Chapter 4: Towards a conceptual framework of futures

4.1 Introduction

This chapter argues that a new Process for anticipating futures should be based on an explicit conceptual framework, incorporating explicitly defined concepts. Accordingly, such a framework is developed in this chapter, to focus the development of a Process for perceiving the future, from a constructionist point of view – in other words, the method applies to the human future, rather than any physical future. The input to this chapter is the literature, particularly on futures studies, systems thinking, organizational development, philosophy, and sociology. The output of this chapter is a conceptual framework, which is used to inform the development of the Process in the following chapter.

4.1.1 Why incorporate a conceptual framework?

To avoid taking an uninformed and purely pragmatic approach – which might result in the development of a Process that worked, but without knowing why – it was important to use a theoretical model of the future that could be used to guide the development of the Process, so that the outcomes would be theoretically driven as well as practically useful.

As Checkland (1995, p2) states, “If descriptions of action research were to be more than merely anecdotal accounts of what had happened, it seemed an essential requirement that the researcher declare in advance the intellectual framework within which knowledge in the research situation will be defined.” Supporting that argument, Checkland extended his Soft Systems Methodology to include the FMA model, showing how a framework of ideas (F), led to a methodology (M), which in turn led to an area of application (A) (Checkland, 1999; Hindle et al, 1995; West and Stansfield, 2001). This model is further discussed in chapter 7.

Transferring that to the present case, the framework of ideas in this chapter leads to the SNM methodology in the following chapter, which in turn led to the application of the Process as described in the case studies in chapter 8.

Also, by developing a Process in line with a theoretical framework, there was some expectation that both could be improved. Not only would the framework guide development of the Process, but its development would also be used to strengthen the theoretical framework.
Thus I sought an appropriate framework, beginning by searching the futures literature covered in chapter 2. However, no single source could be found that covered the full scope of this study. For example, Rescher, in his 1998 book *Predicting the Future*, claims to have written the first book on the theory of prediction since Cicero’s *De Divinatione*, which appeared in 44 BC (Loeb edition, 1970). However, a theory of prediction is not as comprehensive as a theory of the study of the future. As demonstrated in chapter 3, prediction (however qualified, or reframed as anticipation) is only one component of futures studies. Most other comprehensive publications in the area, such as Fowles’ *Handbook of Futures Research* (1978) and the multi-volume *Knowledge Base of Futures Studies* (Slaughter, 1996a) have been edited collections, which by their nature do not have the space in which to developed a detailed theory. The closest approaches to comprehensive theory have perhaps been de Jouvenel’s 1967 book *The Art of Conjecture* and the several volumes of Wendell Bell’s *Foundations of Futures Studies* (Bell, 2003 and 2004). Other significant contributions have been made by Slaughter and Inayatullah, in developing the related areas of critical futures and integral futures, including Inayatullah (1990 and 2002a) and Slaughter (1989, 1996b, 2004).

Not finding a suitable model in the futures literature, I searched more broadly. Since the concept of the future can also be viewed as a re-expression of the concepts of time and of change, I explored the literatures of time and organizational change, and found several theoretical works in those areas. Jaques (1982) focuses on time, from a management perspective. Van de Ven and Poole (1995) and Tsoukas and Chia (2002), also taking a management perspective, focus on change. Abbott (2001) considers time from a sociological perspective, but not comprehensively so. All of the above works provided valuable insights, but none of them was fully relevant to the process being developed.

It became evident that I should have to assemble a framework specifically to guide this work. Seeking guidance on the construction of theoretical models, I explored the works of Dubin (1978), Bacharach (1989), Whetten (1989), and Weick (1989), but most of these were designed for producing theories about content, while the need here was for a model for setting up a structural framework at a more abstract level. Not finding the above writings usable in this context, I determined that such a framework could be assembled in four stages:

1. Determining the scope of a framework;
2. Critically examining the core concept within that scope – in this case, the future;
3. Establishing a set of key principles;
4. Using those principles to construct the detailed framework.
To illustrate those stages using an architectural metaphor, those four stages correspond to (1) deciding the scale of construction, (2) the selection of a site, (3) drawing a plan, and (4) using that plan to build the framework. To continue the metaphor, the application of SNM in a specific case would then correspond to completing the building. However, departing from the architectural metaphor, the creation of a conceptual framework may involve changing an earlier stage in the light of findings from a later stage.

A comprehensive theory of the future would be very useful indeed; the aphorism often attributed to Kurt Lewin applies: “there is nothing as practical as a good theory”\footnote{Lewin (1945, p129) expresses this in quotes, as if it were not original; others attribute it to the 19th-century physicist Boltzmann.}. An entire thesis could be devoted to developing a theory of the future, but this thesis is not it. As the sole purpose of this model to create a solid foundation for the Process, the principle of Occam’s Razor has been applied, and the model is deliberately minimal. It does not attempt, for example, to reach into the areas covered by Slaughter (2004) in his concept of integral futures. The focus here is more outward looking than Slaughter’s, focusing on the sociological aspects, whereas Slaughter focuses more on psychological futures.

Though some writers (such as Weick, 1999) might consider this chapter to be developing a theory, the consensus among others is that the essential component of a theory is explanatory power. For example, Sutton and Staw (1995), in a paper on “what theory is not,” state that theory is not references, not data, not lists of constructs, not diagrams, nor hypotheses. For them, theory is explanation: “theory is the answer to queries of why.” Whetten (1989), in his widely cited paper “What constitutes a theoretical contribution?” echoes Dubin (1978) in stating that a complete theory has four essential components:

- Which factors to include (taking account of both comprehensiveness and parsimony);
- How the factors operate together; their causal relationships;
- Why: describing a plausible mechanism for relationships between the factors
- Who / where / when: the situation in which the theory applies.

Like Dubin, Whetten does not distinguish between a model and a theory. Comparing the present chapter with Whetten’s and Dubin’s view, it is on the borderline. It does not seek to explain the future; rather, it is a way in which the future can be viewed, and thus the label “conceptual framework” is more in accordance with general usage than is the label “theory.”
4.1.2 Scope of this framework

The scope of this conceptual framework is delineated by three main restrictions: its focus on human futures, the medium term, and a probably-restricted cultural background.

**Human futures.** A social-constructionist approach, emphasizing human futures, as opposed to terrestrial. In the words of Waddington (1978, p9) “Whatever the future will be, it will have been made by Man.” Terrestrial factors (e.g. geological) are relevant only in so far as they affect humans. Thus the entities to which this theory applies are social entities: individuals, families, geographical communities (of any size), organizations, products and services, and concepts. Because the future, from another viewpoint, can be described as change, it follows that this framework of the future can also be described as a framework of social change.

**Medium term.** The scale at which this model is designed to apply is the medium term: applying for a period of between (very approximately) 1 year and 20 years. This is for pragmatic reasons. Below one year, the variables are known, and quantitative forecasting or the assumption of continuity will be generally safe. Above 20 years, uncertainty becomes too great, and there is little need to plan for longer periods.

**Cultural background.** Given my cultural background, as an inhabitant of a wealthy English-speaking country – no matter how much I have tried to transcend it – the model is likely to be limited by its origin and time, to the developed world in the early 21st century. I hope, though, that my experience in participative research in Asia, Africa, and Eastern Europe has enabled me to escape some of the limitations of my home culture.

4.2 Clarifying the concept of future/s

Having defined the scope, the argument now turns to address the various concepts of “the future.” For at least two thousand years, philosophers have distinguished slightly different meanings of the future and its relation to time. There are several versions of the various concepts, including variations from the ancient Greeks, Saint Augustine, and the contemporary scholars McTaggart, Jaques, and Koselleck.

**Ancient Greeks.** The ancient Greeks used two words to denote time: *chronos* and *kairos*. These can be roughly translated as “time” and “timing,” according to Jaques (1982). Though these concepts had long been present in Biblical scholarship, the foundation of the concepts
was re-examined by Kermode (1967) in his influential book on literary endings, inspiring other writers to develop variants of the concepts.

**St Augustine.** Writing in 397, St Augustine, in his *Confessions*, mused on the nature of the future, and eventually decided it was more akin to *kairos* rather than *chronos*.

“It is now plain and clear that neither future things nor past things exist. Nor is it correct to say, ‘There are three times: past, present and future.’ However it might be correct to say, ‘There are three times: a present of past things, a present of present things, and a present of future things.’ For these three somehow co-exist in the soul.... It may also be said, in our loose usage, ‘There are three times: past, present, and future.’ But I do not object... as long as the intention is understood.” (*Confessions*, Book XI, chapter XX; my translation of the edition of O’Donnell, 1992)

Augustine was aware of the writings of the philosopher Plotinus (fl.205-270) from whose *Enneads* he may have derived the germ of the above idea, so perhaps Augustine was not the first constructivist after all. However, the times in which he lived must have had an effect on his thinking: were Augustine alive today, the ubiquitous presence of time-measuring devices – from calendars to clocks – may have swayed his judgement toward the *chronos* interpretation.

**McTaggart.** The philosopher McTaggart (1927: Vol II, Book V) developed a paradox in which he attempted to prove that time could not exist. Though it is now accepted that McTaggart’s paradox cannot be substantiated (Popper, 1956, p538; Quine, 1960; Gale, 1968), the two concepts that he described in his argument are still of relevance for the current purpose: the A-series and the B-series of time. The A-series is that in which events are seen as moving backward from the future, through the present, into the past – much as a person standing at a straight and dusty roadside might see a bus appear from the haze on the left, pass the bystander, and disappear to the right in a cloud of dust. The B-series is a relative view of time, in which events are labelled as happening before or after one another – as if the roadside bystander looked neither left nor right, but simply recorded the time at which the vehicle passed.

