The Philosophical Trinity, Soft Systems Methodology and Grounded Theory

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Statement of Original Authorship

This paper contains no material which has been accepted for the award of any other degree or diploma in any tertiary institution, and to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference is made in the text of the paper.

Signed

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12th of May 2005

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Abstract

Choosing an appropriate research strategy is difficult. It requires a deep and honest reflection of one’s own beliefs. It requires commitment to the relationship between the philosophical trinity, the research paradigm, and the research methodology or methodologies. The philosophical trinity answers the questions ‘What exists?’, ‘How do I know?’, and ‘What is valuable?’ This paper argues that the researcher is seeking the ‘sweet spot’ where the overlap, or philosophical alignment, between these questions is maximised. Having identified that the philosophical alignment between soft systems methodology and grounded theory is close, and faithfully matches the researcher’s beliefs; it suggests the integration of the two methodologies as an appropriate research strategy.

Keywords

Paradigm, philosophical trinity, philosophical alignment, ontology, epistemology, axiology, methodology, qualitative research, grounded theory, soft systems methodology.
Section 1  Introduction

The most critical element of corporate strategy is to conceptualise a vision about what kind of knowledge should be developed and to operationalise it into a management system for implementation (Nonaka & Takeuchi 2004, p. 68).

Ikujiro Nonaka and Hirotaka Takeuchi – Knowledge Management Academics

1.1 Background

In the past decade or so there has been an explosive interest in academic and business circles in knowledge management. The central theme is that we are now in the ‘knowledge age’ (Drucker 1993) and that the new economy is based on knowledge exploitation\(^1\) (Kermally 1997, p. 220). Knowledge exploitation, so the argument goes, is concerned with capturing existing knowledge and/or creating new knowledge for commercial advantage (Probert 2003, p. 63). However a critical examination of the knowledge management literature reveals that much of it is evangelistic, and relies upon a ‘business guru’ or self-proclaimed knowledge expert to justify its contention. Recently this has been recognised to some extent with pleas for research that provides an empirical basis for the argument (see for example Bouthillier & Shearer 2002; Edwards et al. 2003; Patriotta 2003).

From this shaky foundation various knowledge management models, such as Nonaka and Takeuchi’s ‘SECI Knowledge Spiral’ (Nonaka & Takeuchi 2004), and Firestone and McElroy’s ‘Knowledge Life Cycle’ (Firestone & McElroy 2003), have been touted in the marketplace as the solution to an enterprise’s problems. Each of these models has a dissimilar approach and begins with a differing set of assumptions. For example Nonaka and Takeuchi’s ‘SECI Knowledge Spiral’ has a justified true belief premise, whilst Firestone and McElroy’s ‘Knowledge Life Cycle’ uses a Popperian framework.

\(^1\) The word ‘exploitation’ is used in the sense of turning something into practical account, rather than the more negative meaning of selfish use for one's own ends.
The problem is that no model published in the literature, as far as I can determine, provides a complete real world example that firstly illustrates the ‘knowledge process’ from end to end, and then explains, rather than describes, how it actually works. This makes it extremely difficult to evaluate the models, let alone determine their utility in the business world. Furthermore, where examples are provided they tend to focus on commercial enterprises rather than public sector organisations. Indeed I would go so far as to say that most of the models in the literature are actually ‘models of knowledge’ rather than ‘knowledge management models,’ which explains why they are so difficult to operationalise. Accordingly my research motivation is to provide an empirical basis from which a generic model of knowledge productivity\(^2\) for a public sector organisation can be developed. The initial problem however, is to develop an appropriate research strategy, given it is such an esoteric and ethereal field.

### 1.2 The aim and scope of this paper

The aim of this paper is therefore twofold. First I intend to explore the common philosophical foundations of research paradigms. This will position both my belief system and my research paradigm. Then I will briefly examine grounded theory and soft systems methodology as two methodological candidates, with a view to integrating them into my research strategy.

The paper is organised into six sections.

- **Section 2** discusses the philosophical foundations of research paradigms, under the headings ontology, epistemology, and axiology. I also introduce the ideas of the ‘philosophical trinity\(^3\) and ‘philosophical alignment.’

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2 Knowledge can be conceived as being a product – that is, it is a thing produced by action. Productivity is a measure of efficiency of production, which implies a comparison of input with output. I think of knowledge productivity as being the purposive action of creating, applying, managing and measuring knowledge.

3 The philosophical trinity is ontology, epistemology and axiology. Philosophical alignment is the relationship between the three disciplines. It is not a new idea, although as far as I can determine no-one else uses these terms. Most authors talk about a four-way relationship between ontology, epistemology, methodology and axiology (see for example, Heron & Reason 1997).
• **Section 3** provides a short account of soft systems methodology. In particular it identifies soft systems methodology's underlying philosophical assumptions and the key areas of contention.

• **Section 4** provides a short account of grounded theory, and also identifies its underlying philosophical assumptions and the key areas of contention.

