

Value Pathways to Strategy Formulation

By Annie Green

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*To reason with knowledge, we first need to be able to represent it in a formal manner
(Cawsey, 1998)*

Using Business Language to Communicate Strategy

Understanding how intelligence and knowledge creates value for a business is knowing the value pathways to achieve its strategy. Strategy should be represented in a language that aligns with the components and assets of its business. This includes the alignment to intangible assets that deliver value to its operations. Collecting enterprise data and aligning it to business language is core to the interworking within the business that holds the intelligence and knowledge about the business's health. Collecting data is reliant on a structure that supports the vitals or essential components of the business. The roll-up of this data within the vitals establishes core indicators that identify where to apply diagnostics. The current unknown is what are the enterprise vitals that corporate executives need to know?

What Vitals Corporate Executives Needs to Know

MuleSoft Connectivity Benchmark Report 2018 (www.mulesoft.com) presented the question to corporate executives:

“What are the goals you would like to achieve with your digital transformation initiatives in your organization?”

The answers were:

- 83% increased **IT's** operational efficiency,
- 71% improved **customer** experience,
- 70% increased **business** efficiency,
- 58% introduction of new **products/services** faster,

- 51% improved **employee** experience, and
- 27% Improved **partner** experience.

Visible in the results of the survey is that creators of enterprise strategy need to know the status of its technology, customers, business processes, products/services, employees, and partners. These six components are the starting point for a neural network that support machine learning and deep learning within the business enterprise. However, before stopping with the six components, the Framework of Intangible Valuation Areas (FIVA) (Green, 2005), a taxonomy validated by corporate executives, expands the list of business components. FIVA support the development of a network and dynamic model for creating, valuing, monitoring and reporting strategic goals and objectives. The eight vitals of FIVA are: Customer (C¹), Competitor (C²), Employee (E), Information (I), Partner (P¹), Process (P²), Product/Service (P³), and Technology (T). Notice, the six components identified in the survey are present, with the exception of two additional components in FIVA -- Information and Competitor.

Information is a major contributor to enterprise performance. In the article dated November 8, 2013, [Various Survey Statistics: Workers Spend Too Much Time Searching for Information](#), a statistic provided by Outsell states that an engineer's time spent searching for information increased 13% since 2002, a survey by SearchYourCloud identified that "workers took up to eight searches to find the right document and information.", a McKinsey report states that employees spend 1.8 hours every day—9.3 hours per week, on average—searching and gathering information" that equals 19.8% of business time – the equivalent of one day per working week – is wasted by employees searching for information to do their job effectively, and the article The Lifeblood of the Enterprise identifies that "the knowledge worker spends about 2.5 hours per day, or roughly 30% of the workday, searching for information. Information truly has a place in enterprise strategy because of its major impact on business efficiency.

Competitor information is critical in competitive enterprises. As John Pepper, Chairman at Procter & Gamble, said it best, "I can't imagine a time in history when the competencies, the skills, and the knowledge of the men and women in competitive intelligence ... are more needed and more relevant to a company being able to design a winning strategy and act on it." Companies that do not take advantage of the digital intelligence and knowledge available are at constant risk of falling behind competitors and losing key positioning in their marketplace. Jay Dwivedi, President of Xinvest Consultants puts the value of competitive intelligence into perspective as he states "What will determine your success is knowing ahead of time what your competitor is going to do so that you can either implement a strategic response before it is an imperative or react in a timely manner. Being caught by surprise can be disastrous." These insights provide reason why competitor is a value-add component to include in strategy.

FIVA may or may not be an exhaustive taxonomy, but, businesses need to capture as much as possible and then forget that which is not useful. According to CIRADAR, Forrester identified that the average business analyzes 12% of their data, which leaves 88% that could provide critical insights and missed opportunities. These eight components provide a solid foundation to digitally represent the business and reduce the risk of missed opportunities.

Digitizing the Business -- Making Sense of Pathways (Machine Learning)

The eight enterprise vitals of FIVA establish a starting point to construct a digital network of interactions. They represent the top layer of a neural network that supports the accountability and status of the business's vital components. The second layer identifies the intangible assets that align with each vital. See figure 1 below, which depicts the first and second layers of the network in tabular format.

Customer (C ¹)	Competitor (C ²)	Employee (E)	Information (I)	Partner (P ¹)	Process (P ²)	Product/Service (P ³)
Acquisition	New Markets	Assignments	Benchmarks	Acquisition	Business Activities	Convoys Sales
Satisfaction	Market Share	Education	External Availability	Assignments	Business Procedures	Copyrights
Longevity	Branding	Experience	Internal Availability	Education	External Processes	Patents
Profitability	Image	Hiring	Market Studies	Experience	Internal Processes	Products
	Reputation	Longevity	Trend Studies	Longevity	Training	Repeat Sales
		Position		Merger	Work Methods	Sales
		Productivity		Partnering	Work Techniques	Services
		Profitability		Agreements		Trade Secret
		Reporting		Position		Trademarks
		Relationship		Productivity		Win/Loss Ratio
		Satisfaction		Profitability		
		Skills		Reporting		
		Training		Relationship		
		Turnover		Satisfaction		
				Skills		
				Training		
				Turnover		