**Jaques.** Elliot Jaques (1982), though writing from a management perspective, deals with the theory of the future in more detail (relevant to the present study) than any other writer, though his explicit focus is “time” rather than “future.” He redefines *kairos* in more detail as “the time of episodes with a beginning, a middle, and an end, the human and living time of intentions and goals.” Hedaa and Törnroos (1997 and 2001) redraw this distinction in the context of business networks, using the terms in much the same sense as does Jaques.
Koselleck. The German historiographer Koselleck (1990 and 2002, with a review by Zammito, 2004) distinguishes between “historical time” and “natural time.” He describes the former as “a future that transcended the hitherto predictable,” a concept that arose around the time of the French revolution, supplementing the older conception of time as simply “the medium in which all histories take place” (Koselleck, 1990, p246).

Extending into the realm of foresighting the *chronos/kairos* distinction and the concepts of McTaggart and Koselleck, two related views of futures can be defined – as St Augustine (397) realized: firstly, the future as *chronos* (similar to the B-series), labelled by its date. This is the conception that St Augustine rejected. His second, and preferred view, was of the future as a percept in the human mind: a conflation of hopes, fears, and expectations, differing from person to person and from one time to another for the same person. The latter view of the future is not precisely the same as the Greek concept of *kairos*, nor quite McTaggart’s A-series, nor quite Koselleck’s “historical time,” but falls within that class of views.

Though all the above writers distinguish two concepts of the future, there are subtle differences between them. Some confusion in the area of prediction seems to have arisen due to these slightly varying dual interpretation of “future.” Thus for the purpose of this Process, it seemed productive to use two different meanings of “future” but to clearly label them when ambiguity might arise. The issue was which two meanings would be most useful. Given the nature of the Process, it seemed most relevant to adopt Jaques’ concepts: his interpretations of *kronos* and *kairos*, meaning respectively “time as succession” and “time as intention.”

Forecasters, confined as they are to predicting specific time periods, perceive the future in terms of the B-series, Koselleck’s “natural time,” or as *chronos*. Scenario builders, however, focus mainly on the future as the A-series, Koselleck’s “historical time,” or as *kairos*, but sometimes slip into the other mode. My proposition is that confusion can best be avoided by clearly distinguishing between the two views, and selecting the appropriate one for each question. Thus the concept of *future* can be seen as having two dimensions that can vary independently: calendar time, and intentions. The hemispherical model developed later in this chapter therefore distinguishes between (a) physical futures / future-as-time / *chronos* and (b) mental futures / future-as-progress / *kairos*. 
4.3 Axioms on the future

For maximum clarity, it was useful to begin with a set of theoretical postulates, from which the conceptual framework outlined in this chapter was derived. After studying the ways in which various philosophers had done this, the approach of Spinoza (1665/2000) seemed to be the most relevant in this case. In his *Ethics*, Spinoza began by laying out a set of definitions. Having clarified his terms, he wrote a number of axioms, supposedly of indubitable truth. From most of the axioms followed one or more propositions, which in the sense of the Greek philosophers were *doxa* or hypotheses rather than *episteme*, or confirmed knowledge (Hirschheim, 1984). Spinoza’s final stage was to “prove” the truth of his propositions, which he attempted to do by reasoning, rather than through empirical evidence. Wittgenstein, in the *Tractatus Logico-Philosophicus* (1922), set out his seven main propositions using similar principles.

Spinoza’s axioms, though he derived the term from Euclid, are not the latter’s mathematical truisms; they are statements with which it is possible to disagree on an empirical basis. Bertrand Russell, though he did not agree with Spinoza’s proofs, praised his method for its clarity and self-containment: “His attempt was magnificent, and rouses admiration even in those who do not think it successful” (Russell, 1961, p547). However, Kantor (1981) pointed out that some of Spinoza’s “truths” could better be described as assumptions. Kantor suggested that psychology could benefit from using Spinoza’s approach, and that to clearly state the axioms involved in a study would reduce confusion and conflict among psychologists who assume different axioms. A more recent model than Spinoza’s was the approach of Kelly (1955) in developing his theory of personal constructs, for which he developed one main postulate, with 11 corollaries.

4.3.1 Bell’s set of assumptions

Though no writer seems to have compiled a set of axioms concerning the future, Wendell Bell (1996) approached this, deriving from the futures literature nine assumptions that are “distinctively part of the futurist perspective”:

1. Time moves unidirectionally and irreversibly.
2. Not everything that will exist has existed or does exist.
3. Futures thinking is essential for human action.
4. The future is not totally predetermined.
5. Future outcomes can be influenced by human action and choices.
6. The interdependence of the world invites a holistic perspective and a multidisciplinary approach.
7. Some futures are better than others – so part of the futurist task is to study the criteria people use to make evaluative judgements of alternative futures.

8. The only really useful knowledge is knowledge of the future.

9. There is no knowledge of the future. (Bell, 1996, pp11-15)

These assumptions, later restated by the same writer with minor variations (Bell, 1998) at first seemed a useful starting point for a theory to accompany the present Process. However, on closer scrutiny, many reservations emerged:

1. “Time is unidirectional” – not necessary for the present process, and in the *kairos* sense of the word “time,” clearly untrue. Bell seems to be saying that the future cannot affect the past or present, but as explained above, if the future is regarded as dwelling in the mind rather than in the calendar, people’s perceptions of futures frequently affect their current behaviour.

2. “Not everything that will exist has existed or does exist” – obvious, but not particularly relevant for the Process.

3. “Futures thinking is essential for human action” – perhaps overstated, given the frequency of unconsidered action. Thus “essential” could be rephrased as “desirable,” or the term “human action” (with its implied “all”) could be replaced by a term such as “human progress.”

4. “The future is not totally predetermined” – the truth of this statement is ultimately unknowable: as philosophers from Epicurus (c.300 BC) to Bostrom (2003) have noted, the illusion of free will could coexist with a universe orchestrated by some superior being.

5. “Future outcomes can be influenced by human action and choice” – accepted, even if the previous assumption does not hold. Again, though, the implied “all” is questionable, depending on the precise interpretation of the word “outcomes” – what if the Sun explodes next week?

6. “The interdependence of the world invites a holistic perspective” – agreed; but this need not imply that all human systems are equally interdependent.

7. “Some futures are better than others” – almost a truism, but the precise nature of “better” may be arguable. Bell’s agenda here and subsequently (Bell, 2004) is to assert the universality of some human values (for which solid evidence exists), but if the future is viewed as a path rather than a destination, it need not always follow that some paths are better than others, even if some destinations are indubitably better.

8. “The only really useful knowledge is knowledge of the future” – but might not knowledge of the past be “really useful,” at least in so far as it helps set up the future?
9. “There is no knowledge of the future” – I demur, given the concept of graduated prediction put forward in the previous chapter, which also applies to knowledge of the future. For example, my knowledge that it will become light tomorrow morning is certain. (But the variant statement “there is no complete knowledge of the future” is undeniable.)

Blass (2003) also criticizes Bell’s assumptions, basing his comments on the 1998 version. He notes the cultural dependence of the implications of the first and sixth assumptions in the above list (the 1998 version is renumbered), and points out the joint implication of assumptions 8 and 9: if both are true, it follows that “really useful knowledge” does not exist – and ergo that Bell’s nine assumptions are not really useful knowledge. It seems, however, from the context of Bell’s other recent writings, that he did not intend the above assumptions to be subjected to such intense cross-examination; and they are not presented as his personal assumptions, merely his compilation of the assumptions of other writers.

4.3.2 An alternative set of axioms
Finding most of the above assumptions to make unsatisfactory axioms, I developed another set, with an emphasis on ensuring internal consistency, and on minimizing challengeability. Following the observation by Kantor (1981) that axioms are assumptions that have survived scrutiny, I venture to refer to these as axioms – on the supposition that no reasonable person might have evidence to disagree with the substance of any of them. They can alternatively be regarded as postulates or working hypotheses: statements whose truth (though in several cases unverifiable) is nevertheless self-evident. Though some axioms may at first seem radical, and far from self-evident, the rest of this chapter may convince the reader of their obvious truth. These axioms, which underlie the Process developed below, and apply only to human entities, fall into five broad groups, labelled Predictability, Interconnection, Impingement, Permanence, and Causation. Each axiom is given a brief mnemonic label, for later reference.

Axioms of predictability

1. Axiom of continuity
Future events have roots in the past, to the extent that the past is held in actors’ minds (cf. axiom 16) and generalizations are formed. Thus perception of the future requires knowledge of the perceived past. This axiom disputes Bell’s 8th assumption (“The only really useful knowledge is knowledge of the future”) by implying that knowledge of the past can also be “really useful.”
2. Axiom of limited knowledge

Though future events cannot be accurately known in all their detail, this is equally true of past events and current events – given the limitations of human memory, and the fact that it is not feasible to record the varying intentions of all actors associated with an event.

3. Axiom of partial predictability

Future events are not totally unpredictable. (Cf. Bell’s assumptions 2, 4, and 9.) Most of “the future” (in the context defined for this study) is created by humans. Even natural disasters, though not predictable in terms of precise timing, can be anticipated to some extent, and their effects are modified by human agency (UNISDR, 2002). The more specific an event, the less predictable it is, as discussed in chapter 3. For example, the total number of meteorites landing on the earth on a stated day of the year can be estimated with reasonable accuracy, though the exact location of their landing places cannot be predicted. A re-expression of this axiom is that every future event is predictable – as long it is expressed loosely enough.

Axioms of interconnection

4. The endogenous/exogenous axiom

The causes of future situations can be separated into two broad groups: the exogenous and the endogenous. In other words, the future of any social entity is partly planned by itself, and partly unplanned. Section 4.4.1 below treats this topic in more detail.

5. Axiom of holonic perception

Any system can be simultaneously perceived at several scales: as a group of sub-systems and part of a larger system. This is true of both events and human systems – with even individuals subdivisible into their various roles. Applying this principle to time, this makes it possible to comprehend the vastness of “the future” by viewing it at whichever scale is most relevant for the current purpose. This is covered in more detail in section 4.5 below.

Axioms of impingement

6. Axiom of social impingement

The future of any social entity (from individual to supra-national organization) does not mysteriously appear out of nowhere, but is influenced by the actions and intentions communicated by other actors.
7. Axiom of proximity
The more direct is such communication (i.e. the fewer intervening actors), the more the entity will be influenced.