• **Section 5** is the conclusion. It begins by providing a handful of reasons why soft systems methodology or grounded theory might be used as a research approach. It then brings together the two methodologies and discusses why they might be combined as research strategy.
Section 2  Philosophical Foundations

If we take in our hand any volume; of divinity or school metaphysics for instance; let us ask ‘Does it contain any abstract reasoning concerning quantity or number?’ No. ‘Does it contain any experimental reasoning, concerning matter of fact and existence?’ No. Commit it then to the flames: for it can contain nothing but sophistry and illusion.

David Hume, 1711-1776, Scottish Philosopher (Partington 1996, p. 355)

2.1 Research paradigms

According to Thomas Kuhn there are two essential qualities of a paradigm. First the paradigm must be ‘sufficiently unprecedented to attract an enduring group away from competing modes of scientific activity’ (Kuhn 1962, p. 10), and second ‘sufficiently open-ended to leave all sorts of problems for the redefined group of practitioners to resolve’ (Kuhn 1962, p. 10). Broadly there are two paradigms available to a researcher – quantitative and qualitative.

In both paradigms research is distinguished from private study by the requirement to have an impact on an audience other than oneself. The paradigms are further distinguished from consultancy work by the obligation to make rigorous and defensible additions to a body of knowledge, rather than to solve an immediate problem. This means that each research paradigm of necessity has a preoccupation with theory, and particularly with the ‘philosophical trinity’ of theory.

2.2 The philosophical trinity

The questions ‘What exists?’, ‘How do I know?’, and ‘What is valuable?’ together form the philosophical trinity. Each question is a discipline in its own right, respectively known as ontology, epistemology and axiology.
2.2.1 Ontology

 Ontology is the philosophy of the world view of reality (Heron & Reason 1997). Sometimes, and in particular in the systems thinking schools, world view is called ‘weltanschauung’ (see for example, Checkland 1999; Hitchins 1992). The seminal ontological question for a researcher is - ‘Is there a “real” world out there that is independent of our knowledge of it?’ The answer to this question firmly positions the researcher into one of two schools. The first school is often known as the essentialist or foundationalist school, and the second rather unimaginatively as the anti-foundationalist school.

 The essentialist school argues that there are fundamental and enduring differences in social phenomena that exist in all contexts and across time. Such a position means that social phenomena can in essence be decomposed to constituent parts. On the other hand the anti-foundationalist school says that all social phenomena are socially constructed and as such must be positioned in time, space and culture.

2.2.2 Epistemology

 Epistemology is the philosophy of knowledge and justification (Audi 2000). The researcher’s epistemological stance is determined in part by their ontological position, even if this is not specified. This is because a theory of the nature of knowledge, or the world, is at the same time a theory about knowledge of the world; hence there are large overlaps between epistemology and ontology. The shaping epistemological question for a researcher is - ‘Can “real” or “objective” relations between social phenomena be identified, and if so how?’ The answer to this compound question positions the researcher into one of three schools – idealists, empericists, or realists.

 Idealists subscribe to the view that all knowledge refers to a human consciousness rather than an objective reality, and that reality does not exist independently of consciousness. Idealist epistemology takes many forms, the most common being rationalism, which tends to treat knowledge as the construct of the process of actually knowing.
On the other hand empericists suggest knowledge is derived through sensation, and that the process of knowing is largely passive. In this sense knowledge is a photocopy of what exists outside consciousness, albeit an incomplete and somewhat distorted photocopy. For an empericist ontology and epistemology are virtually identical, because what is known is the same as what is.

Realists hold the middle ground. They believe that knowledge is gained from our senses and the use of reason. Reason makes use of principles and categories that do not emanate from the object of knowledge, but rather are derived from experience and reflection. Further they maintain that perception is mediated by social and cultural factors, and therefore is not an independent phenomenon as posited by empericists. In this sense a realist epistemology sees knowledge as both created and constructed, and that the result is more or less an accurate depiction of the object or phenomena as it exists.

### 2.2.3 Axiology

Ontology and epistemology deal with truth, however axiology is about values and ethics (Mingers 2003). Axiology is also called value theory, and includes the disciplines of ethics, pragmatics, and aesthetics. Values provide the standard for the evaluation of epistemological and ontological claims. So the crucial axiological question for a researcher is - *What is the ultimate purpose of the inquiry?*

The literature is much less clear about schools of axiological thought, however broadly there are two positions. The first position is valuing knowledge for its own sake and as an end in itself: this is the Aristotelian School (Heron & Reason 1997). Simple understanding is valued above all else. The second position values knowledge as a means to inform, transform, or enable positive change: this might be called the ‘Applied School’.

### 2.2.4 The trinity applied

The philosophical trinity is the essence that makes the quantitative and qualitative research paradigms quite different. The quantitative research paradigm typically has an
essentialist ontology, empericist epistemology, and either an Aristotelian or applied axiology. Often this is called the positivist tradition, which is the position David Hume is espousing in the opening quote of this section.

