From Theory To Practice: Taking General Systems Theory From A Theoretical Concept To A Successful Business Practice

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Abstract

This paper will introduce a new comprehensive, scalable, and systemic business model based on Ludwig von Bertalanffy's Informal Survey of Main Levels in the Hierarchy of Systems, (pursuant to Kenneth Boulding). This new model, greatly influenced by von Bertalanffy's thoughts and observations in his seminal book, General Systems Theory, also incorporates developments in general systems theory as well as other complementary disciplines to form a cogent and dynamic new model for business organizational thinking.

The development of this new model, keys into von Bertalanffy's statements that "general systems theory should further be an important regulative device in science" and that " the existence of laws of similar structures in different fields makes possible the use of models which are simple and better known, for more complicated and less manageable phenomena."

This enterprise-wide model can be used both as a managerial tool and as an organizational framework. It is an "open-systems" model, which may be used for an existing business as well as for the creation of new business ventures. A general overview of the model's fields, functions, and relationships are provided.

This research seeks to further bridge the gap between scientific thought and operational practice for the development and continuance of more natural and organic organizations. Recommendations for the use of this model and implications of its application are also explained.

Keywords: systems theory for business; operationalizing systems theory; general systems model for a business enterprise

Introduction

The scientist has a basic need for a classification system, one that is consistent as possible with the phenomena under observation and one that will hold up long enough to be useful. Behind every classification system lies a theory or hypothesis about the nature of the data and their basic patterns of organization.
--Edward T. Hall, The Hidden Dimension.

Ludwig von Bertalanffy first formulated the notion of General Systems Theory (GST), orally in the 1930's, and in various publications after World War II [1] His publication of General Systems Theory in 1968 brought together much of his work over the previous decades.

Ervin Laszlo in his 1974 forward to von Bertalanffy's "Perspectives On General Systems Theory remarked that Von Bertalanffy both created a *"new paradigm for the development of theories"* and gave us a new paradigm for transdisciplinary synthesis.[2]

This paper will introduce a new comprehensive, scalable, and systemic business model based on Ludwig von Bertalanffy's Informal Survey of Main Levels in the Hierarchy of Systems, (pursuant to Kenneth Boulding). (See: Appendix)

The scope of this paper is to introduce this new model and give a brief explanation of its fields, foundations, and its potential development. It is not to solve the riddle of the Sphinx or to serve as an instructional manual for boiling the ocean. As von Bertalanffy himself said, in the last resort, disappointment results from making what is a useful model in certain respects into some metaphysical reality and "nothing-but" philosophy as has happened many times in intellectual history. [3]

This model ties together people and processes in a unified open system. Represented in what the author describes as "circular hierarchy", this model can be used both a thinking tool and as an organizational framework for businesses both small and large.

C. West Churchman stated… "(W)hen one is considering systems it's always wise to raise questions about the most obvious and simple assumptions." It is with this in mind that we progress with the introduction of this new model. [4]

Definition Of General Systems Theory

It can be challenging to get a clear definition of what exactly what General Systems Theory is. Even Von Bertalanffy himself has defined General Systems Theory in a multiplicity of ways in various publications over time.

Von Bertalanffy wanted to develop a method where different scientific disciplines shared a framework to communicate isomorphism about their specific disciplines. His response to that challenge was the development of General Systems Theory (GST). Von Bertalanffy commented he introduced the term "General Systems Theory, "deliberately in a catholic sense." He wanted his theory to have a broad and liberal scope. [5]

Furthermore von Bertalanffy states "It seems therefore, that a general theory of systems would be a useful tool providing, on the one hand, models that can be used in, and transferred to, different fields, and safeguarding, on the other hand, from vague analogies which often marred the progress in these fields." [6]

General systems theory, therefore, is "a general science of "wholeness" which up until now was considered a vague, hazy, and semi-metaphysical concept. In elaborate form it would be a logico-mathematical discipline, in itself purely formal but applicable to the various empirical sciences". [7]

Von Bertalanffy even seems to have set the context for the use of GST in business in a work published before General Systems Theory. Below are his comments "Robots, Men and Minds" published in 1967.

