

## **A Value Network Approach for Modeling and Measuring Intangibles**

**Proprietary Material**

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### **Introduction**

Interest in intangibles and corporate transparency has increased as business thinking evolves from bureaucratic and mechanistic models to more organic perspectives emerging from biology and living systems theory. Yet, many people working in the intangibles arena, including knowledge management, inappropriately apply traditional business methods, tools, and frameworks to intangibles. This fundamentally different understanding of business and economic activities requires new approaches.

Mastering value creation in the knowledge economy requires appreciating the pivotal role of intangibles in the business model and a thorough understanding of network dynamics. Although important groundwork has been laid with recent breakthroughs in managing intangibles as assets, current thinking and practice does not go far enough in applying the new thinking about intangibles with a true systems thinking perspective. This paper describes a way of modeling business relationships that incorporates new thinking around knowledge and intangibles, networks and organizational complexity. The methodology is grounded in principles of living systems, and represents a decided shift away from mechanistic models. It expands current thinking about intangibles in three important ways.

1. It goes beyond the asset view of intangibles to also consider intangibles as negotiables and as deliverables.
2. It proposes a way to model organizations and business relationships as living networks of tangible and intangible value exchanges.
3. It provides a way to link scorecards and indexes to specific business activities, allowing people to more fully understand the impact of their decisions and actions in both tangible and intangible terms.

### **Enterprise as a Living System**

The key business question is, “How is value created?” The traditional answer to that question is – “through the value chain.” The value chain model, however, is a linear, mechanistic view of business that is based on the industrial age production line. This type of limited process perspective is woefully inadequate to understand the complexities of value in the knowledge economy. Further, most approaches to analyzing business relationships have not taken into account the role of *knowledge* and *intangible* value exchange as the real foundation for value creation.

Most of the management tools we are familiar with are “engineering” type tools. They were developed to break down a complex system into its parts or processes and fine-tune them for maximum efficiency and output with the lowest possible amount of inputs and “friction” in the process. However, when it comes to understanding organizational dynamics, engineering tools are very limited. Something that is complicated, like an airplane, can be engineered. All the parts are ultimately knowable and predictable according to rules of physics and can be managed.

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But organizations are truly complex systems. There are too many variables that simply cannot be controlled. Organizations operate according to the principles of living systems, which are predictable according to certain patterns but not in specifics – and then only to a limited degree. So, it simply doesn't work to try to break a living enterprise down into functions or individual processes, then paste it all back together as an engineered whole system. When you cut a horse in two, you don't get two horses – you get a mess.

Organizations are living networks, so it is far more productive to analyze enterprise activities from a living system perspective. For decades, we have tried to harness the natural network patterns of business with the artificial constraints of hierarchical organizational charts, divisions into discrete functions, and linear process views. In the knowledge economy, technology networks such as the Internet that behave more like living systems are enabling the natural pattern of networks to emerge. It is time to begin thinking of business in terms of networks instead of discrete companies.

### *Characteristics of a Living System*

Physicist Fritjof Capra defines three key criteria of a living system as *pattern*, *structure* and *process*.<sup>1</sup> The *pattern of organization* is the configuration of relationships among the system's components which determine its essential characteristics. Certain relationships must be present before something can be recognized as a leaf, a forest, a dog, or a tree. So, one particular pattern of relationships tells us that we have encountered an organization, while another might suggest a family.

The *structure of the system* is the physical embodiment of its pattern of organization. Seeing the pattern of organization involves an abstract mapping of relationships. A description of structure involves describing the actual components or dynamics of that pattern – their shapes, composition, and so forth. In other words, the pattern of organization may be a dog, but the structure determines whether it is a collie or a toy poodle. Organizations also exist in many varieties: healthcare organizations, government and regulatory bodies, professional associations, dot-coms, churches, family businesses, and corporations, to name just a few. In organizations, a particular structure also points to the purpose of the system - why it exists in the first place.

A third criterion of a living system is *process*. According to Capra, "The *process* of a living system is the activity involved in the continual embodiment of the system's pattern of organization. Thus, the *process* criterion is the link between the *pattern* and *structure*."

However, those three conditions alone (pattern, structure, and process) could also describe a mechanical system. What makes something a truly living system? There are two additional criteria that must be met:

1. The pattern of organization in a living system is consistent with that of an autopoietic network. An autopoietic network is one that continually produces itself, so that the being and doing are inseparable. That continual process of producing is cognitive in nature. So living systems exhibit intelligence.
2. Living systems are also dissipative structures that are open to the flow of energy and matter. They exist on the edge of chaos. With too much openness, they disintegrate; with too little they become rigid and closed and can no longer exchange energy and matter.

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So, modeling business and enterprise from a living systems perspective requires being able to

- a) Identify its pattern of organization as an organization
- b) Describe its structure
- c) Discover its most critical processes or exchanges from both a cognitive perspective and the flow of energy and matter.

The method described here assumes that the basic pattern of organization for business is that of a network of tangible and intangibles exchanges. Tangible exchanges equate to flows of energy and matter. Intangible exchanges, such as knowledge, point to cognitive processes and intelligence. Describing a specific set of participants and exchanges allows a detailed description of the structure of any specific organization or web of organizations.

### **Exchanges – the Molecular Level of Economic Activity**

From a living systems perspective, the molecular level of economic activity is the exchange. In traditional business thinking we have thought of economic exchanges only in terms of goods, services, and revenue – the “value chain” transactions. However, living networks, including companies and business webs, engage in more than material exchanges. Living systems have intelligence, which means they also engage in cognitive exchanges. Sustainable business success depends on exchanges of information, knowledge sharing, and open cognitive pathways that allow good decision making. These exchanges not only have value, but are essential for the success of the enterprise, so they must also be considered as economic exchanges.

However, knowledge and intangibles behave differently than physical resources and it is a mistake to simply treat them as tangibles. This means in describing a business model we must consider two orders of economic exchange: *tangible* and *intangible*. This perspective is much more aligned with living systems theory.

#### *Tangible Exchanges of Goods, Services, and Revenue*

For the business modeling method described here, tangible exchanges are defined as those transactions involving goods, services, or revenue, including but not limited to: physical goods, services, contracts, and invoices, return receipts of orders, requests for proposals, confirmations, or payments. Knowledge products or services that directly generate revenue, or that are expected (contractual) and paid for as a part of a service or good (such as reports or package inserts) are also considered as tangible exchanges.

#### *Intangible Exchanges of Knowledge and Benefits*

Intangible knowledge and information exchanges flow around and support the core product and service value chain, but are not contractual. Intangibles are those “little extras” people do that help keep things running smoothly and help build relationships. These include exchanges of strategic information, planning knowledge, process knowledge, technical know-how, collaborative design work, joint planning activities, and policy development.

