisational strategy or investment when considering a future

course of action. This sequence also represents a perspective of problem solving whereby the toolMaker's intentionality (practice) is transformed through theory testing.

3. Existential Introversion (Choice ➔Intelligence ➔Design)

Intentionality – Theory Testing ➔ Theory Building

In this punctuation, action begins with existential choice. It is then followed by an analysis of how to achieve this choice and then the design alternatives. This action punctuation might be characterised by the tinkering manager who fixes things that aren't broken or has a solution to some yet to be discovered problem. Boland (2002) contends that this action punctuation provides for poor results, as the decision-maker tends to operate in isolation from the situation or context within which the action takes place. While poor outcomes might be the general rule, there are examples where existential introversion has won out. The rise and rise of the Microsoft organisation is one example that readily comes to mind. This sequence also represents a perspective of problem solving whereby the toolUser's intentionality (theory testing) is transformed through theory building.

4. Deferred Design (Intelligence➔Choice➔Design)

Intentionality – Theory Testing ➔ Practice

This form of punctuation begins with the decision-maker sensing a situation in the environment and making choices for action. Subsequently, the decision-maker acquires knowledge or understanding of other courses of action that could have been followed. This action sequence is characterised by a delayed use of design. Boland argues that this punctuation is a failed version of the rational goal-seeking action described earlier where the actor rushes to a decision only to later regret having acted too quickly. This sequence also represents a perspective of problem solving whereby the Scholar/Inheritor's intentionality (theory testing) is transformed through practice.

5. Situational Sensemaking (Design➔Intelligence➔Choice)

Intentionality - Theory Building ➔ Theory Testing

In the situational sensemaking punctuation, a design enactment comes to the actor first as raw action from the environment. The design enactment causes the decision maker to engage in a sensemaking process in which intelligence is applied to selecting those elements of the initiating action that are meaningful and acceptable. This intelligence activity precedes the choice of which meanings and structures to carry forward in subsequent instantiations. Boland (2002) describes this action punctuation as having parallels to Weick's sensemaking model of variation, selection, and retention (see Weick 1979: pp. 122-126). Interestingly, Simon (1977: p. 43) proposed that this action punctuation was highly appropriate where novel technologies were being considered. This sequence also represents a perspective of problem solving whereby the toolMaker's intentionality (theory building) is transformed through theory testing.

6. Existential Heroism (Choice➔Design➔Intelligence)

Intentionality – Practice ➔Theory Building

In this form of punctuation, existential choice is the primary driver of action as for the existential introversion type punctuation described earlier. The actor first chooses who or what they are, develop alternative designs, and then perfect these designs based on some self-defined criteria. Also like the existential introvert, the existential hero makes no reference to the environment for feedback on goals. The environment is essentially ignored in favour of the existential choice of the individual. This sequence also represents a perspective of problem solving whereby the toolUser's intentionality (practice) is transformed through theory building.

The six perspectival punctuated action approaches described above will be used to briefly analyse the public consultation process in the development of a B2G online authentication framework currently being developed by the Australian Federal Government. The following section provides background information, details on the policy development process, and a description of the main thrust of the proposed authentication framework design.

E-GOVERNMENT AND THE ONLINE AUTHENTICATION FRAMEWORK

The Australian Government Authentication Framework (AGAF) is aimed at providing a whole-of-government approach to electronic authentication in all online B2G transactions and was released as a draft exposure document on 21 May 2004 (AGIMO 2004). The specific content and practical implications of the AGAF draft proposal are not central to the analysis presented in this paper. This is because the focus of analysis is the structure of the decision activity within the policy development process and not its content as such. Nevertheless, the authentication framework is briefly discussed below along with relevant background information so as to

define the context within which the online authentication policy is developed, and by which events the research is framed.