General systems theory (in the narrow sense of the term) is a discipline concerned with the general properties and laws of "systems". A system is defined as a complex of components in interaction, or by some similar proposition. Systems theory tries to develop those principles that apply to systems in general, irrespective of the nature of the system, of their components, and of the relations or "forces" between them. The system components need not even be material, as, for example, in the system analysis of a commercial enterprise where components such as buildings, machines, personnel, money and "good will" of customers enter. [8]

There is another important consideration in the definition of General Systems Theory. In many areas, in both theory and practice, "a way of doing something" has become confused with a "system". A grocery store is not a system simply because it is filled with a variety of groceries. Nor is a company or business, with all of it's fragmentations, a system simply because those fragmentations exists under the same roof or authority.

General Systems Theory as described by von Bertalanffy is about scientific exploration of "wholes" and "wholeness". [9]Through that exploration, we can learn not only how things work, but also how things work together. In addition, through that exploration we can learn to eliminate the confusion between "a way of doing something" from a true system.

Case For A Need For New Models

Business, as it exists today, has done great things for society. It has provided tremendous variety of goods and services. It has furnished incredible standard of living and it has created a tremendous economic engine.
However, often when discussing new business models it can devolve into Quantum physics vs. Newtonian physics-type discussion for which there is no escape. Why try and fix something that's not broken? Because there doesn't have to be anything "wrong" to make things better.

New business and new business structures simply require new models. As rapidly as business has changed over the past two decades, we have not changed our fundamental model of business. Few could argue business that technology, globalization, and the Internet have permanently and fundamentally changed the face of business. What are needed are new structures and new models to enhance and improve the quality of the business we do and to assist us in responding to these and other new challenges.

Consider the organizational chart. The standard organization chart mixes people and processes in a way that would confuse even the most sophisticated thinking person. Stafford Beer stated: (W)hat this orthodox organization chart leaves out of account, when it comes to understanding intuitions, is that we are not dealing with pistons, pumps and distributor arms, but with people; and the connections between parts are not crankshafts, pipes and electrical wires but human relationships. [10]

It is not just the organizational chart but also the relationship between the elements, both internally and externally that need reevaluation. Von Bertalanffy knew this also when he opined, "Dynamic interaction appears to be a central problem in all fields of reality.[11] It is as important that the "parts" or elements of a business have profitable interactions for the overall health of the business. But how is this interaction possible when business is departmentalized, compartmentalized and cut off from natural paths of growth and development? New models allow for more appropriate business responses both internally and externally.

History Of This Model

The inspiration of an idea can come from anywhere. Sam Colt got the idea for a revolving pistol by watching the turning paddle wheel of a steamship. This author got the idea for a circular model of business from Ludwig von Bertalanffy's Informal Survey of Main Levels in the Hierarchy of Systems (pursuant to Kenneth Boulding). On the surface, there is nothing inherent about von Bertalanffy's model that says "business." And yet, like Mr. Colt, the author saw something just a little different than what was visible to the naked eye.

These are the author's exact comments from the a document created in December of 2003, "In a book "General Systems Theory" by Ludwig von Bertalanffy, he proposes, in a table form, An Informal Survey of Main Levels in the Hierarchy of Systems. I have taken these categories and applied my own sense of warped logic to them as they relate to a business enterprise. If the organizational chart was the backbone of the corporate structure of the 20th century, I propose this as a model for a 21st century venture."

From there a "relationship" was born and Ludwig von Bertalanffy and his thinking about General Systems Theory have continued to lead the way in the development of this new model of business.

Von Bertalanffy stated, "…As practice in applied systems analysis shows, diverse systems models will have to be applied accordingly to the nature of the case and operational criteria." [12] This speaks to the current application of von Bertalanffy's chart to this new model. Business, both small and large, is a complicated, multi-facetted undertaking and appropriate new models of business should constantly be developed and deployed.

