A VALUE-BASED MODEL OF SUSTAINABLE ENTERPRISE

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ABSTRACT

Researchers and practitioners alike are in need of an operationally useful, and theoretically sound, model of sustainable enterprise. This paper synthesizes insights from systems theory and value theory to construct such a model, which allows for the formulation of descriptive and imperative statements. This value-based model provides a method of conceptualizing sustainable enterprise that incorporates spatial and temporal scales, social and ecological well-being, and conflict and concord among choices and perspectives. Results from this analysis provide useful insights both for future directions in sustainable enterprise research, and for those entrepreneurs dedicated to making the sustainable enterprise a reality.

KEYWORDS

sustainable enterprise; sustainable development; value; organization theory; systems theory.

Rather than a management problem, we have a design problem, a flaw that runs through all business.

– Paul Hawken, *The Ecology of Commerce*

1. INTRODUCTION

Though sustainable development was devised as a macro-level concept (Figge & Hahn 2004), much subsequent work has focused on operationalizing the concept at the organizational level. A rich literature has proliferated on the subject of assisting enterprises to better embody the principles of sustainable development with a myriad of new tools (see Robèrt et al 2002) and management practices (e.g. Lesourd & Schilizzi 2001). But, as Paul Hawken reminds us, applying management systems for sustainable development in an organization that is fundamentally designed to be unsustainable is a self-defeating proposition. This paper argues that the decisive factor in the ability of an organization to survive and thrive in accord with the principles of sustainable development is the enterprise's organizational design.

It is widely recognized that enterprises, both large and small, play a crucial role in the advancement of sustainable development (Defra 2005, Gore 1992, Hawken 1993, PCSD 1999, WBCSD 2002, WCED 1987). Much of the work on advancing sustainable development has focused on technological innovations, however, it has become apparent that it is not human technology so much as the pattern of human activity that is challenging the realization of sustainable development (Norgaard 1994, pp. 15-17). If sustainable development does in fact require a significant change in the patterns of human activity (and it appears that it does), then the role of enterprise must indeed take center stage as organizations, particularly economic organizations, currently constitute one of the most pervasive forms of institutionalized human activity on the planet (Hall 1996).

While the operationalization of sustainable development has often proven intractable, the broader concept is easily understood. As with conventional notions of development, sustainable

development is both a goal and a process (Pirages 1994). 'Development' in this sense refers to a qualitative improvement (Daly 1996, Goodland 1995, Schumpeter 1934) in human well-being (Dodds 1997). 'Sustainability' is succinctly explained by Clark in common sense terms:

> "When we talk about the sustainable future of the *planet*, surely we mean to say a sustainable future for the *planet with human beings*…Sustainability, then, refers to the sustainability of human life, and that ultimately depends on how we humans behave" (Clark 1994, p. 180, emphasis in original).

Qualifying the term 'development' with the term 'sustainable' forces attention to two novel aspects. First, the notion of sustainability requires a future orientation with significantly expanded timescales (Giampietro 1994). Second, sustainability requires consideration for the capacity of ecosystem functions to cope with evolving human activity (Costanza 2000, Hall et al 2001, Pearce 1988). With this perspective on sustainability, humans should be seeking to manage their impact on the planet Earth so as to preserve the continued existence and well-being of the human species. As Morowitz points out, "Sustained life is a property of an ecological system rather than a single organism or species" (Morowitz 1992, quoted in Capra 2002, p. 5). Sustaining the welfare of humans requires appreciating their embeddedness in a hierarchy of organized systems, both social and ecological.

This paper is concerned with a particular level and type of human activity – the enterprise. *Sustainable enterprise* can be defined as a human organization that contributes to sustainable development, where 'sustainable' is understood as a future of the planet Earth with humans, and 'development' is understood as a qualitative improvement in the human condition. Even within this definitional scope, exactly how an enterprise can be considered to contribute to sustainable development remains contested (cf. Atkinson 2000, Dyllick & Hockerts 2002, Keijzers 2002, Laszlo 2003, Starik & Rands 1995). Hardly confined to theoretical musings, this effort has been advanced by a growing cohort of entrepreneurs and business leaders who are putting their own and others' innovative ideas to practice (e.g. Anderson 1998; McDonough and Braungart 2002).

This paper seeks to contribute to that work by proposing a model of sustainable enterprise that is both operationally useful and theoretically sound. This paper continues the development of a model that synthesizes key insights from systems theory and value theory. To that end, the next section draws on systems theory to establish a context for thinking about the functional value relationship between an enterprise and its social and ecological environment. Through an examination of value theory, the section that follows establishes two principles of sustainable enterprise. These principles are then integrated, creating a value-based model of sustainable enterprise. The model is then extended to a diagnostic tool to help explain why some enterprises see sustainable development as a win-win opportunity, and others see it as an exercise in difficult tradeoff decisions. In this capacity the model moves towards a theory of sustainable enterprise as it begins to offer explanatory power. The paper concludes with insights both for future directions in sustainable enterprise research, and for those entrepreneurs dedicated to making the sustainable enterprise a reality.

