



# Book The Learning Layer

## Building the Next Level of Intellect in Your Organization

Steven D. Flinn  
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## Recommendation

Adaptive systems innovator Steven D. Flinn focuses on the way “system thinking applications” can improve organizational learning and knowledge management. He explains how companies can create a “learning layer” within their information technology systems to educate employees and boost productivity and performance. *BooksInShort* recommends Flinn’s book – despite its occasional opacity and some heavy-going circumlocutions – to business leaders who want to make the most forward-looking use of adaptable corporate learning. He offers a solid take on the learning layer as a way to foster organizational education, manage knowledge and make the most of information technology. The book also will intrigue futurists who focus on technology and business. Flinn makes it clear that the learning layer’s infinite capacity exactly fits Sir Arthur Clark’s contention, “Any sufficiently advanced technology is indistinguishable from magic.”

## Take-Aways

- Information technology (IT) systems – if planned, built and implemented correctly – now have the unprecedented ability to become “adaptive learning networks” for corporate education.
- This “learning layer” seamlessly merges systems, knowledge, information and people.
- Such learning structures are modeled on the brain’s adaptive, evolving neural networks.
- This adaptability makes online learning remarkably customizable and flexible.
- The learning layer complements and expands upon conventional corporate education.
- The learning layer adapts to users’ collective behaviors and demands. It even offers recommendations users can fine-tune to meet their individual needs.
- The learning layer’s flexibility suits the needs of business. Major Internet corporations, such as Google and Amazon, already use this kind of system.
- The learning layer evolves intelligently, constantly adapting and growing.
- It helps innovators break existing ideas down into “capability components” that they can recombine in new ways.
- To implement the learning layer, start small in “broken” areas, grow in increments that mesh with your existing processes and evaluate before you move ahead.

## Summary

### The “Learning Network”

A major business and information technology (IT) consultancy bid on a \$200-million-a-year contract from a *Fortune* top-20 company. The consultancy had virtually no existing relationship with the client, though two of the other bidders did. Winning the bid was a long shot, but the candidate company had a unique advantage: its online learning network, an adaptive learning system that improves its own operations continuously based on its users’ collective activities. The client immediately

understood that this new way to leverage its intellectual capital and provide flexible, customized employee education. Appreciating the remarkable, sustained benefits of such learning, the firm gave the consultancy the contract.

## A Revolutionary New Form of IT

Business leaders have long viewed IT as a commodity. This will soon change due to a remarkable advance in “automatic learning capabilities” that enables companies to transform their knowledge flow and the operation of their IT systems based on their users’ actions. The only other system that works this way is the human brain, a neural network that constantly reconfigures its connections according to its experiences. Likewise, the new IT learning structure becomes more robust as users interact with it and as it reacts to their demands by integrating additional knowledge. As this set-up augments itself and adjusts, a fresh “learning layer” emerges – the networked union of employees, their procedures and a supportive, interactive knowledge bank. This radical transformation of existing learning tactics has deep implications for business since the learning layer enables workers to learn faster and more efficiently, a clear competitive edge.

“The bread and butter application is simply applying the learning layer to take the knowledge-based parts of your organization to the next level of performance.”

One result of this innovation’s “socially aware system” is that it can learn and then make intelligent suggestions in response to users’ needs. The system bases such “adaptive recommendations” on the questions that users ask, and then it fine-tunes its ideas based on how users react to its findings. The learning layer even can explain how it arrived at a particular proposal, including referencing any “reservations or doubts” within its own “inference engine.” These recommendations are a new communication mode for the people involved, but such systems-to-humans notations will be “ubiquitous” someday.

“The socially aware system can...make recommendations to itself, applying its learning to quite literally reconfigure itself and, by extension, our work processes on an ongoing basis.”

The learning layer’s transformational adaptability represents the third wave of IT. Speed marked the first wave; connectivity, the second. Like speed and connectivity, this third wave of “adaptive capability” – the mechanical ability to “learn from experience” – also springs from the fertile ground of the Internet. And it isn’t just a futuristic dream. Such adaptive capabilities are already online realities at Google and Amazon, which lead Internet commerce because they have been able to exploit “adaptive technologies” based on human behavior.