On the other hand the qualitative research paradigm characteristically has an anti-foundationalist ontology, a realist or idealist epistemology, and an applied or Aristotelian axiology. The realist epistemology in this approach gives rise to the constructivist research tradition, and the idealist epistemology results in the subjectivist tradition of inquiry.

Clearly then it is important that the researcher understands their own philosophical posture and enunciates it to their audience. What the researcher is seeking is the ‘sweet spot’ where the overlap between ontological, epistemological and axiological positions is maximised – this I call philosophical alignment⁴, which is illustrated at Figure 1.

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⁴ Some authors would call the position of philosophical alignment ‘logic’ (see for example, Doctor Andrew Chrucky’s website at [http://www.ditext.com/philof/ofphil.html](http://www.ditext.com/philof/ofphil.html), noting that Chrucky substitutes ontology for metaphysics). I am tempted to call it methodology, however one can have philosophical alignment of beliefs without conducting research and therefore having a requirement for a methodology.
2.2.5 Philosophical alignment and methodology

Philosophical alignment leads to another trinity: the alignment between the researcher’s belief system (the philosophical trinity), the research paradigm, and the research methodology. The central question of a methodology is - ‘How can a researcher discover whatever they believe can be known (Guba & Lincoln 1998)?’ Philosophical alignment provides the desired logic attributes of the methodology, where methodology is defined as:

‘… a generic combination of methods that is commonly used as a whole – as in soft systems methodology, strategic options development and analysis, or survey methodology covering the design and analysis of questionnaires (Mingers 2003, p. 559).’

The fundamental realities of both qualitative and quantitative research are that no single methodology serves as a panacea for any given situation, and each methodology has many methods. Hitchins (1992, p. 225), coming from a systems perspective, says the seven essential attributes of a methodology are:

- it applies to any system;
- is simple;
- is comprehensive;
- is creative and innovative;
- is for individual and team use;
- is supported by tools and methods; and
- is proven in practice.

To this list I would add that a methodology must have a clear philosophical position, based on the philosophical trinity. These attributes combined distinguish methodology from methods, and mean in practice that a single method can be used in many methodologies.
Having established that the philosophical trinity is the precursor to choosing an appropriate methodology and identified the desirable attributes of a methodology, it is now possible to identify my own philosophical position and what I require from a methodology for my research topic.

2.2.6 My philosophical posture and alignment

My philosophical posture is as follows:

- **Ontological stance.** I subscribe to the anti-foundationalist school because I believe that all social phenomena are socially constructed and as such must be positioned in time, space and culture. That said I do think that some social phenomena can be decomposed to smaller components, which moves me part way up the path to an essentialist position. This stance is consistent with the systems thinking school which sees real properties as emergent depending on where the system boundary is drawn (see for example, Hitchins 1992).

- **Epistemological position.** I am a realist because I think knowledge is both created and constructed by an individual within a social and cultural system located in time and space. Knowledge is therefore both material and immaterial.

- **Axiological attitude.** I belong to the applied knowledge school because first I believe knowledge is actually information in action and therefore is already being applied to a situation, and second, I see little point in understanding for the sake of understanding. For me knowledge is and must be purposeful!

This philosophical posture clearly leads to a constructivist tradition qualitative research paradigm. It also positions me in the systems school. As a systems thinker I try to think of phenomena as complex wholes of material and immaterial things, with the component entities being hierarchical but of themselves being capable of treated as wholes (Hitchins 1992, p. 11).
Given my philosophical posture, and my research topic, I am seeking a methodology or methodologies that:

- explores participants’ world-views on knowledge and workplace productivity, and contrasts them with the debate in the literature – that is the methodology is participant centred;

- allows the researcher to develop a theory of knowledge productivity from the data that is ultimately acceptable to a wider audience - that is the methodology is researcher centred; and

- permits either a generic model of knowledge productivity or a public sector model of knowledge productivity to be developed.

Two methodological candidates appear to be grounded theory and soft systems methodology, each of which is introduced in the next sections.

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5 My primary research question is ‘How can public sector organisations enable knowledge for improved productivity and positive exploitation?’ The supporting questions are: ‘What constitutes data, information and knowledge for public sector organisations?’; ‘How do public sector organisations evaluate a knowledge claim, both at the personal and organisation level?’ and; ‘What workplace practices support individual and organisational productivity, and in turn enable knowledge?’

6 I consider a model to be an intellectual construct in artefact form that provides an abstract and simplified representation of something for descriptive purposes. The model can then be used to explain how something works.
Section 3  Soft Systems Methodology

I must create a system, or be enslaved by another man’s: I will not reason and compare; my business is to create.