2. ENTERPRISE AND THE SOCIO-ECOLOGICAL SYSTEM

Enterprises cannot exist in isolation. Much as a species cannot exist independent of the ecosystem that supports it, so too an enterprise owes its existence to the meta-system of which it is part. This meta-system includes an ecological system, consisting of a web of complex relationships between biotic and abiotic elements, and a social system, consisting of humans and the artifacts of human interaction. Of course, as many authors have pointed out (e.g. Giddings et al 2002), the social system is in fact a subsystem of the ecological system. However, human phenomena have characteristics that are sufficiently distinct from non-human nature to warrant special consideration. Capra (2002) contends that non-human life systems can be understood by integrating three perspectives – form, matter, and process – while understanding human life systems requires integrating a fourth perspective, meaning. To place proper emphasis on both the preeminence of the ecological system and the uniqueness of the social subsystem, the overarching meta-system will be referred to as the socio-ecological system (following Holling 2001). This is the nest within which enterprises and individuals operate.

2.1 Systems Theory

The systems perspective (Boulding 1956, Von Bertalanffy 1972) arose from the biological sciences, and has subsequently been applied to organizational phenomena (e.g. Buckley 1973, Katz & Kahn 1978, Scott et al 1981), although the concept of organizations as systems is evident in organization theory as early as Barnard (1938). The essence of this perspective is that of "complex system[s] embedded in a dynamic environment" (Clegg 1990, p. 50). Systems theory is a useful tool for addressing the process and the goal of sustainable development as demonstrated by the theoretical work of Capra (1996, 2002), and the applied work of Robèrt (2002), among others. The perspective can accommodate and, most importantly, demonstrate the relationship between natural, human, and human-designed systems (Checkland 1981), differences in spatial and temporal scales (Giampietro 1994), social and ecological well-being (Holling 2001), and conflict and concord among choices and perspectives (Morgan 1986). Three aspects of systems theory can inform our discussion of sustainable enterprise, and therefore require some elaboration. They are the hierarchical relationship of systems levels, the distinction between closed and open systems, and the functional relationships of system parts.

Every system is made up of component parts, which are themselves potential systems. Correspondingly, every system is a component, or subsystem, of a larger system (Checkland 1981, Morgan 1986, Scott et al 1981). The hierarchical organization of systems comes to bear when different process rates are experienced at different levels, meaning nested systems operate on multiple organizational and spatiotemporal scales. Higher levels operate with a lower frequency of change, and thereby serve as filters for the higher frequency activities of lower levels (Giampietro 1994). An example of this feature can be seen in the world of business. Functional units within a large corporation may come and go while the corporation persists over time. Similarly, companies within a given industry might start-up and fail at a certain frequency while the industry persists in a more or less constant state. Industries tend to persist longer than most companies and do not show the same rate of fluctuation as individual companies (hence the diversification strategy for risk reduction in financial markets). But even industries will ebb and flow and eventually die while the economy remains relatively stable. Economies themselves have boom-bust cycles and may fail over the longer-term, and so on. Each level of organization

operates at its own process rate, and serves to filter out much of the variation found at lower levels of organization. The scope of lower level processes is therefore bounded by the higher levels.

Another important attribute of systems is whether they are 'open' or 'closed.' Open systems depend on a constant throughput of matter and energy to sustain over time, while closed systems allow exchanges of energy, but not matter. The planet Earth is a closed system in that it allows energy to penetrate its boundaries via incoming solar energy and outgoing dissipation of waste heat. For all practical purposes, matter does not enter or leave the system. Enterprises, by contrast, are usually viewed as open systems (Barnard 1938, Katz & Kahn 1978, Morgan 1986, Scott et al 1981). This is important because it means an enterprise is dependent on its environment for sustenance. The environment is considered to be "whatever lies outside the 'boundary' of a system" (Arbnor & Bjerke 1997, p. 112). The important point here is that as a system seeks resources from its environment to ensure its own survival, it runs the risk of destabilizing the larger system of which it is part. What is needed is a healthy balance throughout the system hierarchy (Giampietro 1994). What this 'healthy balance' is for an enterprise and the socio-ecological system will be discussed in the following sections.

The final feature of systems in need of our attention is the functional relationships between system components. Each subsystem is intricately linked with other systems at the same level, and with higher and lower hierarchical levels (Checkland 1981, Morgan 1986, Scott et al 1981). Levin explains the fundamental importance of these relationships at the ecosystem level:

> "Obviously, any ecosystem is characterized by flows: flows of nutrients and energy, flows of materials, and flows of information. It is such flows that provide the interconnections between parts, and transform the community from a random collection of species into an integrated whole, an ecosystem in which biotic and abiotic parts are interrelated" (Levin 1998, p. 433).

These relationships are not confined to natural ecosystems. All systems, including socially constructed systems, are characterized by such flows. Capra takes this notion further. He asserts

that "there are no parts at all. What we call a part is merely a pattern in an inseparable web of relationships" (1996, p. 37). These relationships that are so fundamental consist of flows of matter, energy, information, and, where humans are concerned, meaning. Social systems are dominated by communication networks in which symbolic signals, including language and visual cues, are continuously projected and interpreted (Capra 2002). In enterprise systems, an important 'energetic' input is the motivation, goals, and drive of the people who make up the enterprise (Katz & Kahn 1978). Although these relationships are described as flows, it is important not to think of them as necessarily exchanges of substantive quantities. While stocks of matter may involve material transfers, other relationships are more aptly thought of as funds producing services (see Georgescu-Roegen 1971, pp. 211-234). A service, for example shade from a tree, cannot be characterized by a quantitative flow, but the relationship between the tree and the entity receiving the shade still involves the transmission of benefits from one entity to the other. Regardless of the constituent nature of the flow or service connecting two entities, relationships always involve the transmission of value. Relationships that contribute to the existence of a given system are beneficial and are therefore of *value* to that system. Alternatively, relationships that destabilize a system's pattern of organization are detrimental and are of *disvalue*.