This new model of business proposes a circular model of business as opposed to the usual linier model for business. Russell Ackoff noted, "A circular organization is intended to maximize opportunities for participation by its members, to maximize the extent to which the organization serves the purposes of its members and by so doing, better serves it own purposes. [13]

Circular model also have an advantage as a thinking tool according to Buckminster Fuller. He said "it is the characteristic of "all" thinking--of all system's conceptioning—that all lines of thought interrelationships must return cyclically upon themselves in a plurality of directions, as do various great circles around spheres**.** [14]

In explaining the Informal Survey of Main Levels in the Hierarchy of Systems von Bertalanffy's declared, in part, "this survey is impressionistic and intuitive with no claim for logical rigor."[15]This author would like to go on record as declaring the same thing.

The Model

We use models everyday for many things. A recipe is a model and so is sheet music. Currency, language, and even the organizational charts are models. What goes into a model and what gets left out can be useful or it can be problematic.

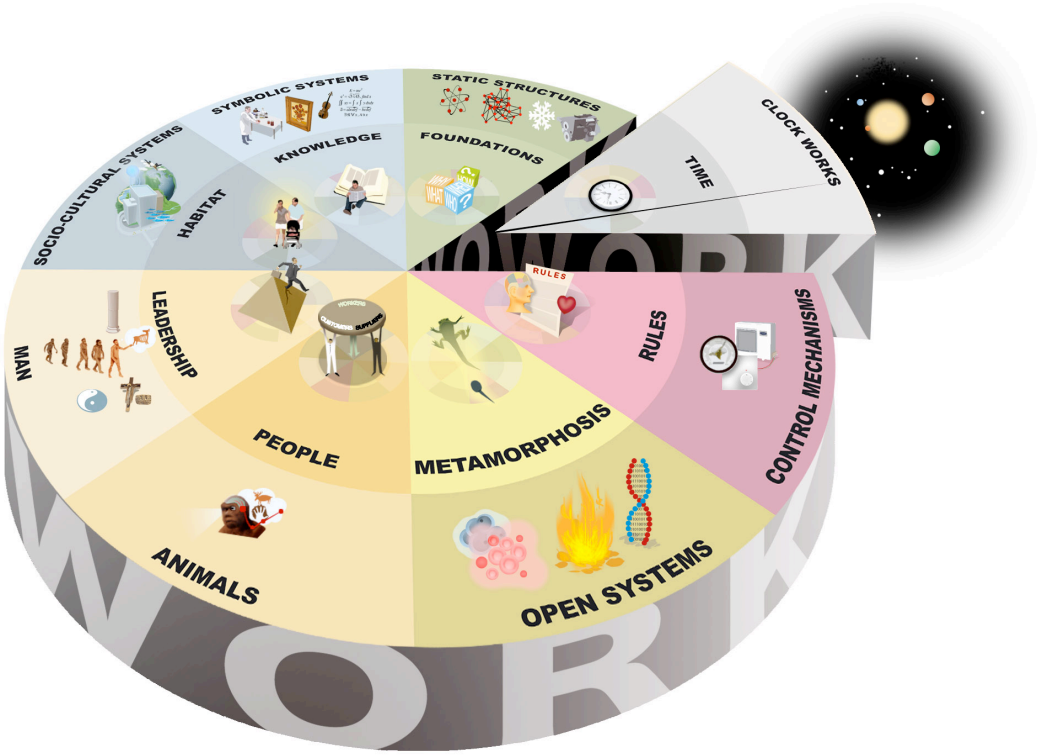
Von Bertalanffy issued the following cautions about models. "The advantages and dangers of models are well known. The advantage is in the fact that this is the way to create theory-i.e., the model permits deductions from the premises, explanation and prediction, with often unexpected results. The danger is oversimplification: to make it conceptually controllable, we have to reduce reality to a conceptual skeleton- the question remaining whether, in doing so, we have not cut out vital parts of the anatomy. The danger of oversimplification is the greater, the more multifarious and complex that phenomenon". [16]

This model new model of business must be viewed in totality to be fully understood. Von Bertalanffy noted, "Since the fundamental character of the living thing is its organization, the customary investigation of the single parts and processes cannot provide a complete explanation of the vital phenomena. This investigation gives us no information about the coordination of parts and processes". [17]
This model is not about one thing, for instance, the singular view that the reason for being in business is to return shareholder value, it is about many things. And it is about the interactions and total structure of the model.