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Intangible benefits are advantages or favors that can be extended from one person or group to another. For example, a research organization might ask someone to volunteer time and expertise on a project, in exchange for an intangible benefit of prestige by affiliation. People can and do “trade favors” in order to build relationships. Intangible benefits often reveal the real motivational factors for people to engage in relationships and activities.

## **Intangibles as Assets**

Intangibles are at the heart of all human activity, especially socio-economic activity. A number of intangible accounting approaches have been proposed to explain, measure, and manage intangible assets. Intangibles, like other assets, are increased and leveraged through deliberate actions. Among these efforts, one finds the intellectual capital methods of Karl-Erik Sveiby,<sup>2</sup> Leif Edvinsson,<sup>3</sup> Johan and Goran Roos,<sup>4</sup> and Annie Brooking,<sup>5</sup> and Pat Sullivan.<sup>6</sup> Related work from the U.S. is the Balanced Scorecard approach of Norton and Kaplan.<sup>7</sup> There are also a number of other experiments such as Kanavsky and Housel’s system for calculating knowledge valued added,<sup>8</sup> a variation of economic value added or EVA.

Recent important work in this area includes the Brookings Institution project in intangible assets spearheaded by Baruch Lev of New York University and Steve Wallman, former Commissioner of the American Securities and Exchange Commission.<sup>9</sup> Virtually every accounting standards body in the U.S. and Canada has special task forces on accounting for intangibles, and the OECD in Europe has also held special hearings.<sup>10</sup> Typical categories of intangible assets include business relationships, human competence, internal structure, and social capital or culture and values.

Other intangibles are being addressed through indicators regarding social responsibility and sustainable business practices.<sup>11</sup> There are a growing number of assessment tools such as the Deloitte & Touche Corporate Environmental Report Score Card,<sup>12</sup> and the Future 500 Performance Tool Kit.<sup>13</sup> One of the most telling examples is the recent shift of focus for Shell. Since 1998, the annual Shell Report for Royal Dutch/Shell Group has emphasized their efforts to support the “triple bottom line.” Shell defines this as “integrating the economic, social and environmental aspects of everything we do and balancing short-term wants with long-term needs.”<sup>14</sup>

These are serious attempts to develop new indexes, equations, measures, and analytical approaches for calculating knowledge assets and for understanding intangible value creation. All this adds up to a serious attack on traditional accounting and enterprise models that regard only revenue and physical assets as “valuable,” and that regard people as liabilities rather than important resources and investments.

## **How Intangibles go to Market**

However, understanding intangibles as assets is just the beginning. If we really want to understand how intangibles create value, there are two other very important dimensions to grasp. The first is how intangibles go to market as *negotiables* in economic exchanges. The second dimension is how intangibles act as *deliverables* in key transactions that take place in any given business model.

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We use intangibles as negotiables in economic exchanges all the time. We might package an intangible, such as knowledge about our industry, and sell it for money. Or we might engage in a direct knowledge exchange. I might show you how to animate your slide shows if you will show me how to build a database. Or we might negotiate a direct exchange of favors or benefits. For example, you might introduce me to important contacts in your business web if I agree to support a certain initiative before a regulatory body. In these last two examples we have made a trade or exchange, employing knowledge and benefits for economic purposes.

So, intangibles basically go to market in two ways: 1) through conversion to monetary value and 2) through barter. If we bestow a gift with no anticipation of return, either directly or indirectly, we have not gone to market because there is no exchange or anticipated economic gain. But if we employ intangibles in anticipation of a return of any kind, then we have engaged in an economic activity.

The most obvious way intangibles go to market, of course, is when they are *converted* to a good or service that has financial value. We might package our expertise into a report that we sell to clients, or we gain a premium price for a product because of extra personalized care and attention that is packaged as part of the purchase. In some cases we may even be able to affix a financial value for certain intangibles such as brand image. Much of the recent attention around intangibles and valuation is focused on this type of intangible value conversion.

However, there is another way intangibles go to market that has received far less attention, yet may be even more important. When we look at business and economic activity, we find a very sophisticated barter system involving intangibles that plays a vital economic role – in building business relationships, creating value for the participants, and assuring that business transactions run smoothly. Barter is basically a one-time negotiated deal that happens between two or more parties who each have something the other wants. Any time we agree to share or exchange knowledge or favors directly, in a reciprocal way, we are bringing intangibles to market in the form of barter.

Economists tend to dismiss barter economies as primitive systems that exist only in a few pockets of culturally unique populations. Barter is “messy,” exceedingly complex, and very subjective. Barter exchanges do not easily convert to monetary value, and consequently do not “show up” in most economic indexes.

Regardless, we are embedded in a complex barter economy that is deeply intertwined with the so-called market or monetary-based economy. This massive complementary barter economy based on intangibles has been invisible to us, not because it doesn't exist but because we have not paid attention to it. Our peripheral efforts to understand it have mostly involved social network analysis, looking at social ties and interactions.

It is clear that we must move beyond the asset view and understand all the market behaviors of intangibles, including direct barter. If intangibles behaved like other goods they would not be called *intangibles*. It is time we truly explore their behaviors as intangibles, even if it takes us into the non-linear, “messy” world of this complex barter economy. This is both a challenge to economists and an opportunity to usher in the next generation of economic thinking.

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In addition to being assets and negotiables, intangibles can also be viewed as *deliverables* in the business model. People engaged in a knowledge exchange, for example, can be held accountable for the effective execution of that exchange. They could develop all manner of performance metrics for the quality, speed, timeliness, quantity, and usefulness of the knowledge they deliver. Further, people also need to track and measure the return they are receiving for those intangibles as negotiables. As we will soon see, metrics concerning intangible exchanges of knowledge and benefits can be directly linked and incorporated into both financial and non-financial scorecards.

## Organizations as Value Networks

Once we begin to view organizations as patterns of exchanges, it becomes readily apparent that our old ideas of organizations are due for revision. From a systems thinking perspective it is more useful to think of organizations as value networks. *A value network is any web of relationships that generates tangible and intangible value through complex dynamic exchanges between two or more individuals, groups, or organizations.* Any organization or group of organizations engaged in both tangible and intangible exchanges can be viewed as a value network, whether private industry, government or public sector.

The concept of an organization emerged at a time when most businesses were bureaucracies designed around strict hierarchies. The human boundary of the organization was, and still is, largely determined on the basis of who is an employee or member. That was useful for awhile because larger companies, in terms of financial transactions and revenue, also had larger numbers of employees. Today, however, revenue and employee numbers don't match up as neatly, as demonstrated by the huge populations of members participating in AOL and Amazon that contribute content or referrals. Now, a company with relatively few actual employees can have a value network that includes tens of thousands of suppliers, millions of members, and billions of dollars in revenues.