2.2 The Enterprise System

While researchers have succeeded in formulating principles of enterprise survival, such as the Barnard-Simon theory of organizational equilibrium (March & Simon 1967), no corresponding principles of sustainability have been successfully developed. In searching for such principles, there is no one organizational theory, or theory of the firm, that can explain the multifaceted nature of an enterprise *in toto*. However, different theories can serve to illuminate different aspects of enterprisal characteristics that are important for understanding their impact on sustainable development. Systems theory is a useful meta-theoretical framework that gives us several important insights. First, enterprises "consist of the patterned activities of a number of individuals" (Katz & Kahn 1978, p. 20). Thus, enterprise are viewed as a mechanism of human coordination (Barnard 1938, Ouchi 1980). Second, the open-system characterization of enterprises suggest they have an active and coevolving relationship with the surrounding

environment (Huygens et al 2001, Lewin et al 1999, Lewin & Volberda 1999, Van den Bosch et al 1999). Hrebiniak & Joyce's (1985) merger of resource dependence (Pfeffer 1982) and strategic choice (Child 1972) theories is congruent with the systems perspective, as it gives due regard both to enterprise agency and strong environmental influences. Third, enterprises are purposeful, goal-directed entities (Etzioni 1964, Perrow 1970, Scott 1964, Thompson & McEwen 1958). In the words of Gross and Etzioni, enterprises "are artificial social units: They are planned, deliberately structured; they constantly and self-consciously review their performances and restructure themselves accordingly" (1985, p. 109). Although enterprises are goal-directed, stakeholder theory (Clarkson 1995, Donaldson & Preston 1995, Freeman 1984, Mitchell et al 1997) and political theories of the firm (March 1962, Pettigrew 1973, Pfeffer 1981) show organizations as constituting the pluralistic goals and interests of its many diverse members. Finally, enterprises are created intentionally (Bird 1988) to create some form of value (Bruyat & Julien 2000). Thus, for our purposes enterprises can be viewed as intentional human coordination mechanisms for the goal-directed purpose of value creation. They are neither master nor slave to the environment, but an active and semi-autonomous component of it. The value they create is expressed through relationships with other components in the socio-ecological system of which the enterprise is but one part.

3 PRINCIPLES OF SUSTAINABLE ENTERPRISE DESIGN

To understand the contribution an enterprise makes to the sustainable development of the socio-ecological system, attention must be directed to the interaction between the enterprise and other components of the meta-system, at both the same hierarchical level and at higher and lower levels. These interactions are defined by value relationships.

3.1 Value Theory

Value theory tells us that the value of an object is relational to the subject doing the valuing (Brown 1984). For example, a hair brush would be valued quite differently by a bald person and a person with long locks of hair. Value is also dependent on the context in which the value object

and the value subject are embedded.[1] One recalls Richard III, who, due to an unforeseen change in circumstances, was willing to trade his kingdom for a horse. When an object is being valued for its use, the valuation process is mediated by that use. It is, in fact, the ability of the object to fulfill this use which is being valuated. So, for example, the value of a newspaper is judged by a reader on how well is reports the news that that reader is interested in.

Giampietro states, "It is commonplace to experience a discrepancy in values when assessing the same phenomenon or action from different perspectives" (1994, p. 616). This point is well established and accepted. But Giampietro then goes on to offer a profound insight – that holding the value subject, the context, and the use constant, perspective, and therefore value, can still dramatically change depending on the organizational or spatiotemporal scale within which the valuation takes place. He argues that not only can the value definitions change, but that the same phenomenon will often exhibit conflicting values at different hierarchical levels. One example he gives is that what may be considered "good to our taste (assessment on a short timescale) may be harmful to our health (assessment on a longer timescale)" (Giampietro 1994, p. 616).

Enterprises face these hierarchically dependent conflict in values all the time. What is often considered good for the enterprise, for example lower labor costs, if often not good for the people who on another level *are* that enterprise, the workers. Looking up the hierarchy, we can say the same thing. What is often considered good for the enterprise, for example use of inexpensive fossil fuels, is often not good for the functioning of the socio-ecological system on which that enterprise depends, in this case the atmosphere's climate regulation function. Time perspective is also an issue for enterprise. Even if we just consider economic performance, short-term profit is often maximized at the expense of long-term value (Ho & Vera-Muñoz 2001, Jensen 2002).