“The next era of information technology has begun to creep up on us, and learning is at its core.”

A true learning organization is “skilled at creating, acquiring, interpreting, transferring and retaining knowledge, and at purposefully modifying its behavior to reflect new information.” This definition also ably describes the adaptive IT networks that will manage intellectual capital, and “accelerate” its use and growth. Such systems can help firms leverage their users’ “knowledge and insights.”

## Modeled After the Brain

The best way to understand how adaptive IT systems work is to look at the human brain, the ultimate learning “machine.” The brain is a huge, complex network of “about 100 billion (1011) neurons with about 100 trillion (1014) connections.” Neurons function as nodes and connect with other neurons at synaptic junctions. These neural connections are analog networks, not binary or digital. The brain learns by “adding, deleting, strengthening and weakening the connections among neurons.” The brain processes data through an “internal feedback loop,” so its neural network is a constantly evolving structure.

“IT...is all about managing intellectual capital that is embodied in systems.”

The operation of an adaptive learning system relies on a “fuzzy network structure.” Unlike standard binary systems, fuzzy networks can handle “shades of gray,” as does the brain. Within such fuzzy IT networks, the nodes are “weighted on a continuum,” an advance over conventional business systems, which do not learn and are not fuzzy. The nodes in an electronic learning system can take many forms: “web pages, blogs, documents, multimedia or interactive applications.” Some nodes are “knowledge assets”; others are “topical areas,” that is, “descriptive information about a collection of knowledge assets.” These two types of nodes connect through “fuzzy relationships,” wherein new fuzzy networks link with nonfuzzy “legacy systems” to create business systems that can learn and adapt, like the brain.

“When the technically feasible begets the sublimely useful, there cannot be anything other than inevitability.”

Such “socially aware” systems capture users’ behaviors and infer (learn) their intentions. These systems include an “inference engine,” that is, “a complex set of algorithms that has to glean as many insights as possible from its behavioral knowledge base, while neither under-interpreting nor over-interpreting.” Learning systems recognize some specific actions, including:

- **“Navigation and access behaviors”** – Searches, “click streams” and “user access paths.”
- **“Collaborative behaviors”** – Personal interactions, like email, microblogs and forums.
- **“Reference behaviors”** – The organization of information, including tagging.
- **“Direct feedback behaviors”** – Comments, user ratings and recommendations.
- **“Self-profiling and subscription behaviors”** – Business continuation preferences.
- **“Physical location/environment”** – Data from a GPS and similar instruments.
- **“Attention/physiological”** – Highly personal information, such as “directions of the user’s gaze, gestures, movements, remarks,” and so on. If a user doesn’t want the system to capture such personal “behavioral information,” he or she can, in effect, turn this function off, and can either erase his or her “historical behaviors,” or ascribe such behaviors to an anonymous user.

## Emergence of the Learning Layer

Setting up business systems with adaptable learning capabilities calls for programming that enables the systems’ basic structure to evolve constantly. Such adaptive

systems “automatically add or delete nodes, or more typically...change the weightings of the relationships among the nodes.” The learning layer does not replace self-maintaining, self-managing, self-regulating existing systems. Instead, it rests lightly “on top” of them. As organizations implement adaptive IT systems, they should combine their intellectual capital with their social networks. This is readily doable through the kind of “fuzzy union” that marks typical social relationships – close friends, work colleagues, casual acquaintances, and the like. Users can also utilize learning networks to reach out to experts. Thanks to the learning layer, expertise will soon be in even greater demand.

