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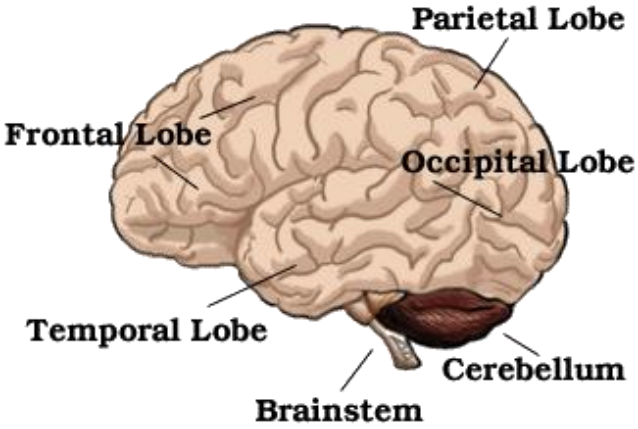
Brain and corporate culture mapping.

Looking for the source of innovation is like better understanding the brain. Elusive but getting better!



Introduction

Researchers and scientists, as never before, are learning about the brain and its workings. Can understanding corporate culture be far behind?

If we are in a position to better understand the working of the human brain, the world's most complex device, we can also better understand the culture of an organization which, in a sense, is the sum total of all the brains in the corporation.

Summary

Comparisons between the human Brain and the 'Corporate Brain'.

Geographical/Ethnic Cultural Differences Influence the Culture for Innovation.

Getting at Facts and Perceptions by Mapping the 'Corporate Brain'

Do we really understand the culture of a corporation? Is it important to know more about corporate culture before launching a program to improve innovativeness? Are the 'probing-for-answers' techniques similar?

Understanding a culture in which innovation is to be encouraged is an essential step towards improving the capacity for innovation.

It turns out that trying to understand the workings of a corporation, particularly its culture, is very similar to delving into the complexities and functionality of the human brain. Obviously, the brain is much more complex than the culture of a corporation, but there are similarities between the methods used to understand the functioning of the brain and understanding the culture of a corporation.

The science of mapping the brain's areas of activity, capacity, linkages, strengths and weaknesses has relevance to trying to understand the culture of a corporation. Mapping[1]; a technique for getting at root causes when there is no obvious linear or observable path between action and reaction, is one of the techniques used to explore the human brain.

[1]Brain mapping is a set of neuroscience techniques predicated on the mapping of (biological) quantities or properties onto spatial representations of the (human or non-human) brain resulting in maps.

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Contents

How people in a corporation see, think, and act make up the driving forces in any corporation. One way to look at the corporation's culture to think that the sum total of all the people's brains in a corporation is the brain of the organization. Knowing how this brain works is important to understanding the inherent culture in a corporation. Just as each individual brain is different, so is the culture of any one corporation.

Often the culture of the organization works in favor, sometimes against, being innovative. Probing the culture of any organization is difficult but the technique of brain mapping, along with an increased understanding of the how the human brain works, potentially offers some help to those attempting to get a handle on the culture of the corporation.

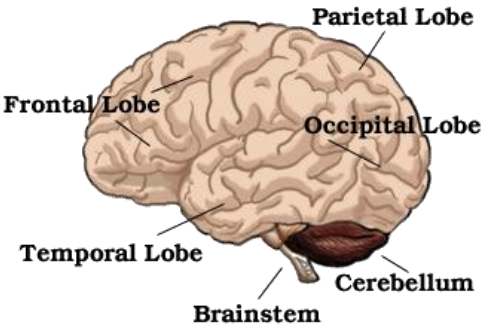
Such tools are for the most part not nearly as sophisticated in the corporate world as in brain research but, with the advent of the intranet and internet and the introduction of collaborative software to tap into and manage ideas, it has become possible to collect data and carry out research and develop new approaches.