The impetus is on humans to ensure that one hierarchical level, say the enterprise level, does not realize its needed value at the expense of the value requirements of the system at other hierarchical levels. Humans must mediate the possible conflict in value definitions between

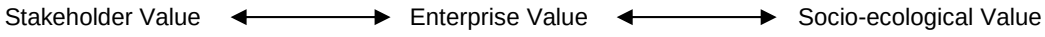
[1] 'Value subject' refers to the entity doing the valuing, while 'value object' refers to the object being valued. 'Object' in this sense refers to any entity that can interact with another entity.

hierarchical levels. Giampietro suggests that to accomplish this, values expressed at multiple levels must "be considered at the same time in a holistic perspective, which should refer to the 'goal' and the 'meaning' of the hierarchy as a whole" (1994, p. 618). This establishes an important principle for an enterprise that seeks to contribute to sustainable development. The first principle can be stated as follows:

Principle I: *Value creation must concord among hierarchy levels*

The definition of a particular hierarchical level is inherently contrived. For practical purposes three discreet levels are identified, one each higher and lower than the enterprise level. These three hierarchical levels are: (1) individual stakeholders, (2) the enterprise, and (3) the socio-ecological system. Figure 1 depicts these hierarchical levels and the value relationships (the arrows) through which they relate.

Fig. 1. Principle I: Concord of Hierarchical Values



The concept of value required by this framework is that of *functional value*. This is a technical, or objective, form of value that resides in the relationship between any two entities that interact, whether human or otherwise. Contrast this with *ascribed* value (also sometimes called assigned value), which is a subjective form, in that the value ascribed to an object depends on held values of a value subject (Brown 1984). While human recognition and appreciation are necessary for ascribed value, they are not necessary for functional value (Lockwood 1997). It is in this sense that functional value is objective. Although pervasively employed in all of the sciences, the

concept of functional value has been largely neglected by social scientists who instead almost universally focus on ascribed value.[2]

Functional value can be defined as the contribution made by one entity to another. Farber et al. note that "if one limits the concept of value to the degree to which an item contributes to an objective or condition in a system, then we can see how natural scientists use the concept of value all the time to talk about causal relationships between different parts of a system" (2002, p. 382-383). In systems theory, something is said to be of value to a system when it stabilizes that system by reinforcing its organized pattern. Although ascribed values are important when dealing with humans, the degree to which a given object meets the psychosocial needs of an individual as determined by that individual's held value system can itself be considered an objective, functional value. The difference is that, while ascribed values are determined by held values, functional values are determined by the needs of the system. To understand what is of value to each system in our hierarchy it becomes necessary to examine the needs of those systems.

3.2 Needs of Systems

Considering first the level of individual stakeholders, arguably the best well-known theory of human needs is Maslow's (1954) hierarchy, in which human needs are viewed as a step-wise succession beginning with basic material needs, progressing through social needs, and culminating at the level of self-actualization. Lutz and Lux (1988) suggest that Maslow's later works view this as more of a dual-self pattern of human needs. The needs necessary for sheer survival of the individual are termed 'deficiency needs' because, unfulfilled, these needs result in physical or psychological illness. These needs include basic physiological requirements, safety and security, belongingness, and self-esteem. The higher level needs are termed 'self-actualized needs' because they are motivated by the personal growth of the individual. Characteristics of self-actualization include openness, respect for others, altruism, and creativity. As a simple

[2] One example of functional value's ubiquitous use in the social sciences are the economic concepts of marginal physical product and marginal value product. However, functional value has received scant attention by value theorists. Brown's (1983) article on 'The Concept of Value in Resource Allocation' only mentions functional value in a footnote. Attention to functional value as a concept has only recently been more fully developed by the works of Lockwood (1999, 1997).

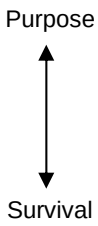
distinction, deficiency needs are those that require resources (either biophysical or social) from the environment, while self-actualized needs require giving back to the environment. The idea of a spectrum of needs spanning from basic, individualistic needs to higher-order, socially-centered needs can also be found in the works of Etzioni (1988) and Kamenetzky (1992). With this conception of the needs of humans it stands that value to individual stakeholders will take two forms: (1) relationships that satisfy basic material and psychosocial requirements, and (2) relationships that allow people to give back to surrounding systems in ways that are meaningful, creative, and expressive.

Like human systems, enterprises can also be said to have both survival needs and higher-level purposive needs. The survival needs involve soliciting resources from the environment to provide for the enterprise's own maintenance and renewal. While most business texts teach that cash flows are at the heart of enterprise survival, Barnard (1938) and Simon (March & Simon 1967) have a more fundamental understanding of the process. Based on their understanding of an enterprise as "a system of interrelated social behaviors of a number of persons" whom they call "participants," Barnard and Simon argue that enterprise survival involves balancing the contributions that participants make to the enterprise, with the inducements the enterprise pays out to participants (March & Simon 1967, p. 86). Purposive needs also involve soliciting resources from the environment, but these resources are used as throughput for the production of goods or services that are of value to entities residing in the external environment. Katz and Kahn assert, "It is a commonplace executive observation that businesses exist to make money, and the observation is usually allowed to go unchallenged. It is, however, a very limited statement about the purposes of business" (1978, p. 21). The raison d'être of enterprise is to create value. Whether the focus is on customers, shareholders, stakeholders (Freeman 1984), or newly coined environmental (Isaak 2002) or social enterprises (Dees 1998) that seek to create 'environmental' and 'social' value respectively, creating value means serving the needs of an entity other than the enterprise itself. With this conception of the needs of enterprises it stands that value to an enterprise will take two forms: (1) relationships that sufficiently maintain the inducement-contribution balance, and (2) relationships that promote the enterprise's capacity for value-creation.

