Chapter XIV
Diffusion of Innovations Theory:
Inconsistency Between Theory and Practice

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ABSTRACT
The literature review on case study design does not explain how the complex relationships (the issues) in a case study are identified. A top down approach, borrowing from argumentation theory, is a distinct contribution of this chapter which introduces the diffusion of innovations (DOI) as a research problem theory applied to the examination of a business case involving the replacement of enterprise systems by a large risk-averse public sector university in Australasia. The business case document is intended to diffuse the innovation to upper management for funding. But, there is a lack of diffusion study about the business case stage (the process) and the business case document (the outcome) as the construct that affects the innovation and its diffusion. A crucial component of the said diffusion research is designing the case study and mitigating the risks of theory-practice inconsistencies. Critical to mitigating that threat are the complex relationships (issues) that should be thoroughly identified. The context of the research provides experiential practical knowledge and analytical lenses to understand the essential components of a case study and the controversies affecting the rigour in the research design. This makes the top down approach of identifying the issues a good methodological base of designing a single-case study in a particular context. It can be useful to post-graduate and PhD students.
INTRODUCTION

FoxMeyer in United States and Fonterra in New Zealand experienced the unexpected undesirable consequences with regards to replacing enterprise systems. FoxMeyer did not succeed in its Project Delta III which bundled with the SAP R/3 and the Pinnacle warehouse-automation. In Chapter 11 (of the Bankruptcy Code), its gatekeepers claimed that their implementation of the enterprise systems drove them to bankruptcy (Caldwell, 6 July 1998; O’Leary, 2000; Stein, 31 Aug 1998; SAP and Deloitte Sued by FoxMeyer, 27 Aug 1998). They sued SAP and Andersen Consulting for a total of US$1 billion dollars. The dairy giant Fonterra put on hold its global SAP ERP project called Project Jedi (Foreman, 2007). Project Jedi is supposed to standardise its disparate manufacturing systems in line with its new business model of “One Team, One Way of Working” (Jackson, 2006; Ministry of Economic Development, Feb 2004). Fonterra justified the suspension of the project: first to reduce further capital spending and second to provide its farmer-shareholders a slightly higher dividends (Jackson, 2006). It did not escalate Project Jedi despite of the huge sunk costs of about NZ$ 260 million from 2004 to 2006.

These consequences highlight a concern in the business case. In large organisations, upper management generally makes accept-reject decision on the basis of a business case. Corporate governance requires a business case for capital expenditure. The innovation could be strategic to a vision or reactive to a crisis. Their executive sponsor explores all options that best fit his strategic or reactive intention and subsequently develops a business case for approval and funding by the upper management. The business case “sells” the innovation. It attempts to diffuse an innovation to the upper management to make favourable accept-reject decision (aka, adoption decision or strategic investment decision). Good business cases sell while the spectacular ones make the upper management over-commit.

An interesting phenomenon. A successful diffusion, that is a good business case, is not necessarily good.

How should the application of the Diffusion of Innovations (DOI) theory be practiced in the context of the business case of replacing enterprise systems? This problem statement has an implication on practice.

Primary problem. What is the most likely application of the Diffusion of Innovations (DOI) theory when practiced in the context of the business case of replacing enterprise systems?

Practitioners gave simpler answers. They asked for practical solutions. On the other hand, academics began with certain premises. Replacing enterprise systems is likely about balancing long-term and short-term achievements, ultimately sustaining growth in the end (Burrell & Morgan, 2005; Dettmer, 2003; Hammer, 1996; Trompenaars & Prud’homme, 2004). It is likely a problem-solving intervention (Thull, 2005) that fosters seamless alignment and comes with a VALUE orientation. The assumptions go on but the practitioners may see them as uninteresting. The practitioners are likely to find a simple framework of a business case that they can use. Here exists the concept of dualism, polarity, or differentiation of practice and theory. Embedded in this concept is a threat of theory-practice inconsistency. Also embedded is a teleology of a theory.

According to Clegg, Kornberger, and Rhodes (March 2004), a theory should facilitate the creation of disturbance to the practice so that the organisation will be able to transform itself. This means that a theory should not be simply a tool to understand a practice. It should help the practice create noises and disturbances so that the organisation can transform. A theory should not only be a thinking hat to understand a worm. Rather, it should somehow help that worm to transform itself.
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into a beautiful butterfly. The elements of theory and practice in the primary problem includes this idealism of the butterfly effect.

Primary claim. The most likely application of the DOI theory is the integration of the business case development as part of the innovation process and the business case document as a form of diffusion of the innovation concerned.

Purpose

This chapter describes, illustrates, and gives an account of a design process of a single-case study. The research examines a complex phenomenon that is about replacing enterprise systems by University of Australasia (name disguised). A detailed articulation of the research design is a form of discipline (Yin, 1994). It attempts to infuse quality into the research and at the same time mitigates any threats of theory-practice inconsistencies.

Literature review on case study does not show how problem statement, its secondary problems, and their issues are developed. Probably it assumes that the people who will do the case study already know the “how to” knowledge. Even if they do, a different group of researchers attempting to answer the same problem statement and assuming the same primary claim may define the secondary research problem differently and likewise identify the issues and their respective claims differently. The top down approach discussed in this chapter, from the primary problem to the issues, is a distinct contribution.

Furthermore, a good theoretical base and a sound approach to designing a case study can be useful to post-graduate and PhD students who are interested in undertaking case study, especially in the fields of diffusion and innovation. The clarification of the terminologies and concepts can enlighten the novice to the case study.

The chapter utilises Figure 1 as a worldview (Kuhn, 1970) to scrutinise the research design and the research procedure and to mitigate the threats of theory-practice inconsistencies. The diagram helps in fostering awareness of what is out there (the metaphysics) that serves as the basis of knowledge (epistemology) and helps to determine what is right (ethics) and what is the right thing to do (praxis).

Figure 1. Threats (1 to 6) of theory-practice inconsistencies and critical choices ([A] to [E])

Diagram is adopted, reinterpreted, and modified from Cua & Garrett (2008) and clarified in Endnote 1
Outline and Delimitation

The background section begins by describing the Diffusion of Innovations (DOI) theory and clarifying briefly the terms case study, the case, issue, and phenomenon. These terms could be confusing to some. The third section illustrates a top down approach to articulate what is the case. This is followed by the fourth section that answered the epistemological question of what can be learned thoroughly from the One case. The fifth section briefly discussed the research design that can optimise understanding that One case. This chapter attempts to answer only these three questions (see Table 1 below). A section about the future research follows. It ends with a conclusion that summarises the discussions.

A theoretical paradigm comes even prior to the ontological and epistemological questions. Without that paradigm in the background, it is not possible to have awareness of what the complex phenomenon is (first question above) and what can be learned thoroughly from that case (third question). This research uses the realism paradigm that allows the researcher to use both objective and subjective evidences. That paradigm is a complex topic excluded in the discussion here.

The Diffusion of Innovations (DOI) Theory

The mindmap in Figure 2 shows four branches representing the four important constructs of the DOI theory for this research.

Everett M Rogers (1962), in his book entitled Diffusion of Innovations, has provided the much needed conceptual framework to evaluate the impact of innovation. In the 1950s, the Iowa State University had a great intellectual tradition in agriculture and rural sociology. George Beal (Rogers’ doctoral advisor) and other rural sociologies in Iowa State University were conducting pioneering studies on the diffusion of innovations like the high-yielding hybrid seed corn, chemical fertilizers, and weed sprays. Their questions included why some farmers adopted these innovations while others did not. Naturally, the context of Rogers’ theory concerned agricultural products.

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**Table 1. Ontological, epistemological, and methodological questions**

<table>
<thead>
<tr>
<th>Theoretical paradigm (eg, realist paradigm) &amp; philosophical assumptions</th>
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<tr>
<td>Ontology starts with an interesting phenomenon</td>
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<td>What is the complex phenomenon?</td>
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<td>What is the local context?</td>
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<td><strong>What is the One case?</strong></td>
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<td>What can be learned thoroughly from the One case?</td>
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<td>What is the time frame?</td>
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<td>Methodology (research design)</td>
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<td>What theoretical paradigm underscores the research?</td>
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<tr>
<td><strong>What research design can optimise understanding the One case?</strong></td>
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**Diffusion** is a communication process which goes through certain channels over a certain period of time among the members of a social system (Rogers, 1962, 2003). The difference between diffusion and communication is the new idea—the innovation—which diffusion attempts to sell in its communication. Selling the new idea necessarily include selling the unique or important characteristics of the new idea. These characteristics are the **perceived attributes of innovation**.

For a new idea, such as replacing enterprise systems, the classical attributes of an innovation is not sufficient because its original application concerned agricultural products. Replacement of enterprise systems is an economic decision. This innovation therefore should take into account both the classical diffusion and economic (value) attributes of that innovation (Cua & Garrett, in press).

