Strategic Thinking: A Neuronal Architectural View

N S Srinivasan and G Balasubramanian

Executive Summary

The customer-centric digital economy needs business leaders and strategic thinkers to develop a new skill-set of delving within the deeper regions of consciousness and precognize the evolving future in order to make critical decisions that will set the future direction of the organization. As change accelerates to a never before recorded level, sustaining the precognitive capability of collective intelligence of the organization is fast becoming a pre-requisite for survival in the context of hyper-competition.

This capacity has to be learnt, understood, and successfully internalized in every strategic thinker. In a business environment where executive functions and passion-driven processes are given greater attention, the precognitive capability gradually begins to wane as either the need for catering to existing demand or anticipation for rewards or both become predominant drivers.

This silent change is very slow, hidden, and is not noticed until strategic decisions begin to miscarry. Most of the time, the person’s general behaviour could still be in confirmation with the culture of the organization, yet it is possible to identify minor anomalies that occur with a better understanding of how the neuronal circuitry is built in the brain and the underpinning motivational drivers that incite their change.

New scientific evidence in the field of Cognitive Science gives us some pointers into hitherto enigmatic queries. The latest research in this field shows that it is possible today to decide on an individual’s capability to deliver future results not merely based on past achievements but on his continuing ability to change based on underpinning motivational drivers. This paper presents a neuronal architectural framework to evaluate the future potential of a top management performer based on scientific evidence rather than depend on either the past performances or probability of future success without considering the individual’s ability to align with the organizational bionetwork.

The paper also addresses every CEO’s cup of woe — motivating people to change and ensuring constant growth. Corporate training has to address the following three dilemmas:

- overcoming the problem of habituation
- activating the Supervisory Attentional System (SAS)
- ensuring that inputs given to each individual possess the appropriate degree of novelty and complexity.

KEY WORDS

Neuronal Architecture
Bottom-up/Top-down Processing
Brain Re-engineering
Synaptic Facilitation
Metacognition
Reverse Networking
Strategic thinking, according to Brian Arthur, would signify the capability to take big decisions by reaching a deeper region of consciousness in the context of the evolving digital economy. According to him, though it takes effort to tune into this brain state and enormous courage to listen to one’s own inner wisdom, once one tunes in to this wisdom, making decisions about the general direction that individuals and organizations have to embark upon becomes relatively easy.

It is not only important for strategic thinkers to possess this ability to dig deep into this state of conscious experience and operate from this state but also maintain this mental state relentlessly for sustained precognition of the emerging future. It is an arduous task because the internal compulsions can drive individuals and thus organizations to forsake deeper regions of consciousness during the process of gratification of immediate biological needs. These unfulfilled needs, forming the key drivers of volition, motivation, thought, feelings, and action, prevent pre-sensing of the evolving milieu, a must for strategic thinkers in the customer-centric digital economy. This results in the collective strategic intelligence in the organization failing to persist with its customer-centredness while operationalizing a market-driven product/service.

In a command and control economy, it was not necessary for strategic thinkers to continually maintain this mental state as growth was possible through identification of new markets or market penetration. In the new customer-centric marketplace, where continuous real time innovation and consistent value delivery are the prerequisites for survival and success, maintaining this mental state provides the organization with the capacity to pre-sense the future, develop a conceptual framework that caters to the tacit demands of the organizational biocircuit,1 incorporating the innate strengths of the organization into this design, the climate for constant learning, and the ability to interpret both weak and strong signals from the marketplace and the organization. These signals act as the feedback mechanism.

The objective of this paper is to analyse the modifications that have to be brought about in the neuronal architecture of strategic thinkers in order that the collective intelligence in organizations can be adapted successfully to the emerging paradigm change.

AMBIGUITY IN CONTEMPORARY SUBJECTIVE TERMINOLOGY

It is increasingly felt that there should be a major change, a paradigm shift, in how we assess the capabilities and capacities of people. However, it is evident that this needed change is not taking place consistently. One of the hypotheses that we need to examine is that as long as the pattern of assessing capabilities of strategic thinkers is based on past performance, there will be lack of consistency. In this context, we need to address the following questions:

- Why is this inconsistency continuing despite the pressure from stakeholders?
- What are the underlying assumptions that the system has probably failed to consider?
- What is it that has to be focused so that strategic thinkers continue to possess the capability to pre-sense the future and bring forth their epiphanies into the here-and-now on an ongoing basis?
- What could be the conditions that would lead not only to short-term gains but also long-term consistency in value delivery?
- What are the necessary and sufficient conditions that would make the capacity to ‘bring-into-the-present’ future possibilities self-sustaining?