Figure 1 - Vitals to Intangible Assets – First and second layer of the business neural network

The Enterprise Mind and Thinking – Deep Learning

The third, fourth to the nth layers expands the business neural network to align the intangible assets to operational and historical data and information. The lower layers of the network contain the “capacity” of the business enterprise, which is the “value-creating ability of an organization” (McNair and Vangermeersch, 1998). Capacity represents four categories of diagnostic information (Drucker, 1998): Foundation, Productivity, Competence and Resource-allocation. These layers comprise a business neural network of data, or a business mind that

supports the building of algorithms (or thinking) that transcends through the cognitive layers of intelligence, knowledge and Learning. A structure that automates strategy scanning and augments strategy formulation by leadership or creators of business strategy. This structure facilitates the development of indicators, the ability to monitor and evaluate leading and lagging indicators using scorecards and dashboards, the ability to implement knowledge discovery by cross-pollinating data and information, and the ability to drill down many layers to deep learning.

Cross-Pollination – Thought (Logic) Discovery

The neural network's physical existence provides a dynamic data structure that identifies solutions focused on improvements, inefficiencies, and innovation. The first layer above the network is the intelligence layer. The intelligence layer is where data scientists can manipulate and summarize data to identify, uncover, and model business intelligence. This layer provides visibility into the value contributions of intangible assets and their elevation into strategic, tactical, and operational knowledge models. The knowledge models are constructed using a common business language that symbolize and represent specific business events. These models utilize the routine and special statistical, financial, forecast, and other models that provide analysis capabilities.

The cross-pollination of these vitals (Figure 2) provide relationships amongst and between the data. For example, the cross-pollination of vitals gives rise to three pathways of intelligence:

- **Relationship Intelligence** – understanding of how the interactions between knowledge workers influence organization performance.
- **Competence Intelligence** – understanding of how the abilities/proficiency of the knowledge workers influence organization performance.
- **Structure Intelligence** – understanding of how the organization's infrastructure environment influences organization performance.

Relationship Intelligence (RI)	Competence Intelligence (CI)	Structure Intelligence (SI)
1. Employee Intimacy (EE, EC ¹ , EC ² , EP ¹) 2. Customer Intimacy (C ¹ C ¹ , C ¹ C ² , C ¹ P ¹) 3. Competitor Intimacy (C ² C ² , C ² P ¹) 4. Partner (Alliance) Intimacy (P ¹ P ¹)	1. Employee Qualification (EI, EP ² , EP ³ , ET) 2. Partner Qualification (P ¹ I, P ¹ P ² , P ¹ P ³ , P ¹ T)	1. Customer Integration (C ¹ I, C ¹ P ² , C ¹ P ³ , C ¹ T) 2. Competitor Integration (C ² I, C ² P ² , C ² P ³ , C ² T) 3. Information Integration (II, IP ² , IP ³ , IT) 4. Process Integration (P ² P ² , P ² P ³ , P ² T) 5. Product/Service Integration (P ³ P ³ , P ³ T) 6. Technology Integration (TT)
Legend: Customer (C ¹), Competitor (C ²), Employee (E), Information (I), Partner (P ¹), Process (P ²), Product/Service (P ³), and Technology (T)		

Figure 2: Cross-Pollination of Enterprise Vitals

Dynamic and Infinite Learning – Deep Learning

Figure 2 identifies thirty-six permutations from tens of thousands that could occur from cross-pollination of the vitals, intangible assets, indicators and measurements. This structure promotes visibility into the strategic business events that are known and the discovery of business events that are unknown. All which can uncover knowledge that drives action.

Above the intelligence layer is the knowledge layer, which facilitates analysis and forecasting and the practice of econometrics. Through analysis and forecasting, the business gains visibility into the knowledge of what impacts its effectiveness, efficiencies and innovation. Knowledge initiates action that drives change. Organizational inquiry results in thinking and acting that yields a form of change in the design of organizational practices (Argyris & Schön, 1996). These changes are the input to business strategy (Kaplan & Norton, 1996) and subsequently enterprise performance measurement. The goal is to have a balanced measurement system to identify and control critical factors that lead to success. The measures for the performance measurement system are chosen based on the organization's vision and strategy (Kaplan & Norton, 1996). The aim is to measure success from different perspectives, like customers, employees, processes, and financial, as well as from the perspective of past, current, and future performance, such that these different aspects of performance are analyzed and managed (Okkonen, Pirttimäki, Lonnqvist, & Hannula, 2002).