A keyword of perceived attributes of innovation is **perception**. Before perception, there is a need for awareness. After perception comes a personal bias. What matters most in perception is belief. Attributes can be real or imaginary strengths (positives) and weaknesses (negatives) of an innovation. Simply put, the perceived attributes of an innovation result in favorable or unfavorable biases regardless of real or imaginary strengths or weaknesses.

The nature of the innovation and its context account the differences of the diffusion process. For example, the farmers in the 1950s were the decision-makers and the users of agricultural innovations such as hybrid seed corns and chemical fertilisers. For the replacement of enterprise systems, the farmers in the 1950s would perceive these innovations as new because they were not part of their agricultural practices at that time. In contrast, the farmers in the 1950s would have a different perception of the classical attributes of these innovations because they were already part of their agricultural practices. This is because the perceived attributes of innovation are based on personal biases and beliefs.
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systems, the executive sponsor and upper management make the decision while there are the rank and file personnel using the enterprise systems. Therefore for the innovation of replacing enterprise systems, there are two sets of stakeholders and one final accept-reject decision to make. One set (Set 1) concerns the gatekeepers (Rogers, 1962, 2003; Rogers & Shoemaker, 1971). The other set (Set 2) of stakeholders are the users. There is also a Set 3, consisting of attributes such as Total Cost of Ownership. These three sets are about the perceived attributes of innovation which lead to expected consequences (refer to Cua & Garrett, in press for detail discussion of “justified perceived attributes of the innovation”).

A big branch in Figure 2 shows the actual consequences which may be desirable or undesirable consequences. Attempting to understand the diffusion process via the “informed judgement” (see Figure 2) makes DOI theory popular. Attempting to mitigate the risk of undesirable consequences (the war stories such as FoxMeyer and Fonterra above described the branch in Figure 2 about actual consequences to undesirable consequences) likewise make DOI theory popular.

Innovation process roughly follows certain steps, namely: being aware of a new idea, forming an attitude toward it, making accept-reject decision, implementing the innovation, and lastly, evaluating the decision. These are the five generic steps of an innovation-decision process model of Rogers (1962, 2003). The whole process could be divided into two phases. The initiation phase (Phase 1) drives the implementation phase (Phase 2). Other authorities break down the innovation process differently. The innovation process is akin to escaping from an island prison (Ross & Vitale, 2000)⁴. Van de Ven et al., (1999, pp 23-25) uses the metaphor of an innovation journey of twelve stages in three phases⁵. In general, these are variants that are more or less similar to the two process models of Rogers (Cooper & Zmud, 1990; Daft, 1978; Ettlie, 1980; Meyer & Goes, 1988; Ross & Vitale, 2000; Tornatsky & Fleischer, 1990; Van de Ven et al., 1999; Zaltman et al., 1973). Thus, the composition of the initiation phase in the mindmap (Figure 2) is a real world variant applicable to risk-averse large organisation replacing the enterprise systems.

The Case Study

The terms “case” and “study” defy full specification, according to Stephen Kemmis (1980). He associates imagination to the case (that is, imagination ⇒ the case) and invention to the study (that is, invention ⇒ the study). Two concepts are associated to this term. The first, the case, connotes an abstract object (hereinafter referred to as the One case) that is difficult to understand and that will be explained in more depth. It is imagined, identified, and articulated. The second concept concerns the study, which is the research process that is designed (invented) to understand the One case. Briefly, the term case study refers to two components.

Case study (1) = An abstract One case (2) that is imagined, identified, and articulated + the study (3), the research process, that is invented (designed) to understand the above abstract One case.

Authorities agree that a case study, as a research invention, is effective in (a) exploring a complex phenomenon and (b) learning the right questions to ask (Datta, Nov 1990; Hoaglin et al., 1982) confirm case study to be a good research design for learning the right questions to ask. Datta (Nov 1990) clarifies. “The product [, the case study report,] is a sharpened understanding of what might be [or perceived to be] important to look at further in similar situations and what explains why the instance happened as it did. Because such inquiry explores only one situation, it is argued that … it can contribute powerfully to the invention of hypotheses [or the complex issues].” In effect, a case study is especially effective for exploring a cave, using Plato’s analogy of a cave⁶.
Other authorities consider a case study a catch-all name for a method or a methodology (Bassey, 1999; Datta, Nov 1990; Merriam, 1988; Orum et al., 1991; Van Wynsberghe & Khan, 2007; Yin, 1994). In fact, The United States General Accounting Office (GAO) defines a case study as “a method[ology] for learning about a complex instance, based on a comprehensive understanding of that instance obtained by extensive description and analysis of that instance taken as a whole and in its context Datta, Nov 1990, p 15.” Robert Stake (2005) defines a case study as “a choice of what is to be studied” and “not a methodological choice.” The last phase has an unexpected consequence. Some authorities mistakenly construe that a case study is not a methodology (Van Wynsberghe and Khan, 2007). In reality, case study is a methodology. It is just not a methodological choice. Case study is not only a methodology, it is likewise an outcome of that study (Stake, 2005).

A case study embodies four concepts: the case (the One case), the case study research (the research process), the case study research design (research methodology), and the outcome of a case study research (the case study report).

The One Case

Of those four concepts that refer to the term case study, the most difficult term to understand is the first one. Stake (2005) alternatively refers to “the case” as an individual case (p 443), a single case (p 443), the singular case (p 444), the specific One (p 444), the specific case (p 448), the study (p 449), and the particular case (p 454). Certainly, the single case (without the hyphen) is not necessarily the single-case (with hyphen). It is hereinafter referred to as the One case to avoid confusing it with the single-case. Emphasis is essential at this point. The One case is abstract. It is a product of imagination, identification, and articulation during the research design. The challenge is not about the concept of the One case but about articulation of this case.

Issues

Stake (2005, p 446) mentions several types of issues concerning the plan for a case study about Ukraine. Issues are “complex, situated, problematic relationships” (Stake, 2005, p 448). They are the organising themes that deepen the understanding of the One case. Stake clarifies. The key issues bring out the concerns and opportunities for research (Stake, 2005, pp 448-449). A dominant theme is among these key issues. There is likely an issue or two under development. Topical issue pertains to the local setting. Briefly, case study involves a topical dominant issue, other key issues, and an issue or two under development. These issues are not the research questions. However, the research questions are organised around certain issues. Similar to the challenge encountered in articulating the One case, the challenge is identifying the issues in order to understand the One case.

Issues are complex, contextual, and problematic relationships and themes in a case study that provide the basis for developing the research questions that further bring out the opportunities of the case study. Ultimately, these issues enhance thorough understanding of the One case.

The Complex Phenomenon

A complex phenomenon is a first choice in a research. A phenomenon is a state of something at a space-time or an event that changes the state of an object, Ron Weber (2003) clarifies. The state of that object includes its properties and their value in relation to space-time. Presumably, an event triggers the object to evolve at a particular (initial) space-time. The value of its properties changes as a consequence. The initial state, the change event, and actual or the expected subsequent state
are the properties of that thing. These properties symbolise the complex phenomenon.

In the parlance of research domain, the complex phenomenon represents the actual domain. It has an outer domain which is the natural, the rich local context-sensitive, setting where the phenomenon happens. The contingent conditions of the outer domain makes the change event that happens to the actual domain unique. Beneath the actual domain is an inner layer. It is the empirical domain where objective facts and subjective experiences can be obtained (Bhaskar, 1978; Outhwaite, 1983; Tsoukas, 1989).

Articulating complex phenomenon demands articulating the three domains (the real, actual, and empirical domains) and the set of assumed, observed, or tentative relationships of the properties of the complex phenomenon. These properties may be about the present state, the change event, and the future state. Constructs or variables are the other words used to signify properties. The statements of relationships are the laws under examination. For this case study, the complex phenomenon is the One case.

Choosing and articulating the complex phenomenon, according to Weber (2003), is the most critical tasks in research. Symbolised by [A] in Figure 1, the two tasks required thorough reflection and understanding of the implications of relevant meta-theoretical assumptions. But, articulating and reflecting the ontological and epistemological assumptions associated to a theoretical paradigm is not a simple task. There exist the relationships between [A], [B], and [C] in Figure 1.

A complex phenomenon has three space-time components and three domains.

The three space-time components are (a) an initial state (eg, antecedents), (b) a change event (eg, an innovation process), and a subsequent state (eg, actual consequences). The change event influences the change of some or all the properties of the initial state of the phenomenon. The natural or managed evolution results to a subsequent state. In short, initial state (properties and their values) ⇒ change event ⇒ subsequent state (properties and their values).