3.1 What is soft systems methodology?

Soft systems methodology was developed by Professor Peter Checkland, Professor Gwilym Jenkins, Doctor Brian Wilson, and Doctor David Rippin, at the Lancaster University in the early 1970’s and first published as a methodology in 1981 (Platt & Warwick 1995, p. 19). Soft systems methodology has its foundations in action research and general systems theory, but has evolved into a methodology in its own right. It is characterised by involvement in a problem situation and learning by doing. It is further characterised by trying to see a system from as many perspectives as possible, and through the eyes of others rather than the researcher.

The Checkland seven-step methodology is the best known of the soft system methodologies\(^7\) and is often thought of as ‘the soft systems methodology.’ It is depicted at Figure 2. Checkland’s soft systems methodology is concerned with human activity systems. A human activity system is defined as:

‘... a notional purposive system which expresses some purposeful human activity; activity which could in principle be found in the real world. Such systems are notional in the sense that they are not descriptions of actual real-world activity (which is an exceptionally complex phenomenon) but are intellectual constructs; they are ideal types for use in debate about possible changes which might be introduced into a real-world problem situation (Checkland 1999, p. 314).’

\(^7\) Other methodologies include Social Systems Design, Viable Systems Diagnosis, Interactive Planning, Soft Systems Dynamics Methodology, Soft Systems Methodology Plus, Strategy Assumption Surfacing and Testing, Critical Systems Heuristics, and Total Systems Intervention, however these are considered no further in this paper.
This definition positions Checkland’s soft systems methodology as having an anti-foundationalist ontology, because systems are socially constructed; a realist epistemology, because knowledge is both created and constructed by an individual; and an applied axiology, because the resultant knowledge is used for purposive action. It also gives some clues to the underlying assumptions associated with the methodology.

![Checkland's soft systems methodology diagram](image)

### 3.2 What are the key assumptions?

When dealing with problem situations in the real world there is often a desire for simplicity even when it is not possible to avoid inherent complexity (McLucas 2003, p. 22). The systems approach rejects reductionist simplicity and instead views the world as being a complex conglomeration of interacting systems. So the core idea in soft systems methodology is that the real world, and particularly the world of business and industry, is comprised of systems (Checkland 1999, p. 146).

Each system is an organised complexity of components that together form a unitary whole and whose interactions reduce local entropy (Hitchins 2003, pp. 313-4). In systems thinking terms these component systems are sometimes called holons, a
neologism coined by Arthur Koestler (Koestler 1967). A holon is an identifiable part of a system, or a system in its own right, which has a unique identity yet is made up of subordinate parts and in turn is part of a larger whole. A holon exhibits both autonomous and cooperative behaviour, and can combine to form another holon, thus forming a hierarchy called a holarchy.

### 3.2.1 Complexity

Holons are characterised by complexity, and all systems are by definition complex. The strength of this thinking is that it enables the construction of very complex systems that are nonetheless efficient in the use of resources, highly resilient to internal and external disturbances, and adaptable to changes in the environment in which they exist.

Human activity systems by their very nature are complex. They are considered to be holistic, subjective, process oriented, in a state of constant flux, and often non-rational. Further, they act based on an interpretation of the world, but there are always several world views because individuals interpret the world differently. This means that for a soft systems methodologist there is no single correct answer to a problem situation. It also means that the models that are derived from the methodology are neither valid nor invalid, but rather represent a particular world view or ‘weltanschauung.’

### 3.2.2 Emergence

Human activity systems are also considered to be emergent. For example, a surgical team can successfully operate on a patient, but the individual components of the team, such as surgeons, anaesthetists, and nurses can’t on their own. They must be ‘organised’ in a particular way to function as a ‘surgical team’, hence the surgical team is emergent. The surgical team is a holon - an autonomous component system - of a larger human activity system called a hospital, which in turn is a holon of a state health system. Emergence is therefore a key characteristic of a human activity system, or any system for that matter.

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8 For example a car can transport a person, but its individual components such as wheels, seats, spark plugs and so on, by themselves cannot. These components together form a system called a car.
The system emerges from its components and the whole is greater than the sum of its parts (Hitchins 1992).

### 3.2.3 Layers and hierarchy

Concomitant with the notion of emergence is the concept of layers and hierarchy. Reality is considered to exist in layers, and the various layers allow different system components to emerge. These layers are in a hierarchy, but the hierarchy does not imply an inferior superior relationship. This is because many of the layers are holons and are therefore autonomous in their own right. The state health care system, which consists of many hospitals, which in turn has many surgical teams, is a good example of this notion. Each layer provides a different degree of fidelity and abstraction, but each layer may be required to give an adequate description of the system and is necessary for an explanation of how the system works. Inevitably in human activity systems layers are abstractions that are perceived differently by the various actors, depending on where they fit into the system.