Although electronic government initiatives have lagged commercial applications of Internet technology, this position is rapidly changing with many national administrations aggressively pursuing online programs. Here in Australia, businesses see online transactions with government providing significant reductions in B2G transaction costs and improvements in decision-making (NOIE 2003). The Australian Bureau of Statistics recently reported that seventy-one percent of Australian businesses (more than 485,000 business users in total) utilised the Internet in 2002-2003 with Internet-based business income rising to $24.3 billion up from $11.3 billion in 2001-2002. (ABS 2004). Not surprisingly, a rapid increase in the volume of B2G online transactions has accompanied these trends. For example, in 2002-2003 seventy-one percent of businesses using the Internet visited a government web site to access a range of online services including:

- The lodgement of taxation forms online (twenty-one percent of businesses)
- Online payments (twenty-eight percent of businesses)
- Information or services related to taxation (forty-two percent of businesses)
- Information on regulations (thirty-five percent of businesses)
- Information on employment (twenty-six percent of businesses)

With this increasing level of interaction between business and government departments, there has been a growing perceived need for the development of an authentication framework that supports a trusted online environment where businesses can interact safely and securely with all federal government departments. Consequently, the Australian Government Information Management Office (AGIMO) released the Australian Government Electronic Authentication Framework Exposure Draft on 21 May 2004. The importance of a secure B2G transacting environment is highlighted within this draft.

AGAF POLICY AS DESIGN ARTEFACT

The overall objective of this section is to use the perspectival punctuated action (PPA) approach above to interpret the structure of the AGAF public consultation process. The general objective when applying this approach is to test its usefulness for framing policy as a designed artefact. The suitability of using PPA for analysing information systems policy development is addressed by asking the following:

What insight can PPA provide to help better understand, predict and evaluate the Australian Government Authentication Framework policy development process?

The development of information systems policy in the context of PPA is only considered here as it relates to the public consultation process for the AGAF draft exposure document. A PPA analysis can be applied to the whole of policy development process from conception through to implementation, and arguably beyond. Examining only the consultation process allows for deeper understanding of a core component of policy development at a critical point in time. Another advantage is that processes during this stage are readily observable due to the emphasis on public interaction and feedback. In contrast, other stages of the policy development process are undertaken internally by AGIMO, which make it very difficult to gain access to policy data, decision-making processes and outcomes. This is particularly so where policy is likely to have significant implications in the wider business community.

Perspectival Punctuated Action (PPA) Implications for the Public Consultation Process in AGAF Policy Development

Stakeholder engagement has become a core principle of public sector governance and is seen as being achieved in practice by the engagement of experts, interested parties and stakeholder groups during various stages of public policy development and implementation (Catt and Murphy 2003). The participation process can take a number of forms, but most variations seek to ensure that communities and other affected groups have satisfactory input into the regulatory activities and practices of government agencies. While the responsibility for policy formulation and the final decision-making unquestionably rests with government, it is argued that better policies and greater community commitment can be realised from engaging the public in policy-making processes (OECD 2001). For the purposes of this study, the public consultation phase in the development of AGAF makes for an interesting juncture for analysis using PPA which will be used to assess the AGAF consultation process paying particular attention to how the process is constituted and to how this process might influence and shape policy outcomes.

After many years in development, the AGAF policy has reached a stage where an initial draft exposure document has been produced and released for public comment (for an historical perspective on the evolution of the framework see NOIE 1998, 2002, AGIMO 2004). Various individuals and key stakeholder groups acting

alone or in concert with others are then able to respond to the draft exposure by formal submission to AGIMO. After the due date for formal submission, key contributors are then invited to participate in a business impact consultative group face-to-face session. This meeting is held in confidence with participants contributing to a general discussion on the strengths and weaknesses of the draft proposal. It is anticipated that policy is further adapted in the light of the feedback received before being prepared for ratification by the relevant departmental head or minister. Applying PPA, the policy development process can be illustrated as in Figure 4.