## “The Fabric of Business”

All enterprises can benefit substantially from weaving the learning layer into the fabric of their business pursuits, using it to build the “basic elements of strategy, capabilities and culture.” Due to changes in the business environment, each enterprise must be adaptive and able to move from one strategic position to another – for example, shifting from focusing on products to emphasizing relationships to building cost-effective supply lines. Most companies start by competing based on their products. Their value rests on “product development, branding and distribution.” Superior goods are the hallmark of “product innovators” like Apple and 3M. Some businesses continue to succeed indefinitely on the basis of their products. Others eventually come to emphasize either their customer relationships or their “business processes and supply lines,” where cost control comes to the fore. Moving from one such “value-driver” to another requires flexibility and superior decision making.

“An organization’s ability to learn, and translate that learning into action rapidly, is the ultimate competitive advantage.” (former General Electric CEO Jack Welch)

For example, Walmart started as a product innovator and gradually began to dominate the market due to its efficient, standardized processes. Soon it became large enough to reshape its “entire supply network.” Now Walmart is so dominant that its request for manufacturers’ environmental impact statements sets a new standard and creates “another cost of entry for all those wanting to benefit from being in the Walmart network.”

## “Learning and Value”

Adaptive learning systems can help companies achieve flexibility and greater productivity based on greater know-how. The learning layer cuts past the “opaqueness of the pool of existing knowledge” within the typical firm. Its most basic use is to improve knowledge-based processes. Business undertakings have intrinsic intentional value – perhaps as profit makers or research activities – and an additional source of value, the “expected learning” they generate. Sometimes this second impact can outweigh the intrinsic value, such as when it changes future decisions.

## “Business Renewal and Innovation”

Sometimes the learning layer applies to existing “practices and processes.” It also can exercise an even greater impact by leading to “a whole new set of best practices.” Product-oriented firms must constantly renew their offerings, so the learning layer’s ability to foster innovation matters to such firms in particular. Leaders do not always appreciate that “innovation is most fundamentally a knowledge-management process” that creatively combines new insights with earlier concepts. The learning layer supports such combinations by making existing knowledge transparent and by multiplying the alternatives for “recombining existing elements in new ways.”

“The future has already arrived; it is just not evenly distributed yet.” (science fiction author William Gibson)

The learning layer helps companies by breaking down the raw material behind an existing idea to make its elements reusable and by looking beyond a company’s typical assets into new or neglected realms. For instance, innovators in technology firms will heed the power of their available science but may overlook the potential of their other relationships. The new “architecture of learning” can help innovators reassemble their various “capability components” into fresh approaches, thus increasing the likelihood that this spilled-out, “flipped funnel” process will lead to usable, fundable concepts. Moreover, the learning layer can deliver insightful “real-time suggestions.” It is also applicable in:

- **“Corporate strategy and analysis”** – More efficient access to information pays well in these and other “data, knowledge, modeling and presentation-intense areas.”
- **“Finance”** – This area is also very focused on data and its uses.
- **“IT organization”** – Knowledge workers need transparent, free-flowing information to recharge their current tactics.
- **“Human resources”** – Flexible, responsive learning offers employees vast opportunities.

## Implementation

Follow this process to introduce the learning layer in your organization:

- **Start out small** – While implementation is not complicated, be conservative initially until you are comfortable with this new paradigm. Use careful planning to ensure that your learning layer complements your existing systems.
- **“Determine potential application areas”** – Target “broken” areas, as well as units where you need the learning layer to increase performance. For instance, a service organization could benefit by introducing its “intellectual capital delivery processes” to more clients.
- **“Prioritize candidate pilots and select”** – Avoid units where only a few people will be part of the network. For the learning layer to work, you need more people, not less.
- **“Initialize the learning layer”** – This requires at least a “few hundred knowledge assets.” You can’t have too many.
- **“Evaluate the results”** – This will be possible within a few months.
- **“Extend the learning layer”** – As you expand the learning layer’s scope, its added value “will increase proportionately.” Eventually, introduce the learning layer as widely as possible. This is the best way to way to leverage your organization’s untapped “cognitive surplus.”

# About the Author

**Steven D. Flinn**, former CIO of Royal Dutch Shell, is CEO and founder of ManyWorlds, Inc., an R&D firm. He also writes on music and on the ties between evolution and information theory.