CONDITIONS FOR CHANGE IN THE EMERGING PARADIGM

With new scientific evidence from the developing field of cognitive science, there are some pointers to hitherto enigmatic queries. We address the following questions to resolve the ambiguity in some of these areas:

- Does external behaviour mask some underlying processes that threaten the future of the organization?
- How much do unconscious aspirations, thoughts, emotions, feelings, etc. play a part in determining the external behaviour?
- Does change and growth in the neuronal circuitry of the brain support a ‘one-size-fits-all’ philosophy?
- If a ‘one-size-fits-all’ philosophy is not suitable in the present market conditions, do organizations have a clear-cut strategy in place to understand and harness the enormous intellectual capital present?

Marshall Goldsmith (cf., Ganguly, 2003), has made a career out of facilitating ‘change’ in CEOs. He points out that most successful people do not want to change for they believe that they are successful because of what they are. His company, ‘The Alliance for Strategic Leadership’

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1 www.dialogueleadership.org/interviewArthur.html.
specializes in developing customized 360-degree feedback for business leaders and in monitoring whether the feedback leads to change. In a customer-oriented environment, lack of change sounds the death-knell to both leaders and their organizations. So, what are the underlying processes that are acting as obstacles to change?

According to Hebb (1949) whose ideas formed the basis for learning and un-learning in the brain, if a processing element (a neuron) receives an input from another processing element, then the pathway between the two processing elements is strengthened. This phenomenon, called the synaptic facilitation, can be observed in computer simulations. The effectiveness of a synapse (where chemical messages from one neuron to another are passed) is represented by a number or a weight. If the weight is larger, the synapse is more effective. The weight may be increased if the synapse requires strengthening. Such modification of weights is deemed to be learning in neural networks. In other words, the pathway between these neurons offers less resistance making the input signal flow through the same pathway repeatedly further strengthening the connection. When Goldsmith (cf., Ganguly, 2003) says that the individual is unwilling to change, what he is probably referring to is that the neuronal path has been strengthened to such an extent that the input is interpreted continually by the same set of processes in the brain leading to similar responses. What is the way out of this predicament? Is there a means by which programmed responses to existing situations can be overcome?

**Supervisory Attentional System**

The brain also has another system which is associated with conscious experience. It is called the Supervisory Attentional System (SAS). SAS is a ‘higher-order’ brain coordinate that helps one override both past conditioning and semi-automatic processes associated with ‘contention scheduling.’ SAS is also commonly termed as metacognition which is the ability to:

- be objective with respect to one’s perceptions, actions, feelings, thoughts, and concepts
- focus on the larger picture

Activation of the neuronal correlates associated with SAS is a must for an individual to be consciously aware of an experience. For example, SAS is not activated when one mechanically drives a car to work or is preoccupied with one’s own plans for the day whereas it gets activated when the driver has to act consciously, say, apply brake when a pedestrian runs across the road or has to give a specific answer to a companion in the car, etc. In other words, SAS is activated only when action is goal-oriented. The goal could be immediate, short-term, midterm or long-term. When one dedicates all energies towards the achievement of a particular goal that a person is innately interested in, then SAS remains activated until the goal in attained — be it fulfilling the pangs of hunger, the need to ‘know’ about a field of inquiry, attain name and fame, etc.

As stated before, SAS also gives one the ability to change by overriding past programming and becoming adaptable to a specific situation — internal and external. Thus, if a person who has been dynamic and flexible in the past is unwilling to change, the most plausible reason (assuming the person has not had a serious illness, head injury or developed a strange disease) is that s/he does not possess a conscious long-term goal. When Collins (2001) asks organizations to evaluate where they want to be in the next 25 years, he is not speaking about one single strategy, but about SAS—that faculty in the brain that figures out effective strategies. This paper outlines the process of developing internal markers that act as invariant principles based on which it becomes possible to understand and harness the potential of underpinning motivations of the individual in various stages of individual growth and development. Considering that the process is a little complex, it makes one consciously think and, in a few cases, contemplate profoundly how to activate SAS where it has been switched off and maintain its activation in others where it is turned on, so that the reinforcements for change, development, and growth are in place.