Today corporations are often organizing more like a business network than a traditional company. Workers are increasingly operating in a virtual environment. Project team members can be scattered all over the planet. Business units and service groups may bid for projects and compete directly with outside suppliers to provide services to their own company. One finds businesses within businesses within larger business within business webs. Hierarchies become irrelevant and frequently unnecessary.

## Modeling the Value Exchange

A value network perspective requires a different approach to business modeling and analysis. First of all, any exchange of value is supported by some *mechanism* or medium that enables the transaction to happen. For example, if you and I want to exchange messages about a meeting, we may use the mechanism of e-mail or voice mail to support the exchange. One could make a house payment using either the mechanism of a written check or the mechanism of an online banking service. Any value exchange is supported by some mechanism that enables it to happen.



Figure 1 depicts both tangible and intangible exchanges. In this case, a technology provider would like to provide an online user group for its customers, for a small monthly fee. The mechanism is that of an online discussion group. This enables the creation of an interactive user group, and supports several exchanges of value. The figure lists the value exchanges that might be enabled through such a mechanism.

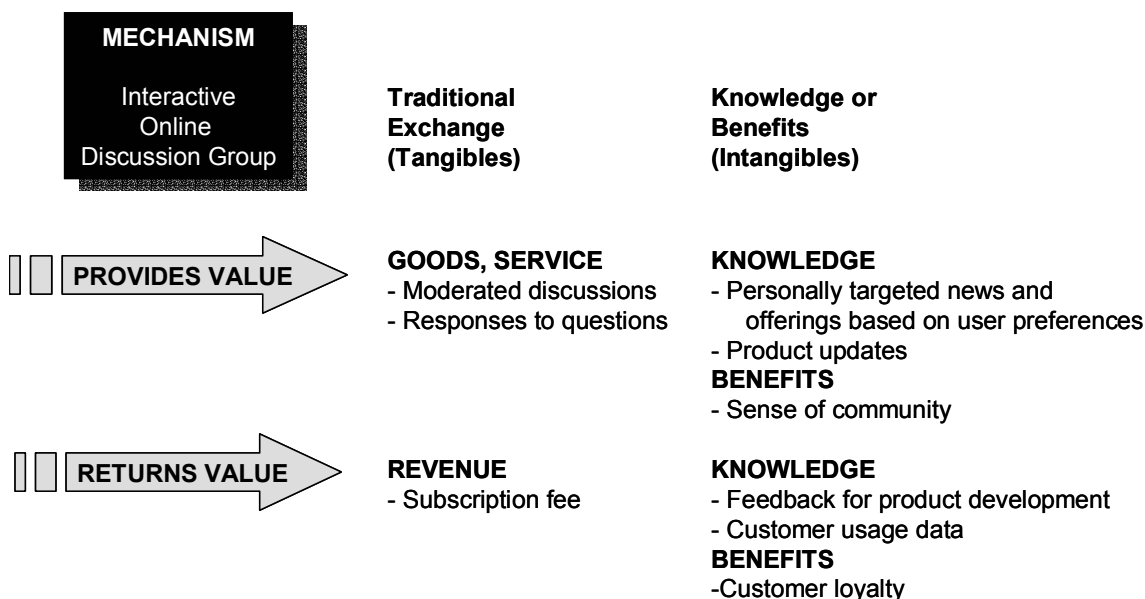


Figure 1  
Example of value exchanges.<sup>15</sup>

In Figure 1, the traditional *tangible* exchange is the provision of moderated discussions and technical information in responses to questions, in exchange for a fee.

The *intangible* knowledge or information exchanges may include gaining customer usage data and feedback for product development. As a result of their participation, the user might receive the intangible value-added exchange of personally targeted news or offerings.

By tracing the intangible benefits that accrue, one finds that the underlying logic for creating such a discussion group is not so much about gaining revenue from the service (indeed it may barely break even). The real goal for providing a user group may be to provide a sense of community, an intangible, for the user. In return of course, one would hope to receive an increase in the intangible of customer loyalty, which should result in increasing revenue. In this case, intangible value exchanges provide the real business logic for engaging in the activity.<sup>16</sup>

### Visualization of the Value Exchange

Value exchanges can be visually expressed by means of a very simple diagramming technique. With this foundation, it becomes possible to map virtually any enterprise or business network as a unique



living system. Remember, living systems have physical exchanges and interactions, and they also have a cognitive aspect, that of an autopoietic or intelligent network. Modeling exchanges of intangibles such as knowledge, that are key to a successful network, can help illuminate significant cognitive pathways and interfaces where new knowledge and innovation may emerge.

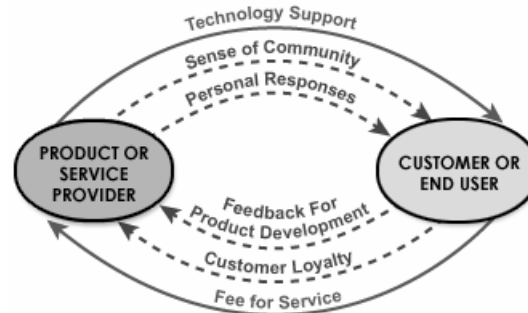


Figure 2  
Modeling the value exchanges.

Using the same example of the technology provider, we can “map” these value exchanges as a flow diagram showing both tangible and intangible exchanges. (Figure 2) The Service Provider provides technology support in exchange for a fee. A knowledge exchange occurs by extending personalized offerings to the customer to elicit feedback and usage data. What the Service Provider is really trying to do is provide a sense of community to users in order to gain customer loyalty, which again is an intangible exchange, this time of benefits.

### Three Simple Mapping Elements

This mapping method relies on three simple elements. Ovals represent the *Participants* or roles, the “nodes” of the network. Participants send or extend *Deliverables* to other Participants. Arrows represent the direction the Deliverables are moving during a specific *Transaction*. The label on the arrow is the Deliverable.

*Participants* are real people – who are carrying out roles in the system. Only individuals or groups of people have the power to initiate action, engage in interactions, add value, and make decisions. Participants can be individuals, small groups or teams, business units, whole organizations, collectives such as business webs or industry groups, communities, or even nation-states. A Participant cannot be a database, a software program, or other technology. Humans may create technologies that mechanize certain tasks or fill a particular role, such as “reservations agent,” but machines do not make their own decisions about which activities they engage in. Only people do.