Is it not better to understand the functioning of the brain prior to undertaking irreversible surgery? Should corporations not take advantage of all the information at their disposal? Is not each brain significantly different? Should not the 'corporate brain' be well understood before taking steps to improve innovativeness?

Comparisons between the human brain and the 'corporate brain'

Different parts of the brain engage in different activities.

The frontal lobe is for conscious thought, parietal lobes play an important part in integrating sensory information, occipital lobe gives us a sense of light and temporal lobe provides a sense of smell and sound.



The similarity between the human brain and the corporation is the functioning of different business units or functions which make up the corporation.

In a corporation, each group has its own culture, developed over time and under a variety of circumstances. There is a need to better understand not only the culture of each group but also how the different parts of the corporation work together.

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Frontal lobe[2].
The front part of the brain is involved in planning, organizing, problem solving, selective attention, personality and a variety of "higher cognitive functions" including behavior and emotions. The frontal lobe might be considered top management since, should damage occur, this can result in significant mood changes. The tone of a corporation is, after all, set by top management.

Cultural Characteristics[3]

Frontal lobe functions.	*Leadership and direction.*	*Tolerance and sensitivity for risk taking, mavericks, and failure.*	*Outlook and planning practices.*	*Rewards for performance and innovation*	*Communications within the corporation*	*Organization; structural and ability to organize to accomplish tasks.*
Ability to initiate	X		X			
Judgment, planning, problem solving	X					
Emotions and ability to control them		X		X		
Expressive language					X	
Memory for habits and motor activity	X		X	X		
Sequencing	X					**X**
Attention	X		X			
Personality	X	X				
Ability to appreciate	**X**	**X**		**X**		

Parietal lobe
The parietal lobes contain the primary sensory cortex which controls sensation (touch, pressure). Behind the primary sensory cortex is a large association area that controls fine sensation (judgment of texture, weight, size, shape).

The parietal lobe could reference the information and communication system within the corporation; the better the IT system, the more the organization has a sense of what is happening throughout the corporation.

Occipital lobe
The occipital lobe is a region in the back of the brain which processes visual information. Not only is the occipital lobe mainly responsible for visual reception, it also contains association areas that help in the visual recognition of shapes and colors. Damage to this lobe can cause visual deficits.

The occipital lobe could refer to those in the organization most connected [or should be] with outside information sources. This is the area where ‘lesions produce hallucinations’

[2] http://www.waiting.com/brainanatomy. A Guide to Brain Anatomy.
[3] Functions from 2009Baycrest Breakthroughs90th anniversary edition.

and can result in inaccurately seeing objects. In other words, data is seen but inappropriately interpreted.

Temporal lobe
There are two temporal lobes, one on each side of the brain located at about the level of the ears. These lobes allow a person to tell one smell from another and one sound from another. They also help in sorting new information (like faces and scenes) and are believed to be responsible for short-term memory. The temporal lobes functions for hearing, memory and categorization of objects, sensing smells and sounds, as well as processing of complex stimuli like faces and scenes, is perhaps the most important since it represents an integrating mechanism bringing a lot of information together.

In the corporation, the temporal lobe might be analogous to the function of every supervisor or manager with a responsibility for taking in the information and acting to integrate, discard, and sort out what is important and what it not.

Brain stem
The brain stem is the lower extension of the brain where it connects to the spinal cord. Neurological functions located in the brainstem include those necessary for survival (breathing, digestion, heart rate, blood pressure) and for arousal (being awake and alert). Most of the cranial nerves come from the brainstem.

The brainstem is the pathway for all fiber tracts passing up and down from peripheral nerves and spinal cord to the highest parts of the brain. Though small, this is an extremely important part of the brain as the nerve connections of the motor and sensory systems from the main part of the brain to the rest of the body pass through the brain stem. The brain stem also plays an important role in the regulation of cardiac and respiratory function. It also regulates the central nervous system, and is pivotal in maintaining consciousness and regulating the sleep cycle.