The Strategic Performance Measurement System

Figure 3 depicts a structure that supports the enterprise levels of abstraction to automate the strategic management process. This structure provides attributes that demonstrate recall and intellectual skills and facilitates regression analysis, enabling a business leaders and executives to be cognizant of past practices and obstacles. This model integrates:

- **Cognition** – Identifies business vitals that support mental models to guide the decisions and actions of the decision-makers.
- **System** – Constructs a map that details the coherent picture of business vitals.
- **Intelligence** – Provides a view of negative and positive impacts on an organization's performance from questions by inquiries, predictions, explanations and prescriptions for control.
- **Knowledge** – Builds formal models based on rules or principles prescribing a particular course of action.
- **Learning** – Accumulates and analyzes knowledge aligned with activities that may be well or badly performed.
- **Change** – Supports inquiries that results in thinking and acting that yields profound inner shifts in people's values, aspirations, and behaviors and outer shifts in processes, strategies, practices, and systems.
- **Performance Measurement** – measures success factors from different perspectives, as well as perspectives of past, current, and future performance.

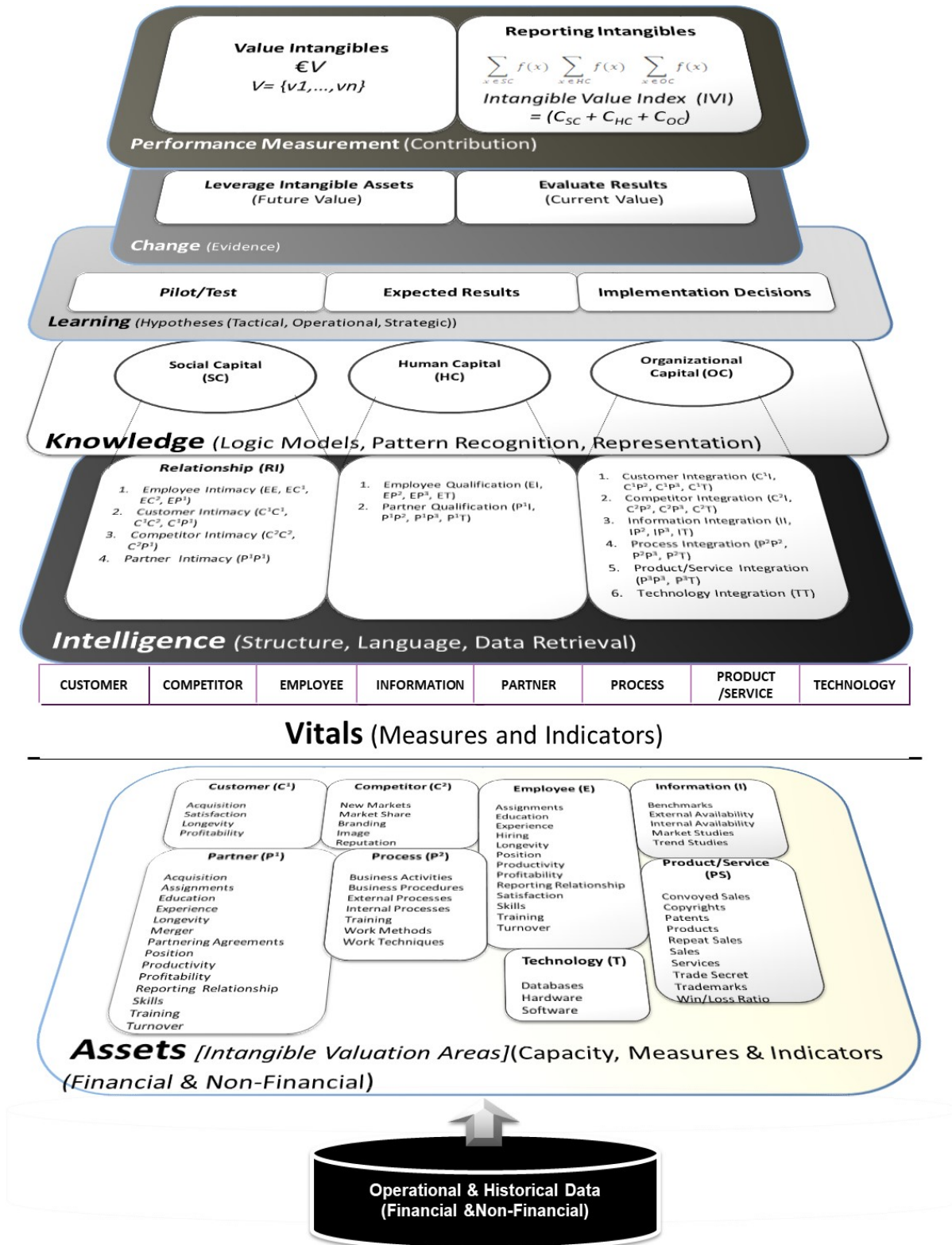


Figure 3: Strategic Management Process Automation - Business Reasoning, Analytics and Intelligence Network (BRAIN)

CONCLUSION

To incorporate artificial intelligence into the strategy of a business requires a data structure that helps it THINK! This cognitive structure starts with business vitals and their capacity, which evolves into intelligence, knowledge, learning, change, and translates into performance measures. These performance measures identify and control critical factors aligned with the ability of a business to meet its goal of identifying and controlling its value contributions. An AI thinking structure possesses nine characteristics: a concept, structure, language, data retrieval, logic models, pattern recognition, knowledge representation, hypotheses, evidence, and contribution.

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