*Transactions* or activities are represented by an arrow that originates with one Participant and ends with another. The arrow represents movement and denotes the direction of something that happens between two Participants. Contrasted to Participants or roles, which tend to be stable over time, Transactions are temporary and transitory in nature. They have a beginning point, a middle, and an end point.

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*Deliverables* are the actual “things” that move from one Participant to another. A Deliverable can be physical or tangible, like a document or a table. Or, a Deliverable can be non-physical, such as a message or request that may only be delivered verbally. It can also be an intangible Deliverable of knowledge about something, or a favor.

Arrows must be one-directional for the purposes of this method – depicting a single Transaction. Two-headed arrows are meaningless from the standpoint of managing anything or conducting a useful analysis. A double-headed arrow only shows that there is some kind of relationship. It does not tell us what the specific activity is, who is generating it, or who is the recipient.

### *The Exchange*

An exchange occurs when a Transaction results in a particular Deliverable coming back. The Example in Figure 2 suggests that there is always a reciprocal Transaction. This may or may not be the case in a real network. An exchange may be delayed as several Transactions flow through different Participants, as we will see in the following case study example. Or there may be “gaps” where something is provided without anything being received in return.

Focusing on the exchange as the molecular element of value creation makes it possible to depict an infinite number and variety of value networks. By viewing organizations as a network of tangible and intangible exchanges, we are modeling according to a basic *pattern of organization* that is typical of business relationships. In the following case study the modeling method will define a particular *structure* – that of a pharmaceutical company. The tangible exchanges depict *exchanges of matter and energy* (goods and money), while the intangible exchanges depict *cognitive and emotive exchanges* such as favors and benefits. Thus, we are approaching a living system model of enterprise that depicts real time states and activities.

### **An Example**

Assessing the health and vitality of a value network requires understanding the overall patterns of exchange, and determining the impact of tangible and intangible inputs for each Participant. Costs and benefits of each value-generating activity also must be calculated in terms of both tangible impact and intangible costs. Thus, a deep analysis can also provide a way to link business activity to both tangible and intangible scorecards.

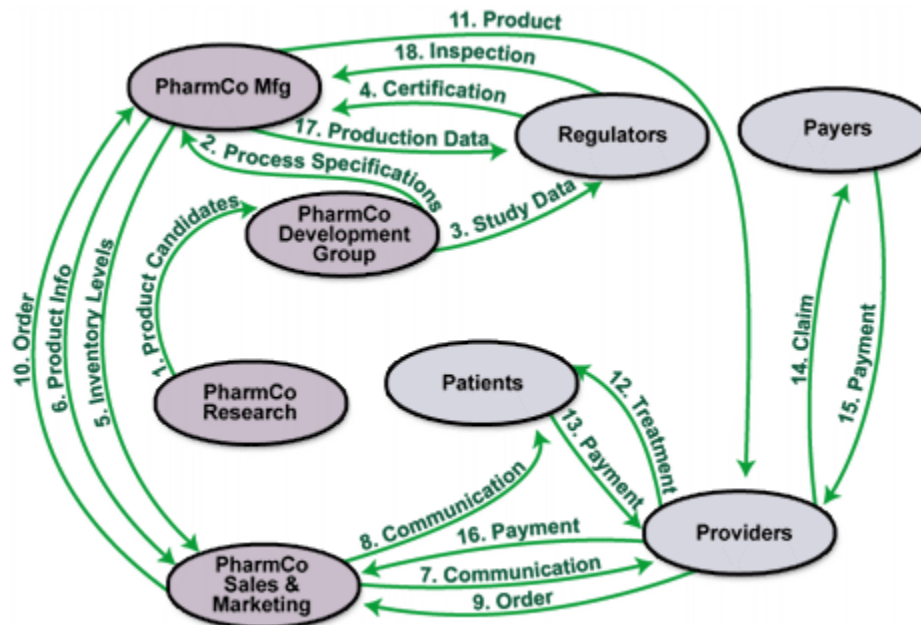
Our example is a fictitious pharmaceutical company, PharmCo. In this instance, the Sales and Marketing group would like to improve their ability to use customer feedback in developing new products.<sup>17</sup>

The first step in the modeling process is to consider all the groups, both internally and externally, that play key roles in the activities of the Sales and Marketing group. In this case, the four key groups (Participants) inside the company are *Sales and Marketing*, *Research*, *Product Development Group*, and *Manufacturing*. Key Participants outside the company are *Patients*, healthcare *Providers* such as doctors, *Payers* such as insurance companies, and *Regulators*. These Participants will be “nodes” in the network diagram. Now we are ready to start modeling the key network dynamics.

## Mapping Transactions

First we will want to think about tangible exchanges that take place between the Participants. What are the core money-related Transactions? What are the tangible Deliverables in the system?

Figure 3 shows tangible Deliverables such as product candidates, process specifications, claims, payments, orders, and so on. In this case, the communication channel is considered a tangible Deliverable because it consists of data links, websites, and call centers that are hosted by PharmCo as part of the expected customer service support.

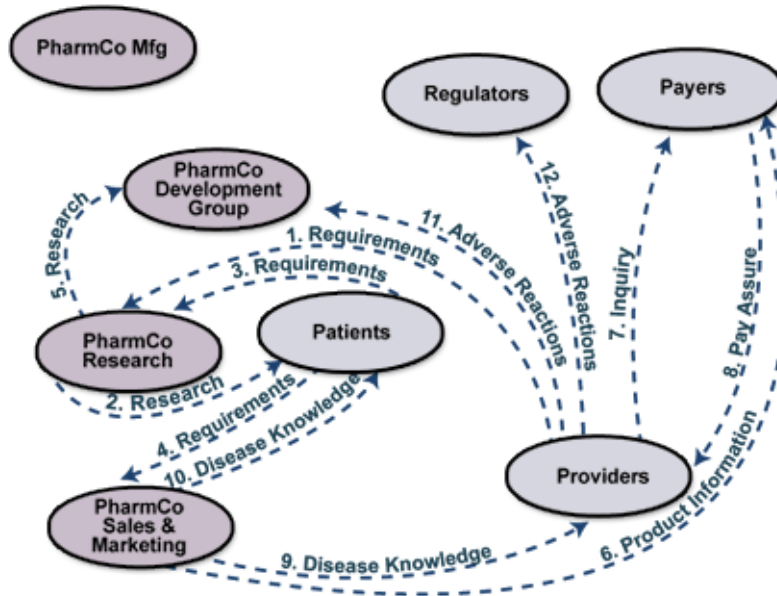


All green solid lines and arrows depict tangible exchanges.

Figure 3  
Tangible Deliverables in the PharmCo Value Network.