### 3.2.4 Communication and control

All systems have communication channels and receptors that enable internal and external situational awareness. These communication channels are used by control mechanisms to react to change so that the system can survive. System stability stems from the self-reliance and independence of holons, which can handle many circumstances and problems on their particular level of existence without asking higher level holons for assistance. However holons can and do receive instruction from and, to a certain extent, may be controlled by higher level holons. The subordination to higher level holons ensures the effective operation and cooperation of the larger whole. This assumption is important because it means that any explanation of how a human activity system works must acknowledge both the existence and influence of higher and lower level holons. It also means that where the system boundary is positioned will influence the resultant model, explanation, and solution.
3.3 What are the typical methods and techniques?

Checkland’s soft systems methodology is typically depicted as a seven step process. Steps 1 and 2 can be grouped and might be called the ‘expression phase.’ Step 3 might be called the ‘naming phase.’ Steps 4, 4a and 4b are the ‘modelling phases.’ Step 5 is the ‘comparisons phase’, Step 6 the ‘change identification’ phase and Step 7 the ‘action phase.’

Questionnaires and interviews are commonly used in the expression phase. A focus group is used in the naming phase. In the modelling phase it is not uncommon to expose the focus group to the models and follow this up with interviews. On the other hand the comparisons and change identification phase tend to use discussion forums.

Despite these comments there are many tools and techniques available for use in each phase of the methodology. For example in the modelling phase cognitive maps, concept maps, social network maps, and causal loops are all contenders. These models are used as devices to assess, reassess, and develop the researcher’s interpretations of the participants’ ‘weltanschauung.’ Indeed these various approaches might be integrated to produce the model or models, and ideally models should generate data and ideas for change that are both culturally feasible and systematically desirable.

In the comparisons and change identification phase matrices can be used to compare the models and to structure process. Similarly scenario analysis can be used to compare the efficiency and effectiveness of the models; typically this uses mathematical simulations, spreadsheet and database manipulations and the like, depending on the situation under examination and the type and voracity of the data.

Two techniques which are peculiar to soft systems methodology are ‘rich pictures’ and ‘CATWOE’, and these are introduced below.
3.3.1 Rich pictures

Rich pictures are commonly used as a tool in the expression phase, but equally can be used in the modelling and comparisons phases. A rich picture is an artefact that represents the real world problem situation, and may depict two or more human activity systems (Platt & Warwick 1995, p. 20), however it depicts the system from the participant’s viewpoint. When the methodology was first developed rich pictures were hand-drawn, but increasingly clip-art is used as an alternative, or as end-product resulting from the hand-drawn diagram (McLucas 2003, p. 155). A rich picture simply provides a way of arriving at an understanding of the situation, and the principle benefit is derived from its generation rather than the end result diagram (Sparks 1997, pp. 5-14). The fundamental requirement of a rich picture is to provide a ‘discussable appreciation of the problem situation (Checkland & Scholes 1990, p. 157)’ rather than a picture in the literal sense. An example rich picture is at Figure 3.

![Figure 3: A rich picture concept map](image)

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9 This rich picture is my interpretation of the RAAF Aircraft Research and Development Unit’s Knowledge Management System as discussed in Crompton, R. and P. Murchland (2002). *Best Practice in Community Building and Information Discovery*, Education Limited, Sydney. Strictly therefore it is not from the participant’s viewpoint, but none the less provides an example of what a rich picture looks like.
3.3.2 CATWOE

The key question in soft systems methodology is ‘What are the names of the notional systems which from the analysis phase seem relevant to the problem?’ (Checkland 1999, p. 166). Relevant systems are defined and agreed by the actors and participants and not the researcher at the naming phase. These systems should encompass the emergent qualities of the holons or systems in question. A root definition is developed for each relevant system, based on the transformation it performs. The mnemonic CATWOE is used as the tool to structure root definitions and to ensure they are complete descriptions. CATWOE stands for:

- Customers – the beneficiaries of the system.
- Actors – the ‘players’ who transform the system.
- Transformation – of input and output.
- Weltanschauung - the specific ‘world view’ that makes the transformation meaningful.
- Owners – those actors who could stop or change the nature of the transformation.
- Environment – the constraints on the system that are outside of the system boundary and its scope.

This process results in a short paragraph that contains all the necessary information to describe the system. A hypothetical root definition is presented below.

‘A National Blood Authority owned (Owner) and staffed (Actors) system, to transform blood and blood product data into an integrated management process (Transformation), which allows tertiary hospitals (Customers) to order and receive these products on demand (Weltanschauung), knowing they will comply to Australian national product standards (Environment).’

Several definitions may be developed for each notional system, because different individuals will perceive the same system in different ways. These differences must be recognised and accommodated.
A good root definition will not only contain all of the elements of CATWOE, but it will also follow the sequence – do $P$ by $Q$ to contribute to achieving $R$; where $P$ answers the question on what to do, $Q$ how to do it and $R$ why to do it (Pala, Vennix & van Mullekon 2003, p. 707). Rich pictures coupled with root definitions of notional systems should allow the development of a model, or models, that can be ‘tested’ for efficacy, efficiency and effectiveness (Pala, Vennix & van Mullekon 2003, p. 707).

