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Value network analysis and value conversion of tangible and intangible assets

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Abstract

Purpose – The purpose of this paper is to provide examples and technical details for conducting a value network analysis that addresses the conversion and utilisation of intangible assets.

Design/methodology/approach – Value network analysis was first developed in 1993 and was adapted in 1997 for intangible asset management. It has been tested in applications from shop floor work groups to business webs and economic regions. It draws from a theory based in living systems, knowledge management, complexity theory, system dynamics, and intangible asset management.

Findings – The paper provides a high level of detail on the analysis method and insights from its practical application across a range of business issues. Tips are provided for how to integrate the methodology with other business analysis approaches.

Research limitations/implications – The paper does not provide a comparative analysis with other methods because most other value network models are process views, social network analysis or clustering techniques.

Practical implications – Sufficient detail is provided so researchers and practitioners will be able to apply the method in their own investigations. Further resources are noted, as well as access points to the global user community and open source tools.

Originality/value – This paper is the first detailed publication of the value network analysis method, which has been acclaimed by experts in intangibles, network analysis, knowledge management, and process analysis. It fills a gap between theory and practice for managers, executives, analysts, and researchers.

Keywords Value analysis, Intangible assets, Adaptive system theory, Complexity theory

Paper type Conceptual paper

Introduction

One of the most important and challenging questions in working with intangibles is "How do we convert intangible assets such as human knowledge, internal structures, ways of working, reputation, and business relationships into negotiable forms of value?". Value network analysis offers a way to model, analyse, evaluate, and improve the capability of a business to convert both tangible and intangible assets into other forms of negotiable value, and to realise greater value for itself. Underlying this approach is an understanding that intangible, but nonetheless strong and dynamic relationships, and the intangible assets that make up and have an impact on those relationships, are the foundation of any successful business endeavor. Indeed, the future success of a company or organisation as a whole depends on how efficiently a company can convert one form of value into another.

An example of value conversion occurs when an intangible asset such as professional expertise is converted into a more negotiable form of value, perhaps in the form of consulting services. The conversion dynamic also applies to value realisation.

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An example is when a tangible value input, such as purchased market intelligence reports, is converted into a non-financial asset of increased levels of marketing competency.

A decade of research and practice in intellectual capital has demonstrated that the impact of organisational (or purposeful network) interventions and actions must be understood in both tangible and intangible terms (Sveiby, 1997; Edvinsson and Malone, 1997; Wallman and Blair, 2000; Lev, 2001; Eccles *et al.*, 2001). In particular, the intellectual capital field has raised awareness about the importance of intangible assets. Intangible assets include relationships, employee know-how and competency, the effectiveness of the organisation's work groups and structure, the efficiency of the organisation's production and service processes, and the level of trust between the people or organisations forming the relationships. Trust is an expression of high degrees of social capital, both within the organisation and externally expressed as reputation and brand. Tangible assets are financial resources and other capital-based resources that are controlled by the firm.

Networks and roles as value conversion mechanisms

Understanding the dynamics of value conversion requires expanding beyond the asset view of intangibles to understand the function of intangibles as negotiable goods and as deliverables. At the macro level, the primary conversion mechanism for converting one form of value to another is the network. There are many different kinds of conversion enablers for networks, of course, such as alternative currencies (Lietaer, 2001). But these are only effective when a healthy value exchange network supports them. Because the network is the primary economic mechanism for value conversion, network analysis can be used to describe the value creation dynamics of work groups, organisations, business webs, and purposeful networks engaging in both tangible and intangible value exchanges to support the achievement of specific outcomes and to generate economic and social good (MacCauley, 1963; Granovetter and Swedberg, 2001; Allee, 2002, 2003).

Purposeful networks, such as organisations, consist of specific roles and value interactions oriented toward the achievement of a particular task or outcome. The active agents of the network are real people who participate in the network by playing particular roles in which they convert both tangible and intangible assets into negotiable offerings and fulfill different functions.

These activity-focused networks, therefore, can be considered value conversion networks, or value networks. A value network is any set of roles and interactions in which people engage in both tangible and intangible exchanges to achieve economic or social good. Internal value networks include activity-focused sets of relationships between individuals (e.g. the chief executive officer and the chief financial officer or team members) within and among work groups (e.g. those within and between the manufacturing, research and development, or sales departments), and between and among the various work groups that make up the organization.

External-facing value networks include those between the organization and its suppliers, its investors (including venture capitalists); its strategic business partners (e.g. a business with a complementary product); and its customers. Other kinds of networks cross organizational and industry boundaries, such as innovation networks or networks of people with the shared purpose of creating a particular social good or

outcomes, such as improving education. Terrorist and criminal networks are also value networks, of course. The network is a value conversion mechanism that achieves not only positive goods and outcomes, but nefarious and negatives ones as well, according to the values and intent of those who serve the network. Still, as long as the principles of a healthy value network are followed, the network will be sustained and fulfill is purpose.

Creating value from intangibles

The idea that intangibles, like other assets, are increased and leveraged through deliberate action is now gaining wide acceptance. Reputation now goes beyond brand to include the assets of social citizenship and environmental responsibility, which are demonstrated in sustainable business values and practices (Allee, 2000; Henderson, 2006).

However, understanding intangibles as assets is only the beginning. To understand how intangibles create value, three other very important dimensions must be grasped:

(1) The first dimension is how intangibles go to market as *negotiable* forms of value. Intangibles are negotiable goods in the sense that they are negotiable economic offerings. One can, of course, exchange knowledge for money in the form of a product or service, thereby converting the intangible to a tangible. One also negotiates exchanges of knowledge for other knowledge, and trades intangible benefits or favors.