We can depict *intangible* transactions or exchanges the same way. To help certain patterns show up more easily, we might use a different color or line style to distinguish the intangible Deliverables from the tangible Deliverables.

For PharmCo, two intangibles are patient requirements and disease knowledge, which PharmCo makes available through publications and its website. Others are informal assurances that Payers make to Providers advising that a new product will be covered, and reports to the Regulators of adverse reactions. (Figure 4) These are intangible because people do not pay for them directly, so they are not contractual or expected. They are extras, offerings extended to another Participant that help things work smoothly or that help build relationship.



All blue dotted lines and arrows depict intangible exchanges.

Figure 4  
Intangible Deliverables in a Value Network. The arrows are dotted to distinguish these transactions from the tangible transactions in Figure 3.

We now can pull together a whole-system view that shows how both tangibles and intangibles are working in the system. (Figure 5) When we diagram all these exchanges and Deliverables together, we have a picture of how the business really operates. Compared to more traditional modeling methods, this is a much truer picture.

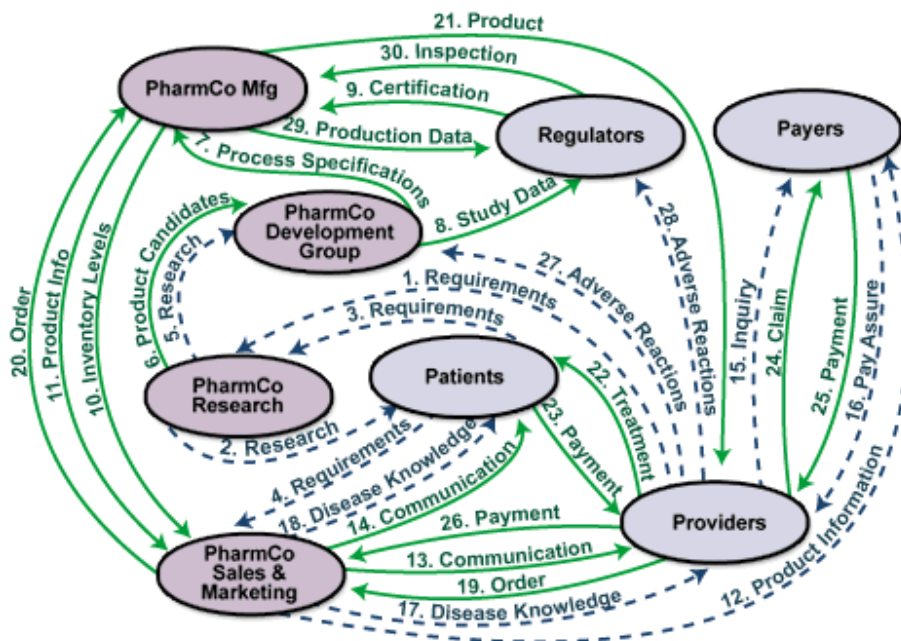


Figure 5  
PharmCo Value Network combined view.

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The value network view of the enterprise helps us more fully understand the role of knowledge and intangibles in value creation. The modeling process maps the most strategically critical intangible exchanges, allowing for easy targeting of value opportunities.

Whole-system views provide a visually compelling way to surface the logic and reasoning behind performance metrics. In this approach, the contributions of intangibles to the business are specific and measurable. Even though monetary valuations rarely can be applied to intangible deliverables, people can almost always come up with qualitative measures for them.

## Analyzing the Value Network

Analyzing the health and vitality of a value network requires addressing three basic questions. The first question, or analysis, is about assessing the dynamics of the whole system. The second and third questions concentrate on each specific Participant and their role in the value system. The basic analysis questions are:

1. Exchange Analysis: What is the overall pattern of *exchanges* in the system?
2. Impact Analysis: What *impact* does each value input have on the Participants?
3. Value Creation Analysis: What is the best way to *create, extend, and leverage value*, either through adding value, extending value to other Participants, or converting one type of value to another?

I will address each of these questions in turn, as we continue with the PharmCo example.

## Patterns of Exchange

The Exchange Analysis assesses the overall patterns of value exchange to determine if the value system appears healthy, sustainable, and expanding. We might ask:

- Is there a coherent logic and flow to the way value moves through the system?
- Does the system have healthy exchanges of both tangibles and intangibles, or is one type of exchange more dominant? If so, why might that be?
- Is there an overall pattern of reciprocity? For example, is one of the participants extending several intangibles without receiving a fair return?
- Are there missing or “dead” links, weak and ineffective links, value “dead ends,” or participant bottlenecks?
- Is the whole system being optimized, or are some Participants benefiting at the expense of others?

Sometimes a breakdown in value flow can be quite critical. So missing links or dead ends might point to Participants who have become marginalized. Knowledge flow is especially critical for some companies. Let's look at the PharmCo example again in Figure 5.

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In Figure 5, at least two patterns are noticeable. The PharmCo Sales and Marketing group gains knowledge about requirements from patients, but that knowledge “dead ends” with them and is never passed on to PharmCo Research or to PharmCo Development. In fact, there is *no* significant knowledge exchange whatever between the PharmCo sales group and their research or development group.

Another pattern that shows up is that knowledge about disease only flows one way. The Sales and Marketing group distributes information about certain diseases, but they do not have any channel for a two-way communication about disease with their patients, providers, or payers. Even though PharmCo created a nice informational website to serve as a communication channel with patients and providers, it was only being used in a traditional marketing sense to broadcast information from the company about its products. Once this pattern became apparent through the analysis, the company developed a new communication channel strategy that would create web-based disease “communities.” There people could enter a real two-way knowledge exchange with users and providers about important research, user feedback and patient concerns.

In the Exchange Analysis we might use a simple transaction table to develop performance metrics for each critical Transaction or groups of Transactions. That step would address how one would know that a particular Transaction or groups of Transactions were achieving excellence. What types of measures would help determine whether those specific activities need to be improved?

There is no one “right” answer for what patterns mean, although problem areas are readily apparent to those who are participating in the exercise. The Exchange Analysis fosters a useful dialogue about the value system as a whole, surfacing issues ranges from missing steps in a key process to complex cultural issues such as trust. It is a powerful tool to support systems thinking and surface systemic issues that may not be apparent through other methods.

## **Managing for Value**

An individual or group cannot manage or change a whole system. However, people can and do self-organize to control their own activities. In fact, building capacity for effective self-organization is a critical success factor in a complex global environment. However, self-organization can only happen when there are truly autonomous agents, such as people, who can make good decisions and take action. As network principles increasingly dominate the business landscape, it is vital that people learn to consider the health and vitality of the networks they are part of when taking action.