Within the corporation, this extremely important part of the brain could be thought about as the command control system, the organization structure, and the means of communicating throughout the organization. Nothing happens – or the wrong things can happen – if this structure is not functioning well.

Cerebellum
The cerebellum is a region of the brain that plays an important role in the integration of sensory perception, coordination and motor control. In order to coordinate motor control, there are many neural pathways linking the cerebellum with the cerebral motor cortex. The cerebellum integrates these pathways, like a train conductor, using the constant feedback on body position to fine-tune motor movements.

Working together
Damage to any one of the lobes, as well as other parts of the brain, most importantly the cerebellum and the brain stem, can have dramatic effects on the overall functioning of the

brain. Knowing which parts of the brain have been damaged is an important part of any diagnosis and provides a focus for remedial work.

Similarly, in any corporation, knowing where the culture of the organization is not helpful to innovation should lead to an improved diagnosis of the problem and to adopting a focus for remedial action. Both the 'corporate brain' and the human brain are functionally complex and require careful and probing analyses.

The human brain reacts to stimulation

So does the 'corporate brain'.

Apparently, a dopamine[4] surge can act to consolidate the 'neuronal connections responsible for the behaviors that led us to accomplish our goal'[5]. The brain, however, needs to be stimulated in order to cause the dopamine surge. While there are many examples of stimulation set out the Dr. Norman Doidge's book, The Brain That Changes Itself, most have to do with the stimulation of individuals or groups.

In the corporate sense, stimulation can come from both internal and external sources. Internal sources include the Board or the senior management group or individuals providing leadership. External sources, such as the successful moves of a competitor or the introduction of new technology can provide a new challenge and therefore stimulate the organization. Whatever the source, stimulation should lead to change and to the 'dopamine surge'.

Dopamine is as important to the brain as rewards are to the corporation's members. While it is generally conceded that rewards of some kind are an important part of the culture of any corporation, there is still much debate about the form or structure of rewards. Rewards range from giving out medals to stock options to bonuses, offering a large range of choice for management. Whether the rewards offered are significant or just seen as a token award must lie in the eyes of the potential recipients.

Do rewards work in your corporation? Which are most effective? This is part of the culture of the organization and is often established at the beginning of corporation's life, sometimes never to be changed, even though the circumstances may change. Understanding the culture of the organization means understanding employees' views on the current reward practices.

The relatively new science of neuroplasticity – the realization that the brain changes with age

Analogous to the 'corporate brain' evolving over time.

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[4] Dopamine; 'is called the reward transmitter, because when we accomplish something-run a race and win-our brains trigger its release…a surge of energy, exciting pleasure and confidence'. Page 105; The Brain That Changes Itself.

[5] The Brain That Changes Itself – page 107.

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Brain Mapping techniques are constantly evolving, and rely on the development and refinement of image acquisition, representation, analysis, visualization and interpretation techniques. Functional and structural neuroimaging are at the core of the mapping aspect of Brain Mapping.

Equally, techniques to better understand a corporation's culture continue to evolve. Just as there is hope for the older, larger and mature corporation if it undergoes change, so it is with the human brain. Change begets stimulation which begets innovation.

Now that we know much more about the brain and can begin to understand why the individual acts in a certain way, we can in some cases take action to improve the cognitive and capacity of the brain. Mapping is one of the keys to starting the process of improvement.

Some companies are highly innovative and others are not. Just as the new science of neuroplasticity (and the ability to change the brain) offers encouragement to those whose brains have been damaged, so is there hope for corporations who are not particularly innovative. It is, however, important to get as much information as possible on the current strengths and weaknesses of the corporation's innovativeness.

Correlating human functionality with brain damage provides a direction for introducing remedial measures

As in the 'corporate brain'.

While corporate heads agree that innovation is very important and in most cases essential to corporate growth, innovation remains a vague subject. The word is probably overused and not fully understood. There are many definitions and a host of interpretations.