### 3.4 What are the areas of contention?

Soft systems methodology, as originally conceived by Checkland, is neither a theory generation methodology nor a theory testing methodology. This leaves it open to criticism as not being suitable as a research methodology, and indeed confining it to a problem solving tool rather than methodology status. If however we accept Hitchins (1992, p. 225), seven attributes of a methodology (it applies to any system; is simple; is comprehensive; is creative and innovative; is for individual and team use; is supported by tools and methods; and is proven in practice) then clearly it is a methodology.

The questions then remain ‘can it be used to generate theory’ and ‘can it be used to test theory?’ With regard to the first question I see no rational reason why not. Indeed Checkland provides an example where soft systems methodology was used to examine a purely theoretical problem (Checkland 1999, pp. 194, 202 -6). He also provides a discussion on using the model out of sequence and relocating the real-world systems-world line (Checkland 1999, pp. 210 - 3) so that Steps 1 and 2 are in the systems world, and Step 6 results in a theory for action. This reflects later thinking on Checkland’s behalf and demonstrates that methodologies are not set in concrete.

The second question is more problematic as it is difficult to provide a publicly defensible proof of individuals’ perceptions\(^{10}\). Indeed soft systems methodology does not produce a predictable outcome, or one that can be exactly replicated in other circumstances. Consequently while a soft systems methodology outcome may be intuitively appealing, it

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\(^{10}\) This problem is not unique to soft systems methodology. The same criticisms can, for example, also be leveled against ethnography and narrative methodologies.
cannot be used as an argument that the solution is optimal or even desirable (Sparks 1997, pp. 5-22).

Having provided a short account of soft systems methodology, and in particular identified its underlying philosophical assumptions and the key areas of contention, I will now turn the discussion to grounded theory.
Section 4  Grounded Theory

It is a capital mistake to theorise before you have all the evidence. It biases the judgment.


4.1 What is grounded theory?

Grounded theory was developed by Barney Glaser and Anton Strauss in the late 1960s as a methodology for extracting meaning from qualitative data collected in the field. It is used to generate a theory that explains a process, or processes, about something at an abstract conceptual level in a specific context or setting (Glasser & Strauss 1967). Typically the researcher does not begin with a preconceived theory, unless their purpose is to elaborate and extend an existing theory. Instead the researcher begins with an area of interest, or an idea, and allows the theory to emerge from the data (Strauss & Corbin 1998, p. 12). This means that data must be drawn from multiple sources. Data is usually collected by means of interviews or focus groups, but can also use observation and questionnaires. The general steps in grounded theory are depicted at Figure 4.

![Figure 4: The general steps in Grounded theory](image)

Grounded theory is an inductive rather than a deductive methodology. The intent is to develop an account of a phenomenon, or phenomena, which identify its major categories, the relationship between the categories, and the context and processes which are occurring (Becker 1993). The result is a middle order theory, as opposed to grand theory or a hypothesis, which explains the phenomenon (Alston & Bowles 2003).
Glaser and Strauss have parted ways since publishing their original work, resulting in two quite distinct schools of Grounded theory. Glaser’s approach is more ‘pure’ in that he selects an area for study and allows the issues to emerge in the course of the research. The Glaser approach might be called an emergent design, because whilst the procedures are explicit the categories and codes are derived entirely from the data. On the other hand Strauss and Corbins’ approach might be called a systematic design because the researcher can predetermine the subject of inquiry (Douglas 2003, p. 45), and the approach is more structured than Glaser’s. In a systematic design there is an explicit sequence of procedures and rules, and the categories and codes can be preset to some degree because of findings from other research. Because of the variances between the Glaser approach and the Strauss and Corbin way the researcher must make explicit which school they are following (Geiger & Turley 2003, p. 581).

4.2 What are the key assumptions?

Grounded theory has its origins in symbolic interactionism, hermeneutics and phenomenology (Goulding 1999, p. 866; Star 1998, p. 220). Researchers start with an area of interest, collect the data and allow relevant ideas to develop. Rigid pre-conceived ideas are seen to prevent the development of theory (Strauss & Corbin 1998). The seminal assumption is that a theory formed during data collection will be more applicable than one developed before a study begins (Glasser & Strauss 1967, p. 32).

The notion of theory is of itself an important assumption in grounded theory. Theory is not considered to be a perfect end-product, but rather an ever emerging complex constructed entity (Strauss & Corbin 1998, pp. 21-4). Theory is defined as:

‘... a set of well-developed categories (e.g., themes, concepts) that are systematically inter-related through statements of relationship to form a theoretical framework that explains some relevant social, psychological, educational, nursing, or other phenomenon. The statements of relationship explain who, what, when, where, why, how and with what consequences an event occurs (Strauss & Corbin 1998, p. 22).’
The resultant theories need not deal in falsifiable propositions, but meaning must be sought within context, and positioned in time and space. Further multiple meanings must be accommodated. Facts are always considered to be theory loaded and value laden (Goulding 1998, p. 53).