People must be skilled in analyzing both the value they are receiving from the system and value they are contributing. Analyzing the impact of value inputs assures that people and their organization are receiving positive value for every tangible or intangible input they receive. If a participant feels they are not receiving fair value for their participation, they are quite likely to withdraw. Also, any participant that is not contributing real value to the network as a whole will become increasingly isolated, or even be expelled. Carefully analyzing value outputs helps people find ways to increase both tangible and intangible value they can contribute to the system, thus strengthening their network ties and relationships.



## Impact Analysis

Every input triggers some type of response. There are costs for handling the input and for leveraging the value received. Each input can directly or indirectly impact both the tangible and intangible asset picture. How is it helping increase the financial picture of the company? How is a particular input helping to build capability by increasing the competence of people, improving processes, or building better business and community relationships? An Impact Analysis answers the question, *What are the tangible and intangible costs (or risks) and gains for each input for a particular participant?* Using the model helps determine how each input:

- Generates a response or activity
- Increases or decreases tangible assets (Cost/Benefit)
- Increases or decreases intangible assets (Cost/Benefit)

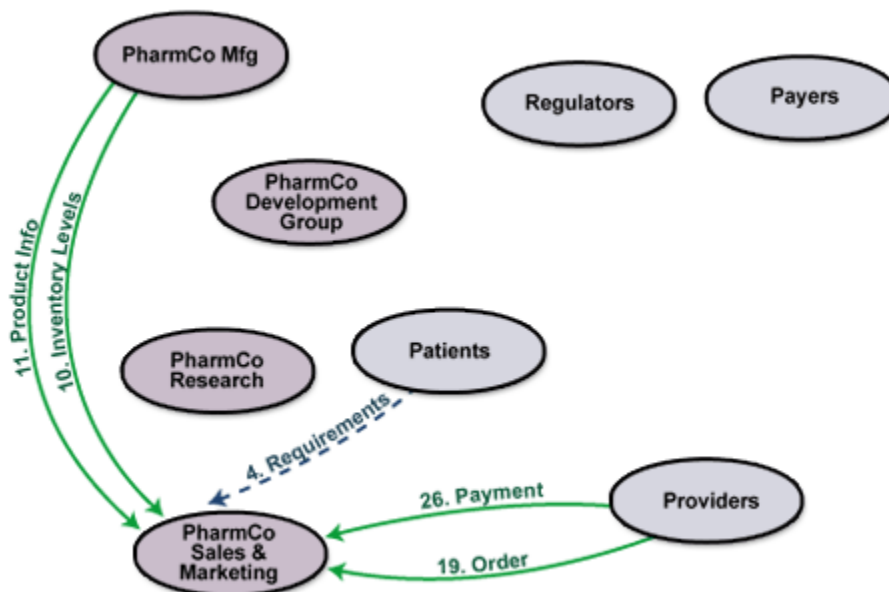


Figure 6  
Impact Analysis showing value inputs for PharmCo Sales and Marketing Group.

Figure 6 shows the value inputs for PharmCo Sales and Marketing group. This view helped the Sales and Marketing group develop several new ways for handling each input. The idea is to look at each of the inputs and explore the various costs and benefits it brings. Even though this analysis is from the perspective of a single Participant, there is consideration of the value impact for the whole firm. Following the diagram, Table 6a describes the “as is” existing value impact for the key tangible and intangible inputs to the Sales and Marketing Group.



**PharmCo Sales and Marketing Group  
Impact Analysis – “As Is”**

<b>Cost/Risk and Benefit:</b>		<b>HIGH = H</b>	<b>MEDIUM = M</b>	<b>LOW = L</b>		
<b>What We Receive</b>	<b>Comes From</b>	<b>Activities</b>	<b>Tangible Impact</b>	<b>Intangibles Impact</b>	<b>Cost / Risk</b>	<b>Benefit</b>
Requirements	Patients	- Informal e-mails	- Requires handling costs	- Increases our knowledge of the Customer	L	L
Inventory levels	PharmCo Mfg	- Meetings - Discussions	- Requires staff time	- Increases our business knowledge	H	H
Product Information	PharmCo Mfg	- Sales calls	- Increases marketing costs	- Expands our product knowledge	H	M
Order	Providers	- Order entry	- Requires handling costs - Improves balance sheet	- Market validation of product	L	M
Payment	Providers	- Posting deposits	- Increases operating capital - Timing impacts interest expense	- Enhances image (financial success)	L	H

Table 6a: PharmCo Sales and Marketing Group Impact Analysis – “As Is.”

Table 6a shows all the key value inputs for the PharmCo sales and marketing group. There are five of these. Each has an impact in all three key areas:

- They trigger activities for the group.
- They have an impact on tangible costs that can be calculated in monetary terms.
- They all impact intangible assets such as human competence or brand image.

A close look at the costs and benefits show that value gained is actually quite low compared to the costs. For example, the first item shows that careless handling of patient input resulted in low value gain since the knowledge does not get distributed across the company. The only exception is the payment, which traditionally is regarded as having a high positive value.

So what could PharmCo do to realize greater value? We can now use a similar table to conduct a strategic analysis, identifying value realization targets, putting some specific numeric targets to the gains, and brainstorming possible new or improved activities to maximize value? The goal is to try to identify ways that each input will result in the lowest cost or risk, and the highest possible benefit. Table 6b shows how the Sales and Marketing Group developed a strategy to enter patient requirements into a shared, organized knowledge bank to increase relevance and access of customer knowledge across the enterprise. Thus, the value realization moved from Low Cost/Low Benefit to Moderate Cost/High Benefit.

PharmCo Sales and Marketing Group  
**Example of Impact Analysis for Strategic Possibilities (Partial Table)**

Cost/Risk and Benefit:		HIGH = H	MEDIUM = M	LOW = L			
		Cost / Benefit					
What We Receive	Comes From	Activities Generated	Tangibles Impact	Intangibles Impact	Cost / Risk	Benefit	
Requirements	Patients	- Entry into shared, organized knowledge bank	- Handling costs (no increase or increase 5-10%)	- Customer knowledge (increase relevance by 100%, increase access 500%)	M	H	

Table 6b: PharmCo Sales & Marketing Impact Analysis for Strategic Targets.