8. Axiom of power influence:
The mutual influence of any two communicating actors is determined by their relative power: the more powerful actor will influence the less powerful actor’s future. (Reversing this axiom creates a definition of power.)

9. Axiom of embeddedness
It follows from the previous three axioms that the exogenous future of any entity is largely the result of exchanges between the entity and other entities with which it communicates. Section 4.4.1 below deals with those axioms in more detail.

Axioms of permanence
10. Endless-rainbow axiom
An “end state,” though often envisaged, never occurs. Like the end of the rainbow, the future cannot be reached, because mental futures (kairos) always outpace physical futures (chronos).

11. Axiom of desired stability
Though there is no end state, humans are comforted by acting as if one exists, hence their constructs such as “heaven.” Such mental comfort need not lie in fixity: it may also be a constant rate of change, such as “unending progress” or “sustainability.”

12. Flat-horizon axiom
The rate of perceived change varies, with plateaus of relative stability interspersed by rapid change (the “punctuated equilibrium” of Eldredge and Gould, 1976). Actors on such a plateau may regard it as a permanent state.

Axioms of causation
13. Multi-cause axiom
Almost no human event ever happens for a single proximate reason. As discussed in section 4.6 below, multiple causation is the norm. Even when there initially appears to be a single cause, there exist underlying causes behind the direct cause.
14. Multi-effect axiom

Complementing the previous axiom: almost no human event has a single result; there are practically always side-effects (except perhaps actions involving only one person).

15. Axiom of enchainment

An effect of one event may be a cause of a subsequent event. (The word “cause” here has the sense used by epidemiologists rather than the sense used by physicists, as explained in section 4.6.1 below.)

16. The decision-linking axiom

In the social world, no event directly causes another event. Events are connected through human decisions, whether explicit or implicit.

The general thrust of the above axioms is that “the future” is not nearly as unpredictable as is often claimed – as for example by Bell’s 9th assumption. On allowing that futures are partly predictable, a suitable objective for a futures process is to clarify the boundaries of the predictable and the unpredictable, and to assess the stability at those boundaries.

The epistemology underlying the above axioms derives from the confluence of two streams of thought:

(a) social constructionism (or constructivism), as described variously by Berger and Luckmann (1967), Watzlawick (1984), Gergen (1994, 1999), and Schwandt (1994). Slaughter (2002a) summarizes the uses of this mode of thinking in futures studies.

(b) of pragmatism and its descendant, critical realism. The former encompasses the varying emphases of Dewey, Mead, Peirce, and Rorty (as noted by Tapio, 1992 and 1996). The critical realism stream is detailed by Sayer (1984), and applied to futures studies by Bell and Olick (1989) and Bell (2003).

Though constructionism and critical realism might be regarded as incompatible, in that the existence of a “real world” is essential to realists but irrelevant to constructionists, for the purpose of the present theory they are both useful, and need not be contradictory, as noted by Mir and Watson (2000). Futures are very clearly constructions, and (from a pragmatist point of view), the critical realist approach, as applied by Pawson and Tilley (1997), can usefully explain constraints on possible futures.
In the remainder of this chapter, some combinations of the above axioms are used to develop a more coherent theory of the future.

4.4 A taxonomy of forces influencing the future

This section provides more detail on axioms 5 to 9: the division of forces on the future into the endogenous and the exogenous, and subdivisions of those forces. This bipartite division of influences on the future is long established. For example, Machiavelli, in *The Prince* (1525, chapter 25) writes of *necessita* and *virtù*:

> “Nevertheless, not to extinguish our free will, I hold it to be true that Fortune is the arbiter of one-half of our actions, but that she still leaves us to direct the other half, or perhaps a little less.” [translation by W K Marriott, 1908]

In other words, the future (as *kairos*) of any human entity is partly determined by external forces (whether “the market,” fate, globalization, or karma) and partly by its own actions.

4.4.1 A formula for the future

Lewin (1948) set out a generic formula for predicting social behaviour, as:

\[ B = f(P, E) \]

where \( P = \) personality and \( E = \) social environment. In other words, behaviour is a function of personality and environment. Following Lewin’s example, recasting the exogenous/ endogenous axiom in mathematical notation, a formula for the future can be set out as:

\[ F = f(ex, end, int, err) \]

In other words, the future of any human entity \((F)\) is a function of four types of variable:

1. \( ex = \) exogenous: resulting from sources external to the entity;
2. \( end = \) endogenous: from sources within the entity itself;
3. \( int = \) interactional: neither purely exogenous nor purely endogenous, but resulting from the interaction between the two), and
4. \( err = \) random variation or “error”: the effectively random properties of the future: what makes the future unpredictable. When \( err \) is small in relation to \( ex, end, \) and \( int, \) the future is less unpredictable. Though “error” is the term used in regression, it is not the most appropriate word in this situation: “variability” conveys the sense better.

Though the above formula is similar to that for regression analysis, the statistical analogy should not be taken too far. Unlike the independent variable whose value a regression equa-
tion predicts, the future cannot be expressed by a single variable – nor in fact by any number of prior variables, because new variables and constructs are continually evolving. In mathematical terms, the future might be seen as an array rather than a variable – but an array with an indeterminate number of vectors, some of which are undefined.

The above four components of the future may be further subdivided:

**Exogenous components**
1. Actions of influential others: e.g. governments (enacting laws) or market leaders.
2. Explicit plans of impinging actors.
3. Perceived motivational drivers of impinging actors: their motives, attitudes, worldviews, capabilities, beliefs, values, images, visions, expectations, and hopes about the future – as perceived by the focal entity.

**Endogenous components**
4. Plans: concrete plans, intentions, and their ensuing actions. Some of these contribute to the eventual goals, while others may have unintended consequences, and militate against accomplishment of the goals.
5. Motivational drivers of the entity: even if the entity has no specific objectives, its members’ motives, attitudes, worldviews, capabilities, beliefs, values, images, visions, expectations, and hopes about the future can shape its direction. As the future (in St Augustine’s preferred sense) resides inside human brains, its perception can be influenced by these drivers.
6. Behaviour (or lack of behaviour) by the entity that is not purposive or goal-directed, but turns out to have some eventual bearing on its future. This includes inaction due to an impression of inevitability.

**Interactional components**
7. Conjunction (to borrow a term from astrology): an effect due solely to a particular confluence and/or sequence of several uncommon events – such as the “normal accidents” of Perrow (1984).
8. Power imbalance: Unless there is a clear difference in power between the focal entity and any impinging entities, any conflict in plans will be unlikely to have a direct effect. But when one entity is able to influence another, this may have a large impact on the future of the weaker entity. As few entities are powerful enough to affect their entire envi-
ronment, the power imbalance in most cases will consist of inward influences: suffering power rather than exerting it.

9. Zeitgeist: generally (but unhelpfully) labelled the “spirit of the times” (Maffesoli, 1993). It may be more useful to define Zeitgeist in terms of what is and is not currently thinkable: assumptions that are so widely accepted within a social system that they are not noticed, and are therefore unquestioned, both by the focal entity and its surrounding entities. A Zeitgeist component may be noticed only after some years, when the situation changes, or by comparing past behaviours with current behaviours.

**Unpredictable components**

10. Occurrence of the unexpected: a totally unanticipated event with major effects on the human world – a large earthquake under the Zuider Zee, for example.

11. Non-occurrence of the expected: the failure of a cyclic event – such as non-arrival of the *belg* or “small rains” in Ethiopia, resulting in drought and consequent famine.

Though it is not possible to demonstrate that the above list is comprehensive, no additional distinct components have been identified after several years’ development and discussion. A literature search revealed no equivalent list, except to some extent that of Leach (cited in Bell, 1964). On attempting to further subdivide these 11 categories, more detailed breakdowns began to reveal overlapping constructs. For example, any attempt to subdivide items 3 or 5 raises difficult questions about the boundaries between these various mental components. Thus it seemed appropriate to stop at that point.

The practical use of the above list of forces is that, when considering the nature of the impingement of a system on the main system, it is helpful to consider to what extent each of the above forces might apply, and what form that impingement might take.

### 4.4.2 Rethinking the concept of trends

One notable omission in the above equation of components of the future is trends. Many of the earlier writings in futures studies focused on trends as a determinant of the future. This emphasis is at its strongest in cross-impact analysis (e.g. Helmer, 1977), in which trends are compared pairwise with a view to estimating their potential compounding effects. However, over-reliance on trends has also been criticized by writers such as Brooks (1986) and van Notten, Sleegers, and van Asselt (2005) who point out that trend analysis is insufficient for anticipating discontinuities. Others have decomposed trends into several streams. For example Dator (1993, p2) states that “‘the future’ may be considered as emerging from the interac-
tion of four components: events, trends, images, and actions.” He groups the trends into three categories:

a. Trends that are a continuation of the present and the past;

b. Cyclical trends;

c. Emerging issues, not based on past trends.

Though the endogenous/exogenous categorization of influences on the future laid out above does not include trends, given axiom 1 above – that the future has roots in the past – the present theory needs to take explicit account of the forces from the past.

In sociology, the concept of trend has a precise meaning: a continuing unidirectional change in a variable over time. However, emerging trends are difficult to measure, because a construct must be closely defined before it can be measured. In the realm of social affairs, definitions of constructs are often arguable; vide the nine changes in the definition of unemployment by the Thatcher government in the UK, as noted in chapter 2. By the time agreement has been reached on the definition and therefore the measurement of a construct, a trend can be well under way, and such identification may be too late for some purposes – such as to gain “first mover” advantage with a technological innovation (Mohr, 2001, pp53-54).

Perhaps for this reason, a looser use of the term “trend” seems to have developed in futures work, as suggested in Dator’s tripartite grouping definition above: his context was broader than the types of trends and social indicators measured by statistical bureaus. The problem with emerging trends is that they are not known trends (in the stricter sense) but possible trends. However, from the point of view of the exogenous future of a specific individual, given axiom 6 above (that an actor’s future is largely mediated by the future of surrounding actors), the existence of a trend may be irrelevant: it is not vague trends that affect the individual’s future, but specific influences, mediated through specific actors.