As with the previous two hierarchical levels, we could say the socio-ecological system has both survival needs (sustainability) and purposive needs (development). Survival needs are predicated on maintaining the stability of the socio-ecological system. This requires maintaining the regenerative capacity of the core system functions (Hueting 1980). One way of operationalizing this for the ecosystem is to think in terms of ecosystem sources and sinks. The use of ecosystem resources must not exceed their rate of regeneration, and waste emissions must not exceed the ecosystem's assimilative capacity (Daly 1990). In addition to ecologically sustaining function, socially sustaining functions must also be maintained. These services include the restorative, care taking, nurturing, and stress relieving functions of households and communities (O'Hara 1997). The socio-ecological system's purposive needs can be viewed as the collective desire for qualitative improvement. Although some take development to be synonymous with *quantitative* growth, such seminal economists as Schumpeter (1934) and Daly (1996) argue that development can only be understood as a *qualitative* change, presumably for the better as defined by individual and collective aspirations. From a systems perspective this involves moving the system to a new state. If this new state is desirable, it is considered development. With this conception of the needs of the socio-ecological system it stands that value to the system will take two forms: (1) relationships that maintain ecologically and socially sustaining functions, and (2) relationships that promote the system's qualitative improvement. This examination of the needs of systems establishes a second principle for enterprises that seek to contribute to sustainable development, as depicted in Figure 2. The second principle can be stated as follows:

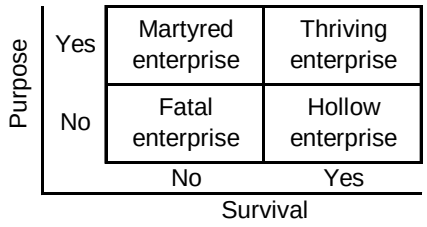
Principle II: *Value creation for realizing survival and purpose must concord*

Fig. 2. Principle II: Concord of Survival and Purposive Values



Establishing and maintaining concord between an enterprise's survival and purpose may not be as easy as it would seem. Although enterprises are initially formed to serve an intended purpose, the survival needs of the enterprise can often trump and even conflict with the enterprise's purposive needs (Gross & Etzioni 1985). Figure 3 presents a matrix classifying an enterprise's character based on the fulfillment of its survival and purposive needs.

Fig. 3. Enterprise Character Matrix



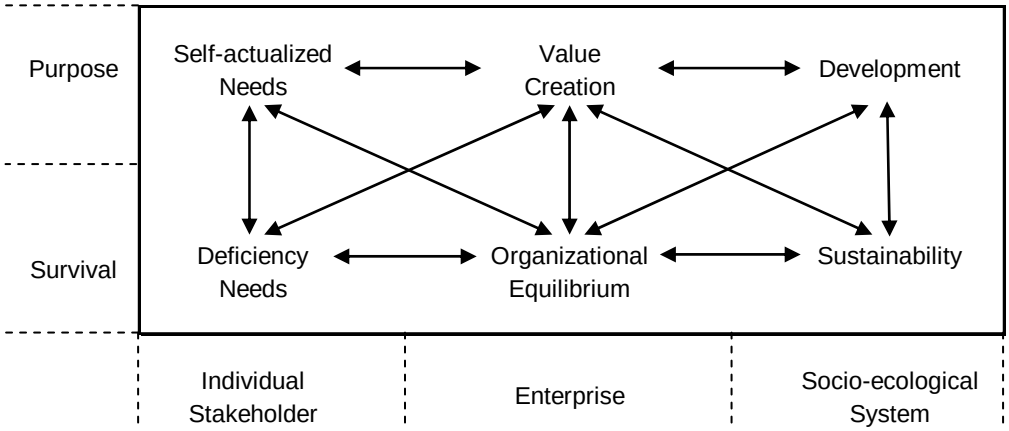
An enterprise that emphasizes its purpose without attending to its survival needs is labeled a 'martyred enterprise' because such an enterprise sacrifices its existence for its ideals. This represents the fate of many socially-oriented enterprises. The end result is that little or no value is created in the long-term because the enterprise inevitably fails. By comparison, an enterprise that loses sight of its purpose by attending only to its survival needs is labeled a 'hollow enterprise' because these enterprises lack soul. This is the fate of the majority of today's enterprises, as all too often survival becomes the sole purpose of survival in a self-serving cycle. An enterprise that fulfills neither its survival nor its purposive needs is labeled a 'fatal enterprise' because they are fatal both to themselves and to the socio-ecological system. The inevitable outcome, enterprise failure, is in fact a social good as valuable resources can be redirected toward other enterprises. Finally, an enterprise in which the realization of survival and purpose concord is labeled a 'thriving enterprise.' This is true regardless of what the enterprise's purpose is, sustainable or otherwise. But certainly this is a necessary condition for a successful sustainable enterprise, as explained by Atkinson:

> "From society's point of view the interesting question can be thought of in terms of the contribution of a given entity (e.g. business or sector) to sustainability defined in the wider sense (e.g. nation). From the entity's own perspective, the extent to which its contribution impinges on the sustainability of its own activity will also be of concern. The key to defining corporate sustainability is to reconcile these two outlooks…" (Atkinson 2000, p. 240).