As mentioned earlier, in the emerging business environment, persistent change is a must for survival. Hence, maintaining this state of conscious experience while gathering and processing information about the marketplace is a necessary condition for appropriate actions to unfold. Therefore, strategic cognition for business leadership in the customer-centric digital economy is not about asking subtle questions but about building and adapting neuronal circuitry and maintaining a conscious mental state from which epiphanies emerge when exposed to novel and complex experiences. Cognitive processing — questioning, thinking or feelings — is a natural consequence of this input data. It is only when the individual maintains the ability to change, learn, adapt, and grow by activating SAS that the gateway to precognition is
initiated and thereafter sustained. What are the internal motivations that assist the learning of this novel skill? How can one become conscious of them and harness them to promote individual change, collective intelligence, and organizational growth?

Gaining Expertise through Bottom-up Processing

Information from the world builds neuronal circuitry in the human brain. The innate need to know about the world and particularly about a specific field activates SAS. Learning about this field is not complete unless the following three aspects of knowledge acquisition are complete:

- explicit knowledge
- tacit knowledge
- self-transcending knowledge.

By explicit knowledge we mean the information one gathers through mere perception of data and superficial questioning such as ‘what?’ ‘why?’ ‘how?’ etc. Tacit knowledge refers to the comprehension of the domain in which the answers to the above-mentioned questions remain valid. Self-transcending knowledge pertains to the need for a learner to ‘see’ the concepts learnt from the point of view of the expert. Here, the learner has to go beyond his little self and view the framework from the perspective of the expert so that it can be internalized and adapted to existential circumstances.

The genetic need to integrate perceptual differences with reflective unity compels the individual to weave a conceptual tapestry from the various theories learnt and internalized. ‘Expertise’ appears to be gained only when this theoretical framework is used either to solve a contemporary problem or expand it by examining the constraints on its domain. Solving such a preponderant issue assists the individual in learning to rotate and transform the constructed framework to the needs of the situation to be resolved. This stage of development can be termed as bottom-up processing—BUP (Hebb, 1949). The main objective of this exercise appears to be building and strengthening of one’s neuronal circuitry (Figure 1).

While information about the field provides the necessary conditions for change, the individual’s innate passion to enquire about a particular field of knowledge provides the sufficient condition for change. By devoting oneself to this intrinsic need, SAS remains kindled, helping one achieve ‘expertise.’ The human brain reinforces one’s efforts through the ‘reward mechanism.’ This mechanism releases a neurotransmitter called dopamine, every time an action that promotes survival is performed. Dopamine gives rise to feelings of bliss, pleasure, and euphoria. This unconsciously reinforces actions that promote survival—in this case, ‘learning,’ — thus sustaining the processes until it is complete.

Learning to Deliver Integrated Solutions through Top-down Processing-I

Once expertise has been gained, the next stage of change is to understand the explicit and tacit needs of the marketplace. This needs a different method of processing when compared to BUP. The individual has to learn to consciously shut down all attempts at higher-order cognitive processing while ‘listening’ to the needs of both internal and external customers. Being habituated to instant analysis at the level of BUP, the individual has to activate SAS if change is to be enabled. The facilitator for this level of change is the motivation to fulfill unsatiated biological needs. For example, during the late 1990s, when software professionals were in great demand to solve the Y2k issue, there was a great turnover of experienced professionals. Some of these professionals jumped as many as four to five companies in a few months with pay increases involving every jump to satisfy their hitherto unfulfilled biological needs.

With novel information from the marketplace and allied fields flowing into the cognitive system, the neuronal circuitry that is termed here as ‘reverse networking’ appears to be built from the areas associated with SAS bestowing one with the ability to (a) gain a systemic view of customers’ problems, (b) be objective with respect to one’s emotions and postpone one’s enjoyment, (c) listen, conceptualize, and thereafter creatively plan and execute a solution, (d) focus on teamwork and to develop a network of experts help the individual arrive at integrated solutions, (e) align one’s efficiency and effectiveness to the
overall strategy of the organization rather than focus on individual efficacy, (f) gain intimate knowledge of different brain states of arousal so that they can be suitably manipulated to deliver results consistently. This stage of development can be termed as ‘top-down processing-I (TDP-I) (Srinivasan and Balasubramanian, 2003) (Figure 2).

The main purpose of this stage of human growth is the comprehension of the implicit and explicit demands of the marketplace and developing a systemic overview of the existing social reality. The reward mechanism promotes this by releasing a small quantity of dopamine whenever a customer-focused action is performed until this stage is completed. When this circuitry is still incomplete, individuals are forced from within to have conflicting motives — the need to fulfill unsatiated biological needs and the needs of the marketplace. One can observe the contradiction between the stated objectives (customer-orientation) and the subsequent behaviour (may be a quick ROI), leading to the scheme not achieving its estimated targets.