Most C.E.O.s would know which companies, in their business segment, are innovative. These companies are the ones that over the years continue to introduce new products to replace even their own product lines and challenge the industry to react and, if they can, follow the leader. Other companies introduce new business models; some succeed and some fail. Even the old 'suggestion box', now probably an 'e-mail suggestion box' is still in use and is meant to tap the ideas from all levels of employees.

Corporations know what innovation represents in terms of output but are less clear on what to do; i.e. the input. Corporations are often not as sure on how to become innovative; how to initiate, foster and encourage innovation. Innovation is illusive to most corporations.

The culture for innovation can vary

Geographical/Ethnic Cultural Differences.

Early research, in the mid 1980's by Arthur D Little, noted some differences in the management of innovation among countries.

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Top down approaches to innovation processes were found more in Europe than in Japanese management. Japan also scored differently than North America and Europe when it came to giving attention to the long term and not short term problems.

Japanese management, at the time, seemed to be less in touch with customer needs and market trends. North American companies were seen, at the time of the research, to have fewer expectations from innovation than either European or Japanese companies.

Research undertaken today would likely come up with the similar but more muted differences since companies are now much more global in their operations and the melding of cultures has moved ahead. Still, differences exist, and it is prudent to understand those differences before taking action to improve innovativeness with only one set of ideas on how to improve innovation.

Interesting insight into cultural differences among ethnic peoples is noted in 'The Brain That Changes Itself'[6]. That 'different cultures interpret the world differently' is apparently now conceded by most scientists, sociologists, etc. and that this is due primarily to their exposure to 'different aspects of the world'. Whether these differences are based on 'different interpretations of what was seen' and not on 'microscopic differences in their perceptual equipment and structures' is a matter for much discussion.

At the same time, it is generally accepted that 'Westerners approach the world "analytically" dividing what they observe into individual parts. Easterners 'tend to approach the world "holistically", perceiving by looking at the whole and reemphasizing the interrelatedness of things'. Clearly, since different cultures can perceive events in different ways, there is an implication that having a culture for innovation may also be viewed differently.

Since different cultures have adopted their own approach to innovation it is prudent to have a custom made 'brain map' for each situation for fear of applying a solution which, while successful in one location, is in its totality, inapplicable elsewhere.

It is relatively easy to analyze how a business unit, or for that matter, a whole corporate entity, is performing from a financial perspective. A multitude of techniques have been developed for this purpose. What is less clear is how to analyze why the culture of an organization either works for or against innovation, or if it has any impact whatsoever. But to deny the existence of a culture in the first place is probably asking for trouble at the time of introducing change.

Innovation is synonymous with change. Innovation causes change. Understanding innovation and how it works in the corporate environment is just as much a step towards rewiring the pathways in the corporation as it is in the structuring of the human brain.

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[6] The Brain That Changes Itself. Page 302/303.

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The following section of presents some ideas on how to achieve a better understanding of the culture of the organization in general and, more particularly, how culture relates to innovativeness.

Getting at Facts and Perceptions

Mapping the 'Corporate Brain' can aid in setting priorities for improvement

Mapping the corporate culture begins by getting at the facts and perceptions as best one can. Some of the factors impacting the culture for innovation are relatively easy to measure, some are not, and the challenge is more complex because of the inter-play of all aspects of culture. Never-the-less, several examples of cultural aspects which can be measured are set out below.

1. **Ascertaining the availability of reward measures for innovators.**

   Are there explicit rewards provided, hard or soft, and are they transparent to the corporation overall?

   There are two parts to this question; the first is the recognition that appropriate rewards exist and the second is that they are made known and are transparent and clear to all. Stock options are typically transparent. Bonuses are not. Sometimes a company will only make rewards behind the scenes so as to not upset those who think they should also receive a reward.

   Think about the dopamine function in the human brain.

2. **The existence of career ladders for innovators**.