(2) The second dimension is how intangibles are managed as *deliverables*. When negotiating an intangible exchange, the promised intangible can be viewed as a deliverable. These include informal knowledge products and also benefits that can be extended from one person or group to another. Intangibles in this sense include all unpaid or *non-contractual* activities that make things work smoothly and help build relationships. In contrast, tangible deliverables include anything that is *contracted*, *mandated* or *expected* by the recipient as part of the delivery of a product or service and that directly generates revenue.

(3) The third dimension is exactly how both tangible and intangible assets are dynamically converted into other forms of value in the business model, and how value inputs are used to increase tangible and intangible assets.

The molecular level of economics is the trade or exchange, whether it involves financial currencies or not. Intangibles are used as negotiables in economic exchanges all the time. One might package an intangible, such as knowledge about our industry, and sell it for money. Or one might engage in a direct knowledge exchange. One person might show another how to animate a slide show if the other demonstrates how to build a database. Or one might negotiate a direct exchange of favors or benefits. For example, one person might introduce executives from another company to important contacts in the person's business web if the executives agree to support a certain initiative before a regulatory body. These exchanges are not outside the realm of economics, but are the molecular level of value creation that ultimately leads to financial wealth and/or social good.

A *transaction* occurs when a deliverable originated by one role is conveyed to and received by another. Two or more reciprocal transactions are an *exchange*. Once an exchange has been negotiated, both parties can be held accountable for the effective

execution of any transaction either originates. Between them, they can develop performance metrics for the quality, speed, timeliness, quantity, and usefulness of the completed transaction. (Transaction costs can even be tracked, although that is not the most useful view of these types of exchanges.) In this way, the negotiable form of value has become a deliverable that can be just as deliberately managed as any other transaction. However, *at no time in this process is it necessary to convert the negotiable into a financial or tangible form*.

Mediums of exchange

Intangibles basically go to market in two ways:

(1) through conversion to monetary value; and

(2) through conversion to a negotiable form of value that can be used more informally as a type of barter (Allee, 2003).

Money is basically a medium of exchange whereby goods can be assigned a value in the form of an agreed-upon measure. Money is an enabler of value conversion because it allows people to convert things to units of measure and trade the units in a marketplace, instead of trading physical goods. This way they do not have to carry around everything they own and make trades for what they need on a daily basis. They can exchange the units of measure instead of the things themselves, and then use those units to purchase other goods.

Some have suggested that alternative currencies, such as airline miles or community service credits, represent movement into an intangibles economy and could even replace monetary systems. However, airline miles and community service credits are still common units of measure that serve as mediums of exchange, even though the currencies are more localized into in-kind credits. Alternative currencies offer a healthy diversity into the larger economic system and could serve as a fall-back economic system in times of financial instability. However, the underlying assumption is still the same as that for financial currencies: Things of value can be converted into like units of measure.

However, the majority of intangible transactions remain in the realm of the intangible and are *neve*r converted into units of like measure (i.e. alternative or financial units) – *nor do they need to be*.

Some types of value can readily enter into the tangible realm through direct conversion into something that can be sold for money, or by a less direct conversion, such as using an alternative currency as a medium of exchange. However, the effort to convert every type of value into a common unit of measure is fundamentally the wrong approach to the intangibles economy. Carried to its extreme, this could lead to proposals for systems of micro-credits for ideas. This would entail treating ideas and knowledge as if they were things instead of emergent properties of networks.

The most visible way intangibles go to market, of course, is when they are converted to a good or service that has financial value. However, business and economic activities actually comprise a very sophisticated barter system involving intangibles that plays a vital economic role in terms of building business relationships, creating value for the participants in those relationships, and assuring that business transactions run smoothly. Any time one agrees to share or exchange knowledge or favors directly, without conversion to a financial cost, that individual or group is

bringing intangibles to market in the form of barter. Intangibles must be understood *as* intangibles, which includes understanding how they are converted into other negotiable forms of value – and just as importantly, understanding when and why they are *not* converted.

Value conversion

Value conversion is the act of converting or transforming financial to non-financial value or transforming an intangible input or asset into a financial value or asset. The theme of value conversion runs through social exchange theory and is a key question in the field of socioeconomics (Homans, 1958). Some advocates of the intangibles perspective, such as Jan Taug (2004), have expanded the boundaries of exchange theory by suggesting that relational or social capital is the catalyst for interconvertability, whereby different capital forms flow in multiple directions. This intraconvertability of value is a foundational dynamic of a knowledge-based economy.

Knowledge, an intangible asset, is one of the most interchangeable commodities. Knowledge can be "traded" for more knowledge; it can be traded for another form of intangible value, such as a favor or benefit; or it can be packaged and sold for profit as a tangible form of negotiable value. Whenever one type of value has been created or realized from another type of value, a value conversion has been executed.

The value conversion question runs in two directions:

(1) Converting value as inputs, or value realization: how does one convert inputs into value (financial and non-financial)?
   - How do value inputs help one build or manage tangible and intangible assets?
   - How do value inputs affect one's financial picture?

(2) Converting value as outputs: how does one utilize tangible and intangible assets to create value for customers and other participants in an internal or external value network?
   - What kind of intangible value outputs can one create from both tangible and intangible assets?
   - What kind of tangible outputs can one create from intangibles to directly generate revenue?