The individual who is able to complete these two levels of neuronal circuitry building is able to realize one’s worldly goals. In the case of most people, they can no longer aspire for anything else as almost all their survival instincts have been satiated. This is why Goldsmith states that most CEOs are unwilling to change. When people are unwilling to take the risk necessary in order to change, the first casualty is the ability to precognize as they start to work for immediate ends. Thereafter, the only way for most people to gain their next dosage of dopamine is to start accumulating wealth and power. When they are no longer willing to change, SAS shuts down. As the domain in which they are operating keeps changing, they are forced to manipulate rather than add value to achieve their ends as margins drop.

As the need for dopamine turns into dependence, behaviour becomes impulsive leading to failure. This causes the levels of serotonin, another neurotransmitter associated with judgement, to lower along with plummeting dopamine levels. Bizarre behaviours begin to manifest. As dopamine dependence turns into an addiction, behaviour becomes extremely indiscriminate.

**Aligning One’s Neuronal Circuitry with the Environment through Top-down Processing-II (TDP-II)**

If change has to take place from this moment on, then the individual or the collective intelligence in an organization has to be motivated by a subtler aspiration — the need to align with the surrounding environment. This need also appears to be ingrained in man and reveals itself as a support for concepts like conservation, preservation of bio-diversity, pollution-control, etc. It appears to manifest in its entirety only when unsatiated biological needs are consistently met as in the case of Tompkins, the founder of the North Face, Esprit, and Pumalin Park (Collins, 2001). The need for alignment with the organizational bionetwork is what helps companies move from ‘good’ to ‘great.’

TDP-II is also a must for organizations to move up the value-chain, be it an Infosys or Wipro; to maintain their premier position by continuing to unravel new breakthrough innovation as in the case of a McKinsey or Accenture; to ‘survive’ when the domain in which they are operating indisputably changes, as it happened to Arvind Mills when the denim market collapsed and naphtha prices skyrocketed.

When one has to bring about this re-adaptation of the neuronal circuitry, exposure to cutting-edge scientific research and diverse management practices provides the novelty and complexity of the information that helps the individual to restructure the existing neuronal circuitry. Constant re-examination of the quintessence of one’s field and its reconceptualization to meet the tacit demands of the marketplace is a must. Wanting to align with the needs of the global organizational bionetwork and working with it helps organizations and individuals overcome resistance and stay tuned with the bionetwork. The objective is to draw up a systemic delivery model that incorporates the inherent strengths of the organization and serve the diverse interests of the organizational bionetwork. This modification of the neuronal network is termed as top-down processing-II (TDP-II) (Srinivasan

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**Figure 2: Reverse Networking**

<table>
<thead>
<tr>
<th>Input from world</th>
<th>Areas associated with perception</th>
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<tbody>
<tr>
<td>Output</td>
<td>Emotions and feelings</td>
</tr>
<tr>
<td>Motor areas</td>
<td>Pre-cognitive areas</td>
</tr>
<tr>
<td></td>
<td>Analytical thinking</td>
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</tbody>
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SAS helps to maintain objectivity
and Balasubramanian, 2003). Progressive re-engineering or readaptation on the neuronal circuitry to the prevailing domain leads to envisioning of breakthrough product/service. By persistent empirical testing, customizing, and adaptating the vision to customer and organizational bionetwork’s needs, a culture that promotes continual change gets embedded into the organization. Both the implicit and explicit needs of the organizational bionetwork are, thus, constantly fulfilled. At this stage, TDP-II phase of growth appears to be complete.

The reward mechanism in the brain bolsters this process by releasing dopamine whenever a strategic cognition is apprehended for it increases the probability of survival. By releasing larger quantities of dopamine for greater risk taken (in this case, improved clarity about the means to the actualization of the goal), the brain appears to impel itself to re-adapt its neuronal circuitry.

**Passive Processing (PP) and Strategic Thinking**

Each individual appears to be genetically compelled from within to align with the external environment. This alignment process starts with alignment to one’s innate enquiry and proceeds to those that one can service to those whose life is directly and/or indirectly impinged upon. The last step is to stay aligned with the environment and to be entirely input-driven. It is this process that bestows the strategic thinker with the capability to adapt and be flexible, while seamlessly blending one’s mental processes with the incessantly changing market environment. The main role of the strategic thinker is to precognize where the market is headed and identify the resources for developing infrastructure for the future especially in terms of intellectual capital by identifying people who possess the capability to fulfill the emerging demands. By taking up this responsibility of continually staying aligned to the changing environment, the strategic thinker discharges his/her paramount obligation to the organization — ensuring its future. This process of constantly and persistently aligning one’s neuronal architecture to the ever-changing environment through input supplied from the environment can be labelled as passive processing (PP).