   Some companies make the criteria for promotion part of their performance review system. Technical personnel have sometimes found that they have been tagged as such and this stigma almost limits their ability to be promoted to a managerial role since it is obvious, but not right, that they are brilliant technically but could not possibly perform a management role. Career opportunities are denied.

   Think about how the brain's neuroplasticity accepts change and allows for new process to develop.

3. **The turnover of talented people.**

   While it is often not easy in a corporation to identify those, who could be considered innovators, in the broadest sense of innovation, it is relatively easy to complete an analysis of the turnover of talented personnel. Tracing the route of those that have left the company and are successful in subsequent organizations could, if it is pronounced, highlight a problem within the corporation.

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Separating out those who have left for greener pastures from those who perhaps took advantage of an outsourcing entrepreneurial opportunity encouraged by the corporation would be an important element of any exercise. Who was lost and why?

A culture which causes undue turnover of talented personnel is at risk – a bit like a brain losing some of its 'brain cells' or losing the 'synapses'.

4. **The trend in innovation.**

   Tapping into peoples' beliefs and attitudes about the trend of innovation in the corporation [is it increasing or decreasing?] is not a difficult task and can be easily accomplished by the appropriate survey, interviews, communication and listening.

   The sense of innovation happening or being in decline can be a major determiner of employee turnover and, significantly, the related inability to hire the right people. People are more drawn to an organization that is 'on the move'. A person has to have confidence in what they are doing and a sense that they and the corporation are making progress**.**

   Just as the brain can be stimulated by new ideas and personal pleasures, so can the corporation benefit by having a sense of moving forward. The dopamine is flowing!

5. **New ideas, products or services**.

   The incidence of new ventures in the form of new products, new process, basic and applied research, new business models, new whatever, provides a dynamic to the overall organization that is not lost on stakeholders. Each organization has its own 'dynamic' or pulse and therefore the important factor to fathom is the change in the dynamic, not its static condition. NPVI[7], the measure used by 3M is a great example.

   Some organizations have a sense of ongoing change and become concerned when the dynamic starts to decline.

   If employees can answer the question what's new and do it with a spirit and ease which shows their enthusiasm, then at least this part of having an innovative climate could be considered to be working well.

6. **R&D spending compared to competition.**

   Research and development and venture-funding play a central role in the

[7] 3M tracks this dynamic by measuring the incidence of new products/services within the past five years compared to the total offerings.

development of most innovative corporations. The narrow view can be that this solely related to the spending and size of the R&D department. This, by itself, does not recognize the notion of overall investment in medium and longer term initiatives.

R&D spending, however, is a starting point and is perhaps the easiest to measure and can be easily compares to the competition's spending.

The broader aspect of R&D is the amount of human effort and capital allocated to new and risk-bearing investments. Taking the broader approach encompasses other investment initiatives such as modified approaches to product, process, or to the business model.

7. **The role and frequency of using independent work groups.**

   Innovative companies are big users of independent work groups to accomplish any number of tasks or special projects. Some corporations, on the other hand, make little use of such groups.

   There is a fear that separate groups can take away from the authority of the existing line and staff organization, or that the separateness will discourage the level of collaboration required for certain initiatives. What is often overlooked is the stimulation which can occur when a person is nominated to be part of an independent group. The stimulation acts like a reward because the individual is singled out. Making a list, to measure the incidence of these special initiatives, can be instructive.

   Think about the use of dopamine.

Not all factors affecting the culture of an organization can be measured. Getting a handle on the facts and, equally, on the perceptions associated with the culture for innovation, is an important first step towards determining what to do and where to place the emphasis and fix the culture.

Deciding which factors are important to understanding the culture for innovation is the starting point. There is a growing body of knowledge about the factors associated with innovative companies. This is not about the brilliant individual, with a brilliant brain, who discovers a brand-new product or new business model all on his or her own and manages to sell it to the corporation. This is about the organization as a whole working to become more innovative.

Just as brain research indicates that damage in one area can affect the overall functioning of the brain, so it is with the corporation. All parts must work well and together.

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