As the narrativist movement in historiography has demonstrated (e.g. Danto, 1985; Ricoeur, 1988; Roth, 1988), the concept of a trend carries some degree of historical inevitability. For example, Lindenfeld (1999) uses concepts from chaos theory to examine the rise of Hitler in the 1930s, considering whether there existed key points at which the Nazis might not have come to power, thus forestalling all that ensued from that. Lindenfeld identifies one such key point as the January 1933 election in the tiny province of Lippe, which the Nazis won. Had they not been elected in Lippe, Lindenfeld argues, it is plausible that Hitler would not have become Chancellor. Extending this counterfactual, there are two alternatives:
(i) the Nazis would have eventually come to power because of the underlying trend, and World War II would have gone ahead in much the same way; or
(ii) with support for the Nazis already declining in 1933 (as reported by Lindenfeld, 1999), they would not have been elected, and the course of the 20th century would have been very different.

A “trend theory” in the mainstream sociological tradition (e.g. Collins, 1995) would argue for (i), and a “chaos theory” for (ii). Alternative labels for the two alternatives are “robust-process” explanations, which implicitly consider counterfactual worlds (equivalent to (i) above), and “actual sequence” explanations, equivalent to (ii) above (Pettit and Jackson, 1992; Sterelny, 1996).

Though there is no way of knowing what might have ensued had the National Socialist party lost in Lippe, there were two clear alternative possibilities, and an over-emphasis on trends carries an overtone of an inevitability that may not exist. Specific events (in the chronos sense) do not simply arise through “trends” but are mediated through actors. In this case, the communication path was from the Nazis to the voters in Lippe, and the actors were all those involved in that path.

Thus the concept of trends is subsumed in this Process (and perhaps more usefully) by a concept of inertia: that some forces from the past will persist, for one reason or another, even after the reason for their creation no longer applies. These forces can be from the very recent past, such as a perception of a new fashion in clothing (Gladwell, 1997). This concept of inertia, an extension of the sociological concept of cultural lag (Ogburn, 1957; Brinkman and Brinkman, 1997) is more flexible than the concept of trend, fits better with the actor-oriented approach inherent in this theory, and requires fewer assumptions to be made. This is not to claim that trends are a subset of inertia, or that they do not exist: simply that the practical effect of a trend on an entity will be manifested through some form of inertia, at some level of effect.

Inertia can take several forms:
- Inertia of the focal entity – such as an organization resistant to change because its staff are comfortable with their established practices (Wenger, 1998; Pettigrew, Woodman, and Cameron, 2001).
- Inertia of impinging actors – such as customer non-acceptance of a new product, typified by the “New Coke” (Casnig, 2003).
Social momentum is another form of inertia. In this condition, when inertia is overcome by a sweeping force for change, the social system may tend to overshoot, in a mechanism that is perhaps a social equivalent of cognitive dissonance (Festinger, 1956). An example is the adoption of radical free-market economics by Russia in the 1990s.

A trend can arise simply through differing degrees of inertia among actors. It is well established (Rogers, 1995) that innovations are adopted at a varying rate: at first slowly, then accelerating, then slowing again as the innovation approaches saturation. When graphed, this is an s-shaped curve. This can be explained (Bass, Krishnan, and Jain, 1994) by the simple two-factor Bass model, in which both factors can be regarded as different forms of inertia.

If inertia is important, why is it not included in the above equation? This is not because it does not fit into the exogenous/endogenous division, but rather that inertia, in its various forms, can be a factor in all of the components listed above, and operates differently in each of them. For example, take the first exogenous component “actions of others,” which includes the enactment of laws. One major source of inertia is the body of existing law, the principles of which change very slowly, even though new laws are often made. Some new laws have effects that do not become apparent for several years. A relevant example of inertia (in the case of this thesis) was a 1997 reduction of funding for the Australian Broadcasting Corporation (where I was then working). This resulted in the eventual abolition of my position in 1999, which in turn led to my working in a university, the requirement to gain a PhD, and eventually the completion of this thesis. There were two sources of inertia here: the two-year lag between funding reduction and my departure from the ABC, and the six-year completion of a part-time PhD. Section 4.7 below, in setting out the theory of hemispherical layers, further develops the concept of inertia.

### 4.5 The holonic principle

Combining axioms 6 to 9 (i.e. the future of any entity is largely determined by those with which it communicates) and axioms 10 to 12 (actors can be divided and recombined at various system scales), the combination of influences and system scales can be expressed well by using the concept of holons.

Holons (as originated by Koestler, 1967) were defined by him as “self-regulating open systems which display both the autonomous properties of wholes and the dependent properties of their parts” (Koestler 1978, p304). That reference was to biological holons, but Koestler also...
acknowledged evolutionary, morphogenetic, behavioural, linguistic, and social holons. To that list I am proposing to add holons of three perceptions: of time, of events, and of intentions. A holon can be regarded simultaneously as a system, its collection of subsystems, and the larger systemic environment in which it exists. Holons can be nested inside other holons, and they can overlap. For example, any business with a single office is a member of both its industry and a member of its local area. To ask “Is that one holon or two?” misses the point, because a holon is simultaneously singular and plural. However two businesses, in different industries, in different countries, would share a holon only at global level. Though the word “systems” could be used in the same sense, to refer to “holons” clarifies the hierarchical embeddedness inherent in the concept.

In a paper taking a critical view of General Systems Theory, Phillips (1969) criticizes its presumed inability to specify precisely where a system starts and ends, and quotes Stafford Beer (1960): “the crucial scientific problem for systems research is this: how to separate a particular viable system for study from the rest of the universe without committing an annihilating division.”

But must it follow that if something has no unambiguous boundaries, it cannot be described? The concept of holons is a partial solution of this problem. Since a holon is an embedded system, it can be viewed either as part of a larger system, or as the entire holarchy of a smaller system. Koestler (1967) limited his concept of holons to the biological and social, and described holons purely in hierarchical terms. Thus to Koestler, an industry would not be a holon, if it contained competing firms that did not form part of a common hierarchy. Nor would the population of a small island be an entity, if that island did not have a separate administration. A related concept from complexity theory is that of fractals, which are recursive rather than hierarchical (Mandelbrot, 1982; Gleick, 1988).

As a purely hierarchical model is limiting, for the purpose of this theory, a broader definition of holon than Koestler’s is used, bearing in mind the statistical concept of clustering (as in cluster analysis, not as in sampling): a holon is defined by a high ratio of within-group to between-group associations. The associations can be measured – potentially, at least – by the frequency and/or perceived importance of communications between the sub-holons (individuals, perhaps) whose holonic boundaries are to be defined. For example, a group of people working in a large office may or may not be regarded as a holon, depending on their ratio of

2. But, even using the concept of holons, and the “boundary work” concepts of Churchman (1971), Ulrich (1994), and Midgley (2000), boundary-setting turned out to be one of the key empirical problems in this study, as noted in chapter 9.
within-group to between-group communication (Wenger, 1998). The group may be a holon for some purposes (such as evacuation in an emergency) but for other purposes it may be a number of small holons (such as separate departments). In other words, a holon is not an intrinsic property of an object, but a property of its relationship with other objects. (“Objects” here are not only social structures, but also events and intent structures, as discussed below.)

The use of the (enlarged) holonic concept in the Process solves several practical problems, partially overcoming boundary-related objections expressed by Philips (1969), and also enabling data reduction. Thus it is not only social entities that can be seen as holons, but also events. A problem mentioned in writings on cognitive mapping (Vennix, 1996; Eden and Ackermann, 1998; Huff and Jenkins, 2002) is that cognitive maps often become so large that perceptions of detail overwhelm perceptions of structure. The use of the holonic principle enables participants to focus at a productive scale on any part of a cognitive map.

4.5.1 Events as holons

Any event (however large or small) has the properties of a system, as defined in General Systems Theory (e.g. von Bertalanffy, 1956): it has one or more inputs (preceding events, which might be labelled “causes”), and one or more outputs (“effects”). Inside the black box of the event is some process for converting inputs into outputs. Since any system can be viewed as a holon, events are holons too. Many events, particularly those reified by labels, are multiple events: in other words, collections of events, which could be referred to as event systems (“World War II,” for example). What may singly appear to be discrete events often turn out to be event systems. Historians refer to this as the “problem of colligation”: determining the most appropriate scale for historical analysis (McCullagh, 1978 - though some use a different definition, as noted by Roberts, 1996, chapter 2).

Events can be colligated at any scale, either successively increasing or decreasing. As an example of increasing colligation, somebody passing the open door of this office might see me pressing a key on the keyboard. As far as the passer-by was concerned, that was the event. But from a more microscopic point of view, this was a holon of several smaller events:

1. I decide to press a key.
2. I decide which key to press (it will be A).

3. It makes no sense to aver that a particular social entity is a holon, because a holon is a perception, or construct; the holonic property rests with the perceiver, not the perceived.
3. My brain sends a message to the little finger on my left hand to press the A key.
   (This could be subdivided further still: locate the A key, decide which finger to use,
   find the appropriate muscle, and consciously move that finger to lie above that key.)

4. I press the key.

Pressing that key was just one part of the larger event of writing the preceding paragraph,
which in turn is a subset of writing this chapter, which in turn is a subset of this thesis…and
so on. At the extreme, the period of human life on planet Earth can be viewed as a single
event – as it may be, millions of years in the future, by students in another galaxy. Our
“extended present” (Elise Boulding, 1988) may be summed up by a single sentence in their
textbook on the history of the universe.

An example of a smaller (but currently still enormous) event is World War II, which involved
millions of people for six years. From the perspective of 60 years later, World War II is
regarded as one event – as revealed by its label. It had specific beginning and ending dates,
and its social consequences made the label “World War II” a shorthand way of referring to all
of its components in a single phrase. However, a war is made up (inter alia) of battles, and
those who participated in World War II may have seen at the time it not as one event, but as a
kaleidoscope of many. Each of those battles (and other events) in turn were made up of many
smaller events…. and so on. At the most microscopic level, a soldier crooking a finger to pull a
trigger and fire a gun was an event.