4 A MODEL OF SUSTAINABLE ENTERPRISE DESIGN

With the two principles that emerge from our understanding of value it becomes clear exactly what it is a sustainable enterprise seeks to accomplish. A successful sustainable enterprise can be understood as one that fulfills both principles of concord. That is, the process and outcome of its activities contribute to both survival and realization of purpose at multiple hierarchical scales of organization. In this way the enterprise ensures its own capacity to survive and thrive while contributing to the capacity of its stakeholders and the socio-ecological system to do the same. By combining the two principles of concord we get a model of sustainable enterprise, as depicted in Figure 4.

Fig. 4. A Model of Sustainable Enterprise Design



This model shows that at each hierarchical level both survival and purposive needs must concord. In addition, the value flows at each level must concord with the requirements of higher and lower levels. The arrows in Figure 4 indicate relationships between various needs. The value flows that satisfy these needs can either conflict or harmonize. A successful sustainable enterprise will organize so as to achieve maximum harmonization among these relationships.

The top half of the model, the needs of purpose, are subjectively determined by individual and collective aspirations, but once defined it should be possible to objectively measure them. In contrast, the bottom half of the model, the needs of survival, can mostly be considered objective, but not fixed. They are objective because they can be given identities that indicate when the needs have been met, but they are not fixed because as systems evolve, the exact point at which these needs are met will likely fluctuate. At the individual level, basic needs theory tells us that survival needs are met when services equal or exceed basic biopsychic needs. For enterprises, Barnard and Simon's equilibrium theory tells us that survival needs are met when participant contributions equal or exceed inducements. At the socio-ecosystem level, ecological economic theory tells us that ecological sustaining functions require that resource regeneration equal or exceed resource use, and waste assimilation equal or exceed waste generation. It is not clear that a comparable identity for socially sustaining functions exists.

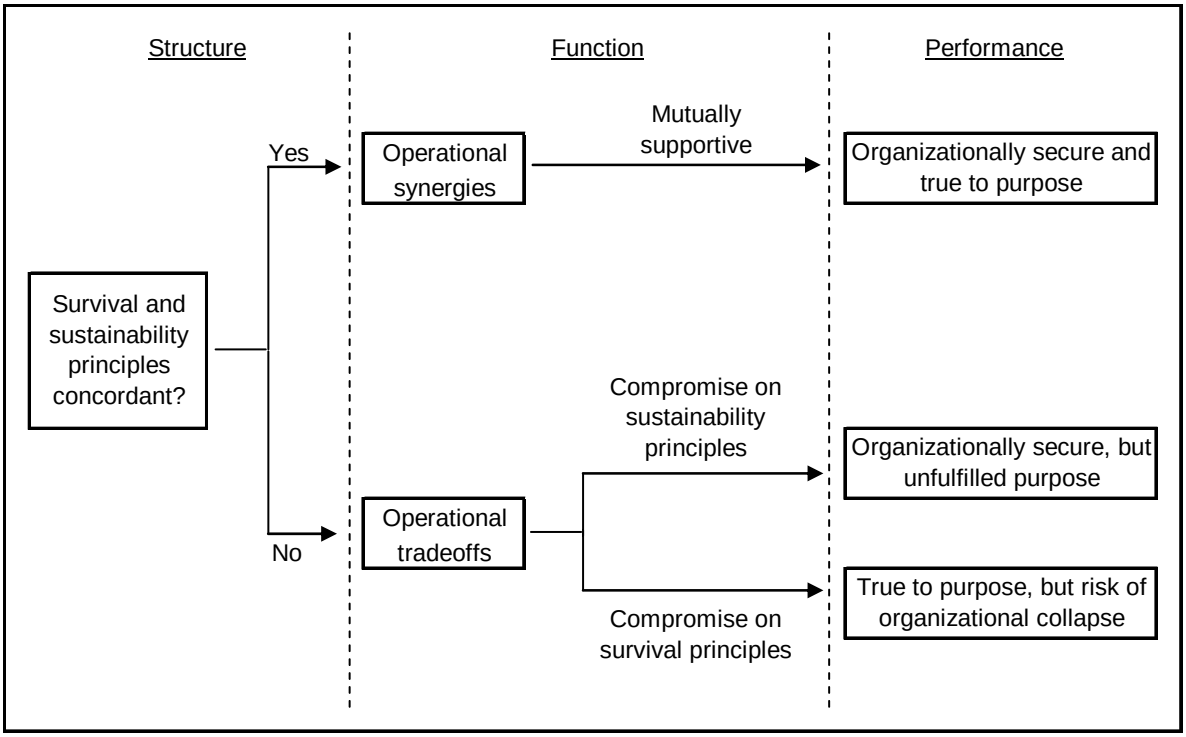
A model is an interpretation of an empirical phenomenon that provides intellectual or perceptual access (Bailer-Jones 2002). The model of sustainable enterprise described in this paper provides such intellectual access because it provides an understanding of the functions that must be performed by an enterprise's structure and operations, thereby allowing the formulation of descriptive statements. Its purpose is therefore to provide perspective for the considered activities of individuals by situating levels of social organization in a field of functional value relationships. Existing models suffer especially from a lack of integration of the psychosocial and biophysical requirements of sustainable development. For example, Starik and Rands (1995) use hierarchy and contingency theories to develop a model of environmentally sustainable enterprise. As the name would suggest, this model focuses exclusively on the biophysical ends of