**Value Creation Analysis**

A Value Creation Analysis is similar to an Impact Analysis. This analysis focuses on one Participant at a time, analyzing how they are extending value to other Participants in the system. This step analyzes the tangible and intangible costs (or risks) and gains for each value output for a particular Participant. Using the model helps determine how each value output:

- Adds new tangible or intangible value
- Extends value to other Participants in the value network
- Converts one type of value to another

Each Participant can then assess each value output to determine:

- Activities, resources, and processes required
- Cost/Benefit of each value-creating activity

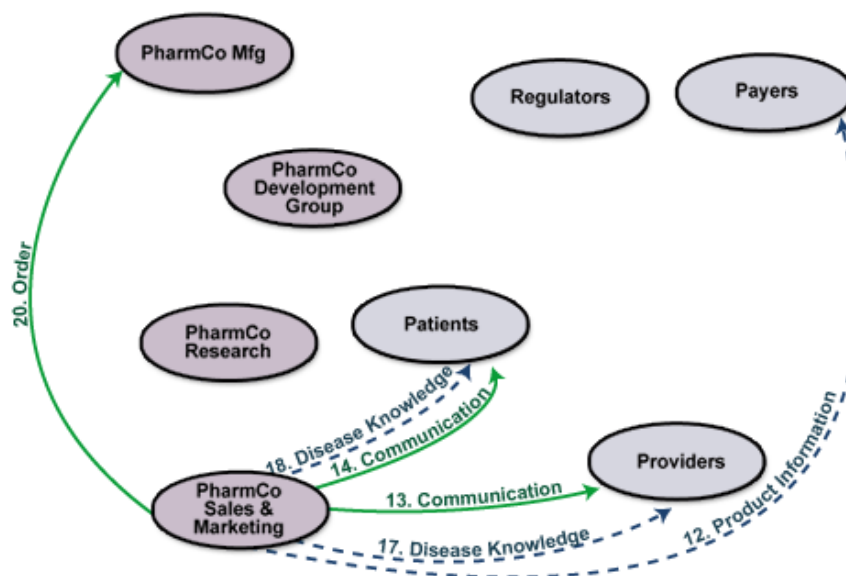


Figure 7  
 Value Outputs for PharmCo Sales and Marketing Group.

PharmCo Sales and Marketing Group  
**Value Creation Analysis – “As Is”**

**Cost/Risk and Benefit: HIGH = H MEDIUM = M LOW = L**

		What do we do to add value to this output?)		
What We Output	Goes To	Value Enhancements or Value Added	Cost / Risk	Benefit
Product Information	Payers	- Packaging - Personal contact	M	H
Communication	Providers	- Email - Provide a personal representative	H	H
Communication	Patients	- Public web site - Hot-line	H	M
Disease Knowledge	Providers	- Taking raw knowledge inputs from R&D and turning into knowledge products for medical professionals - Targeted mailings	H	M
Disease Knowledge	Patients	- Taking raw knowledge inputs from development group and turning into knowledge product for patients - Demographic mailers	H	M
Order	PharmCo Mfg	- Order entry	L	L

Table 7a: PharmCo Sales and Marketing Group Value Creation Analysis – “As Is.”

When we look at the table 7a above, it is clear that one important value creation process for the sales and marketing group is to add value to raw inputs from research and marketing by creating marketing materials for patients, providers and payers. Their role in order entry is very small, being of both low cost for them and also low benefit. They are also an active agent to extend value through targeted mailings and other efforts to reach their target population of patients, providers, and payers. At the present time they are not engaged in a value conversion process where they convert one type of value to another. Now, let's see what they came up to increase value creation. The following partial table shows other activities they might engage in to increase value creation. The new strategic possibilities and changes in costs and benefits are depicted in normal type. Current activities that they plan to continue are in Bold type.

PharmCo Sales and Marketing Group  
**Value Creation Analysis for Strategic Possibilities**

**Cost/Risk and Benefit: HIGH = H MEDIUM = M LOW = L**

		How can we increase our value outputs by adding enhancements, extending the value to others (perhaps via the Internet) or otherwise increase sales?		
<b>What We Output</b>	<b>Goes To</b>	<b>Value Enhancements or Value Added</b>	<b>Cost / Risk</b>	<b>Benefit</b>
Product information	Payer	- Packaging - Personal contact	M	H
Communications Channel	Provider	- <b>Email</b> - <b>Provide a personal representative</b> - Web-enable - Online discussion forums - More translations - Extend channel to development group - Extend to university researchers - Convert traditional one-way channel into a two-way channel for product feedback	H	H
Disease knowledge	Providers	- <b>Taking raw knowledge inputs from development and turning into K product for professionals</b> - <b>Targeted mailing</b> - Sales calls - Translation into more languages - Support more presentations and exhibits at public conferences - Create special interactive web seminars for a fee	H	H
Orders	PharmCo Mfg	- Order entry	L	L
		Additional value output		
Customer survey	Providers	- Survey / questionnaire to determine provider success with product	M	H

Table 7b: PharmCo Sales and Marketing Group Value Creation for Strategic Targets.

The example in Table 7b looks at the value outputs that go to providers, the tangible communication channel provided to support the sales process, and the intangible of disease knowledge. They especially felt they could do a better job of leveraging their intangible value outputs (products about disease knowledge) into more advanced knowledge products that could be turned into a revenue stream. In the example, the communication channels were mostly one way, conveying product knowledge from PharmCo to providers. With a focus now on converting that expected communication channel to another type of value gain, they will web-enable communication and launch on-line discussion groups to gain immediate feedback for product development. Thus they have converted a tangible value to gain back an intangible value of product feedback. This also supports their strategic intent of rapid response to changing patient and provider needs.

As another example, they looked at how they were packaging disease knowledge. They had been doing only the expected documentation of their products and free informational pamphlets on different diseases. Since they were free, these were being provided as an intangible benefit. Still keeping those same knowledge products, they realized that if they were to move into more sophisticated multi-media products or seminars, they might be able to charge a fee based on the high quality and in-depth information. By taking their disease knowledge products to the next level of value added, they could create a new revenue stream for PharmCo. Thus they could convert an intangible input of disease knowledge to a tangible value output.

Value Creation Analysis can become very rich indeed. People usually see quite a number of ways they can increase their value outputs – especially by leveraging the intangible value they generate.

For a value network or organization to be healthy and viable, positive value inputs and outputs must be greater than negative or neutral contributions. Therefore, a value creation analysis isn't really complete until the Participant also understands what impact a particular output has on the Participant who receives it.

A perfect example of this is the story of one financial services company that maximized efficiencies in their client reports. Their overall cost benefit analysis was excellent – for them. However, a closer analysis showed that their efficiencies had greatly inconvenienced the customer. Their customers had to spend so much time making the reports compatible with their system, that they actually saw receiving the report as a negative value input. Oops.