Another illustration of the constructivist character of events occurs when what may be
regarded from a distant viewpoint as one event is seen by those involved as several different
events. For example, people from the USA refer to the “Vietnam war,” while the Vietnamese
speak of the “American war” (Chiến Tranh Chống Mỹ Cựu Nước). While that war was
happening, there was no agreement on its purpose. In the battles of that war, the US govern-
ment was fighting against communism, while the Vietnamese were fighting for national
unification. At an individual level, the US troops were fighting because they were military
career staff or had been drafted, while the Vietnamese tended to have a more local focus, of
defending their communities (Neale, 2001).

As the above examples demonstrate, given the fluidity of boundaries and interpretations of a
single event, it is obvious that an event is purely a social construct. Without an observer, no
event is demarcated; and the scale to which an event is constructed depends on its propinquity
to the observer. The mass media help to create and maintain social constructs, by labelling
them and reconfirming them (McCombs and Shaw, 1972; Dearing and Rogers, 1996; Scheufele, 2000).

Events can be colligated into larger events using five main criteria. Though holonic boundaries of human groups can be established by comparing between-group and within-group messages, this cannot be applied to events in time. Instead, events can be colligated using the following criteria. (Events are denoted as A and B, with no relation to McTaggart’s A-series and B-series.)

<table>
<thead>
<tr>
<th>Principle</th>
<th>Guiding question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjacency in time</td>
<td>Did B happen immediately after A, without an intervening event of the same type?</td>
</tr>
<tr>
<td>Adjacency in space</td>
<td>Did A and B occur at the same location?</td>
</tr>
<tr>
<td>Adjacency of actors</td>
<td>Were the same actors involved with both A and B?</td>
</tr>
<tr>
<td>Adjacency of context</td>
<td>Did A and B occur in the same social context?</td>
</tr>
<tr>
<td>Attribution</td>
<td>Is A widely regarded as “causing” B?</td>
</tr>
</tbody>
</table>

I submit (influenced by Braudel, 1980, Danto, 1985, and Pierson, 2003) that the more of those questions are answered affirmatively, the more likely that A and B will be seen as a single event. And the more distant in place and time from an observer, the more likely that observer will regard them as a single event. The practical relevance of the holonic properties of events for scenario maps is that when an event is plotted on a map, it can be at any scale. Though one event might appear as a single point on the scenario map, it can be expanded indefinitely if required. And when an event is viewed as a construct rather than a sequence (such as the Great Plague; cf. Ziegler, 1969), narrativity does not apply: a static description, as with an “end-state” or “snapshot” scenario can be used. At that level, the event is a holon, as if in a closed box; it is only on opening the box that the event is visibly a narrative.

**Events, situations, and processes.** The perception of events as holons can include events that could also be described as situations. If World War II was a large event, it was also experienced as a situation by some of those involved in it. From a teleological view it could also be regarded as a process, in which two opposed forces were striving for victory. In that sense, “situations” and “processes” are constructs which fall within “events.” A more complex model of history might separate them, but as this is a minimal model, all three constructs are combined in the same group.
4.5.2 The holonic nature of intent structures

Having demonstrated that both social systems and events can usefully be regarded as holons, I shall now apply the same argument to intent structures. An intent structure, as used in theory-based evaluation (Weiss, 1998; Bickman, 1990; Chen, 1994), is a sequence of intentions to achieve a goal through performing a series of actions. I posit that there is no clear distinction between actions and goals, because at any scale, each goal may be subdivided into a near-infinite number of actions, and, conversely, every action will contribute to some goal.

This concept is inherent in some widely used management methods, though not explicitly stated. In Total Quality Management, for example, the Japanese use a process described as “the five whys and the five hows” (Mizuno, 1988). For each possible action, one can ask “why should we do this?” For each answer, ask the same question again. Repeat the process, perhaps five times, and eventually you reach the final goal – no matter which action was initially chosen. Working back in the other direction, keep asking “how can we do this?” then “how can we do that?” The process is repeated till eventually the initial answer to every “how” question may be some immediate physical action – even if only to make a phone call. The laddering method developed by Reynolds and Gutman (1988) and used in marketing research to detect consumers’ needs, takes a similar approach.

From a constructivist viewpoint, moving in the “why” direction is broadly equivalent to hermeneutic inquiry, while the “how” is almost equivalent to scientism (Riedl, 1984). The ladder of inference, as described by Senge (1990), climbing up and down between the concrete and the abstract, is a similar concept.

Logical Framework Analysis (Baccarini, 1999; McCaul, 2000; Sartorius, 1991), and its derivatives such as ZOPP (Ziel-Orientierte Projekt Planung; see Helming and Göbel, 1997, and COMIT, 1998) and program logic models (Cumming, 1997; Funnell, 1997; Julian et al 1995) are widely used widely by aid agencies in planning and evaluating projects. These methods use a similar approach, which can be regarded as traversing a series of discrete steps from objectives to practical implementation. The Leaf of Goals developed for this Process (see section 5.3.4 below) is a structure in which all these concepts can be situated.

4.6 The role of causation in this model

The classical concept of causation, as defined by Hume (1739/1978) employs the concepts of necessity and sufficiency. Like Wendell Bell’s first assumption about the future (Bell, 1996)
causation is asymmetrical in time: an effect cannot precede its cause (note the implication that the object of a cause is an event). In the Humean sense, event A can be shown to cause event B when the link is both necessary and sufficient. For example, if there is a pencil on my desk and I push it with my finger, that push will be a necessary and sufficient cause to make the pencil move along the desktop – provided that all conditions are suitable. That is, I must push it hard enough to overcome static friction, the pencil must not already be touching the wall at the back of the desk (I cannot push hard enough to move the wall), and the desktop is level (thus the pencil was not already moving). Even in this very simple example, what first appeared to be simple cause and effect, it now transpires, applies only in certain conditions. Pearl (2002) notes that:

“The modern study of causation begins with the Scottish philosopher David Hume... Hume has introduced to philosophy three revolutionary ideas that, today, are taken for granted by almost everybody... First, he made a sharp distinction between analytic and empirical claim – analytic claims are the product of thoughts, empirical claims are matters of fact. Second, he classified causal claims as empirical rather than analytic. Third, he identified the source of all empirical claims with human experience, namely, sensory input.” (Pearl, 2002, p95).

This is the classical concept of causation (or causality; the two words seem to be used interchangeably, as by Mohr, 1999, and Davidson, 2000). Perhaps because this view of causation is rooted in the physical world, and physical phenomena can readily be examined, several aspects of cause and effect seem to have been taken for granted by writers on this subject. There are implicit assumptions that (a) causes and effects exist; (b) they can be distinguished, and (c) causes and effects occur in pairs: one cause to one effect (and vice versa, as in the TQM concept of “root cause” – cf. Finlow-Bates, 1998). Outside the physical realm, however, causation cannot be guaranteed to work in such a simple way – if, indeed, “causation” is the appropriate term to use.

4.6.1 Causation in epidemiology and in law

One discipline for which the concept of causation is central is epidemiology. To be able to prevent diseases, epidemiologists must know their origins. As empirical data do not accord with the “one cause, one effect” principle, epidemiologists have developed the concept of the “web of causation” (Timmreck, 1998; Krieger, 1994). In other words, cause and effect tend to operate in networks. In terms of the axioms listed above, the multi-cause axiom, the multi-effect axiom, and the enchainment axiom apply. One “cause” can have many “effects,” and vice versa. Nor need a cause always have an effect: for example, when a person is immunized against a disease, the precipitating cause (bacteria, perhaps) may have no effect on that person.
Medicine in the 19th century (according to Abbott, 2001, p100) “separated the causes of diseases into three layers: predisposing causes, precipitating (or ‘exciting’) causes, and anatomical causes.” Predisposing causes imply a differential likelihood of effect (such as contracting a disease), precipitating causes are the final reasons for contracting a disease (such as the presence of certain bacteria), and anatomical causes are physical lesions that created the symptoms. Green and Krueter (1991) offer a slightly different list: predisposing, enabling, and reinforcing factors, in which “enabling” refers to factors such as lack of health services.

The legal profession has sidestepped the problem of enchainment (as when assigning blame after a traffic accident) by focusing on “proximate cause”: the last cause in a chain (McLaughlin, 1925-6). If one car hits another on a wet road, the fact that the driver was on a particular errand is not a proximate cause. Epidemiologically, though, there would be a whole network of events and situations: an enchainment of causes and effects such that the effect of one event may be the cause of the next. The preferred term in epidemiology is association. Unlike causation, which is deterministic (A either causes B or it does not), association is probabilistic: the presence of A significantly changes the probability that B will occur. Thus Rothman and Greenland (1998) use the concepts of inhibitors and promoters: factors that increase or decrease the risk of disease.

Aristotle’s four causes are not strictly “causes” in the Humean sense. As McDonald (1999) states: “The Aristotelian four-fold approach to causality is the antithesis of reductionism. It means that in answering why something is so, there are at least four valid and different explanations, or different approaches in explanation.” Aristotle is thus arguing for the multiple cause axiom, in a broader sense than the term is normally used today.

4.6.2 Causation in the social sciences

In social research, the establishment of causation is even more complex than in epidemiology, because of reflexivity (Steier, 1991; Alvesson and Sköldberg, 2000; Soros, 2000, pp91-115). As Checkland points out:

“How much more complex chemical research would be if the molecules could decide to behave idiosyncratically in order to thwart researchers in chemistry laboratories! Social science research is complex not least because human beings can act in relation to researchers in a way that changes the phenomena investigated and determines the result obtained.” (Checkland, 1991, p397, cited in Larsson, 2001)

Even when no researchers are involved, human behaviour is subject to many social influences. Though direct cause-and-effect chains do occur (as when an employee follows the direction of
an employer, and, negatively, when a citizen decides not to break a law) the execution of such chains cannot be guaranteed; it does not occur on all occasions, even when the external conditions are unchanged. Bateson (1972, p452) notes that in the social world, an absence of action can be a cause, due to the expectations of others: “the letter which you do not write can get an angry reply.”