The three domains are (a) the real domain, (b) the actual domain, and (c) the empirical domain. A complex phenomenon is itself the actual domain. Its outer domain is the real domain (rich natural setting or the local context-sensitive setting). The inner domain is the empirical domain that embodies objective and subjective evidences. In short, real domain ⇒ actual domain ⇒ empirical domain.

ONTOLOGY: WHAT IS THE ONE CASE?

A series of choices that confront case study (Stake, 2005) start with choosing the complex phenomenon (Weber, 2003).

The Complex Phenomenon

Previously stated, choosing the complex phenomenon, articulating the complex phenomenon, and [justifying the choice] are the most critical tasks in a research (Weber, 2003). A business case influences upper management to be cautious, positive, or overly positive. At one extreme of the continuum is upper management’s inability to commit or under-commit. At the other extreme is an over-commitment. Both extremes in the continuum result to unexpected undesirable consequences. A successful diffusion, that is a good business case, is not necessarily good. This gives justification to the importance of understanding the complex phenomenon.

As stated above, a complex phenomenon has three space-time components and three domains. The research questions about a complex phenomenon in context form a matrix (Table 2) a matrix of these three components and three domains.
The **complex phenomenon** of this research concerns the replacement of enterprise systems. Replacing enterprise systems is likely a problem-solving intervention to foster seamless alignment (ontological assumption). Thus, its initial state likely contains a condition that triggers the need for the change event with an expected subsequent state in mind. In a risk-averse organisation, the person who is supposed to undertake the change event and the person who approves the change event belong to different organisational hierarchy. The executive sponsor to the innovation agenda is normally a senior manager from the middle management while the people who control the use of resources and who approve the replacement of the enterprise systems belong to the upper management. For the change event to take place, the executive sponsor normally submits a business case which is a document intended to sell his new idea for approval by the upper management. How that business case is written and presented influences the upper management to be cautious, positive, or overly positive. At one extreme of the continuum is upper management’s inability to commit or under-commit. At the other extreme is an over-commitment. Both extremes in the continuum result to unexpected undesirable consequences. Thus, a good business case is not necessarily good after all.

Table 2 and Figure 4 map the relationships of the four constructs: the innovation, the diffusion, the business case, and the perceived attributes of the innovation. At the initial state, the active constructs are the innovation (the new idea in mind), the interactions and the diffusion among the people within and without the social systems (the University of Australasia), the consequences expected by walking the innovation process, the consequences expected by not walking it, and the perceived attributes associated to the innovation. The mindset also includes the supposedly right way to walk the innovation. The process includes

| Table 2. Articulating the complex phenomenon by analysing it in terms of the real domain (the local context), the actual domain (the complex phenomenon), and the empirical domain (the issues) |
|---------------------------------|-----------------|-----------------|-----------------|
| **Local context**               | **Initial state** | **Change event** | **Subsequent state** |
| What was the state of the University of Australasia that made the replacement of enterprise systems necessary? | How did the executive sponsor walk the initiation phase that ends with the submission of the business case to the upper management? | What did the executive sponsor expect when he acted on his agenda? When really happened? |
| **Complex phenomenon**          |                  |                  |                  |
| What were the dimensions of the innovation (construct 1)? What were the reasons cited to diffuse (that is, to justify; construct 2) the replacement of the enterprise systems? What were the perceived attributes (construct 4)? | How did the executive sponsor convey and sell his intention to replace the enterprise systems in the business case (construct 3)? | Was the executive sponsor successful in selling his innovation? Why? Why not? |
| **Issues**                      |                  |                  |                  |
| Perceived attributes (issue 3), Decision points (issue 4) | Matchmaking stage (issue 1) | Business case (issue 2) |
request for information (RFI), request of proposal (RFP), and a business case submission. The business case construct therefore has two components: a process component and an outcome component. After the business case submission, an accept-reject decision will occur. This critical change event will affect what the subsequent state will look like.

**Justifying the complex phenomenon.** Real world cases, such as those of FoxMeyer and Fonterra, have highlighted a need to understand the business case in the innovation process. Yet the Diffusion of Innovations (DOI) theory has overlooked the business case as a construct. Likewise, it has overlooked “visioning” (or a view of the future) as a crucial element in walking the innovation. Rogers (2003, p 422) mentions that organisations generally react to problems and thereafter perceives the need for innovation. His two process models clearly indicate that walking the innovation is reactive to a problem and not strategic to a vision. That reactive intention probably leads to an oversight of strategic intention.

**The Local Context**

The local context of this research concerns the replacement of enterprise systems by the University of Australasia (name disguised). In effect, this research is a single-case study that explores the complex phenomenon articulated in Table 2.

This exploratory single-case study starts with an intrinsic interest on a complex phenomenon. It has just one aim: to explore and understand thoroughly the business case development and the business case document in a context. The aim includes the intention to understand the empirical domain (the four issues in Table 2). It consists of theory and practice dimensions which can be likened to the two sides of a coin. The researcher attempts to identify the domain and put a structure to the business case research using the DOI lens and focusing on the four complex issues (discussed later).

The theory and practice dimensions are the two thinking hats. The academic hat wants to look at the relationships of the DOI constructs that are
relevant to the business case and the domain of the business case stream of a diffusion research. A business case research should embrace a plurality view toward visualising, mapping, and realising expected consequences. Such a mindset fosters a better understanding of the current state and the perceived needs, the innovation as a solution or a means to an end, the alternative options, the preferred choice of the executive sponsor, a view of the future state, the desirable expected consequences to achieve, the undesirable expected consequences to avoid, and the perceived positive attributes required. The practitioner, on the other hand, wants to know more about the business case, noting the caveat that a good business case is not necessarily good for the organisation. A structured approach to develop a business case will be a welcomed resource.

What justifies this context? As a Certified Public Accountant, an Associate Chartered Accountant, and an Oracle Implementation Team Member (Master Level), this researcher is fortunate to gain access to investigate on the replacement of enterprise systems. For the last twenty years, he has had the opportunities to implement many enterprise systems. The systems range from small SBT/ACCPAC accounting systems to big Oracle Financials. In an upgrade *cum* implementation of Oracle Financials, his executive sponsor had a nervous breakdown. The organisation had been forced to upgrade. The old version would not be supported in a near future even if it was meeting the needs. The upgrade was inevitable. The executive sponsor became ambitious. He decided to include several new modules to be implemented simultaneously with the upgrade. Obviously, the account executive was effective in diffusing the idea of a simultaneous upgrade and implementation. The project became huge. The budget skyrocketed. The stress became unbearable, causing a nervous breakdown.

This is a field of research that he is passionate about from both academic and practitioner perspectives. So, the research commenced with an opportunity which he subsequently “exploited”. It is without doubt that the University of Australia is typical of a large public sector risk-averse organisation. Its four campuses, its ranking in the performance-based research fund regime, and its offerings provide adequate contextual uniqueness. So the justification follow the following path:

The researcher availed an opportunity of ACCESS of a complex phenomenon in a large public sector risk-averse organisation.

 bó This site is not easily accessible. It is critical and extremely unique (Yin, 1994).

 bó The intrinsic interest (initially on the complex phenomenon and later the One case) justifies the case study (Stake, 2005).

 bó The lack of research on the business case in a context compels the research to explore this field.

 bó Exploratory single-case research

 bó Opportunity exploited

**The One Case**

Imagine a local context as the outermost layer of a reality (the biggest rectangular box in Figure 4). Beneath it are two inner layers. The second layer is a complex phenomenon under study (the shaded rectangular box that the four constructs). Beneath that complex phenomenon is a third layer consisting of the four issues, their interactions, and the research questions (Table 2). The three layers are respectively the real domain, actual domain, and empirical domain (Bhaskar, 1978).

The four issues of case study research reflect complex relationships of their structural and functional elements. They represent the One case. Their relevance to the One case relies on how these issues have been identified. In turn, the relevance of the One case to the primary problem depends
on how relevant the issues are to the one case. There is a chain of relevance and in that chain embeds the justification of the One case.

The process of thinking and developing the issues from the primary problems is not a simple one. It will be thoroughly explained. The rigour and the logic that put into the process serve to justify the relevance of the issues.

Because the research concerns the innovation process of replacing enterprise systems and because the stages in walking an innovation is a variant of the process model of Rogers (2003), another diagram will be useful in validating the relevance of the issues. Figure 5 is consistent to the second model of Rogers where between the initiation phase and the implementation phase is a dotted line which symbolises an accept-reject decision to be made by the upper management.

There is nothing new to the formal structured procurement stages from RFI (request for information) to RFP (request for proposal) to BC (business case). Many organisations, especially the large and risk-averse organisation, imposes this standard operating procedure as part of their governance. The identified four issues in Figure 4 fits perfectly into Figure 5 with the perceived attributes of the innovation (Issue 3 in Figure 5) embedded into the decision points that run across the whole process. This leads to the concept of value.