When considering value conversion, it is necessary to assess the inputs and outputs for each role in the network to determine whether value conversion opportunities are being overlooked. For example, a financial services company had been providing a series of standard reports to its customers. Assessing value conversion opportunities helped the company realize that many of the reports it provided for free could be packaged more attractively, enhanced with expert analysis, and then sold for a fee. Thus, the company executed a value conversion by transforming an intangible asset of knowledge or expertise that had been formerly used as an intangible (free) output into a tangible form of value with which it could generate revenue.

Participants in a value network, either individually or collectively, *utilize* their tangible and intangible asset base by assuming or creating roles that *convert* those assets into more negotiable forms of value that can be delivered to other roles through the execution of a transaction. In turn, the value of deliverables received is *realized* by

participants when they convert them into gains or improvements in tangible or intangible assets. The value conversion strategy model in Figure 1 illustrates this value conversion. This visualization of strategy conversion was co-developed with colleague Oliver Schwabe (2007).

Using value network analysis to address value conversion

There is a growing interest in network perspectives as people explore new ways of thinking about organizations and business relationships. The term "value network" is being adopted in general business practice, primarily in regard to industry value networks, but also in regard to business webs. SAP, IBM, WalMart, and others refer to their value networks as a way to describe their efforts to bring coherence to supply chains or to industry clusters. Technology companies are likely to use the term when discussing service-oriented architecture (SOA) in their efforts to integrate technology systems across industries. These communications mostly are oriented toward marketing and have little if any methodologies of substance behind them.

Early discussions about value nets were usually focused on supply chain, using frameworks, scorecards, and variations of supply chain models to describe supply chain networks (Parolini, 1999; Bovet and Martha, 2000). Yochai Benkler (2006) moved more solidly into a value analysis with his landmark book *The Wealth of Networks*, but focused primarily on internet-based social production models. Shoshana Zuboff (2002) drew a bit closer to the network value question in *The Support Economy* with her brief discussion of intangibles in federated support networks.

Several analysts and researchers are using social network analysis, both metaphorically and analytically, to try to understand networks as economic entities with some limited focus on intangible outcomes and exchanges (Cross and Parker, 2003; Dawson, 2003; Iansiti and Levien, 2004). Social network analysis (SNA), referred to as organizational network analysis (ONA) when applied to organizations, is being used in some organizations to understand knowledge flows (one kind of intangible) and the network patterns of expert communities. This methodology has been a valuable tool in the social sciences since the 1930s, and has been widely used to address a variety of questions about relationships and communication (Nohria and Eccles, 1992). Although this approach provides powerful insights into knowledge exchanges, it falls

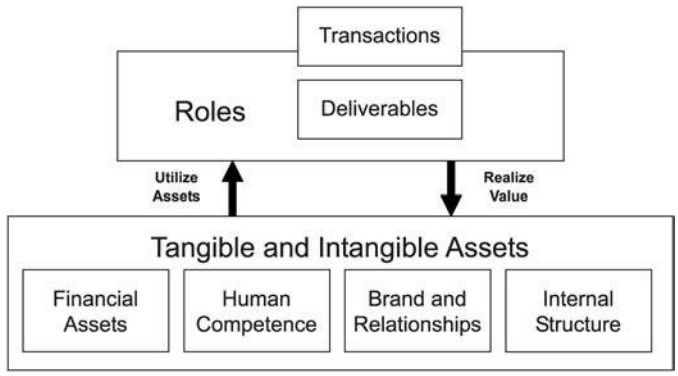

Figure 1.
Value conversion strategy model

short in being able to demonstrate a direct linkage between network patterns and value.

Value network analysis (VNA) links specific interactions within the value creating network directly to financial and non-financial scorecards. It does the following:

- provides a fresh perspective for understanding value creating roles and relationships, both internal and external, upon which an organization depends;
- offers dynamic views of how both financial and non-financial assets can be converted into negotiable forms of value that have a positive impact on those relationships;
- explains how to more effectively realize value for each role and how to utilize tangible and intangible assets for value creation; and
- provides a systematic analysis of how one type of value is converted into another.

Exchanging intangibles

Knowledge and intangibles behave differently than do physical resources, and it is a mistake to simply treat them as tangibles. This means, in describing the value model of a business, one must consider two orders of economic exchange – *tangible* and *intangible*.

Tangible exchanges of goods, services, and revenue

In value network analysis, tangible exchanges are defined as *contractual* transactions involving goods, services, or revenue, including but not limited to physical goods, services, contracts, invoices, return receipts of orders, requests for proposals, confirmations, and 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 (e.g. reports or package inserts) are also considered tangible exchanges. The determination of whether a deliverable is considered a tangible or intangible is dependent on its contractual nature, not its physical nature.

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 include those "little extras" people do that help keep things running smoothly and build relationships. These include exchanges of strategic information, planning knowledge, process knowledge, technical know-how, collaborative design work, joint planning activities, and policy development. Although these intangibles may have a strong element of expectation, they tend to be informal, not part of the contract, and rarely deliberately negotiated.

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 specific activities.

"Roles" are the agents of value conversion

The organisation or "the firm" is typically referred to as a discrete entity, when in fact it consists of real people playing a variety of roles in different activities. Any role controls a set of tangible and intangible assets or resources that support execution of the role. People (as individuals groups or organizations) play each role by processing those assets and resources into negotiable value outputs. Roles also process different inputs by using them directly as resources for themselves or they convert them into financial and non-financial assets that accrue to the firm. Therefore, assessing value conversion is particularly valuable when focused on a single role and the way that role engages in value conversion. Roles describe how people contribute to a particular activity.