Because of these problems of applying the principles of physical causation to social behaviour, a number of writers have suggested looser alternative concepts: probabilistic rather than logical. For example, Axelrod (1976) refers to “influences.” Weick (1979) refers to “interlocked behaviour cycles” and Abbott (2001, p190) uses the term “enchainment” – similar to the epidemiological concept. The concept of probabilistic influence is inherent in statistical methods such as path analysis (Lazarsfeld, 1955) and structural equation modelling (Jöreskog and Wold, 1982; Hoyle, 1995).

In cognitive psychology, the study of causality has been recast as the study of attribution: the issue is not whether causes and effects exist in some “real world” but whether humans act as if they do (Heider, 1958; Weiner, 1986; Munton et al, 1999). To that extent, causes do not precede effects, but follow them: after an effect is noticed, a cause is sought – as noted by Nietzsche (de Man, 1979, pp107-110). Thus hindsight arises.

Davidson (2000), from the viewpoint of evaluability, distinguishes nine forms of evidence for inferring causality:

<table>
<thead>
<tr>
<th>Label</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Temporal precedence</td>
<td>A occurs before B, and B does not occur not before A.</td>
</tr>
<tr>
<td>2. Constant conjunction</td>
<td>Whenever A occurs, so does B.</td>
</tr>
<tr>
<td>3. Contiguity of influence</td>
<td>Evidence suggests A and B are related in some way, possibly via C.</td>
</tr>
<tr>
<td>4. Strength of association</td>
<td>B occurs much more with A than with others.</td>
</tr>
<tr>
<td>5. Biological gradient</td>
<td>The level of A is highly correlated with the level of B.</td>
</tr>
<tr>
<td>6. Coherence</td>
<td>This A-B relationship accords with previous knowledge of A and B.</td>
</tr>
<tr>
<td>7. Analogy</td>
<td>A and B resemble the accepted association between C and D.</td>
</tr>
<tr>
<td>8. Causal list inference</td>
<td>Almost all B’s are caused by C, D, or A. As C and D didn’t occur in this case, A is likely to be the cause.</td>
</tr>
<tr>
<td>9. Modus operandi</td>
<td>Evidence of the characteristic footprint of causal process A, and not of other likely causal processes.</td>
</tr>
</tbody>
</table>

Davidson’s classification is literature-based, not a taxonomy: the first three forms are from Hume (1739/1996), the next four from Miles and Huberman (1994), and the last two from...
Scriven (1974). The epidemiologist Bradford Hill (1965) provided nine slightly different factors of causation, and Timmreck (1998, p337), combining Bradford Hill’s nine with several others, lists 12 factors of causation. However, because none of these classifications is logically exhaustive, there can be no certainty that all possible factors of causation are included.

A more systematic approach would be to base a causal taxonomy on the logic gates used in designing computer circuits, which perform combinations of AND, OR, and NOT operations (Roth, 1999). These need not be electronic; they are simply the logical results of combining several inputs into a single output, or vice versa. Using these principles, the ancient Chinese could have invented computers by assembling thousands of people and having them memorize instructions such as “if somebody behind you puts a hand on your left shoulder, take your hands off the shoulders of the person in front of you.” Such a “computer” would be slow, but as long as the instructions were followed, it would work. A key difference between the logic gate method and Davidson’s typology is that most of Davidson’s types require some memory, while logic gates work without using any stored data from the past. They can thus be prospective. In contrast, Davidson’s focus (given her background in evaluation) is on evaluating a completed project. Put another way, if Davidson’s typology is about causes, logic gates are about effects. Because this Process involves tracing the evolution of futures from their roots in the past (cf. the continuity axiom), the two approaches are complementary, and both are used in this Process; see section 5.4 in the next chapter.

A second key difference between social and physical causation is that one social event cannot directly cause another (the decision-linking axiom). Though an earthquake can cause a tsunami without human intervention, this does not apply to human actions, on which this Process focuses. Because social events are, by definition, mediated by humans, social causation will always include an element of decision, as noted by Weiner (1986) and other attribution theorists. Thus event B becomes “caused” by event A because an actor decides or acts as if this will be so, creating a repeating sequence of Event – Attribution – Reaction. For example, future history books may report that the terrorist attacks on the US in September 2001 caused the US attack on Afghanistan a few months later. The enchainment of events could be reported as...
TABLE 4.3  ILLUSTRATING THE ENCHAINMENT OF EVENTS AND ATTRIBUTIONS

<table>
<thead>
<tr>
<th>Date (2001)</th>
<th>Data type</th>
<th>Headline (with actors in bold type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Sept</td>
<td>Event</td>
<td><strong>Unidentified terrorists</strong> crash aircraft into buildings in USA</td>
</tr>
<tr>
<td>13 Sept</td>
<td>Attribution</td>
<td><strong>US Secretary of State</strong> blames the group Al Qaida, whose leaders are believed to be in Afghanistan</td>
</tr>
<tr>
<td>16 Sept</td>
<td>Event</td>
<td><strong>US delegation</strong> sent to Afghanistan asking government to hand over Osama Bin Laden</td>
</tr>
<tr>
<td>21 Sept</td>
<td>Statement</td>
<td><strong>Afghan government</strong> refuses to hand over Osama Bin Laden</td>
</tr>
<tr>
<td>c.6 Oct</td>
<td>Reaction</td>
<td><strong>US president</strong> orders US military to attack Afghanistan</td>
</tr>
<tr>
<td>7 Oct</td>
<td>Event</td>
<td><strong>US aircraft</strong> begin bombing</td>
</tr>
</tbody>
</table>


The associative connection between the first and last of the above events was decisions of the US government: specifically, the President, the Cabinet, and their top military advisors. Some decisions led to further decisions, and other decisions led to military action. Though the terrorists had been living in Germany, and most were Saudi Arabian, the USA did not attack Germany or Saudi Arabia, so other factors must have been involved in the decision to attack Afghanistan. One such promoter (to borrow that epidemiological term) would have been the public dislike in developed countries of the Taliban government, with its oppression of women and its then-recent destruction of the ancient Buddhist statues at Bamiyan.

In summary, the model of causation to be used in this process should not be the “necessary and sufficient” model of physical causation, but the probabilistic (as opposed to deterministic) model of social causation, as espoused by Gerring (2003): “The core, or minimal, definition of causation held implicitly within the social sciences is that a cause raises the probability of an event occurring.” This definition can include evidence from the past, and employs a range of criteria from evaluation and epidemiological sources, as embodied in the epidemiological “web of causation.” It also follows from the argument in the previous section that since intent structures can be regarded as holonic, and since a web of causation is an intent structure, causation can also be represented holonically. In other words, any cause can be seen as part of a larger web of causation, and on further examination can itself be seen as forming a smaller web. This sense of causation is used to explain the links between the layers described in the following section.
4.7 Layers of change

The framework for this Process uses a layered view of social change, with each layer influencing the layer above it, but with inertial delay. Inayatullah (1998), summarizing his development of Causal Layered Analysis, describes four levels at which CLA operates: the litany (at the most superficial level), trends, worldview and social structures, and (at the deepest level) myth and metaphor. The present theory, inspired by Causal Layered Analysis, currently involves three layers. It borrows the concept of “time depth” from anthropology (Riner, 1987), and thus has a somewhat different emphasis from CLA.

<table>
<thead>
<tr>
<th>Top</th>
<th>Layer 1: events</th>
<th>...which can be grouped as holons, into states or situations.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Layer 2: motives</td>
<td>...including intentions, less enduring attitudes, and the like. These motives influence the events and states in Layer 1.</td>
</tr>
<tr>
<td>Bottom</td>
<td>Layer 3: values</td>
<td>...long-term values, beliefs, worldviews, and assumptions (about both situations and other actors’ motives), influencing the values in Layer 2.</td>
</tr>
</tbody>
</table>

In this categorization, each successive layer changes more slowly than the one above it. The layers can be seen as combined into a hemispherical model, with events and states on the equator and worldview near the South Pole. The sequence of layers is one of accessibility and ease of change. Events – at the surface level – are obvious, particularly at a small scale. Large events may only appear as wholes when viewed from a considerable temporal distance – such as the Thirty Years’ War, as discussed by Danto (1985). Comparing the second with the third level, motives (including intentions and medium-term attitudes) change more quickly than do values (as noted by Kluckhohn and Strodbeck, 1961; Meddin, 1975; Taylor 1977; Hitlin and Paliavin, 2004). Moving down the layers towards the collective unconscious, influences on behaviour are progressively less concrete, and change more and more slowly.

In terms of the two definitions of the future in section 4.2 above, physical futures (chronos) are displayed in the first layer, while mental futures (kairos) occupy the second and third layers. The following diagram shows how the layers fit together as a hemisphere.
This may be regarded as the southern hemisphere of the Earth. (The northern hemisphere was less suitable: the metaphor of depth would not fit, because the “deepest” forces would be in the sky.) On this hemisphere, time progresses from left to right on the diagram. Around the equator, change is rapid, but at each successively lower level, change becomes slower; inertia, time-lag, and hysteresis increase. The vertical line in the centre marks the present time, but the extent of the present becomes broader at the deeper layers, where chronology is less relevant. Though the future is often considered only in terms of events (the *chronos* model), the theory underlying the hemispherical diagram is that change (and thus the future) happens at various levels, but that different levels change at different rates.

### 4.7.1 Why three layers?

Inayatullah (1998), in his version of Causal Layered Analysis (CLA), distinguishes four layers. Slaughter (2002b) uses three layers, Hollinshead (2002) lists seven, and Japanese writers on quality management (Imai, 1986; Mizuno, 1988) use five in their Root Cause Analysis – but all the purposes and contexts are slightly different, and this hemispherical model is not quite the same as CLA. The precise number of layers, if they are viewed as holons, is arbitrary. In earlier versions (List, 2002a and List, 2003a) this model had four layers, the last two of which were labelled values and worldviews, but after finding it not possible to separate these in the case studies (chapter 8), Occam’s Razor was wielded.