In a business sense, assessing a business case means justifying that the innovation (that is, replacing the enterprise systems) adds economic value in the medium term as well as in the long term (Copeland et al., 2000; Morin & Jarrell, 2001; Rappaport, 1986; ten Have et al., 2003).

Figure 4. The four constructs in the DOI theory and a worldview
How does an executive sponsor sell that value to the upper management? This brings in the next two questions, which are: What constitutes value? How do enterprise systems help an organisation to create value? Probably, the value could be traced to the enterprise systems. It could be traced to the perceived attributes of the new enterprise systems to replace the old enterprise systems and of the vendors who will be supporting the systems. The challenge is to quantify benefits and value.

The One case is more complex than the big picture depicted in Figure 4 and Figure 5. There are more components to take into account than just the four issues and the boundary visualised in that diagram. Table 3 provides a more comprehensive picture of the One case.

The One case is difficult to conceive at the start. A top down approach starts by articulating a primary claim (1 in Figure 6) that captures the essence of the primary problem (2), which is the overriding problem. There should only be one primary claim (1) to capture the essence of a primary problem (2). An assertion (the thesis statement) represents that claim. It is a statement that should be supported by evidences (eg, the experiential data or narrative truth) and argumentation. The result of the argument is epistemology, the processed knowledge, which contributes ultimately to knowledge.

The path to interpreting and evaluating a primary claim is rather complex (Van Eemeren et al., 2002, pp 63-78; Zarefsky, 2005a, pp 86-95; Willard, 1992, pp 239-257). Figure 6 shows how the primary claim (1) leads (3) to determining and articulating the secondary problems (4) which further identifies (5) the secondary claim (6). Similar to the primary claim, analysing the secondary claim helps to identify (7) the issues (8) which subsequently serve as a basis to further determine (9) tertiary claims (10). The secondary claims (6) and those claims below them (10), if validly argued, will support the primary claim (1). It is when the primary claim becomes valid and accepted by the community will there be a contribution to a higher realm of knowledge. That primary claim is a statement that will capture the substance of the primary problem. It is the ultimate
Table 3. Essential components of the One case

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<th>Context:</th>
<th>Local context and the complex phenomenon</th>
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<td>Visual case study map:</td>
<td>Boundary, structural/functional elements, &amp; their relationships</td>
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<td>7.</td>
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<td>8.</td>
<td>Ethics:</td>
<td>Ethical considerations and ethical clearance</td>
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</table>

Figure 6. Relationships among research problems, claims, and issues

Imagine a top-down approach that culminates in Figure 6, which satisfies the rule of confirmability (construct validity), by breaking down the phenomenon into components. Literature review on case study design does not show how the problem statement, its secondary problems, and their issues are to be developed. Probably it assumes that the people who will do the case study already know the “how to” knowledge. Even if they do, a different group of researchers attempting to answer the same problem statement and assuming the same primary claim may define the secondary research problem differently and likewise identify the issues and their respective claims differently. Nevertheless, the top-down approach imposes a rigour to identifying the issues and their corresponding claims. The systematic way of thinking about the research problem (first level) and breaking down into the issues (third level) inevitably includes interpretive judgment of the researcher. The approach in Figure 6 is subjective, interpr-
EPISTEMOLOGY: WHAT CAN BE LEARNED THOROUGHLY FROM THE ONE CASE?

A thorough examination of the One case indicates the following problems, issues, and claims (also refer to Figure 6 and Appendix) can be learned.

- **Foreshadow problem.** The relationships between innovation (construct 1) and its diffusion (construct 2) are not clear in diffusion research. Furthermore, these relationships have not been investigated in the context of the business case (construct 3) of replacing enterprise systems by large public-sector organisation. Particularly important in the business case are the perceived benefits and value (aka, the perceived attributes of innovation; construct 4) of the alternative courses of action. Given the second, third, and fourth constructs, how do these constructs affect each other? For example, how does the business case influence the perceptions of positive or negative attributes of the alternatives to be explored? What factors (eg, the organizational size and its mindset to risk) affect the perceptions and the diffusion process?

- **Secondary problem 1.** What is the most likely explanation for the importance of the innovation process prior to the accept-reject decision using the Diffusion of Innovations theory?

- **Secondary claim 1 (of secondary problem 1).** The most likely explanation for the importance of the innovation process prior to the accept-reject decision using the DOI theory is its description as organisation’s exploitation of an opportunity.

- **Issue 1.1 (derived from the secondary claim 1).** Matchmaking stage
  - **Claim 1.1 (of issue 1.1).** The matchmaking stage is likely to embody opportunities for the organisation to establish the right relationships with the right vendor.

- **Issue 1.2 (derived from the secondary claim 1).** Business case
  - **Claim 1.2 (of issue 1.2).** The business case is the most likely form of diffusion to facilitate the selling of an innovation.

- **Secondary problem 2.** Is the concept of classically perceived attributes of innovation more likely to matter to the replacement of enterprise systems? Are there newer theoretical attributes that falsify, replace, or make the classical attributes obsolete?

- **Secondary claim 2 (of secondary problem 2).** The concept of classical perceived attributes of innovation of the DOI theory is more likely generic and “one-sized” in order to fit all innovations. This strength is inadequate to explain that part of the innovation process prior to making the accept-reject decision of replacing the enterprise systems. It is more likely that there are newer theoretical attributes that make the classical attributes of innovation obsolete.

- **Issue 2.1 (derived from the secondary claim 2).** Perceived attributes (value) of the innovation
  - **Claim 2.1 (of issue 2.1).** Each perceived attribute of innovation likely represents a decision point in the initiation phase of an innovation process. The set of attributes likely varies depending on whether the innovation (that is, the replacement of enterprise systems) is strategic or reactive.

- **Issue 2.2 (derived from the secondary
Claim 2). Decision points
\begin{itemize}
\item Claim 2.2 (of issue 2.2). The relevance of a perceived attribute of innovation likely depends on where the decision point occurs in the timeline of the innovation process.
\end{itemize}

How Much Must be Known?

Despite delimiting the One case to the four issues, there is nevertheless a wide range of viewpoints concerning those issues.

Visioning the Outcome of the Case Study

Visioning is a critical part in designing the case. It helps to determine how much must be known from the case. As a preview (Figure 8) which is like that of a whole movie, the vision helps to anticipate and explore plausibly and coherently the ways in which the One case may evolve. Every issue is sufficiently complex. It is a system in itself. It is worth studying. It is a mini case in itself.

Identifying the Research Questions

Research questions that surround the issues have yet to be identified. The top-down approach, that starts with a problem statement and ends with the four issues and their respective claims, does not simply stop there. The research questions concern the individuals, the social systems, their structural and functional elements, and others. They help to understand the One case. Answers could be drawn all at once (Stake, 2005) from sources as Stouffer (1941) has suggested: PEST (political, economic, social, and technological) environments, competitive environment, physical settings, historical background, tasks and processes of the socio-technical system, informants, and other cases.

Integrating the four issues, as illustrated in Figure 4, Figure 5, and Figure 8, leads to the exploration and interpretation of their complex interactions, the context, the possibility of contingent features or wild cards that can change the phenomenon, and the research questions surrounding them. In all these diagrams, the interaction is a dominant logic, loosely adopted from that of C Prahalad & Richard Bettis (1986), that mentally locks the thinking about the new idea and diffusion (communication) into a specific contextual manner.

It should be noted that Diffusion of Innovations theory takes into account the antecedents (\(\Phi\) in Figure 7) which includes the conditions, the expected consequences, and the perceived attributes (\(\Theta\)) of the innovation, the process which consists of the decision points in that process (\(\Theta\)), and the consequences (\(\omega\)). This research examines the decision points in the matchmaking stage and the business case stage (Figure 5) as well as their implications. In effect the worldview of Figure 7 complements the worldviews of Figure 4, Figure 5, and Figure 8. These four diagrams are viewpoints of the same complex phenomenon and the One case being examined. The following research questions that have been derived from articulating the complex phenomenon in Table 2 become relevant.

1. **What constitutes VALUE to the organisation on the bases of the vision and objectives the organisation is trying to achieve?**

   What are the vision and the objectives of the organisation? Explain the innovation. What were the dimensions of this innovation? What is it? Why is it so? What were the key barriers? What were their implications, especially to the executive sponsor?

2. **How did the change event (the innovation process) and how will the new enterprise systems (the innovation) help to achieve that value?**

   What were the actual or perceived attributes, whether positive or negative, about the innovation that the
executive sponsor, change agent, and other team members used to assess alternative options? What were the reasons cited to “sell” the innovation by the executive sponsor to the upper management? How well did the business case document do the selling? What are the relevant information technologies that will enable the organisation to bring in the value? How did the business case document influence the perceptions of positive or negative attributes of the innovation and its options? How successful was the executive sponsor in selling this agenda? Why? Why not? How should the organisation walk the innovation in order to be able to leverage the information technologies? What are the benefits expected? How do those benefits align with the vision, objectives, and value (eg, total value of ownership)?