sustainable development, and portrays a unidirectional relationship of the enterprise reacting (even if preemptively) to environmental contingencies. While this model does contribute to our understanding of enterprises embedded in a multi-level hierarchy of organization, it neglects the mutual contributions that an enterprise can make to these other hierarchical levels. At the other end of the spectrum, Laszlo (2003) uses the concept of value and stakeholder theory to develop a model of sustainable enterprise. But his model fails to recognize the limitation of providing a valid basis for attending to ecological functions that are biophysical in nature with a theoretical framework that is grounded in the ascribed value systems of humans. Extant models and definitions of sustainable enterprise touch on some of the key themes evident in this paper's model: organizational scale (Atkinson 2000, Keijzers 2002, Starik & Rands 1995), temporal scale (Dyllick & Hockerts 2002, Starik & Rands 1995), stakeholders (Dyllick & Hockerts 2002, Laszlo 2003), social development (Keijzers 2002), harmonization of value (Atkinson 2000, Laszlo 2003). But none are as inclusive or comprehensive as the value-based understanding proposed here.

5 TOWARDS A THEORY OF SUSTAINABLE ENTERPRISE DESIGN

When the implications of this model are drawn out, it has the capacity to explain, and possibly predict, the performance outcomes of enterprises that seek to operate in a sustainable manner. Thus, as depicted in Figure 5, an enterprise's organizational design is functionally linked to enterprise performance. Making this link allows for the formulation of imperative statements about sustainable enterprise performance.

Fig. 5. Performance Diagnostic of Sustainable Enterprise Design



From the understanding provided by the model of sustainable enterprise, several propositions can be offered, all originating from the enterprise's organizational design. If the enterprise approaches the requirements of the ideal-type model, in which its organizational structure and operations are designed in such a manner that survival and sustainability principles concord, then the organization is in alignment (Harrison 1983) and can operate synergistically. In other words, the activities that allow the enterprise to survive and thrive are the same activities that support the flourishing of individual stakeholders and the greater socio-ecological system. The principles of survival and sustainability are mutually supportive and serve to reinforce one another. As a result of the synergies that emanate from structural alignment, the organization is secure and operates true to its intended purpose. The character of such an enterprise is, therefore, that of the 'thriving' enterprise (as was depicted in the matrix of Figure 3).

Proposition 1: An enterprise design with concordant survival and sustainability principles will be organizationally secure and operate true to its intended purpose.

If the enterprise's structure and operations are designed in such a manner that survival and sustainability principles conflict, then the enterprise is forced inherently into a situation in which it must tradeoff accord with one principle for the other. It is important to distinguish the type of conflict and concord addressed by this model. All organizations will contain a certain amount of pluralism due to the diversity of perspectives, needs, and interests of its constituent stakeholders (March 1962, Pettigrew 1973, Pfeffer 1981). While such conflict has the potential to become dysfunctional, it is also a necessary component of healthy organizations. The conflict and harmony specified by this model is limited to that which is built into organizational structures, rules, and underlying logics (see Morgan 1986). Thus, the degree to which an organization is forced to sacrifice principles through tradeoff decisions is explained by its organizational structure.

Proposition 2: An enterprise design with discordant survival and sustainable principles will demonstrate tradeoffs between sustainability performance and organizational security.

In a tradeoff position, an enterprise that places primacy on its own survival will be forced to compromise on its sustainability principles. In such a case the enterprise may obtain organizational security, but it will not fulfill is sustainable purpose. Thus, the root cause for many enterprises which seek sustainability but cannot seem to truly embody the principles without harming the viability of their operations can be traced back to the fundamental structure of that enterprise. The character of such an enterprise is that of a 'hollow' enterprise.

Proposition 3: An enterprise that compromises on sustainability principles will be organizationally secure but will not fulfill its sustainable purpose.

In a tradeoff position, an enterprise that places primacy on the purpose of contributing to sustainable development will be forced to compromise on its survival principles. In such a case

the enterprise may remain true to purpose, but it risks organizational collapse. This explains the high failure rate of many public service enterprises intended to contribute to the public good, but which are designed in such a way that their purpose is fundamentally at odds with principles of survival. The character of these enterprises is that of the 'martyred' enterprise.

> *Proposition 4. An enterprise that compromises on survival principles will be true to purpose but will be at risk of organizational collapse.*

The enterprise's organizational design determines if survival and sustainability principles are mutually supported by operational functions or if tradeoffs must be made. But if an enterprise's design makes operational tradeoffs unavoidable, the decision of which principles to compromise is a matter of choice for the enterprise's stakeholders. In such a situation the sustainable enterprise model can be combined with political theories of organization (March 1962, Pettigrew 1973, Pfeffer 1981) to predict whether a conflict-laden structure will result in an unfulfilled purpose or a collapsed enterprise, or both. The priorities of the enterprise's 'dominant coalition', or those stakeholders with the most decision-making power, will ultimately determine the outcome of the tradeoffs decision. Or, put another way, the tradeoffs will demonstrate the priorities of the enterprise's dominant coalition.