Emergence is also a key assumption in grounded theory. Data, information and knowledge are seen as emergent phenomena that are actively constructed. They therefore can only have meaning when positioned in time, space and culture, and are only relevant in an experiential world (Goulding 1999).

These assumptions position grounded theory as having an anti-foundationalist ontology, because meaning is socially constructed and positioned in time and space; a realist epistemology, because knowledge is emergent and gained from the researcher’s senses and reason; and an Aristotelian axiology, because the resultant knowledge is a middle order theory that may or may not be used for purposive action.

4.3 What are the typical methods and techniques?

Each step of a grounded theory analysis, as depicted in Figure 4, requires complete and careful documentation. Typically grounded theory collects data through interviews or focus groups, but can also use observation and questionnaires. Interviews may be structured or unstructured, and focused or unfocussed, depending upon the research design (Alston & Bowles 2003). In every case extensive notes are taken, and usually conversations are electronically recorded, so that they can be examined in detail at a later date. A key technique in grounded theory is three-pass data coding into categories.

4.3.1 Coding into categories

Coding is a categorisation and labelling exercise of data fragments. Data are sorted into categories that have relationships. This is achieved by analysing transcripts word-by-word, line-by-line and phrase-by-phrase (Douglas 2003, p. 47), which is obviously very time consuming if done properly and may result in the researcher becoming ‘lost’ in the
data (Goulding 1998, p. 56). Open Coding occurs in the first pass, and is used to determine the initial categories. Axial Coding occurs once the categories exist. One category is selected as the core concept and all other categories are related to it. The core category is determined by:

- selecting a category that appears frequently,
- comparing it with other categories,
- eliminating category redundancy, and
- ensuring all, or most, other categories have a relationship with it.

Selective Coding occurs in the last pass. Relationships between the core category and other categories are both described and explained, using data quotations to support the concepts – this helps to generate the theory. The resultant theory is a middle range theory that is applicable to a substantive topic. That is, it is not a grand theory or a minor hypothesis, but is generalisable. The essential criteria for the derived theory are fit, understandability, generalisability, and control (Glasser & Strauss 1967, pp. 237-50).

### 4.3.2 Memoing

Memoing is another key tool in the grounded theorist’s armoury. Memos are written continuously throughout the research process, and are used to explain and reflect upon meanings as they emerge from the data (Douglas 2003, p. 48). Constant referral to the memos results in an iterative process that in turn allows the theory to emerge from the data.

### 4.4 What are the areas of contention?

The use of literature and how extensive the initial literature review is are areas of significant contention. When dealing with areas that have a well established research history, Goulding (1999, pp. 868-9) recommends that:

‘... during the early stages of the study the researcher should avoid steeping...’
him/herself too heavily in the finding of others, as this will form certain
expectations of outcomes and will potentially influence what to look for.'

However if the grounded theory methodology is correctly followed the emergent theory
should guide the researcher to the literature that assists in contextualising, explaining and
informing the research (Goulding 1998, p. 51).

Another area of contention is the researcher’s dependence on self-knowledge and self-
scepticism, which requires sceptical probing behind conventions and continual reflection
and self-questioning. Furthermore grounded theory requires the researcher to think
abstractly rather than descriptively (Goulding 1998, p. 55). These are very difficult
disciplines to acquire and require concentrated commitment on behalf of the researcher.

The final major area of contention is data saturation. Data is supposed to be collected and
analysed until saturation is achieved – that is data continues to be collected as the theory
emerges until such time as any new data does not contribute to the theory. In practice it
is very difficult to determine when this point has been reached. Furthermore because this
is an iterative process it is often not possible to fully pre-determine and scope a research

At this point the philosophical assumptions and the key areas of contention for soft
systems methodology and grounded theory have been identified. The next section
discusses why they might be combined as research strategy and makes some concluding
comments.
Section 5  Conclusions

As often as a study is cultivated by narrow minds, they will draw from it narrow conclusions.


5.1 Why use the methodologies?

Real world activities are ‘hows’ related to a specific ‘what’, which is usually implicit rather than explicit. In social situations the ‘whats’ can be difficult to define and many problems might be considered to be ‘wicked’ – that is they are complex, dynamic, systemic, emergent, difficult to resolve, and confounding to manage (McLucas 2003, p. 220)\textsuperscript{11}. Soft systems methodology can be used to model real world ‘whats’, and equally to model alternative ‘hows’ for improvement. Indeed Gao, Meng and Nakamori (2002) suggest that soft systems methodology is a valuable research approach to study knowledge management, and that some of its value is ‘to offer inspiration on how to learn continuously and effectively’ (Gao, Meng & Nakamori 2002, p. 13).’