3. **What or who triggered the change (the innovation)?** Who were the key participants and stakeholders during the initiation phase?

4. **How did the initiation phase happen? Why did it happen that way? Did the process (including the business case submitted) make sense? Why? Why not?** What factors (eg, the size of organisation or the mindset to risk) affect the perceptions and the process? If each considered attribute of innovation would be regarded as a decision point, what were the decision points along the initiation phase? How relevant was each decision point at that point in time? Was there a time element factor?

5. **Did the timeline matter? Why? Why not?**

**METHODOLOGY: WHAT DESIGN CAN OPTIMISE UNDERSTANDING THE ONE CASE?**

**Case Study as a Research Design**

Realism paradigm by default justifies the use of case study. The One case further justifies the use of case study. In fact, the One case is the one and only justification of case study (Stake, 2005).

Certain key characteristics (Table 4) justify the use of case study methodology (Benbasat et al., 2002; Feagin et al., 1991; Flyvbjerg, 2001, 2006; Simon, 1980; Stake, 1995, 2005; Yin, 1993, 1994). A case study attempts to essentially answer the why and how questions about a contemporary phenomenon that is complex. The essence does not compel a similar form. The primary problem of this research illustrates the point’.

**Figure 7. Another worldview of the business case stream of diffusion research**

- **Antecedents**
  - Articulate the innovation, including its conditions, that can facilitate achieving the corporate vision and creating the value expected from that innovation.

- **Innovation process**
  - Understand the right way to walking the innovation.

- **Consequences**
  - Articulate the expected desirable consequences to achieve and undesirable consequences to avoid.

- **Perceived attributes of innovation**
  - Identify and justify the perceived attributes of the innovation, that facilitate value creation.

- **Executive sponsor, change agent, and other team members**
- **Assess alternative options**
- **Executive sponsor to upper management**
- **Business case document**
- **Perceptions of positive or negative attributes**
- **Information technologies**
- **Executive sponsor in selling this agenda**
- **Organisation walk the innovation**
- **Leverage the information technologies**
- **Benefits expected**
- **Alignment with vision, objectives, and value**
- **Timeline**
- **METHODOLOGY**
- **WHAT DESIGN CAN OPTIMISE UNDERSTANDING THE ONE CASE?**
- **Case Study as a Research Design**
- **Realism paradigm by default justifies the use of case study**
- **One case further justifies the use of case study**
- **One case is the one and only justification of case study (Stake, 2005)**
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- **A case study attempts to essentially answer the why and how questions about a contemporary phenomenon that is complex. The essence does not compel a similar form. The primary problem of this research illustrates the point’**
Figure 8. A preview of the case study

1. Describe the context (the system) to be studied.
2. Define the key elements including driving forces and proximate triggers.
3. Identify the key actors and stakeholders.
4. Explain the innovation. What is it? Why is it so?
5. Introduce the theoretical model.
6. Describe the innovation process, particularly the promotion phase.

Wild card

7. Describe the matchmaking stage.
8. Describe the business case stage.
9. Explain the options, their attributes, and decision points.
10. Describe the key attributes of a good business case document.
11. Explore policy implications. Identify policy, plans, and actions.
The natural setting provides the rich context for the researcher to examine the unit of analysis intensively. The researcher does not, cannot, and should not undertake experimental controls or other manipulations. The complexity of the phenomenon makes articulation difficult at the start. However the passion and a hundred percent attention committing to the case overcome this difficulty. A third pre-requisite is inherent to the researcher. The outcome of a case study relies heavily on his integrative power because the strength of the case study comes from the triangulation of methods used to gather, to analyse the data, and to theorise. These three conditions justify the use of the case study as a research design.

An interest in the One case can be intrinsic or it can be instrumental. In a majority of case studies, the intrinsic interest compels the use of case study design to understand thoroughly the complex phenomenon in its rich local setting. An interest in the case can be instrumental. Alternatively, the researcher may use case study as a means to an end. The interest on case study is thus instrumental to an end in mind. According to Yin (1993), a case study can be a means to describe, to explore, or to explain that complex phenomenon. Whether a case study is descriptive, exploratory, or explanatory, it is instrumental to achieve those ends. GAO (Datta, Nov 1990) refers to them as the expected consequences (the applications) of a case study design. Regardless, it is the intrinsic interest or instrumental interest on the One case that triggers the case study (Benbasat et al., 2002; Franz & Robey, 1984; Stake, 2005).

A different reason for choosing a case study design could be due to the dissatisfaction with or a personal bias against quantitative methodology (Benbasat et al., 2002). Quantitative methodology has to have large sample size in order to generalise. Yet, the generalised knowledge could not possibly apply to all practices, especially to those with rich and sensitive contexts. This weakness becomes the strength of case study. It is particularly well suited to generate knowledge for the practitioners. Knowledge learned from the instrumental case study makes practice less complex over time (Baskerville & Pries-Heje, 2001; Benbasat et al., 2002 Christenson, 1976). Even a trial-and-error practice is crucial for knowledge to accumulate (Christenson, 1976). It is especially appropriate to a research area, such as the business case, in which none or few previous studies have been carried out (Benbasat et al., 2002). In short, a case study design facilitates the exploration of a complex phenomenon.

Table 4. Key characteristics of case study as a research design

<table>
<thead>
<tr>
<th></th>
<th>Overriding theoretical paradigm:</th>
<th>Realism ([C] of Figure 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Phenomenon:</td>
<td>Contemporary and complex ([A] of Figure 1)</td>
</tr>
<tr>
<td>3</td>
<td>Context:</td>
<td>Natural setting (University of Australasia)</td>
</tr>
<tr>
<td>4</td>
<td>Questions:</td>
<td>Why and how</td>
</tr>
<tr>
<td>5</td>
<td>Unit of analysis:</td>
<td>Streams of innovation/diffusion research</td>
</tr>
<tr>
<td>6</td>
<td>Application:</td>
<td>Intensive examination of unit of analysis</td>
</tr>
<tr>
<td>7</td>
<td>Motivation of the study:</td>
<td>Intrinsic or instrumental interest ([A] of Figure 1)</td>
</tr>
<tr>
<td>8</td>
<td>Concentration required:</td>
<td>One hundred percent (100%) attention required</td>
</tr>
<tr>
<td>9</td>
<td>Skill of the researcher:</td>
<td>Integrative powers of the researcher</td>
</tr>
</tbody>
</table>
Diffusion of Innovations Theory

Optimising the Understanding of the One Case

Justifying the Research Problem
Theory (DOI Theory) in a Single-Case Study

The seven constructs, identified in Figure 2, make the DOI appropriate to understand thoroughly the selling of new enterprise systems through a formal business case document.

However, does DOI theory fit more appropriately to a study of a large number of enterprises than a single enterprise? The answer is no, not necessarily. Earlier works of using DOI theory to a single-case study justify the appropriateness of this theory to single case study. One single-case study used DOI theory to identify in advance the complex issues that inhibit or facilitate the radical technological change in a hospital at Uganda (Gladwin et al., Jun 2003). Another single-case study found the concept of perceived characteristics of the innovation useful to provide a framework for thinking about the adoption of video conferencing technology (Al-Qirim, 9-11 June 2003).

A third justification concerns the two units of analysis to guide the philosophical inquiry. Diffusion research has several distinct streams, each with a specified unit of analysis. The critical task of choosing the unit of analysis is not simply picking any or a combination of the five streams. This research uses the DoI and the PT streams after having thoroughly reflected and selected the complex phenomenon and its boundary ([A] in Figure 1), after having conducted a thorough review of the Diffusion of Innovations theory ([B] in Figure 1), and after mapping the constructs and their relationships (Figure 3 and Figure 4) to examine. The business case development is part of the matchmaking stage during the initiation phase of the innovation process. The business case document is likely a form of diffusion. These justify the PT and DoI streams as the units of analysis.

Optimising the Understanding of the One Case means not Generalising the One Case

Does optimising the understanding of the One case mean that nothing follow after understanding the One case? Is theorising the One case is not a part of the purpose of the study?

Case study excludes generalising. The purpose to understand thoroughly the One case does not include generalising beyond the One case, although a case study is a means, a small step, toward generalisation (Campbell, 1975; Feagin et al., 1991; Flyvbjerg, 2001, 2006; Simon, 1980; Stake, 2005, p 448; Vaughan, 1999; Yin, 1993, 1994). Generalising beyond the case reduces the one hundred percent concentration required by the case study to thoroughly understanding the particulars of the case (Stake, 2005, p 448).