### Customizing for Corporate Scorecards

Any of these analysis tables can be customized to a particular company scorecard. For example, the Impact Analysis table can have additional columns added to consider intangibles impact specifically in scorecard categories such as Human Competence, Customer Capital, and Internal Structures, which are three popular sub-categories of intellectual capital. This “plug-and-play” versatility makes it possible to link specific, measurable business activities to any tangible and intangible scorecard, whether a company is using a Balanced Scorecard, an Intellectual Capital monitor, Triple Bottom Line, or a unique configuration of their own.

**Cost/Risk and Benefit:    HIGH = H    MEDIUM = M    LOW = L**

			Cost / Benefit					
What We Receive	Comes From	Activities Generated	Tangibles Impact	Intangibles Impact			Cost / Risk	Benefit
				Customer Capital	Human Competence	Internal Structures		

Figure 8: Customized scorecard

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## Core Assumptions about Value Networks

This method and approach is based on some basic understandings and assumptions:

1. Participants and stakeholders participate in a value network by converting what they know, both individually and collectively, into tangible and intangible value that they contribute to the network.
2. Participants accrue value from their participation by converting value inputs into positive increases of their tangible and intangible assets, in ways that will allow them to continue producing value outputs in the future.
3. In a successful value network, every participant contributes and receives value in ways that sustain both their own success and the success of the value network as a whole. When this is not true, participants either withdraw or are expelled, or the overall system becomes unstable and may collapse or reconfigure.
4. Successful value networks require trusting relationships and a high level of integrity and transparency on the part of all participants.
5. Insights can be gained into value networks by analyzing: 1) the patterns of exchange 2) the impact of value transactions, exchanges, and flows, 3) the dynamics of creating and leveraging value.
6. A single transaction is only meaningful in relation to the system as a whole.

## Transparency and Self-Organization

Complex living systems are self-regulating and self-managing. They cannot be designed or engineered from the outside; there are simply too many variables. For decades, we have tried to manage our organizations from the outside in – by designing structures, systems, rules, and formal reporting relationships. Now, many such efforts seem to get in the way more than they help. In a rapidly changing economic and business environment self-organization is the only way complex webs of business activities can respond quickly and effectively to change.

However, for self-organization to happen there must be autonomous agents, such as people, who have the information and whole system understanding they need to make good decisions and initiate effective action. Since the behavior of autonomous agents can never be predicted, there must be simple rules to guide behavior that create the freedom and flexibility to act in different ways. Customer service is an example. If there are too many rules, customers are locked into a bureaucracy that seems unresponsive to their needs. Too few rules and there is inconsistency and chaos. The art of management is to assure that there are simple guiding principles and that people have the information, technology and support they need to make good decisions.

People must also have the supporting mechanisms they need for both tangible and intangible exchanges, so they can negotiate their own activities with those they interact with. No one person or

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group of people can manage a complex system. However, as participants, people can self-organize their inputs and outputs and negotiate exchanges with others in the system as they need to. Modeling the business as a dynamic pattern of tangible and intangible exchanges helps people find themselves and their role in the system in a completely transparent way. They can then manage their activities in ways that assure success for themselves, their business, and the economic ecosystems they are part of.

## Conclusion

As the natural network patterns of business are better understood, people are increasingly seeking management tools and methods that help them manage their activities in ways that support the health and vitality of the economic and business systems they are part of. The linear, mechanistic, engineered approaches of the past cannot meet this challenge. Approaches based on the principles of living systems are required to manage the complex interdependencies of the networked knowledge economy.

To be successful, people need to understand the patterns of value exchange, the value impact of the tangible and intangible inputs they receive, and the dynamics of creating and leveraging value. The whole-system value network approach described in this paper is a powerful and robust tool for supporting the types of business analysis needed for transparent enterprise, yet is a simple method to master and understand. By incorporating new understandings about knowledge, intangibles, and living systems, it provides a foundation for much more effective management practices in the networked world of organizations. The power of an intangibles perspective and the self-organizing potential of a truly transparent organization can then be fully realized.

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<sup>1</sup> Fritjof Capra, *The Web of Life*, Anchor Books, 1996.

<sup>2</sup> Karl Erik Sveiby, *The New Organizational Wealth: Managing & Measuring Knowledge-Based Assets*, San Francisco: Berrett-Koehler, 1997.

<sup>3</sup> Leif Edvinsson and Michael S Malone, *Intellectual Capital: Realizing Your Company's True Value by Finding its Hidden Brainpower*, New York: Harper Business, 1997.

<sup>4</sup> Johan Roos, Goran Roos, Leif Edvinsson, and Nicola C. Dragonetti, *Intellectual Capital: Navigating in the New Business Landscape*, New York University Press, 1998.

<sup>5</sup> Annie Brooking, *Intellectual Capital*, 1996. London: International Thompson Business Press, 1996.

<sup>6</sup> Patrick H. Sullivan, *Profiting from Intellectual Capital*, John Wiley & Sons, 1998.

<sup>7</sup> Robert Kaplan and David Norton, *The Balanced Scorecard: Translating Strategy into Action*. Boston: Harvard Business School Press, 1996.

<sup>8</sup> Tom Housel and Valery Kanavsky, "A New Methodology for Business Process Auditing," *Planning Review*, v23n3, May/June, 1995.

<sup>9</sup> *UnSeen Wealth: Report of the Brookings Taskforce on Understanding Intangible Sources of Value*. The Brookings Institution, 2000. Available through <http://www.brook.edu>. Baruch Lev, *Intangibles: Management, Measurement and Reporting*. Brookings Institution, 2001. Available through <http://www.brook.edu>.

<sup>10</sup> *Measuring Knowledge Assets*, The Society of Management Accountants of Canada, 2000. Available through <http://www.cma-canada.org>.

<sup>11</sup> Verna Allee, "The Value Evolution," *Journal of Intellectual Capital*, May, 2000.

<sup>12</sup> Deloitte and Touche Tohmatsu, *Corporate Environmental Report Score Card*, (Deloitte & Touche, 1997).

<sup>13</sup> Tachi Kuichi, and Bill Shireman, *What We Learned in the Rainforest: Business Lessons From Nature*, Berrett-Koehler, 2002.

<sup>14</sup> *People, Planet and Profits: A Summary of the Shell Report 2000*. Shell, 2000. Available at <http://www.shell.com/shellreport>.



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<sup>15</sup> Verna Allee, *The Future of Knowledge: Increasing Prosperity through Value Networks*, Butterworth-Heinemann, 2002.

<sup>16</sup> Verna Allee, "Reconfiguring the Value Network," *Journal of Business Strategy*, July-August 2000.

<sup>17</sup> Verna Allee, "ValueNet Works™ Analysis," White Paper, author 2001. Available through the Verna Allee Toolkit, <http://www.alleetoolkit.com>.