

ECONOMIES OF LEARNING

Enterprise economies and the nature of competition have changed. While still important, economies of scale (the predictable reduction of marginal production costs across a relatively uniform offering) has been augmented with economies of scope (lowering average unit cost based on common platforms or infrastructure, such as from mass customization or last-mile specializations). Now, leading companies are pursuing “economies of learning,” the continual improvement, innovation and variation based on leveraging data and cognitive technologies to identify and fulfill changing needs for scale, scope, and engagement.

Economies of Competition

With the arrival of the industrial revolution, organizations sought competitive advantage through economies of scale. With **economies of scale**, the cost per unit of output decreases as the scale of production increases. The costs of production and overhead (facilities, equipment, procurement, distribution, marketing, sales, management, etc.) are amortized across the output. The more units produced, the less cost per unit.

Introduction of techniques like TQM and Lean allowed for focused “learnings” to provide incremental improvements in processes. However, the large fixed investments of scale inhibited the enterprise’s agility and the speed in which it could accommodate market changes.

As manufacturing capabilities became more sophisticated, there was a shift toward **economies of scope**, a proportionate saving gained by producing two or more distinct goods when the cost of doing so is less than that of producing each separately. The average total cost of production decreases providing a competitive advantage when the enterprise produces a complementary range of products focused around its core competency.

As enterprises got better and customer demands increased, the techniques of **mass customization** began to enhance the economies of scope.

Mass customization is a marketing and manufacturing technique which combines the flexibility and personalization of custom-made products with the low unit costs associated with mass production. But there is more to it than just that. Mass customization is the ability to produce a single customized product with the same efficiency as a mass-produced product. This implies seamlessness from

configuring, pricing and ordering all the way through supply, manufacturing and delivery.

In the January 1997 issue of Harvard Business Review, James H. Gilmore and B. Joseph Pine II identify "The Four Faces of Mass Customization".

1. **Collaborative** customizers conduct a dialogue with individual customers to help them articulate their needs, to identify the precise offering that fulfills those needs, and to make customized products for them.
2. **Adaptive** customizers offer one standard, but customizable, product that is designed so that users can alter it themselves
3. **Cosmetic** customizers present a standard product differently to different customers.
4. **Transparent** customizers provide individual customers with unique goods or services without letting them know explicitly that those products and services have been customized for them.

The concept of mass customization, whereby a company is able to deliver personalized experiences at scale is now more relevant than ever. Mass customization allows the customer to order exactly what they want, but while in the past they would have to wait for it to be custom manufactured, customers today are not willing to wait additional time for their effort. In addition, the advent of big data, AI and predictive analytics had drastically changed organization's relationship with their customers.

In today's environment, mass customization goes beyond these foundational types.

Organizations that can predict what the customers will want and can provide a unique, personalized experience will have the competitive advantage. So how does an organization go about doing that?

Beyond the Learning Economy

As with other things, learning as part of competition has also been evolving. Applied to scale and scope, learning helps drive down cost by boosting efficiency and reducing waste in production, by synergies and productivity, by better management practices, and more. The evolution of these concepts has been referred to as the "learning economy" in which efficiency and growth is driven by training and specialization resulting in profitable, high added value [goods](#) and services.

In his Blog, Jeff Thomas Cobb writes "Learning is a process. An economy is a system. Both are dynamic and evolving; both never "end" in any meaningful sense. In a Learning Economy, the process of learning is the fundamental driver of the system. Learning fuels innovation; it fuels change; it enables participants in the system to adapt so that they can sustain wealth and create new wealth... What is different now, though, is the sheer speed, scope, and scale of learning – and, by extension, the change – that is possible." <https://www.jeffthomascobb.com/learning-economy/>

The main difference between the learning economy and [economies of scale](#) or [scope](#) is that learning was no longer correlated to [production](#) levels in the same way. The learning economy does not depend on producing more quantity or a more varied portfolio, but rather from becoming a true specialist in a particular field and on having the best understanding of the ecosystem (customers, suppliers, partners, competitors). But again, while discussions of the learning economy are not new, they predate big data and cognitive computing. When we add these new aspects into the evolution, we get to the **economies of learning** - the continual improvement, innovation and variation based on leveraging data and cognitive technologies to identify, predict and fulfill changing needs for scale, scope, and engagement.

Figure 1 summarizes the difference in these 3 types of economic competition with respect to the value they generate versus the variety of production.

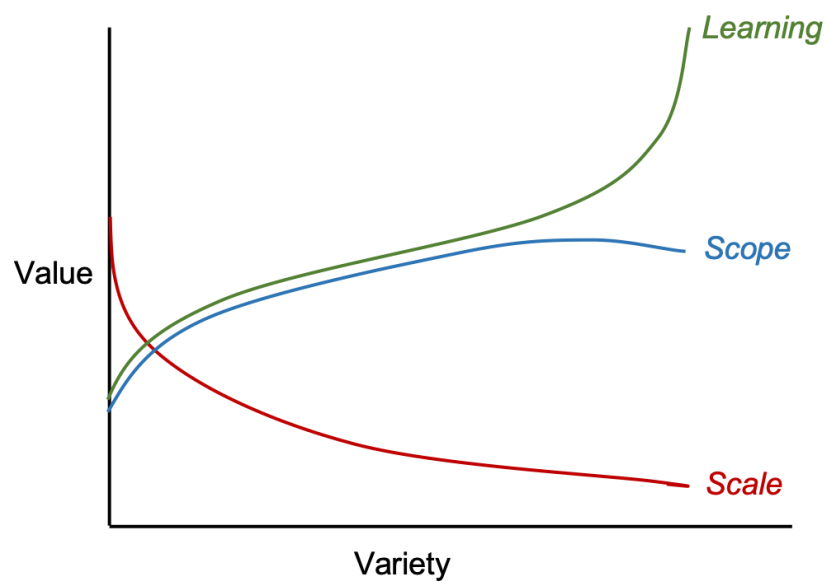


Figure 1 - Value versus variety

The red line shows economy of scale. The fewer items that are produced, the more value that this competitive strategy provides. The blue line illustrates economy of scope. As the variety of production increases (around a core competency), the value of this competitive approach increases. In some organizations there is a turning point where the complexity of the production variation outweighs other concerns and the value trails off a bit. The green line illustrates the economy of learning. Like scope, the value to the organization increases with variety. But, with the increase in variety, also comes an increase in data. When that data is turned into knowledge, the value of learning increases. As more and more data and knowledge are created, a "critical

mass" point is reached where value increases exponentially with the organization's ability to understand its ecosystem and predict actions that will provide competitive advantage.