Therefore understanding the One case and attempting to generalise it is in itself a threat of theory-practice inconsistency because it hinders the 100% attention and the 100% knowledge expected from understanding the One case. This is the reason why the intention to generalise should simply linger during the whole research process (Stake, 2005).

Not Generalising the One Case Does Not Mean Not Theorising the One Case

If optimising the understanding of the One case should not include generalising beyond the One case, then does not generalising the One case mean not theorising the One case? A researcher conducting the case study and attempting to thoroughly understand the One case can nevertheless theorise even if he does not generalise beyond
the One case. Understanding what a theory is and differentiating theorising and generalising resolve this confusion.

A **theory** is simply a statement of the **relationships** (eg, the four issues in Figure 4) of the properties, constructs (eg, the four constructs in the same diagram), or variables related to a complex phenomenon (eg, the shaded area in that diagram). Weber (2003, p iv) defines theory as “an **account** that is intended to explain or predict some **phenomena** that we perceive in the world.” Thus, a theory is an account of a phenomenon in practice. This account expresses relationships. Metaphor, dualism, category, and concept are statements of the relationships. These are theories, which can be context-bound or context-free. Llewelyn (2003) suggests a five-level structure to what counts as theory (Table 5).

If the context-bound theory (the Level 4 theory) of Llewelyn (2003) and her context-free theory (Level 5 theory) could be interpreted as a differentiation of two extremes in a continuum and if the metaphor (Level 1 theory), differentiation (Level 2 theory), and conceptual innovation (Level 3 theory) are the theories that reside at any points on the continuum, then it could be said that the Level 1 to Level 3 theories developed through theorising are not the product of generalisation as long as these theories do not reside at the context-free theory side or somewhere near that end. Theorising is therefore not generalising as long as the theory that has been created reside near or somewhere near the end of the context-bound theory.

With this interpretation, it is possible to bring into relevance the theory or theories that result from the thorough understanding of the One case and putting the practice ([A]) either in congruence or paradox to the research problem theory ([B]). Thus, **the purpose of case study is**

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**Table 5. 5-level structure to what counts as theory**

- Opposite to the highest Level 5 grand theory is the lowest **Level 1** metaphor. Giving meaning to form, a metaphor is a concept of what “we live by”, state Lakoff & Johnson (1980, p 126). Morgan (1983) clarifies that metaphor is “a basic structural form of experience through which human beings engage, organise, and understand their world.”

- **Level 2** theories involve differentiating, comparing, contrasting, categorising, and bridging the dualism. Examples of dualities are black and white, left and right, up and down, presence and absence, objectivity and subjectivity, finite and infinite, private and public, inner and outer, yin and yang, masculine and feminine, micro and macro, and so on. McGregor (2006) differentiates Theory X (the traditional view of direction and control) and Theory Y (the integration of individual and organisational goal). The concept of social construction by Berger & Luckman (1966) bridges the objective and subjective dualism. Level 2 theories cut up experience, creates meaning and significance, sets up contrasts and layered categories, and bridges dualism.

- A concept belonging to **Level 3** is what Anthony Giddens (1987) associates it as a “conceptual innovation”. In this level, there is a certain degree of generalisation and opens up “ways of seeing” (Giddens, 1987). It associates itself a certain unit of analysis and bridges gaps from micro level to meso (organisational) level to macro level.

- **Level 4** is specific to a specific social, organisational, or individual phenomenon in their rich contextual setting.

- **Level 5** grand theory is applicable to all phenomena. The last is a one-size fits all.
the understanding thoroughly the One case. That understanding includes giving accounts of the issues in the form of theories that are context-bound. The following twenty six approaches of Weber (2003) are applicable to theorising (Table 6). A pre-requisite is the identification of the focal constructs (eg, the four constructs of Diffusion of Innovations theory).

**Modes of Analysis**

Six modes of analysis are relevant to optimise the understanding of the One case. Each mode of analysis ensures a tight coupling of data gathering and data analysis (Myers & Avison, 2002). An underlying principle is the concurrent gathering and analysing of the data. Data will not be gathered and later analyse. Rather, prior to the data gathering phase, there is a contemplation of how the data will be analysed and subsequently how the data will be collected. This mindset lingers subconsciously as the research design goes on. Here are the six relevant modes of analysis:

1. The simple “noticing, collecting, and thinking” (Seidel, 1998) facilitates the clarification of the data. It is iterative and progressive in a continuous infinite spiral to end when this report is completed.

2. “Little data with lots of brain” limits the code of the data with the use of ALTAS.ti version 5 as little as possible (Agar, 1991,p 194). This mode starts by reading and re-reading the data, noticing a few interesting things, avoiding intensive coding early in the analytic process, collecting one or more of these things, and intensively thinking about them.

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**Table 6. Types of theory and steps of generating theory**

| Type 1 theory | Articulates the constructs of a theory and explains or predicts its value. The theory may be (1) new. The construct may be (2) new to, (3) added to or (4) taken from an existing theory. The existing constructs of an existing theory can be (5) defined more precisely or (6) conceptualised somewhat differently. |
| Type 2 theory | Articulates the relationships between or among the constructs of a theory and explains with precision how the value will change based on some sort of law. The relationships and the laws are social constructions. The theory may propose (6) new laws of interaction among the new constructs in a new theory. It may propose (7) a new law, (8) add a law, or (9) remove a law for the existing theory. It may even (10) define an existing law more precisely or (12) conceptualise it somewhat differently. |
| Type 3 theory | Articulates the lawful present state of the phenomenon for which the value of the construct holds. The theory may specify more precisely a singular value that a construct (13) holds or (14) cannot hold or a collective values of constructs for which the theory (15) holds or (16) does not hold. |
| Type 4 theory | Articulates the lawful change event with (17) unlawful initial state or (18) unlawful subsequent state or (19) both unlawful states. Likewise, the change event may be unlawful with (20) lawful initial or (21) lawful subsequent states or (22) both lawful states. |
| Type 5 theory | Similar to Type 3, articulates the lawful future state of the phenomenon for which the value of the construct holds. The theory may specify more precisely a singular value that a construct (23) will hold or (24) will not hold or the collective values of the constructs for which the theory will (25) hold or will (26) not hold. |
3. The “critical narrative truth” tells a story of how University of Australasia walked the innovation until the point Craig submitted his business case. The narration is written in a way that links it to the theory. Effectively, the narration reflects a real-word in relation to the theory about change and innovation. It is therefore informative and, at the same time, critical of the social change to benefit the intended audiences (Chase, 2005, pp 669-671; Clough, 2000; Lincoln, 1997; Ruegg-Stürm, 2005).

4. Hermeneutics and content analysis, the fourth mode, helps to interpret the way the executive sponsor, his project team members, and upper management make the adoption decision meaningful (Boland Jr, 2002). It attempts to form a big picture of what the executive sponsor was trying to convey. But interpreting texts of a document has a problem with “hermeneutic circle” (Gadamar, 1976; Myers & Avison, 2002, p 10). What is true of the parts is probably true to the whole (generalisation). In reverse, what is true for the whole is probably true for the parts (classification). To mitigate that problem of the circle of generalisation and classification, it is essential to interpret the texts individually and collectively. It is likewise essential to understand the subjects from the viewpoints of other people. Examining and appreciating the rich-local setting facilitate perceiving the viewpoints of other people.

5. Argumentation is a form of analysis and thinking. It is thinking per se and “selling” the claim in a way that people will freely assent to that claim. Toulmin’s model is a good start. However, it is not complete. So here comes the sixth mode.

6. Clarifying, classifying, and structuring are the first three steps of the seven-step argument analysis of Michael Scriven (McPeck, 1981, pp 87-89; Scriven, 1976; Walton, 2006). First, clarify a meaning of an argument and its components. Second, identify hidden or stated assumptions. Third, portray the structure.

FUTURE TRENDS

Visioning

Adapting to ever-changing external environments means that an organisation should be able to maintain its stability while moving forward to implement a radical change which can cause disruptions. (Burrell & Morgan, 2005; Dettmer, 2003; Trompenaars & Prud’homme, 2004). An illustration of this is Air New Zealand which outsourced the maintenance of its wide-bodied jets Boeing overseas in order to reduce costs and improve profit, causing job cuts that affected more than six hundred engineers (“Air NZ has no option: Norris”, 22-23 Oct 2005; Dearnaley, 2005). Air New Zealand has attempted to manage its profitability and cash flows in the short term and innovation in the long term to be able to sustain itself in the end.