This model should be used in the following ways:

1. It should be used to show relationships.
2. It should provide direction on categories and interactions of business.
3. It should stimulate thinking and conversation.

This author believes a visual representation of this model will be of service in the facilitation of understanding the model and it's relationships. Below is the model (Figure1) and a brief explanation of its components.



(Figure 1)

This model's fields follow the impressionist lead of von Bertalanffy's original survey.

There are nine "fields" in this model. In physics, a field is an assignment of a physical quantity to every point in space (or, more generally, space-time). A field is thus viewed as extending throughout a large region of space so that its influence is all-pervading. It is interesting to note that the strength of a field usually varies over a region. This author believes the strength of each field will vary depending on a variety of factors, including, but not limited to, interactions, the nature of the task, the demands on the systems, etc.

The term "fields " has also been chosen for its metaphoric value as it relates to growth and development. These fields are designed to become isomorphic breeding grounds for the development of new paradigms both inside each field and throughout the entire system. These fields interact to form a biome, or an entire community of living organisms in a single major ecological area, in this case, the business environment.

The fields include **WORK, FOUNDATIONS, TIME, RULES, METAMORPHOSIS, PEOPLE, LEADERSHIP, HABITAT**, and **KNOWLEDGE.**

The relationships can be described as direct, implied, circular and most importantly mutually recursive. Each field is always in constant interaction with all other fields.

The “divisions” between these components are at best oblique, having sides of unequal length or form, and interactions take place through “permeable membranes” that act to create individuality while allowing of a more complete assimilation when and if necessary. The membrane of a normal a cell wall can be penetrated at almost every point on its surface, but it cannot be penetrated by everything and not at all times.

One other important definition is that of business. Rather an enterprise or an individual, a multi-nation corporation or a neighborhood flower shop, the definition of business should cover a lot of isomorphic ground.

We have become almost myopic discussing business, focusing only on the corporation and not the small or individual business. Yet, Sam Walton had one store and literally borrowed ideas from his competitors before making Wal-Mart a retail giant. Tiffany’s was a “stationary and fancy goods emporium” in 1837 and even the large mutli-national company Fujitsu began not as an electronics firm but a mining concern.

For the purposes of this model, business is simply the commercial exchange of goods and/or services.

WORK

What is work? Real work is the art of doing work.

The Greek word for work was *ponos*, taken from the Latin *poena*, which meant sorrow. Our current perspectives regarding work seemed to have developed in the 16th century out of the Protestant Reformation.

They are based on the combined theological teachings of Martin Luther and John Calvin. Max Weber, the German economic sociologist, coined a term for these new beliefs about work calling it the "Protestant ethic." This is where the concept of work as a “duty” originated. I may also explain some of our current thinking about work.

As represented in this model, work is a focused activity for a directed purpose. Work is also a structure used to conceive clearly designed activities, which are well adapted to some given context. More often than not, work, the activity, is left out of theoretical constructs that are supposed to be designed for the purposes of helping work. Work, in an open system, may also posses many of the autopeoistic characteristics needed to maintain a system.

Autopoiesis refers to the characteristic of living systems to continuously renew themselves and to regulate this process in a way that the integrity of their structure is maintained. Whereas a machine is geared to the output of a specific product, a biological

cell is primarily concerned with renewing itself. Upgrading (anabolic) or downgrading (catabolic) processes run simultaneously. Not only the evolution of a system, but its existence in a specific structure becomes dissolved into process. In the domain of the living, there is little that is solid and rigid. An autopeoistic structure results from the interaction of many processes. [18]

Work as a designed, not assigned function is a strong consideration for this model. Von Bertalanffy, writing about general characteristics of open chemical systems said, "In order to perform work, it is necessary that the system be not in a state of equilibrium but tend to attain it; only then can energy be won….The apparent "equilibrium" found in an organism is not a true equilibrium incapable of performing work; rather it is a dynamic pseudo-equilibrium, kept constant at a certain distance from true equilibrium; so being capable of performing work but on the other hand requiring continuous import of energy for maintaining the distance from true equilibrium". [19]

As it happens, the solar system has one body (the sun) whose mass is much larger than any of the other masses, larger in fact, than the mass of all of the other bodies together. [20] Work occupies a similar position in this model. It compromises a much larger mass, thought not necessarily the same density than perhaps all the other areas combined.