The internal environment within which the policy is formulated and communicated to the public is provided by the host government agency – in this case AGIMO. Here it is assumed that the policy development process initially follows Simon's rational goal seeking punctuation where Intelligence precedes design and choice (i.e., Intelligence ➔ Design ➔ Choice). As mentioned earlier, Boland (2002) identifies this action narrative with many public policy developments. It is also assumed that the intentionality of the Scholar/Inheritor (PRACTICE) is transformed through the classically rational approach of theory building and theory testing. At first glance, the commonsensical nature of the rational goal seeking/practice punctuation appears fundamentally attractive. While the strength of this approach is that it focuses attention on developing policy aimed at satisfying existing needs, its weakness is that it may not be as useful in changeable or emergent environments where policy development must be more forward-looking.
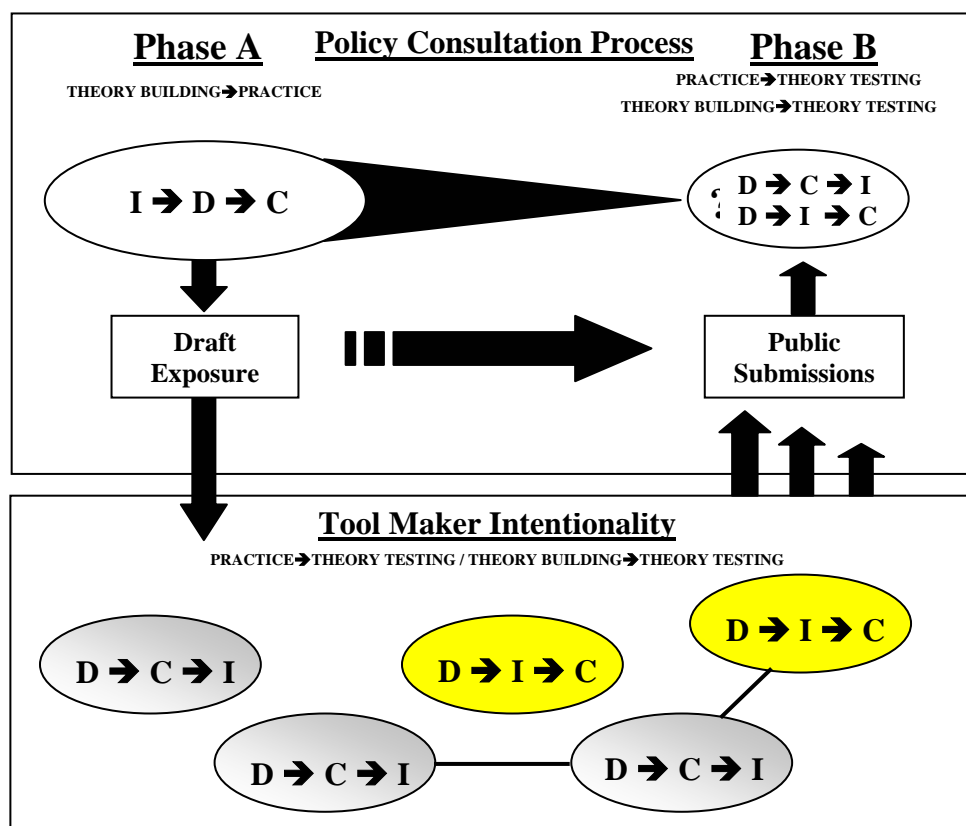

Figure 4: The Public Consultation Process in AGAF Policy Development.

The structure of this perspectival punctuated action narrative also has implications for how much influence public consultation will have on policy design. On the one hand, a draft exposure document that was determined on the basis of a rational goal seeking/practice approach would, in theory, provide a solid design base upon which stakeholders could focus their comments and concerns (as in Phase A). On the other hand, the policy foci and scope will have been "hard-wired" to a great extent into the initial draft exposure document thereby restricting debate and legitimising only minor variations on the original design. This "design tautology" could be further exaggerated if elements of the policy are made more explicit to address the specific concerns that might emerge from the public consultation process.

A very interesting pattern emerges from the public consultation phase with regard to individual stakeholder action narratives. As the design action is a given, a respondent can adopt only one of two distinct action narratives: (1) Happenstance Rationalisation (Design ➔ Choice ➔ Intelligence – THEORY TESTING – practice + theory building), and (2) Situational Sensemaking (Design ➔ Intelligence ➔ Choice - THEORY