Possessing and sustaining this novel skill would help the individual and organization overcome the Lewin-Schein Model of unfreezing-change-refreezing (Schein, 1993). As customization takes hold, the culture that promotes constant activation of SAS would help the strategic thinker avoid the arduous task of overriding all past conditioning. The activated SAS helps one decode every input from first principles thus facilitating the interaction with the present as it emerges. This opens and maintains the gateway for sustained precognition. Moreover, this exponentially reduces the chances of an offering or response not being market-focused. Failures of products/services thereafter are almost eliminated. The lag-time between envisioning and operationalizing is dramatically reduced for the visionaries are directly involved in the operationalization of the product/service and reduction of the communication and learning gap. This helps in making optimal use of today’s huge cash reserves. The various stages of circuitry building, their operational efficiency, and shortcomings are summarized in the Box.

**IMPLICATIONS FOR MANAGEMENT SELECTION AND TRAINING**

In today’s customer-centric environment, constant change is inevitable. Strategic thinking is no longer onedimensional. It has many facets, each one having its own set of motivational underpinnings. Organizational strategy has to be geared to address this issue if organizations have to survive the current global downturn and sustain innovation in the next millennium.

<table>
<thead>
<tr>
<th>Different Stages of Circuitry Building</th>
<th>Operational Efficiency Gained</th>
<th>Shortcomings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bottom-up processing (BUP)</td>
<td>Expertise in the field of one’s specialization</td>
<td>Not fully focused on the market needs</td>
</tr>
<tr>
<td>Top-down processing-I (TDP-I)</td>
<td>Expertise in delivering integrated solutions to chosen target customers</td>
<td>Individual perspective predominates action; Not equipped to tackle paradigm shifts</td>
</tr>
<tr>
<td>Top-down processing-II (TDP-II)</td>
<td>Re-engineering all business processes to align with the market environment</td>
<td>Preponderance towards the long-term, so real-time decision-making suffers</td>
</tr>
<tr>
<td>Passive processing (PP)</td>
<td>Completely input driven; Constantly re-engineering brain processes; Capable of real-time processing and systemic yet instantaneous responses</td>
<td>Real-time decision-making</td>
</tr>
</tbody>
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Box: A Summary of Different Stages of Circuitry Building, their Advantages, and Shortcomings
The most likely strategic thinkers and leaders of the future are those who are predisposed to strategic cognition and not mere cognitive processing, i.e., those who have complete BUP, TDP-I and, at least, the envisioning part of TDP-II. By ensuring that the CEO gets to PP level, they are actually ensuring that the culture is in place for the organization to stay aligned to the existing and emerging marketplace, thus securing the future of all stakeholders and getting the infrastructure in place to cater to the tacit and overt needs of the organizational bionetwork.

Regarding corporate training, organizations have to give up the one-size-fits-all philosophy. They have to make sure that each individual in the organization gets to cognize and interpret a set of novel and complex experiences that will build and/or re-engineer the neuronal circuitry, depending upon the individual’s stage of growth and development. While these only supply the necessary conditions for change, the HR professionals have to ensure that the motivational drivers are in place and consistently reinforced through learning, rewards, recognition, etc. Hands-on mentoring will play a very important role if this has to be actualized. The resources spent in building and re-engineering neuronal circuitry would pay off in terms of developing breakthrough innovations on an ongoing basis.

As leadership in the emerging millennium acquires new dimensions, sustaining precognition would be most critical. This condition would not be fulfilled unless:

- Leaders stay anchored to a deeper region of consciousness and make sure all decisions or cognitions emanate from here.
- There is an effort to acquire complex and novel inputs or experiences constantly so that the brain is primed for incessant change as it ensues.

Both these conditions would guarantee that the world economic order in the next millennium stays both robust and customer-centric.

ENDNOTES

1. An organization’s bionetwork in this context refers to global consumers, stakeholders, market environment, government policy-makers, global perspectives, etc.
2. Metacognition is also called second-order representative and is not a mere abstraction; it occurs in neural structures such as the thalamus and the cingulated cortices.
3. The process of circuitry building is input-driven.

REFERENCES


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