It is very important that the concept of work be redesigned, rethought and revisited for this model to have the life and vibrancy for which it is capable.

FOUNDATIONS

If the set-up is messed up, so is everything else.

Foundations are needed to build, grow, and maintain a business. Before anything happens, you must know what business you are in, what your business does, what your business wants to do, and how the business will operate.

Von Bertalanffy sought a comprehensive outlook on foundations from the electron microscopic to the macroscopic level. His description of structural formulas and anatomical descriptions are ideal for the foundations of a business. Take a standard franchise agreement. It spells out in exact detail what the responsibilities are of the parties engaged. A comprehensive business plan does the same.
When considering business foundations and their subsequent use, structure and process go hand in hand. Von Bertalanffy reminds us that." In the last resort, structure (i.e., the order of parts) and function (order of processes, may be the very same things; in the physical world matter dissolves into a play of energies, and in the biological world structures are the expression of a flow of processes. [21]

Erich Jantsch states a slightly different, but complementary view in The Self-Organizing Universe; " The notion of system itself is no longer tied to a specific spatial or spatio-temporal structure nor to a changing configuration of particular components, nor a set of internal; or external processes.

Rather a system now appears as a set of coherent, evolving, interactive processes, which temporarily manifest in global structures that have nothing to do with the equilibrium and the solidarity of technical structures**.** [22]

Additionally, this author recommends the concept of "loose structure". This concept is backed by Christopher Alexander in a Timeless Way Of Building when he suggests, " Instead, to strike a balance between being too narrow and too loose, you must express and visualize a pattern as a kind of fluid image, a morphological feeling, a swirling intuition about form, which captures the invariant field which is the pattern. [23]

TIME

Time is the universal equalizer.

C.S. Lewis declared the future is something which everyone reaches at the rate of sixty minutes an hour, whatever he does, whoever he is. [24] And Steward Brand opened the book "The Clock Of The Long Now" with this: Time and Responsibility. What a prime subject for vapid truisms and gaseous generalities leading up to the most boring sermon. [25]

This paper is not about reinventing time, but it certainly wants to change the view of time as it relates to business and the use in this model. Modern science applies whatever sort of space and time is most convenient and appropriate for describing the events in nature [26] and business should do the same.

Watts Wacker and Jim Taylor wrote this eloquently about "business time". "For business, the paradox of time is, in part, the paradox of the visionary: To succeed in the short term, you need to think long term, yet the greater your vision and the longer the time interval over which you predict results, the greater the risk you will be unable to take the steps necessary in the short term to achieve long-range ends. Discoveries about the future tend to make actions in the present irrelevant, but only if you look at them in the context of future activity. Activities in the present tend to make discoveries about the future irrelevant, but only if you judge them by the standards of short-term success.
By its very nature, the future destabilizes the present. By its very nature, the present resists the future. To survive, you need duality, but people and companies by their very nature tend to resist living in two tenses". [27]

This author suggests applying a new time frame to all business ventures. The above referenced, "Clock Of The Long Now" is about building an extremely slow clock that will keep perfect time for the next 10,000 years. Following Brand's lead, this author suggests a requisite time frame consideration for business should be between one second and 10,000 years. Planning should be no shorter than one second and no longer than 10,000 years but always in between. Imagine for a second thinking about doing business for 10,000 years, it changes the view on what long-term thing is. It also gives an established minimum/maximum field of time to work with.

Thinking about time in a different manner creates the opportunity to use time in a different manner. Time as a strategic component of business, can not only lead to better planning but better, more complete scenario planning.

If a 10,000-year time frame seems a bit far-fetched for business it's already almost happened. In 1759, at the age of 34, Arthur Guinness took over a small, unused brewery at St James Gate in Dublin and leased it for 9,000 years at the rate of £ 45 a year. Guinness is currently in their 347th year of business and still going strong.

RULES

Rules allow things to happen as opposed to preventing things from happening.