The two crucial elements of innovation include a vision that comes with a time frame and the means of implementing that change as well as its contribution to the vision and the company. (Nadler and Tushman, 2004; Trompenaars & Prud-homme, 2004). Just as people are bound to their self-conscious image of the future (Polak, 1973), organisational change can also be bound by the corporate vision. Radical innovation consists of a vision, an innovation that fits that vision, and an innovation process.

A vision is a view of the future. Although “vision” and “future” are not in the index section of the book entitled Diffusion of Innovations written by Rogers (2003), “uncertainty” and “time” are in that section. Rogers has mentioned “vision” and “future” in the discussion of the innovation-development process (Rogers, 2003, pp 136-167),
Diffusion of Innovations Theory

the birth of the laptop computer at Toshiba (Abetti, 1997; Rogers, 2003, p 145), and the fumbling of the future at Xerox PARC (Rogers, 2003, p 153). Vision is a crucial element in walking the innovation. But, that vision is a missing construct in the DOI theory.

A Matrix of a Vertical Continuum and a Horizontal Continuum

The determinism viewpoint of authorities like Karl Marx & Frederick Engels (1973), Marshall McLuhan (1964), Alvin Toffler (1970), Jacques Ellul (1964), George Orwell (1949) defines a technological innovation as a force beyond human control that causes a change in a social system. The instrumentalism viewpoint negates this. It defines technology as a tool that people use to control their destiny and shape their future. Depending on the way it is used, the technological innovation could be good or bad. The deployment or replacement of enterprise systems is used to change a business process (Luftman & Koeller, 2003). Whether the change produces positive or negative results, technological instrumentalism is perceived to be valuable to an organization because of the perceived benefits that comes with it. (MacKenzie & Wajcman, 1999).

The real issue does not lie within the vertical continuum between determinism and instrumentalism, Andrew Feenberg (1991) believes. Instead, it can be found in the innovation, the options it provides, the expected consequences, and the process involved. Other points that should be considered include the vision from which the expected consequences originate and the perceived value of the innovation, which is crucial to the attributes of the innovation that are perceived to be critical. Other authorities, however, believe that the vertical continuum is relevant because the points within it drive the innovation. The origin of an innovation, its diffusion, and other constructs drive an innovation (Lubrano, 1997). The “other constructs” affirm that understanding the social systems, their relatively unstable components, and their relatively stable structure is essential to understanding the innovation (Toffler, 1970).

A diffusion research about technological innovation can examine a matrix that is formed by the intersection of a vertical line that represents determinism and instrumentalism and the horizontal line that represents the macro and micro view of innovation. With this matrix of Daniel Surry and John Farquhar (May 1997) and Toffler (1970), technological innovation can be seen as a force at societal level and a tool at organisational level. The macro view of determinism consists of a relatively stable societal structure and its effective framework while its micro view includes the process of designing, developing, and evaluating the innovation. The macro view of instrumentalism, on the other hand, shows the unstable political, economic, societal, & technological environments of an organisation. Its micro view represents the perceptions of potential adopters, their needs, and the characteristics of the adoption site.

One to One, One to Many, Many to One, and Many to Many

Although this diffusion research uses the DoI and the PT streams because of their relevance, other streams provide opportunities for future research. Many authorities favour using multiple streams or perspectives in their research. According to Abrahamson (1991), in a period of uncertainty, the fad and fashion models give better explanations than the efficient choice model. Baskerville & Pries-Heje (2001) utilise three process models and show a possibility of mapping one or more models to one or more streams of the diffusion study provided that the model fits the stream of the study. Poole & Van de Ven (1989) illustrate the study of innovation using different perspectives of organisational theory (eg, institutional, rational, and emergent). Thus, the streams of the diffusion research and their models can be utilised in the diffusion research on the basis of one to one, one to many, many to one, or many to many.
CONCLUSION

This chapter has briefly introduced the Diffusion of Innovations (DOI) theory and an overarching framework to understand a complex phenomenon that concerns the business case (construct) of replacing enterprise systems. A business case influences upper management to be cautious, positive, or overly positive. At one extreme of the continuum is upper management’s inability to commit or under-commit. At the other extreme is an over-commitment. Both extremes in the continuum result to unexpected undesirable consequences.

To explore this complex phenomenon involving business case, vision, and executive sponsors, this chapter further describes, illustrates, and gives an account of a design process of a single-case study. The eight questions in Table 1 will likely guide the researcher to articulate a case study design and ensure quality in designing the research.

Of the essential components of a case study (Table 3), the most difficult is identifying the issue in the One case. The diagram in Figure 6 shows a top down approach. In this approach, the secondary problems and issues could be determined from the primary problem. Another approach could start from primary claim (similar to hypothesis in quantitative research) that answers the primary problem. From this claim, identifying the secondary problems and their issues is possible. Both of these approaches can be used singularly or collectively. Borrowed from argumentation theory, the top-down approach satisfy the rule of confirmability (construct validity) by breaking down the phenomenon into components.

The realism paradigm is appropriate in a case study. Understanding a complex phenomenon using both objective and subjective viewpoints is practitioner-oriented. Case study is rich, contextually speaking, if the study is able to accept all empirical and experiential evidences from all possible sources.

The complexity of a case study, however, demands a hundred percent attention while the researcher undertakes the study. The study relies on the integrative power of the researcher.

For a case study to be credible to the community in which it is intended, quality must be embedded into its research design.

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Diffusion of Innovations Theory


**KEY TERMS AND DEFINITIONS**

**Business Case** is used both to describe a process and a document. Corporate governance generally compels a business case document as a tool to justify a capital investment (a radical innovation). In this report, the exploitation of an agenda by an executive sponsor is considered a form of diffusion. A completed business case document is a formal written document that argues a course of action, which contains a point-by-point analysis that leads to a decision after considering a set of alternative courses of action to accomplish a specific goal. A business case process walks through the initiation phase of the innovation.

**Business Case Stream of Diffusion Research** embraces a plurality view of visualising, mapping, and realising future consequences. It permits an attempt to understand the perceived needs (the current state), the solution (aka, the innovation), its alternatives (objects of innovation), the preferred choice, a view of the future (the future state), the desirable expected consequences to achieve, the undesirable expected consequences to avoid, and the perceived positive attributes required.

**Diffusion** is essentially the communication of a new idea (aka, the innovation) within a social system (such as an organisation) with the intention of convincing the audience to adopt or use the innovation.
Diffusion of Innovations (DOI) Theory is a theory of Everett M Rogers (1962) that concerns the study of communicating a new idea to individuals or organisations. It can be defined as the study of how, why, and at what rate the new idea (the innovation) diffuses and its adoption takes place.

Innovation represents a product, a service, or an idea that is perceived or should be perceived by the audience or the market in which this innovation is intended to be new and of value.

Implementation Phase proceeds after the initiation phase of “walking an innovation.” For enterprise systems, this phase consists of pre-production, production, and post-production (also known as upgrade and maintenance). Refer to innovation process.

Initiation Phase consists of awareness stage and matchmaking stage, which ends with an accept-reject decision. This phase is the first phase of the innovation process. The second phase that follows is the implementation phase. Refer to innovation process.

Innovation Process starts with an initiation phase through which the individuals or decision-making units move from identifying and understanding the innovation, to forming an attitude toward that innovation. This subsequently leads to the decision to accept or reject it. The awareness stage is an agenda setting stage. The attitude formation stage is the matchmaking stage in which the executive sponsor attempts to match the attributes of the innovation to the requirement. The accept-reject decision terminates the initiation phase. An accept decision continues the innovation process toward the implementation phase, which consists of the pre-production, production, post-production, and confirmation stages.

Perceived Attributes of an Innovation are the Set 1 positive or negative biases that the decision makers have. These attributes may be real or imaginary. However, it is the perception of their presence that matters.

Perceived Attributes of Using an Innovation are the Set 2 positive or negative biases that the users have. Similar to the perceived attributes of an innovation (Set 1), what matters is the perception regardless of whether the attributes (eg, perceived usefulness and perceived ease of use) are real or imaginary.

Risk connotes a possible negative impact to something of value. It symbolises the probability of a loss.

Total Cost of Ownership, also known as TCO, is a rigorous and holistic methodology, which helps in estimating how much an investment will cost to operate over its lifetime. It takes into account all direct and indirect costs. The indirect costs are generally insignificant individually. However, they become very substantial when accumulated over time.

ENDNOTES

1 This chapter concerns how to mitigate the threats of theory-practice inconsistencies. One threat exists between theory and practice (\textcircled{1} in Figure 1). It originates from an attempt to understand a practical problem in theory or an academic theory in practice (Baskar, 2002; Smaling, 1987; Smith, 2006; Taleb, 2007). Another threat resides between philosophical assumptions and the research design (\textcircled{2}). The ontological and epistemological assumptions (\textcircled{2}) influence the awareness of the practice (the complex phenomenon) and theory (the Diffusion of Innovations theory as a research problem theory). The same assumptions affects (\textcircled{3}) the research design (\textcircled{3}) and its reasoning (interpretation) and argumentation (evalu-
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In turn, that research design affects (3) the outcomes (2) of the research. In turn, those outcomes affect a person’s understanding of the reality (3) as well as the contribution of the research to epistemology (4). A backward link from the outcome to the research design applies to action research where the outcomes of the study go back to research design. Lastly, there is a threat that is embedded in the research design (5) itself.