One reason for envisioning the layers as a hemisphere is to use an Earth-like metaphor. A person standing at the equator is spinning at some 2000 kilometres an hour, but near the South Pole, the movement is extremely slow. The lower the level, the slower the change – and the more delayed its effect. So in terms of this hemispherical model, a “trend” corresponds to a change in the strength of a force at a particular layer. Using multiple layers allows us to
disaggregate changes into three types: changes in events, in motives, and in values. When changes happen gradually, they possess inertia: slow to gather momentum, and difficult to stop or divert. The deeper the layer, the greater the inertia, and thus the greater the time-lag. Knowing this inertia, it becomes possible to predict the future by working upward from the south pole of the hemisphere – but only to a broad extent, because upper layers incorporate more possibilities than lower layers.

A hemisphere defines the future as seen by one actor, or one homogeneous stakeholder group. As different actors may have different motives, values, and worldviews, multiple actors are best indicated by overlaying hemisphere diagrams over one another. In practice it was found that depicting all actors on a single diagram (except at event level) produces diagrams so complex that they are difficult to interpret.

Each layer is now considered in more detail.

4.7.2 Layer 1: events

The top layer of the hemisphere, at the equator, is the time-bound world of events. Though not the same as the “litany” of Inayatullah’s CLA (Inayatullah, 1998), it shares the superficiality of that concept. This is the quantitative view of history: as with school children reciting “1945, atomic bomb dropped on Hiroshima.” It tells us when, but not why.

Though one physical event can directly cause another (for example, a major earthquake might cause a tsunami, severely damaging coastal settlements) most events in the hemispherical model affect other events only by mediation through the human brain. In other words, most “events” are social constructions. They can thus be of different scales, nested inside one another. For example, “atomic bomb dropped on Hiroshima” is part of the larger event “US attacks on Japan in early 1940s,” which in turn is part of the still larger event “World War II.” The larger (in time) an event, the broader its position within the first layer; a continuing situation can be regarded as an event with a long duration, and a trend (in activities) as a situation that is gradually changing.

If events seem to occur at random, without a discernible pattern, perhaps it is because they are being driven by forces that emanate from lower levels of the hemisphere. The present framework distinguishes two levels of these lower forces, labelled motives and values.
4.7.3 Layer 2: Short term forces: motives

The second layer of the hemisphere contains the proximate causes of the events in layer 1. These causes can variously be described as intentions, motives, trends, forces, drivers, expectations, attitudes, norms, or in the language of conflict management as triggers and inhibitors (Beyna et al, 2001). In this context, those terms refer to the short term: no more than a few years. As there is no single word in the English language that covers this range of meaning, I have chosen to label this layer as motives – either individual or organizational. The reader is asked to bear in mind this intended broad connotation of the label.

There is a bi-directional influence here: not only can events be due to motives, but motives can also change in response to events. Motives (in this sense) tend to last for only a few years, until memories of those events are overlaid by memories of more recent events. The larger the event – in terms of its duration, the number of people involved, and the strength of its effect on them – the longer its memory could persist, and the longer its effect could last.

Layer 2 also involves the problematization of the attribution of cause: in other words, the interest is not merely in why “A causes B” but more in why participants believe that to be true. As mentioned in section 4.6.2 above, the word “cause” here is used in the broader sense of “influence,” not the strict Humean sense of necessity and sufficiency.

Another factor in the second layer, though less obviously a motive, is the way in which events influence subsequent events, through inertia, the momentum of a “world system” (Pepper, 1957), or “path dependence” (Håkansson and Waluszewski, 2002; Liebowitz and Margolis, 1995; Mahoney, 2000) – for example the use of the QWERTY keyboard. The “motive” here (further stretching that label) is reluctance to change a habit. A related factor is social hysteresis (Simon, 1997), which occurs when reversing a cause does not reverse the corresponding effect – such as when unemployment remains high after a recession ends. A further factor is habit, defined here as a type of mental inertia: repeating an activity in order to avoid the effort of considering alternatives. All of these factors are slightly different, and their time span extends typically between a few months and a few centuries.

4.7.4 Layer 3: Long-term forces: values

If motives influence events, what influences those motives? Here we must look at longer-lasting social factors, such as values, long-held beliefs and attitudes, culture, and worldviews (all combined here under the umbrella label of values). At this third layer, change is slower still, taking more than a year to occur, and perhaps as much as a generation. Descending from one
level to the next (as if deeper into the earth) cognitive processes are gradually left behind, slipping from the heights of the cerebral cortex to the instinctive reactions of the mid-brain.

For the practical application of this layer, rather than invent a new taxonomy, previous work was used as a foundation. The work of Rokeach (1973), followed up by S. Schwartz and colleagues (1987, 1992, 1994) involved the study of some 70 cultures around the world, distinguishing between instrumental and terminal values. Schwartz’s work has empirically established the existence of 10 main groups of terminal values. A recent review of values in sociology (Hitlin and Piliavin, 2004) found no taxonomy with better empirical support.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description – from Schwartz (1994)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hedonism</td>
<td>Self-centred personal gratification</td>
</tr>
<tr>
<td>Power</td>
<td>Status and prestige, controlling people and resources</td>
</tr>
<tr>
<td>Achievement</td>
<td>Competitive success, for both individuals and groups</td>
</tr>
<tr>
<td>Stimulation</td>
<td>Encourage risk-taking and adventure</td>
</tr>
<tr>
<td>Self-direction</td>
<td>Autonomous thought and action</td>
</tr>
<tr>
<td>Prosocial</td>
<td>Tolerance and concern for welfare of others</td>
</tr>
<tr>
<td>Benevolence</td>
<td>Preserve and enhance welfare of those close to the actor</td>
</tr>
<tr>
<td>Conformity</td>
<td>Self-restraint and subordination of one’s own inclinations to the expectations of others</td>
</tr>
<tr>
<td>Tradition</td>
<td>Traditional and religious activities</td>
</tr>
<tr>
<td>Security</td>
<td>Stability, safely and harmony of society, relationships, and self</td>
</tr>
</tbody>
</table>

All of the above are individually held values, because they were derived from questionnaires administered to individuals. Because the Process studies the futures of social groups, several variations were made to Schwartz’s list of values in Table 4.5, to define values more relevant to the present conceptual framework and case study:

1. The individual value of Hedonism was broadened to an equivalent social value of Comfort, implying a desire for wealth and an easy life.
2. Harmony (lack of conflict in relationships) was added, because this is a value important in social relationships but less meaningful for individuals. This is a combination of Schwartz’s values of security, conformity, prosocial, and tradition.

Inertia (as described in section 4.4.2 above) is not part of tradition in Schwartz’s sense: the latter is more active. Rather, inertia applies to all of those values, as a reluctance to change. (In this framework, the deeper the layer in the hemisphere, the stronger the force of inertia.)
Though *values* (as interpreted by Schwartz, Rokeach, and others) is the most apposite term for human forces that last for some years, their research did not extend to beliefs, attitudes, and long-term desires. Thus Schwartz’s categorization is here taken as a starting point, and not assumed to include all forces in the third layer, which is primarily defined in terms of duration.

At the base of the values layer, people find it difficult to change their assumptions (including assumptions about other actors) even if they want to, partly because many such assumptions are unconscious, and not verbalized. On the hemisphere, this is close to the South Pole. Substantial change must wait for the next generation to be born, and to collectively evolve a new set of values during its upbringing. This level could involve the collective unconscious (Jung, 1969), tacit knowledge (Polanyi, 1966), Kropotkin’s concept of mutual aid (1914/1955), the “consensual mind” of Bohm and Peat (1987), the “global brain” of Bloom (2000), the “intersubjective patterns in consciousness” and “superconscious” of Wilber (1999, p128), the *intellectus agens* (active intellect) that Averroes derived from Neoplatonism (Davidson, 1992), and almost the memes of Dawkins (1976). Though it may not be possible to establish using conventional scientific methods that such phenomena exist, some evidence for their existence is the fact that so many thinkers, from a wide range of cultures and centuries, seem to be in broad agreement on this issue.

Two future-oriented taxonomies were found: the “mindscapes” of Maruyama (1980, 1982, 1994) and the “values memes” or Vmemes of Beck and Cowan’s (1996) spiral dynamics. The four mindscapes of Maruyama progress from less advanced to more advanced; these apply to whole civilizations or cultures. Like the values memes, individuals and civilizations are said to progress through a sequence as they become older and wiser.

**Table 4.6 The Mindscapes of Maruyama**

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H. Hierarchical</td>
<td>Corresponding to Weberian bureaucracy</td>
</tr>
<tr>
<td>I. Individualist</td>
<td>Corresponding to the Nietzschean or entrepreneurial view</td>
</tr>
<tr>
<td>S. Stability</td>
<td>Stability in social relationships – e.g. Confucian</td>
</tr>
<tr>
<td>G. Generative</td>
<td>Pluralist, “generating new patterns by interaction” – no historical example</td>
</tr>
</tbody>
</table>

Beck’s model is widely cited in the futures literature (including Wilber, 1999, Inayatullah, 2004b, and Daffara, 2004). In Beck and Cowan’s original form, the model has four quadrants, but only the first quadrant (of eight values memes) is applicable here. Each values meme is labelled as a colour. They are intended to progress from a primitive to an advanced level of consciousness. In that sequence, they are:
TABLE 4.7 THE VALUES MEMES OF BECK

<table>
<thead>
<tr>
<th>Values meme</th>
<th>Description – from Wilber (2003)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Beige</td>
<td>Instinctual</td>
</tr>
<tr>
<td>2. Purple</td>
<td>Magical-animistic, tribal</td>
</tr>
<tr>
<td>3. Red</td>
<td>Egocentric, power, feudalistic</td>
</tr>
<tr>
<td>4. Blue</td>
<td>Mythic-membership, conformist, fundamentalist, ethnocentric, traditional</td>
</tr>
<tr>
<td>5. Orange</td>
<td>Excellence, achievement, progress, modern</td>
</tr>
<tr>
<td>6. Green</td>
<td>Postmodern, multicultural, sensitive, pluralistic</td>
</tr>
<tr>
<td>7. Yellow</td>
<td>Systemic, flexible, flowing</td>
</tr>
<tr>
<td>8. Turquoise</td>
<td>Cosmic unity, integrative, nested hierarchies of interrelationships, holism</td>
</tr>
</tbody>
</table>

By identifying a relevant world hypothesis (Pepper, 1957), mindscape or values meme for a given set of actors’ values operating at Layer 3, events in Layer 1 can be explained. For example, Wilber (2003) interprets the 2003 war in Iraq in terms of the values memes. However, the eight values memes and four mindscapes are intended only as a guide: simply a starting point for consideration of the worldviews of actors in their relevant roles, not as a comprehensive taxonomy into which every situation can be assigned. Though fundamental values hardly change, they might sometimes vary for individuals in different roles. For example, a white-collar worker in a developing country might use different values at home and at work, if the home environment is a traditional family structure and the work environment is a modern western one. (Many of Hofstede’s (1980) subjects in developing countries, all of whom worked for IBM, would have been in this position – thus casting some doubt on the generalizability of his findings.)