Mission statements aren't rules. Neither are employee handbooks, codes of ethics or corporate resolutions. They are representation of rules. Yet rules are often the "guidance systems" both for business operations, behaviors, and communication.

Systems and cybernetics are often confusingly mentioned in the same sentence. Von Bertalanffy sought to clarify this when he warned, "this model (cybernetics) is of wide application but should not be identified with "systems theory" in general. [28] However, this new model requires a model of control and there are some cybernetic concepts that may provide the basis an interesting rules framework.

Cybernetic theory has four components: variety, circularity, process and observation. Variety relates to the information and communication/control theories and emphasizes choices. Circularity ignores concepts of hierarchy in systems, favoring a more level playing field. Process looks at feedback loops and involves regulations within systems. Observation involves decision-making and how we compute conclusions. [29]

Perhaps it is because of its electrical/mathematical foundations that cybernetics is sometimes thought of as leading to increased mechanization and automata. This author does not have the knowledge or the background in cybernetics to embrace, refute, or debate this concept.
However, this author believes the aforementioned four components of cybernetic theory, when further "humanized", perhaps in the direction of Stafford Beer and other, may hold tremendous promise for improving business operations, behaviors and communications.

When making rules for business and this model, it may also be helpful to consider the following question. Do formal laws merely codify existing social practices or do they play a role in shaping morality? [30] This author believes it is both and that duality should receive strong consideration.

METAMORPHOSIS

Change without growth is like motion without movement.

What happens when conditions like the economy, politics, or society change the business landscape? Ideally, it should constitute a growth opportunity at every step. In the biological world, change takes place with a purpose. It takes place for the maintenance of the organism.

Stuart Kauffman pointed out, "Things capable of evolving –metabolic webs of molecules, single cells, multi-cellular organisms, ecosystems, economic systems, people- all live and evolve on landscapes that themselves share a special property: They allow evolution to "work"." [31]

So how can we allow this type of evolution in this business model?

Business can learn to understand those perturbations, both large and small as a function of growth. Biologically, von Bertalanffy explained it as such: "Progressive mechanization, however, implies loss of regularbility. As long as the system is a unitary whole, a disturbance is followed by the attainment of a new stationary state, due to the interactions within the system. The system is self-regulating. If the system is split into independent casual chains, regularbility disappears. The partial processes will go on irrespective of each other. This is the behavior we find, for example, in embryonic development, determination going hand in hand with decrease in regularbility. [32]

The systemic solving of problems, not the fragmentation and compartmentalizing of problems is an excellent progressive, construct for this model of business. Change for business should not be a problematic experience but a metamorphic opportunity.

PEOPLE

There is not a business that operates without people.

Russell Ackoff argued that "a central problem of our young systems age is that of humanizing organizations: increasing the compatibility of organizational and individual objectives".
He further suggested the "(s)oluition of this problem in a whole-oriented organization requires developing relevant incentives and ways of providing individuals more meaningful participation in their organizations. [33]

But who are these individuals and what are relevant incentives? The relevant incentives are beyond the scope of this paper Margaret Wheatley, however, said of these individuals; "We cannot hope to influence any situation without respect for the complex network of people who contribute to our organizations [34]

That "complex network of people" in this model extends outside the common boundaries of "company" or "business". People are the "human interface" of business and fall into three distinct categories: customers, suppliers, and workers. The author refers to this triad as the "Three-Legged Stool of Business". Each of these constituencies is obviously

free to operate independently in any manner they choose but each is aware it is their collective results are what matters. One of the three groups cannot successfully be removed from the equation without a devastating negative impact on the others. Conversely, the increased performance or efficiency in one area, or by one group will benefit the whole. This is also a clear example of a system within a system.

Also, this arrangement of people may provide the philosophical underpinnings for something even more important. This author believes if this "Three-Legged Stool of Business". Is given the proper consideration, we may finally begin the process of moving away business organizations that employ humans to developing and growing human organizations that employ business. The results of this would be impressive.

LEADERSHIP

There has rarely been a charge of under-management or over-leadership.