Similarly grounded theory is useful in situations where little is know about a topic or problem area, or to generate new and exciting ideas in settings that have become static or stale. It is a powerful and thorough research method for collecting and analysing research data, and can provide deep insight into the real issues associated with phenomena. Furthermore it forces deep consideration of the variables by the researcher.

Soft systems methodology lends itself to develop a set of structured research questions to a wicked problem. It is also useful to assist in building a road-map of the research project, and to show the logical dependencies of the various research activities in multi-disciplinary research activities (Hindle et al. 1995), particularly given that the research process in this circumstance is of itself a purposeful human activity and therefore is part

\textsuperscript{11} It seems to me that ‘knowledge management’ is of itself a wicked problem!
of a human activity system. Soft systems methodology can also be used as part of the research triangulation process, which confirms, amplifies or refutes findings.

The power of grounded theory lies in the depth of analysis and the resultant explanation. A good grounded theory explains rather than describes, which gives it a predicative quality (Douglas 2003, p. 51). Because of the depth of analysis grounded theory results in deep understanding of phenomena.

5.2 Why integrate the methodologies?

Grounded theory is a sound research approach for any behaviour that has an interactional element to it (Goulding 2005, p. 296). Similarly soft systems methodology captures the participant’s world view rather than the researcher’s, and therefore provides a basis to articulate a problem or define a question for research. The two methodologies therefore complement each other, because they both deal with human activity systems.

A comparison of the two methodologies reveals that they are both seven-step processes, with remarkable similarities. This is illustrated at Table 1, which lines up the methodological steps. It is immediately apparent that the two methodologies are complementary. For example steps 4 and 5 result in similar outcomes, albeit they are expressed differently. Further many of the same methods, tools and techniques can be used in either methodology. For example the use of questionnaires and interviews are common to both methodologies. It is also not inconceivable that focus groups could also be used as a data source in both methodologies, or that a rich picture could be used as the end product to depict the derived theory.

With regard to the philosophical trinity both methodologies share an anti-foundationalist ontology and a realist epistemology. The axiology is different, which is what in part differentiates the two methodologies. That said both methodologies share the assumption that the problem or the phenomena determines the final model or theory. Both methodologies have in common surfacing and exploring participants’ values and beliefs – in this sense they both share constructivist and interpretivist philosophical positions.
The practical difference is that soft systems methodology values data from the perspective of the participant, whilst grounded theory develops theory from data interpretation by the researcher. Therefore it seems logical that by integrating the two methodologies the research question will have a more holistic explanation: this is perhaps the primary reason to integrate the two methodologies.

<table>
<thead>
<tr>
<th>Steps</th>
<th>Soft Systems Methodology</th>
<th>Grounded Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The problem situation unstructured</td>
<td>An unexplained phenomena or process</td>
</tr>
<tr>
<td>2</td>
<td>The problem situation expressed</td>
<td>The phenomena or process identified for study</td>
</tr>
<tr>
<td>3</td>
<td>Root definitions of relevant systems</td>
<td>Data collection and coding</td>
</tr>
<tr>
<td>4</td>
<td>Conceptual model construction</td>
<td>Theme extraction</td>
</tr>
<tr>
<td>5</td>
<td>Model and problem situation comparison</td>
<td>Postulate generalisations</td>
</tr>
<tr>
<td>6</td>
<td>Feasible and desirable change construction</td>
<td>Develop taxonomies</td>
</tr>
<tr>
<td>7</td>
<td>Action to improve the situation</td>
<td>Theory development</td>
</tr>
</tbody>
</table>

Table 1: A comparison of soft systems methodology and grounded theory

5.3 Finis

Choosing an appropriate research strategy is difficult. It requires a deep and honest reflection of one’s own beliefs. It requires commitment to the relationship between the philosophical trinity, the research paradigm, and the research methodology or methodologies. The philosophical trinity answers the questions ‘What exists?’, ‘How do
I know?’, and ‘What is valuable?’, each question being a discipline in its own right, respectively known as ontology, epistemology and axiology. It is my contention that the researcher is seeking is the ‘sweet spot’ where the overlap, or philosophical alignment, between ontological, epistemological and axiological positions is maximised. It is also my contention that the researcher must clearly understand their own philosophical posture and enunciate it to their audience.

My own philosophical attitude has an anti-foundationalist ontology, a realist epistemology, and an applied axiology, which positions me in a constructivist tradition qualitative research paradigm. Grounded theory and soft systems methodology share an anti-foundationalist ontology and a realist epistemology. Soft systems methodology has an applied axiology, whilst grounded theory has an Aristotelian axiology. Philosophical alignment between the methodologies and my own beliefs is therefore close. Given this close alignment, integrating the methodologies as a research strategy appears to offer the advantage of a more holistic explanation, because data will be examined from both the participants’ and my own weltanschauung – this should provide deep understanding of the research topic.
Appendix 1  References


Sparks, JN 1997, *Soft operational research techniques for the acquisition and management of logistics*, Department of Defence, Canberra.