The organization chart is an attempt to describe recurring roles or functions in the firm. However, it is essential to understand value network roles separately from organizational roles. In any given activity, these roles may be the same, but it is more useful to consider that every "job" or business unit actually involves a number of different roles in different business activities. It is easier to understand value conversion by considering the actual roles in an activity, and not confusing the role with what person or business unit may be filling the role at any given moment.

Roles and value network strategies

People playing roles are responsible for using the assets under their control to create value outputs or deliverables that can be traded for other forms of value, whether financial or non-financial. Basically, each role initiates or offers a potential deliverable for trade that becomes a completed value *transaction* upon acceptance by another role in the network. So, although value can be offered at the role level, *it is only when that value is accepted or validated by another role in the network that the value conversion is complete*.

Acceptance of a value offering is contextual and dependent upon the functioning of the whole network or system of value. In other words, a deliverable is considered value in one context but not in another. *Value is therefore an emergent property of the network, so understanding the functioning of the network as a whole is essential to understanding exactly how and why value is created.* Although it is useful at the role level to understand one's role in the network and manage one's value inputs and outputs, the dynamics of value in a network are dependent upon network effects, and one cannot determine value by simply adding up all the roles and their outputs.

Developing a value network strategy requires understanding the shared purpose and values of the network, then carefully selecting the role(s) one chooses to play in the network. The emergent purpose and values of the network are revealed through the pattern of roles and value exchanges in service to fulfilling an economic or social goal or output. The shared purpose and values may be either tacit or explicit but can be deduced from the network patterns. Value is continually being negotiated in this context of overall purpose and values. Sustainability of the network is dependent upon there being a high level of both transactional and network perceived value. Figure 2 builds on Figure 1 by depicting the value conversion strategy of a group of participants into the fabric of the value network itself.

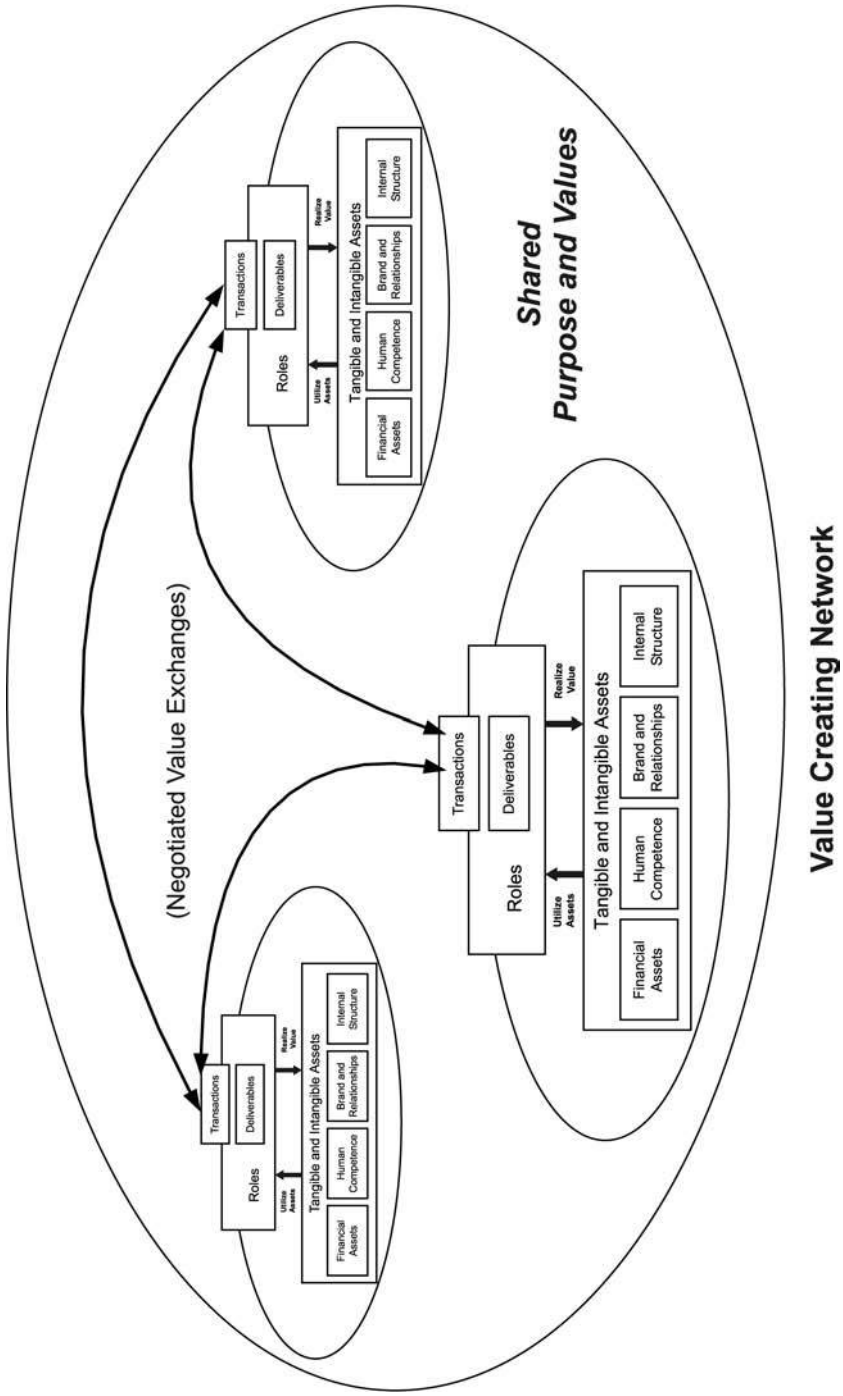

Figure 2.
Value network strategy model

Mapping the network

In order to fully develop a value network strategy it is necessary to first map out the value exchanges across the network. This mapping method relies on only three simple elements – roles, deliverables, and transactions:

(1) *Roles* are played by real people or participants in the network who provide contributions and carry out functions. Participants have the power to initiate action, engage in interactions, add value, and make decisions. They can be individuals; small groups or teams; business units, whole organisations; collectives, such as business webs or industry groups; communities; or even nation states.

(2) *Transactions*, or activities, originate with one participant and end with another. The arrow is a directional link that represents movement and denotes the direction of what passes between two roles. Solid lines are formal contract exchanges around product and revenue, while the dashed lines depict the intangible flows of market information and benefits.

(3) *Deliverables* are the actual "things" that move from one role to another. A deliverable can be physical (e.g. a document or a table) or it can be non-physical (e.g. a message or request that is only delivered verbally). It can also be a specific type of knowledge, expertise, advice, or information about something, or a favor or benefit that is bestowed upon the recipient.

In Figure 3, the nodes depict roles in an activity, and the arrows with labels indicate all the important transactions through which deliverables are conveyed from one role to another. The diagram shows an external facing value network focusing on market innovation for a technology company.

Analyzing the value network

Once all of the critical roles, value exchanges and transactions have been identified then it is possible to do full value network analysis. Analyzing a value network requires addressing three basic questions. The first question is about assessing the value dynamics, health and vitality, and value conversion capability of the system as a whole. The second and third questions concentrate on each specific role as it relates to value conversion. The basic questions are:

(1) *Exchange analysis* – What is the overall pattern of *exchanges* and value creation in the system as a whole? How healthy is the network and how well is it converting value?

(2) *Impact analysis* – What *impact* does each value input have on the roles involved in terms of value realization?

(3) *Value creation analysis* – What is the best way to *create*, *extend*, and *leverage value*, either through adding value, extending value to other roles, or converting one type of value to another?

Exchange analysis

An exchange analysis assesses the overall patterns of value exchange. Some key questions are:

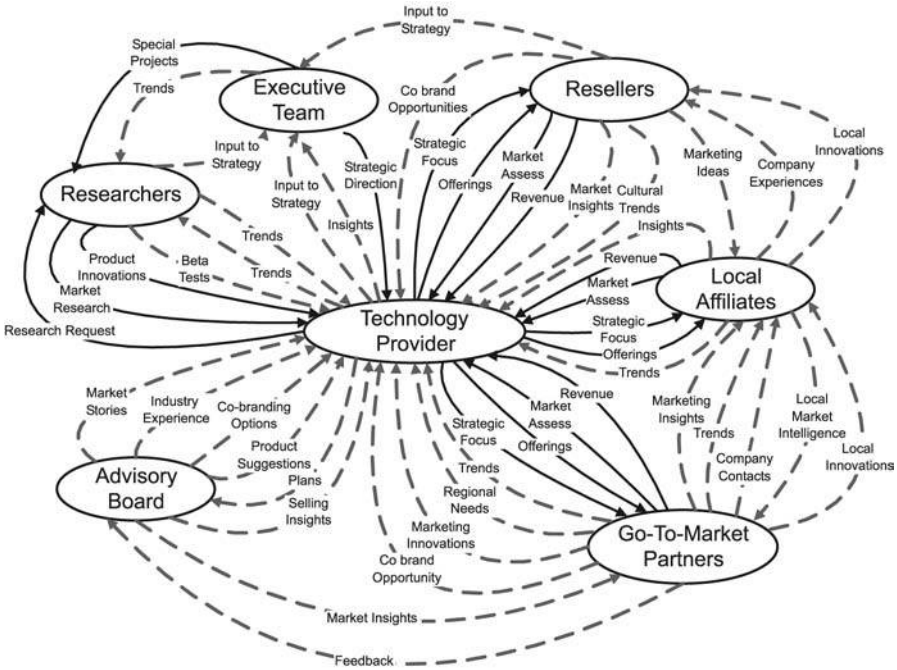

Figure 3.
An external value network focusing on market innovation for a technology company

- 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 roles extending several intangibles without receiving a similar return?
- Are there missing or "dead" links, weak and ineffective links, value "dead ends", or bottlenecks?
- Is the whole system being optimized, or are some roles benefiting at the expense of others?

Additional insights come from comparing the ratios of intangible and tangible transactions. Although a research effort is underway to collect comparative benchmark data, the research has not yet been determined what the ideal ratios are. However, it is sometimes insightful to ask if the ratio of intangible inputs to tangible and intangible outputs seems appropriate, given the purpose of the network. Patterns would probably vary by strategy, by complexity of the activity focus, and even by industry.

Many questions about the overall indicators and patterns for healthy value networks remain unanswered. As more research data become available, however, it may be possible to discern what those ideal patterns would be and to develop diagnostics to more accurately assess the value conversion capability of organizations and networks. One such effort is the SMART evaluation currently being conducted for the European Commission. This evaluation is using value network analysis and

intellectual capital indicators to assess innovation deployment networks in member states and regions of the European Union. The final results of this study may well provide a typology of value network patterns that correlate with macro-economic indicators and intellectual capital indicators at the local level (European Commission, 2007).