New models of business will certainly require new leadership structures and perspective. As Stafford Beer stated: "In order to get rid of the concept of an institution as a fixed entity, we have to get rid of the classical picture of its organization. You know how this looks. The institution's activities are divided into chunks, which are also perceived as entities; these chunks are divided into smaller chunks and so on. In every chunk there is a boss-man with lesser bosses reporting to him and running the smaller chunks". [35]

There are indications things are already changing. Francis Fukuyama writes:"The early twentieth century corporation and the factories and offices it created were bastions of hierarchal authority, controlling thousands of workers through a system of rigid rules in a highly authoritarian manner. What we see in many contemporary workplaces, however, is something of the opposite: formal rule-bound, hierarchical relationships are being replaced by flatter ones that give subordinates greater scope for authority or else by informal networks. In these workplaces, coordination bubbles up from below rather than being imposed from the top, and is based on shared norms or values that allow individuals to work together for common ends without formal direction.
It is based, in other words, on social capital, which becomes more rather than less important as the complexity and technological intensity of an economy increases". [36]

Leadership, not management is the key to advancing business in this model. Management, as it is practiced today, promotes hierarchy. Leadership, in this model, promotes cooperation. Not everyone can manage but everyone has the ability to lead. Peter Senge addresses this when he reveals, " One of the paradoxes of leadership in a learning organization is it is both collective and highly individual. Although the responsibilities of leadership are defused among men and women throughout the organization, the responsibilities come only as a result of individual choice. [37]

And moving from a management model to a leadership model in business will certainly be a learning task.

HABITAT

What is valued most in business is recorded, remembered and relived.

Von Bertalanffy wondered, "Is cultural change and evolution essentially expression of an inherent and autochthonous dynamics or is it or is it brought about by cultural diffusion? Is history a sequence of individual, unrepeatable and therefore merely describable events, or does it show recurrences and regularities as, respectively, the opposing "idiographic" and "nomothetic" views of history contend? [38]

Restated is culture a factor of its own existence or can culture be a driving force in the history and direction of a business. Does business history itself bounce back and forth between hard facts and abstract statements? Of course it does, and culture is certainly a driving force behind the making of business history.

The observed fact is that culture takes a long, long time to learn. The observed fact is also that individuals are highly resistant to changing the picture of their world their culture projects to them. [39]

However, by changing the structure of organization, perhaps culture, and the business environment in which it exists can progress. Bela Banathy's concept of a "Human Activity System" offers great promise. Banathy describes a Human Activity System as "an assembly of people and other resources organized into a whole in order to accomplish a purpose. The people in the system are affected by being in the system, and by their participation in the system they affect the system. People in the system select and carry out activities -- individually and collectively -- that will enable them to attain a collectively identified purpose." [40]

The development of a common language, the emergence of natural relationships and the principles of organic, piecemeal growth are all parts of a cultural landscape in organizations that can designed and grown by the people in the organization.
Under the optimal circumstances in this model, these patterns will emerge locally, naturally, and holistically.

KNOWLEDGE

Knowledge is information with context.

As complexity increases and information has increasing value, we must find a way to systemically transform information into knowledge. But it is also important to understand where we are with information and knowledge today.

In "The Social Life Of Information" made the following statements about the context of information today. "Some of the people driving us all hard into the future on the back of new technologies appear to assume that if we all focus hard enough on information, then we will get where we want to go most directly. This central focus inevitably pushes aside

all the fuzzy stuff that lies around the edges-context, background, history, common knowledge, social resources. [41]

This certainly indicates the contextual nature of information and von Bertalanffy's understanding of information, slightly before the "Information Age", is as valid today as it was then.

"Facts, observations, data, and protocols, are not simply "given" as raw material of science. They are not only selected from an unlimited number of possible and actual observations, but are created in accordance with an accepted conceptual universe. Any perception and any scientific observation is already and interpretation. There is no "things in themselves" which can be expressed in physicalist "thing language". What observations a relevant and how they can be organized depends on the conceptual schemes that cannot be derived from those observation" [42]

Demming certainly validates this when he says, "Knowledge has a temporal spread. Knowledge comes from theory. Without theory, there is no way to use information that comes to us in an instant. [43]

The important think to understand about knowledge is it's contextual nature.
This paper is information. How much knowledge it contains depends on how it is used. This is where the concept of "operacy" is important.