A paradigm contributes to knowledge (epistemology) by naming and describing certain generative mechanisms (the real domain) that facilitate understanding a complex phenomenon (the actual domain). The understanding leads to the discovery of experiences (the empirical domain) or new knowledge with the use of theoretical reasoning (Bhaskar, 1978; Outhwaite, 1983, p 332; Tsoukas, 1989). The reasoning when combined with episteme (a lower realm of knowledge) results to epistemology (a higher form of knowledge). It is obvious of the tight coupling of a theoretical paradigm to ontology and epistemology.

The classical perceived attributes of innovation is a crucial concept in DOI (Hurt and Hubbard, 1987; Kwon & Zmud, 1987; Moore & Benbasat, 1991; Rogers, 2003; Tornatzky and Klein, 1982; Van de Ven, 1993).

In the design stage, a prisoner executes a plan, carefully considers if he should go through his intentions (vision and expected consequences), and maps out the path to take at the same time. Then, in the implementation stage that follows, he takes a dive off a cliff and toward the bottom of the sea. The third stage is stability. Before running out of breath, he attempts to resurface, hoping that he would not be shot. The fourth stage is improvement. He starts to swim to freedom. The last stage is transformation. If he succeeds, he transforms himself into a free man.

The initiation phase consist of the gestation (stage a), the shocks (stage b), and the planning (stage c). The planning stage is tantamount to the business case stage in which a plan (e.g., the business case) is submitted to the top management (the resource controller) to obtain the resources needed to move on to the next phase. In the development phase, one can find the stages of proliferation (stage d), setbacks and mistakes (stage e), changing of goal post (stage f), fluid team composition (stage g), getting continuous support from the top management (stage h), building interorganizational relationships (alliances; stage i), and involving network externalities (stage j). The third phase is implementation phase composing of constant adoption and re-adaptation of old to new (stage k) and visible cultural change (stage l).

Plato compares the knowledge-gathering process to a journey through a dark cave, walking through the long tunnel and coming out into the open to view objects under the bright light of day (Melling, 1987; Santas, 2006). The individuals inside the cave can only see the illusions on the wall. They are ignorant of the reality outside the cave. If they successfully walk out into the open and be exposed to the sun for the first time, they will realise the reality outside the cave. They will be enlightened. They will discover a higher realm of reality through a long challenging intellectual journey. The reality outside the cave as well as the illusions that they have experienced while inside the cave are both their sources of knowledge. In the case study, Stake (2005) suggests drawing all the information from multiple sources at the same time to learn about the One case (discussed in the chapter) and to answer epistemological questions of the case.
The question, “What is the most likely application of the Diffusion of Innovations (DOI) theory when practiced in the context of the business case of replacing enterprise systems?” elicits the primary claim which explains how the DOI theory is applied in this context as a response. The secondary problem, “What is the most likely explanation for the importance of the innovation process prior to the accept-reject decision using the Diffusion of Innovations Theory?” leads to the secondary claim which explains how important the innovation process is to the result of the accept-reject decision.

The seven constructs are, namely: the innovation (Construct 1), the diffusion (Construct 2), the business case (Construct 3) which is embedded in the matchmaking stage (Construct 5) of the initiation phase (Construct 6) of the innovation process (Construct 7), and perceived attributes of the innovation (Construct 4).

In their single-case study of the planning and implementation a health management information system (HMIS) that was introduced as part of national policy in a low-income African country, Gladwin et al (Jun 2003, pp 215, 221) used DOI theory to “identify in advance issues that inhibit or facilitate adoption [that is, the implementation] of a technological change”. The DOI theory serves as a thinking hat to identify issues.

Al-Qirim (9-11 June 2003). regarded the perceived characteristics of the innovation (eg, relative advantage, etc) in the DOI theory to be appropriate to gain a richer picture of his single-case study of adoption of video conferencing technology (TMVC) for dermatology within Health Waikato in New Zealand.

A study that focuses on the new idea itself (the innovation itself or the objects of innovation) belongs to the Diffusion of Innovations (DoI) stream. The organisational innovativeness (OI) stream focuses on the organisation and its innovativeness. The process theory (PT) stream focuses on the stages of the innovation process. The organisational learning (OL) explores the influences of the experiential learning processes of acquiring knowledge about action-outcome relationships in organisations and its effects on innovation performance. The ambidextrous organisation (AO) stream uses organisational design as a unit of analysis. Of these five streams, the first three streams are the thoroughbred of diffusion research.

The organisational innovativeness stream of diffusion research is a consequence of the realisation of the limitations of the DoI stream (Wolfe, 1994). It concerns the variables that influence the propensity of an organisation to innovate. Organisational structure is a key variable. Other variables include the adopters, the stakeholders, the concerned organisation(s), and the macro environments (Hausman, 2005). Cultural consensus and organisational value are independent variables (Jaskyte & Dressler, 2005). With organisation itself as a unit of analysis, OI stream of diffusion research purports to discover and understand an organisation’s propensity to innovate (Wolfe, 1994, pp 408-409). The research methodology is commonly statistical. However, the way the variables interact with each other hasn’t been completely understood (Downs Jr & Mohr, 1976). Making the research context specific might help. Another solution might be to use knowledge-based view of the organisation (Grant, 1996, 1997) as a post-script to shed light on organisational innovativeness. The OI stream will consequently lead to the examination of the innovation process.

Although this section discusses the DoI and the PT streams because of their relevance to this particular research, other streams provide opportunities for future research.
Many authorities favour using multiple streams or perspectives in diffusion research. According to Abrahamson (1991), in a period of uncertainty, the “fad” and “fashion” models give better explanations than the efficient choice model. Baskerville & Pries-Heje (2001) utilise three process models and show a possibility of mapping one or more models to one or more streams of the diffusion study provided that the model fits the stream of the study. Poole & Van de Ven (1989) illustrate the study of innovation using different perspectives of organisational theory (eg, institutional, rational, and emergent). Thus, the streams of the diffusion research and their models can be utilised in the diffusion research based on one to one, one to many, many to one, or many to many relationships.

A success factor of case study is a commitment to put a hundred percent concentration (Stake, 2005, p 448). “Attention,” a fifteenth-century Japanese Zen Buddhist priest Ikkyu responded when his student asked him to summarise the highest wisdom (Coon, 2005, p 213). When asked again, what that word means, he answered gently: “Attention means attention.” It is this “attention” or the mindfulness or concentration to thoroughly understand the particular One case that represents the greatest strength of case study.
Primary Problem: What is the most likely application of the Diffusion of Innovations (DOI) theory when practiced in the context of the business case of replacing enterprise systems?

Secondary Problem 1: What is the most likely explanation for the importance of the innovation process prior to the accept-reject decision using the Diffusion of Innovations theory?

Issue 1.1: Matchmaking stage

Issue 1.2: Business case

Secondary Problem 2: Is the concept of classical perceived attributes of innovation more likely to matter to the replacement of enterprise systems? Are there newer theoretical attributes that satisfy, replace, or make the classical attributes obsolete?

Issue 2.1: Perceived attributes (value) of the innovation

Issue 2.2: Decision points

Primary Claim: The most likely application of the Diffusion of Innovations theory is the integration of the business case development as part of the innovation process and the business case document as a form of diffusion of the innovation concerned.

Secondary Claim 1: The most likely explanation for the importance of the innovation process prior to the accept-reject decision using the DOI theory is its description as organization’s exploitation of an opportunity.

Claim 1.1: The matchmaking stage is likely to embody opportunities for the organization to establish the right relationships with the right vendor.

Claim 1.2: The business case is most likely form of diffusion to facilitate the selling of an innovation.

Secondary Claim 2: The concept of classical perceived attributes of innovation of the DOI theory is more likely generic and “one-size” in order to fit all innovations. This strength is inadequate to explain that part of the innovation process prior to making the accept-reject decision of replacing the enterprise systems. It is more likely that there are newer theoretical attributes that make the classical attributes of innovation obsolete.

Claim 2.1: Each perceived attribute of innovation likely represents a decision point in the initiation phase of an innovation process. The set of attributes likely varies depending on whether the innovation (that is, the replacement of enterprise systems) is strategic or reactive.

Claim 2.2: The relevance of a perceived attribute of innovation likely depends on where the decision point occurs in the timeline of the innovation process.