Impact analysis for value realization

Because roles are the critical agents for value conversion, it is helpful to explore value creation at the level of key roles. An impact analysis shows whether a role is realizing value from the inputs it receives. Value realization is the act of a turning a value input, either tangible or intangible, into real gains, benefits, or assets that contribute to the success of the participants and their organization. The impact analysis is designed to:

- assess how specific value inputs are bringing value or benefit to each role;
- assess the overall tangible and intangible cost/benefit for each value input;
- identify value realization opportunities to better leverage value received;
- identify potential opportunities for value conversion; and
- link the key value network transactions and deliverables to financial and non-financial scorecards.

How to do it

The impact analysis can be effectively executed in a spreadsheet.

- Determine if the impact is going to be evaluated for only the role being examined or for how value accrues to the company as a whole. If both are being evaluated, two separate analysis tables can be created or extra fields can be added.
- Create a spreadsheet or table by listing the transactions on one axis and the key impact categories on the other. Icons, numeric values, or symbols can be used to indicate the degree of positive or negative impact. Actual performance indicators (current or targeted) can be included in the table as well.

What to ask

In general, considering each transaction and its deliverable in turn, conduct an expanded cost benefit analysis. In this way, it is possible to determine whether the transaction is creating value and what costs and risks are incurred as a result of the transaction.

(1) *Activities generated* – What is the immediate visible response to this particular input? In other words, what activities or behaviors are triggered by this input:
   - What decisions does it trigger?
   - What is involved in processing or handling of the input?
   - What communication is needed as a result of the input?

(2) *Costs* – What are the costs and risks of these activities? What is at risk when handling this input or when not handling it well? What are the demands on resources and assets?
   Tangible costs and resource needs:
   - financial investments or operating capital;
   - time and materials; and

- facilities and equipment.

Intangible costs and resource needs. What are the demands on:

- human skills and competence?
- internal structures and systems?
- business relationships?
- brand and identity?

Benefits. What are the benefits of this input?

- increased tangible value, by directly generating revenue, improving the quality of product or services, or reducing costs;
- improved current capability, by increasing the speed or quality of value conversion, generating greater innovation, or improving organizational environment or culture; and
- expanded future capability (intangible value), by adding to or improving the store of knowledge, enabling greater collaboration, learning, and skill development, increasing intellectual capital or intangible assets, increasing human competence, building internal structures, improving our business relationships or brand recognition, fine tuning strategy, reinforcing values, or supporting one's identity, or being a good citizen, socially and environmentally.

Displaying data

Data can be handled using a table or spreadsheet such as the one suggested in Figure 4, which is based on the Intangible Assets Monitor of Karl-Erik Sveiby (1997) and has the non-financial asset categories of "Human competence", "Internal structure", and "External structure". In some companies, the scorecard might include corporate social responsibility, leadership, or even culture. The format can vary according to different models of intangible assets.

Use the cost/benefit comparison to identify high-potential or high-leverage activities. The goal is to realize the highest possible return for the lowest possible cost or risk.

Once an "as-is" analysis has been completed, use the same approach for brainstorming ways to increase the impact or value in a "strategic" analysis.

Note that the last column in Figure 4 allows the assignment of a perceived value in the view of the recipient. This often brings insights because participants can perceive a

Transactions			Impact Analysis							
Deliverable	From	To	What activities generated	Impact on financial resources	Impact on intangible assets			Overall cost/risk	Overall benefit	Perceived value in view of recipient
					Human Competence	Internal Structure	Business Relationships			+2 +1 Neutral -1 -2
Intangible										
Tangible										

Note: The table configurations are available open source in the Excel®-based Gen*Isis*™ workbook, which is part of the Gen*Isis*™ Value Network Suite of tools and applications available at https://sourceforge.net/projects/genisis.

Figure 4.
Impact analysis sample table configuration

particular transaction quite differently. (It is also possible to have participants assess the perceived value of the network itself.)

A very natural extension of this table would be to include more traditional ROI performance indicators or performance targets. Other factors that can be included are costs and benefits in terms of corporate responsibility and brand.

Value creation analysis: converting intangible assets into negotiable value

Value creation analysis looks at how each role adds value to the network. The roots of this analysis lie in the principles of value-added accounting and value chain analysis. The theory goes that, at every point along the value chain, one should add value to the product or service. In value network terms, this means that when a role receives a value input, ideally the people playing that role would find ways to use that input to provide greater value in the form of products and services. The value creation analysis broadens these questions to consider and assess intangible as well as tangible value.

Value creation analysis is focused on the value creation and *output* of each role, much as impact analysis looks at how a role gains or benefits from an *input*. Of course, if participants can both gain value for themselves and also leverage that input for a greater value output, then that is really maximizing value. Like impact analysis, value creation analysis is basically an expanded cost/benefit analysis, with a focus on asset utilization. So the key questions are:

- How well are assets being used to create this value output?
- What value features or enhancements are provided with this output?
- What is the level of benefit to the business in providing this output?

Dimensions of value creation analysis

Value creation analysis explores five dimensions of value creation. It not only considers the sources of value and the assets, but also assesses how value is created and what impact it has on other participants. Figure 5 shows this basic framework:

Asset utilisation is the first dimension of the value creation analysis. How well is the participant leveraging financial and non-financial assets to create each value output?