An example of Layer 3 in action occurs in the context of the “former Yugoslavia” – how did those ancient animosities break out so quickly in 1991-92, when several parts of the country split away? Lake and Rothchild (1996) argue against the concept of ancient animosities resurfacing on the breakup of the federation, and Szayna (2000, p13) offers the somewhat circular argument that human behaviour is always rational, because “if human behavior is irrational, of course it cannot be predicted or even anticipated.” However, abundant evidence exists, even from economists (for example the research reported by Kahneman, Slovic, and Tversky, 1982) that human behaviour is not purely rational – and as reported in chapter 2, forecasts of human behaviour are not always accurate. Fear, in particular, can be irrationally inspired, as populist demagogues have found.

The deepest values in Layer 3 corresponds to a level of autonomic arousal that is inaccessible and thus not readily amenable to change. In the Yugoslavian context this could involve fear of the secret intentions towards each actor’s group among the Other – which in that particular
case is othered (Said, 1978) because it follows a different religion, uses a different form of “Serbo-Croat” (a language name that no longer exists) and writes with a different alphabet.

I submit that such worldviews are mediated through roles and social situations, and as such are not necessarily consistent within individuals. Worldviews held by groups such as businesses generally embody rarely-examined assumptions in communities of practice, reinforcing “the way things are done around here” (Wenger, 1998). In the work of groups and organizations, these are the assumptions buried so deep that they are invisible, and thus seldom questioned. Even though they slowly evolve over the years, the change is barely perceptible: such assumptions are difficult to verbalize, so that they cannot readily be compared.

4.7.5 The place of worldviews

The original four-layer model (List, 2002a and 2003a) distinguished between values (Layer 3) and worldviews (Layer 4). The two layers were combined partly due to practical problems of separating values from worldviews, but also because the concept of worldviews turned out to have two meanings: in one sense, they are deeply embedded values – now considered the base of Layer 3. In another sense, worldviews are modes of perception: so pervasive that they affect all layers – just as inertia and trends do. Events are constructs, and worldviews (as perceptions) filter constructions of events (as in the Vietnam War / American War example above). Worldviews also determine intentions, affect cognitive beliefs (“If I do A, then B will happen”), and partly determine values. Thus it is more accurate to see perceptual worldviews as pervading the entire hemisphere, not residing in a single layer.

4.7.6 Interrelationships of the layers

To summarize the hemispherical model, Events (Layer 1) are driven by Motives (Layer 2) which in turn are driven by Values (Layer 3). It is important to note that the terms Events, Motives and Values are simply portmanteau labels for mixtures of concepts that have no single word in English. Thus Events includes situations and processes; motives include intentions (not necessarily explicit) and attitudes, and Values range from attitudes almost to instincts. The chief criterion for the latitudinal placement of a concept on the hemisphere is its temporal duration. The lengthening duration of drivers in the lower layers may be associated with some qualitative difference: in particular, with less cognitive content and more affective content. The principle is that it is more difficult for actors to change at the lower layers than at the upper layers. Because this is untestable empirically, the claim of this thesis is simply that the concept of a layered hemisphere is a useful construct in anticipating futures.
In the physical world, one event can directly cause another. For instance, an earthquake can cause a tsunami. But in the human world, the decision-linking axiom indicates that events do not directly influence other events, but that their influences are mediated through lower levels of the hemisphere, and return through V-shaped paths of various depth (i.e. of impact) and width (i.e. duration).

This proposition can be illustrated by a well known example: the terrorist attacks on the US in September 2001. These came to public notice as a series of events (shown as A in the diagram below), which coalesced into a larger holon of events referred to as “nine eleven” (B), which, through the news media, caused an unusually strong impact on many Americans deep in Layer 3: almost visceral fear that they were in danger, combined with anger that some of their national symbols had been attacked (C). (According to Loye, 1996, p610, the 1945 atomic bombings in Japan produced a similar level of worldwide social shock.) The unusual penetration of an event directly to Layer 3 invoked values relating to security (D) that set in motion the “war on terror” (E) that enabled further events (F), such as a war on Afghanistan, and sporadic attacks on mosques in the US.

![Figure 4.2 MOVEMENT THROUGH LAYERS OF THE SEPTEMBER 2001 ATTACKS ON USA](image)

Just as the initial attacks had their own genesis (the result of a previous V) the outcomes of war in Afghanistan spawned a new set of consequences: a subsequent V, to the right of position F above. Reactions arising from lower layers seem to have more diffuse effects than reactions from upper layers: something that penetrates to Layer 3 (as did the 2001 terrorist attacks on the psyche of Americans) is likely to have wider-ranging and (by definition) longer-lasting effects than a V that penetrates only to, say, Layer 2 (arousing motives but not values).

In the hemispherical map, the deepest layer is difficult to describe for a particular case, but when one considers the ways in which recent events have influenced other events, describing V-shaped paths gives participants more insight into the drivers at the deepest layers.
The ladder of “five whys and five hows” (Imai, 1986) expresses the idea that the root cause of any action can be revealed by successively asking “why”; conversely, the achievement of any purpose can be revealed by successively asking “how”. A “why” question in one direction on this ladder is equivalent to a “how” question in the other direction. In the following example, the Why column should be read downwards and the How column upwards, following sequence Q1, A1, Q2, A2, Q3, A3, Q4, A4 (following the arrows). To clarify the example, only one cause is shown for each effect, and vice versa.

Table 4.8 Applying the ladder of whys and hows to the hemisphere model

<table>
<thead>
<tr>
<th>Layer</th>
<th>Why</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motives</td>
<td>A1. To rid the world of terrorists.</td>
<td>Q4. How did the US rid the world of terrorists?</td>
</tr>
<tr>
<td></td>
<td>Q2. Why did the US want to rid the world of terrorists?</td>
<td>A3. By ridding the world of them.</td>
</tr>
<tr>
<td>Values</td>
<td>A2. Because terrorists make trouble.</td>
<td>Q3. How did the US stop terrorists making trouble?</td>
</tr>
</tbody>
</table>

The two dimensions of the hemisphere, time and layers, corresponding to *chronos* and *kairos* respectively, allow the separation of causality from teleology. When delineating the layers of a particular hemisphere, the mechanisms (answers to questions beginning “how”) move horizontally forward, while reasons (answers to “why” questions) correspond both to previous events and the vertical transmission of purpose between layers.

Given the way in which humans make mental connections through cognitive proximity (Ausubel, 1968; Karamanos, 2003) it is likely to be more productive to seek proximate causes and effects than ultimate ones: in other words, to travel, when possible, up and down through the layers of the hemisphere one at a time. By jumping immediately to the bottom (or “root cause,” in TQM terms) or to the top (or specific event) we may not see how the processes actually come to occur, how the mechanisms work (Pawson and Tilley, 1997; Machamer, Darden, and Craver, 2000).

Also, on accepting that no event happens for a single reason (the multi-cause axiom), and that every cause has multiple effects (the multi-effect axiom), instead of a single ladder, we are faced with multiple ladders – or a set of scaffolding. The intention in this Process is to focus on the layers, more than on the progression of time. Returning to the twin concepts of time
(chronos and kairos), chronos is shown horizontally on the hemisphere – the analogy is the earth turning at a constant rate – while kairos progresses at an angle through various layers.

If a map of the hemisphere is drawn using nodes and arcs (boxes and arrows), the nodes at the top level will be events, or holons of events, with arcs expressing attributions of causality. At the second layer, however, the arcs on the top layer become the nodes at this layer. At the third layer, values are the nodes used to explain the changes in motives. In other words, the nodes in each layer would be derived from the arcs in the preceding layer, as follows:

![Figure 4.3 Interrelationship of Lower Layers from Upper Layers](image)

The entire hemispherical model, with its three layers, assumes that in the world of human futures (to which this model restricts itself) forces for change flow in both directions. In other words, this framework suggests that values indirectly influence human events, while those events also influence values, indirectly; but because of the inertia of values, the latter process occurs far more slowly, except when large shocks occur.

### 4.8 Review of this chapter

This concludes the development of the conceptual framework of the future. It is characterized as a “working model” because its main purpose is to inform the development of the Process. It makes no claim to be comprehensive, and some difficult philosophical questions (such as the distinction between reasons and causes) have simply been bypassed – on the ground that if philosophers have failed to agree for centuries, this thesis is unlikely to provide a solution; and that is not its purpose.

To recapitulate, the model was constructed by (1) defining a scope, (2) defining the central concept, the future, in a dual way (3) stating a set of axioms (or assumptions), and (4) outlining the basic principles of the model. These were (a) a decomposition of forces that could affect futures, (b) the principle of holons, (c) linking the holons by influence rather than strict
causality, and (d) the concept of the layered hemisphere, in which events are influenced by motives, and motives by values, each of these being slower to change than the previous layer.

As noted above, the model presented here is a minimal one. No claim is made that this model in any way supersedes or replaces other models of the future (nor, for that matter, of history, or of social change). The purpose of the conceptual framework presented in this chapter was to set the groundwork for the hemispherical model, which was kept deliberately simple so that it could readily be explained to participants in scenario workshops, and help them to explore possible futures in more detail than would have occurred without such a conceptual framework.