Getting Back to Data

So how does an enterprise compete with an economy of learning strategy? In my June Column "Turning Data into Value", I referenced the DIKW Model (Pyramid) – Data, Information, Knowledge, Wisdom. As a brief review, it is a common model for thinking about data transformation and value creation. As we increase in value, we transform up the levels of the pyramid.

- **Data** put into context to have meaning becomes useful *information*, or a description of "what" – allowing us to interpret things.
- **Information**, given meaning with understanding, becomes contextualized to be *knowledge*, or a description of "how to" – allowing us to model things.
- When we further add explanation, or "why" to knowledge, we gain *understanding*.
- **Knowledge** (and understanding), given insight or judgement, becomes actionable as **wisdom**, or a description of "what is best" – enabling us to make better decisions.

This transformation from raw data into understanding, knowledge or wisdom takes place through learning.

Figure 2 illustrates an example of the pyramid in terms of three aspects that are relevant to the economies of learning:

- **Data Enrichment** – the transformation of data to information, knowledge, and wisdom (the traditional pyramid).
- **Value Development** – how an organization develops the opportunity for value by applying those transformations.
- **Learning** – the realization of the value development in terms of what has been learned.

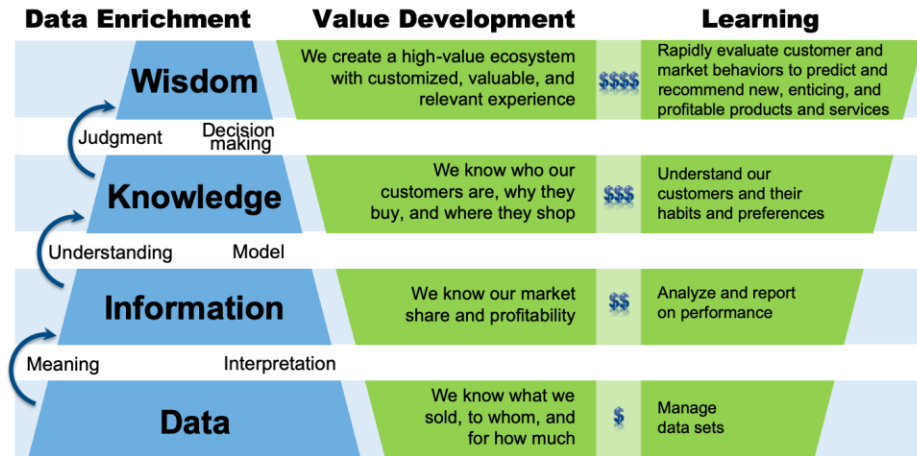


Figure 2 – Value Development and Learning

The exponential growth of value in the economy of learning comes from four main components:

1. **Maturity** in the technical, human and process capabilities and use of cognitive technologies.
2. **Incremental** development and reuse of analytical and predictive models with continuous feedback and enhancements to create and grow beyond the critical mass.
3. **Scope** - A wide variety of targets for analysis and associated data across the entire ecosystem and all aspects of the enterprise.
4. **Management** commitment to being a learning organization.

The learning organization is not just about providing a better customer experience (although that's obviously important). Creating a sustainable competitive advantage requires learning across all aspects of the enterprise. One of the important things that we know about AI is that insights often come with the combination of data from seemingly unrelated sources. It is the discovery of those relationships that lead to the new insights. As an example, below are some (there are many more) important areas for data collection, analysis and learning:

- Customer engagement: customer experience analytics, hyper personalized experience, needs prediction, curated product assortment, optimized fulfillment, marketing, sales, servicing, loyalty, brand, trust
- Production: JIT manufacturing, optimized supply chain, supply chain accountability, intelligent sourcing, connected assets, smart manufacturing, logistic automation

- Planning and simulation: digital twins, predictive inventory, risk management, quality management, contracting, planning, advance simulation, competitive analysis

So, what is the secret to turning data into value for the learning organization?

1. Collect data from multiple different sources. But don't just collect data, collect valuable data that you actually use.
2. Understand the concepts and usage of the DIKW model. Mature your use of cognitive technologies (automation, machine learning, AI, etc.) to transform data into information and into knowledge. Leading organizations -- those that effectively compete with learning -- will transform knowledge into wisdom.
3. Apply learning and combine multiple types of information across the entire ecosystem to discover new and different insights.
4. Act on the insights and knowledge to produce better engagement with stakeholders, improve productivity, reduce costs and risk, improve planning and create better products, services and new revenue streams.

An important strategy for every organization today is to understand and take advantage of the economies of learning. That means being as serious about learning as you were about scale and scope. Applying learning to every aspect of your organization. Harnessing the power of automation, AI, ML and more for continuous improvements in efficiency and effectiveness. Creating an enriched and rewarding experience for customers, partners, employees and other stakeholders. Using knowledge and insight for better planning and predictions that keep you ahead of the competition. Are you ready to compete? Is yours a learning organization?

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