TESTING – theory building + practice). Those submissions involving stakeholders acting collectively will most likely display elements of both punctuations. While Happenstance Rationalisation may not be desirable, Situational Sensemaking TESTING activity is likely to generate useful feedback and should therefore be encouraged. As mentioned already, there is some risk that the policy development cycle that resumes within the government agency (as depicted in Phase B) will not be entirely responsive to the unusual or extreme suggestions that might emerge from the public consultation process. This is particularly so if Happenstance Rationalisation (Design ➔ Choice ➔ Intelligence - THEORY TESTING – practice + theory building) activity dominates this stage of the process. Nevertheless, restricting scope in this way may not be detrimental to the design process and could in fact have desirable outcomes. For example, restricting AGAF focus to B2G transactions will cause controversial suggestions such as extending the framework to include C2G transactions to fall outside the scope of public consultation. The discussion presented in this paper provides only a brief demonstration of how the theory of perspectival punctuated action (PPA) can be used to analyse the public consultation process in the design of information systems policy.

CONCLUSION

A single theoretical understanding of the phenomenon under scrutiny is not that useful in an attempt to gain knowledge and understanding of ITS management overall. A perspectival punctuated action (PPA) approach, such as that highlighted by figure 3, allows a multi-facetted analysis to take place (albeit a complex one) that gives us greater insight into all the reconciliation/integration of the subjects, objects and ITS management processes, policies and procedures under scrutiny.

The key to PPA's effective use is not to attempt to reduce understanding of ITS management, as we have seen in much of the theory to date, but to allow multiple perspectives to stand as individual multiple "constructions" which serve to illuminate the process of ITS management and the required skill sets (technological skill sets but also, outcomes, conceptual expression, building techniques and cultural context) from many different points of view as supported by Haynes (2001). The intention of PPA is not to understand the differences between object and subject and rectify them (which is the mainstay of objectivist theory), instead the intention is to utilise these differences to add to and transform our understanding of the complexities ITS management and its subjective meaning.

ITS management approaches are context dependent and many contextual influences are only identified and understood from deeper analysis of the subject/s under study which might indicate emerging contextual factors. Many studies within ITS, however, are conducted from an ontologically objective, rational, Western, process oriented perspective, which is positivist in research orientation while attempting to be reductionist and generalisable in nature. This is reflected in a world-view that underpins our understanding of ITS management.

Wax (1997) puts much the same ideas forward in his work on negating positivism. He argues that positivism subsumes relativism by reductionism. He talks about his observance of the effects of a positivistic research ethos on young anthropological researchers at the University of Chicago in Robert Redfield's era (the 1940's).

Instead of viewing the analysis of the AGAF policy document in terms of a reductionist understanding i.e. comparison to and compliance with Rational Goal Seeking PPA, it can be viewed from multiple perspectives and process orientations. The subjective contextual factors that influence the divergence from and disagreement with the Rational Goal Seeking approach become a more important area of focus than the fact that there is a divergence from rational goal seeking behaviour. The reconciliation integration of subject/object from this anti-reductionist perspective becomes transformational in intent.

Ciborra and Hanseth (1998) outline four ways in which transformation may happen (as developed by Dreyfus (1993)) these include *releasement* – a comportment towards technology which expresses a "yes" and a "no" at the same time; *openness to the mystery* – remaining open to hidden meaning in technology as well as rehabilitation of astonishment at that which has hidden meaning; *new sense of responsibility* – responsibility in accepting what is beyond our control or which cannot be foreseen and *shifting fluctuations at centre stage* – taking up practices that are at the cultural margins (make them central) while de-emphasising those practices that are currently central.

In reconciling/integrating subject/object from an anti-reductionist and transformational perspective we become free to see influences and factors at play that we may not ordinarily be able to. This is illustrated in all six PPA approaches that have been outlined in this paper. These approaches may then be used to review what might constitute and AGAF policy document (from a variety of perspectives) and also to take a "fresh" look at how AGAF policy may be managed. The question, "how do we get good policy?" inexorably leads us to a more pressing concern, "how do we get good policy design?" Carlsson (2002) argues that good policy design comes from removing obstacles to creativity and innovation through policy facilitation. Policy developers and organisational decision-makers alike will always be bound by the limits of rationality and also by the constraints

of power, politics and social context. PPA may lead to better policy design by facilitating an appreciation of how different design perspectives address desired and undesired outcomes from particular policy development processes.

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