> *Proposition 5. Which principles are traded off will be determined by the priorities of the enterprise's dominant coalition.*

6 DISCUSSION AND CONCLUSIONS

Terms such as 'need', 'requires', 'determines', and 'choice' have been used throughout this paper without their range and limits being clarified. The model and performance diagnostic of sustainable enterprise presented herein could therefore be interpreted as a case of a deterministic environment dictating enterprise-level structure in which the human stakeholders involved are forced to react as passive bystanders in a dynamic out of their reach and out of their control. This interpretation would be, however, not what is intended; the era of such deterministic models has

been largely transcended by a richer understanding of the relationship between human action and higher level structure (see Reed 1992). This model was developed with a view of human agents as intentional actors (Bird 1988) embedded in structure that is both constraining and enabling (Giddens 1976). An enterprise's structure is constraining because its functional capacity of coordinating human activity (Barnard 1938, Ouchi 1980) toward desired goals (Etzioni 1964, Perrow 1970, Scott 1964, Thompson & McEwen 1958) necessarily limits the available choice of actors. Yet at the same time, it is these very coordinated activity patterns that enable actors to achieve what would be unachievable individually. Thus, this model is best situated in a framework such as that provided by Hrebiniak and Joyce (1985), who view resource dependence and strategic choice as two complementary dimensions necessary to explain the evolution of organizational form.

In this vein, this paper's functionalist discussion of system 'needs' is not intended to impart an emergent teleology to those systems. Rather, the 'needs' and 'purposes' of higher level systems are metaphorical terms indicating necessary requirements of those systems if satisfaction of the very real needs and meanings that humans have invested in those systems are to be realized (see Bryant & Jary 1991, pp. 22-24). For example, as discussed in the introduction, the socio-ecological system's 'survival need' for sustainability is derived directly from the human desire to remain a part of that system. And, the socio-ecological system's 'purposive need' for development is derived from the human desire to realize a qualitative improvement in human well-being. This model serves the function of directing attention to important relationships spanning multiple spatial and temporal scales, and provides a potentially useful means of understanding and approaching the concept of sustainable enterprise.

6.1 Implications for research and practice

This model suggests that managerial systems and tools designed to move an enterprise toward sustainability are likely to lead only to marginal successes. While a management tool may be able to assist a manager in making a tradeoff decision between competing principles, it cannot significantly modify the performance outcomes of an enterprise with an inherently unsustainable organizational design. If sustainable enterprise is the goal, what is needed is wholesale

organizational re-design. While stakeholders do hold agency over enterprise design, it must be remembered that the process of organizational design is not a wholly calculated procedure, in the same way that sustainable architecture and sustainable product design are. Organizational design is an organic, emergent process of negotiated human action produced and reproduced over time, involving both intentioned and contingent behavior.

This suggests that research into entrepreneurship, or intrapreneurship, understood as the creative, collaborative process of organization design (Sarasvathy 2004a), is vital to gain a stronger understanding of how sustainable enterprise can be systematically achieved. Greater attention must be paid to those innovative entrepreneurs who are breaking the isomorphic mold (DiMaggio & Powell 1983) by creating new organizational structures and pioneering business models that attempt to bridge the gap between enterprise success and the creation of value that is in harmony with the socio-ecological system's multiple hierarchical levels. Schumpeter (1934) argues that innovative entrepreneurs possess a disproportionate ability to alter socio-economic patterns by making 'new combinations,' resulting in a process of 'creative destruction' that sees new patterns of production replacing the old. Sarasvathy offers empirical support for this view. She argues that, "Entrepreneurship creates value in society that is disproportionate to its role within the economy," and that "credible evidence for this has been found – whether entrepreneurship is modeled as innovation (Griliches 1984), or entry (Geroski 1989), or an independent organizational form (Shane 1995)" (Sarasvathy 2004b, p. 708). Evidence suggests such entrepreneurial initiatives are in fact proliferating as so-called social (Dees 1998), environmental (Isaak 2002, Schaper 2002), and sustainable (Tilley & Young 2004) entrepreneurs are setting out to create different forms of value.

6.2 Conclusions

It has become clear that to meaningfully contribute to sustainable development, leaders of enterprise must manage the functional relationships that span the entire socio-ecological system. These relationships connect entities in a complex web of interconnection, characterized by relationships of functional value in which one entity contributes to the existence of another. An examination of value theory establishes two principles of sustainable enterprise. Principle I deals

with managing relationships across multiple organizational and spatiotemporal scales. Principle II deals with ensuring the survival and flourishing of the individual enterprise. When combined, these two principles of concord provide a comprehensive ideal type model that describes the organizing principles of enterprises that strive to contribute to sustainable development. This model allows for the formulation of descriptive statements about the organization of sustainable enterprise. When functionally linked with performance outcomes the model becomes a diagnostic tool that allows for the formulation of imperative statements. This paper has attempted to demonstrate both the theoretical soundness, and operational utility, of the model.

Implications of this model point to an organization's structural and operational design as the determining feature of sustainable enterprise performance. The task of wholesale organizational design or redesign is significantly more challenging than the implementation of tack-on management systems and tools. Leaders of enterprise seeking to contribute to sustainable development thus face significant obstacles in their ability to realize the desired system-wide outcomes. However, entrepreneurship is a dynamic force of often dramatic, discontinuous system-wide change from within. Entrepreneurs have a proven disproportionate ability to alter patterns of human activity. Emerging evidence suggests entrepreneurs are already in pursuit of the sustainable enterprise, and attention to this phenomenon offers promise at better understanding the contributions enterprise can make to a future of planet Earth *with people* – a future in which people both survive and thrive.

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