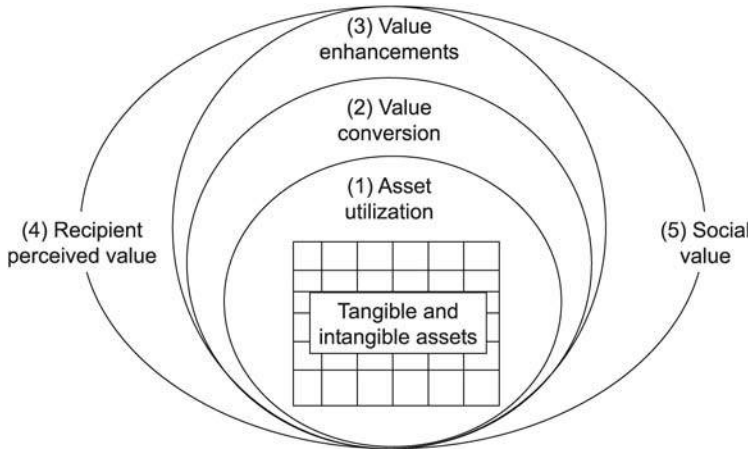

Figure 5.
Dimensions of value creation considering core tangible and intangible assets and how well they are utilized in value conversion

The indicators used for this determination can be as simple as a three-point high/medium/low subjective value, such as:

- high – this asset is being leveraged or utilized very well to create this output;
- medium – this asset is being utilized to an average degree; and
- low – this asset is being utilized poorly or not at all.

Indicators also can be much more involved and include hard indicators, such as financial costs, person-hours required, equipment costs or system demands, efficiency factors around speed and quality, external infrastructure required, and partnerships costs.

The second dimension involves looking at the *value conversion* process through which assets are turned into value outputs. Value conversion is achieved by converting one type of value input into another kind of value as an output.

For example, if a participant receives an item of competitive intelligence (an intangible knowledge input) from another participant, how could the first participant convert it into a value output?

- *add* value by contributing insights and providing it as an intangible deliverable to another business partner;
- *extend* the value by making it available for other value network partners to access; or
- *convert* the competitive intelligence into a tangible value offering that can generate revenue.

An example of this last strategy would be to publish an industry analysis to sell as a product. Or, conversely, if the participant purchases the competitive intelligence as a tangible, it could be converted into intangible value by providing it at no cost as an intangible benefit for a colleague or strategic partner.

The third dimension considers what specific *value enhancements* or value features are created or added that make this value output unique:

- addition of value by enhancing the basic input (e.g. obtaining an industry report supplier and adding an expert commentary); or
- extension of a value gain to other participants (e.g. distributing or broadcasting a basically unchanged knowledge output to other participants).

The fourth dimension of value is the transaction's *perceived value* from the perspective of people who are the direct recipients of this value output. How highly does the recipient of the output value it? Perceived value could simply be a high/medium/low assessment on the part of the participant who receives the value input. If everyone in the network has completed an impact analysis, then that would provide the most accurate data. If an impact analysis has not been completed or it is not possible to do, whoever is doing the value creation analysis can simply estimate the perceived value. Needless to say, at some point, a reality check is needed to assess the accuracy of that estimate.

Comparing the cost or utilization factor to the perceived value of the output can help evaluate investment decisions or value creation strategies. Whenever a value is

provided, the participant is looking for the highest possible value for the recipient and the highest possible benefit for himself or herself, at the lowest possible cost.

Social value is the fifth dimension. This looks at the value (or negative value in terms of costs) that these outputs hold for industry, for society, and for the environment. In other words, it assesses what accrues to indirect recipients of the value outputs.

How to do it

Value creation analysis should be conducted after completion of the visual value network map and after an initial "as-is" exchange analysis. It can be done either before or after an impact analysis, or any time one is ready to focus on the value being provided by a single role or participant, or by the network overall:

- determine which role(s) is going to be the focus of the analysis;
- create a spreadsheet or table by listing the transactions on one axis and the key value creation questions on the other axis;
- the table can be customized for any financial and non-financial scorecard; and
- it is also possible to consider the negative costs or impacts of the value output.

What to ask

The basic questions are focused on understanding how effectively this role is generating value offerings. Sample questions are:

- What are the core value-creating activities for this role?
- What specific value outputs (tangible and intangible) does it generate and provide to other roles and participants?
- Is it possible to create more value outputs utilizing the same assets?
- Are the outputs providing value for the system as a whole?
- Are resources adequate to achieve the outputs?
- Are some variables or resource constraints affecting a participant's ability to create value?
- How quickly and efficiently does this role add, extend or convert value (speed of value creation)?

The example in Figure 6 uses the format from the Gen*Isis*™ application (see www.value-networks.com), as mentioned previously. Figure 7 shows text details from the overview in Figure 6.