"Operacy is a term coined by recognized creative thinking teacher Edward de Bono. Operacy involves such aspects of thinking as: other people's view; objectives; alternatives; consequences; guessing; decisions; conflict-resolution; creativity and many other aspects not covered in the thinking used for information analysis. These things are part of 'pro-active' thinking, not the usual 'reactive' thinking". [44] A change in the way we view information and knowledge changes the information and knowledge.

Conclusion

This paper steered clear of concepts such as global economies, emerging technologies, and corporate consolidations, some of the bigger problems that seem to slip into a paper about business and new business models. This is not done out of naïveté, this is done out of design.

It appears that the best hope for this model, and other system models like it, is that they are initially grown, developed, and maintained on a smaller, local level. Both biological evolution and business evolution do not determine a course, but rather provide the possibilities and present the constraints.

The litany of operational details for the implementation of this model could easily span another two or three papers. This however, is an introductory paper and many specific

details in relation to implementation are beyond the scope of this paper. There are however, a few suggestions for implementation this author would like to offer.

For an existing company, an excellent framework for the implementation of this model of business may be found in the concepts of Interactive Planning and Idealized Design forwarded by Russell Ackoff. Corporate change is an inside job and must be designed and implemented by the people who those businesses affect the most.

For new and smaller companies, this model can serve as a framework for an entirely new way of doing business through the development of new ideas, new ways of thinking and the creation of new models for growing and developing a business.

Business has developed a remarkable capacity for fixing problems. It is time that business develops an even greater ability for solving problems. New models such as this can serve to get that process started. It is evident to this author that science in general and General Systems Theory specifically, supports the concept of an organic, living and open systems model of business.

Finally, like Belgian surrealist painter Réné Magritte's notable work, *Ceçi n'est pas une pipe* (This Is Not A Pipe), this model is not a business. It is merely a model for the possible arrangement of business elements. If used to create new ideas, new processes, and new paradigms, this model will truly find its usefulness realized.

FOOTNOTES

1. Von Bertalanffy, Ludwig, *Perspectives On General Systems Theory*, George Braziller, New York, 1975, 153.
2. Ibid, 12.
3. Von Bertalanffy, Ludwig, *General Systems Theory*, George Braziller, New York, 1968, 23-4.
4. Churchman, C. West, *The Systems Approach*, Dell Publishing Co., Inc., New York, 1968, ix.
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Appendix

An Informal Survey of Main Levels in the Hierarchy of Systems. Partly in pursuance of Boulding, 1956b

LEVELS	DESCRIPTION AND EXAMPLES	THEORIES AND MODELS
Static Structures	Atoms, molecules, crystals, biological structures form the electron-microscopic to the macroscopic level.	E.g. structural formulas of chemistry; crystallography; anatomical descriptions
Clock works	Clocks, conventional machines in general, solar systems	Conventional physics such as the laws of mechanics
Control Mechanisms	Thermostat, servo-mechanisms, homeostatic mechanisms in organisms	Cybernetics, feedback, information theory
Open Systems	Flame, cells and organisms in general	(a)Expansion of physical theory to systems maintaining themselves in a flow of matter. (b) Information storage in genetic code (DNA)
Lower Organisms	"Plant-like" organisms. Increasing differentiation of system (so-called "division of labor" in the organism); distinction of reproduction and functional individual "germ track and soma")	Theory or model almost lacking
Animals	Increasing importance of traffic in information (evolution of receptors, nervous systems); learning; beginnings of consciousness	Beginnings in automata theory (S-R (stimulus-response) relations) autonomous behavior (Relaxation oscillations) etc.
Man	Symbolism; past and the future, self and world, self-awareness etc., as consequences. Communication by language, etc.	Incipient theory of symbolism
Socio-Cultural systems	Populations of organisms (humans included) symbol determined communities (cultures) in man only	Statistical and dynamic laws in population dynamics, sociology, possibly history. Beginnings of a theory of cultural systems
Symbolic systems	Language, logic, mathematics, sciences, arts, morals, etc.	Algorithms of symbols (e.g. mathematics, grammar); rules of the game, such as visual arts, music.