Combining impact analysis and value creation analysis

By comparing value outputs with inputs, a number of interesting value creation questions can be addressed for each role:

Transactions		Perceived value		Value Creation							
				Tangible asset utilization	Tangible costs	Risk level	Intangible asset utlization	Intangible costs	How we add value	Cost/ Risk	Benefit

Figure 6.
Value creation analysis overview

Transactions			Perceived Value	Value Creation Analysis		
Deliverables	**From**	**To**	**Recipient highly values this deliverable.** Strongly agree (+2) Agree (+1) Neutral (0) Disagree (-1) Strongly disagree (-2)	**Tangible asset utilization** is: H = high M = medium L = low	**What are the tangible costs?** (financial and physical resources)	**How high is the risk factor in providing this output?** H = high M = medium L=Low
Intangible	<Please select>	<Please select>				
Tangible	<Please select>	<Please select>				

Value Creation Analysis (continued)								
Intangible asset utilization is: H = high M = medium L = low (Human competence Internal structures Business relationships)			**What are other intangible** costs or benefits? (Industry, society, environment)			**How do we** add to, enhance, or extend value?	**What is the overall combined cost / risk** for this input?	**What is the overall benefit** for us in providing this input?
HC	IS	BR	Industry	Society	Env			

Figure 7.
Value creation analysis

- Is this role actually creating and adding value, or merely extending it?
- Does a disconnect exist with respect to how the value outputs are perceived by the provider and the recipients?
- Do apparent discontinuities exist, with value outputs seeming to have little or no correlation with assets available or with other inputs?

Integration with other business analysis approaches

Because value network analysis focuses on both tangible and intangible transactions, it is compatible with and enhances other business analysis tools (Figure 8). At the Boeing Company and the Mayo Clinic, practitioners of value network analysis who combine it with lean manufacturing claim that doing the whole system view of the value network assures they have a full grasp of context before moving to process analyses. The big breakthroughs are more likely to be discovered at the whole system or network level.

Also at Boeing, the Complex Adaptive Systems group and others combine value network analysis and system dynamics. System dynamics helps uncover structural issues, while the value network analysis helps identify what roles and interactions are needed to fix problems. At Cisco and Telenor, value network analysis is being used in the customer support environment in combination with organizational network analysis (ONA) (Allee and Taug, 2006). After the critical intangible exchanges have been identified, the ONA helps determine whether the human pathways are really open for the exchanges and knowledge sharing to take place. And, of course, value network analysis combines smoothly with other approaches to intangible asset management.

Due to the compatibility of value network analysis with other business modeling tools, it can serve as an integrative language for modeling a business or value network. The Value Networks Consortium and the open source movement are now focused on

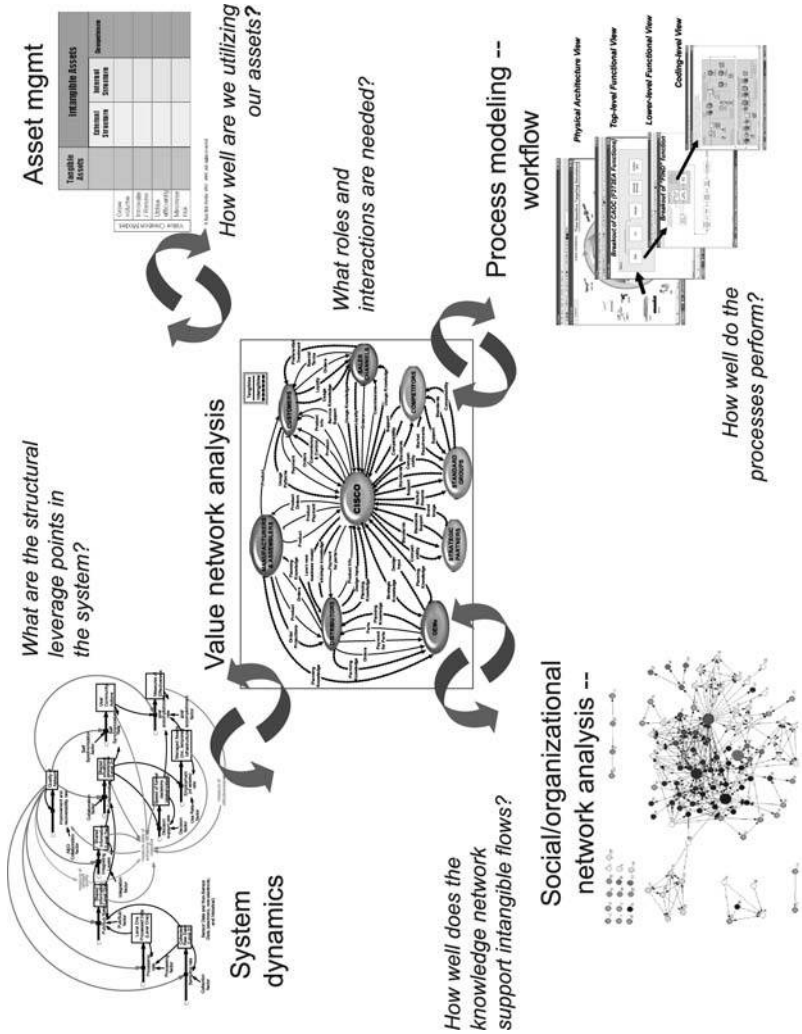

Figure 8.
Value network analysis and other business analysis approaches. Illustration co-developed with Bob Wiebe of The Boeing Company

developing standards for a value network information object model that would be XBRL enabled to support Enhanced Business Reporting Language.

Conclusion

Value conversion is one of the most challenging questions for those trying to understand the economic principles of creating value from intangibles. It is understood that intangibles do not work like other resources, yet the struggle to come up with a viable theory of knowledge economics continues. Value network analysis can provide a systematic way for approaching the dynamics of intangible value realization, interconvertability, conversion, and creation. The key to understanding the knowledge economy lies in not only understanding intangibles as assets, but in coming to terms with how they are set into motion in unique configurations of relationships, interactions, and resources in value conversion networks.

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