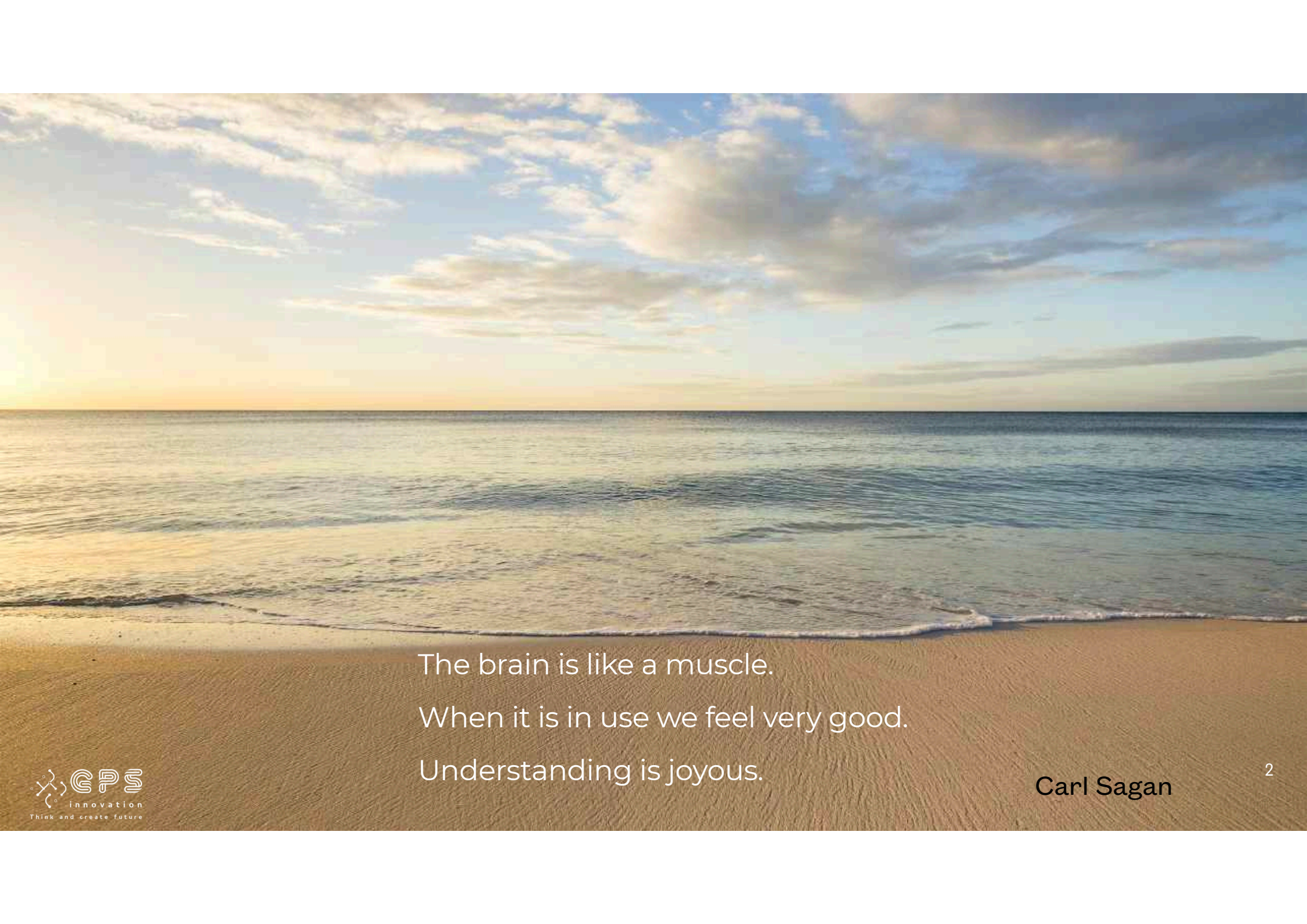

Spotlight Series

Some Facts about our Brain



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The brain is like a muscle.
When it is in use we feel very good.
Understanding is joyous.

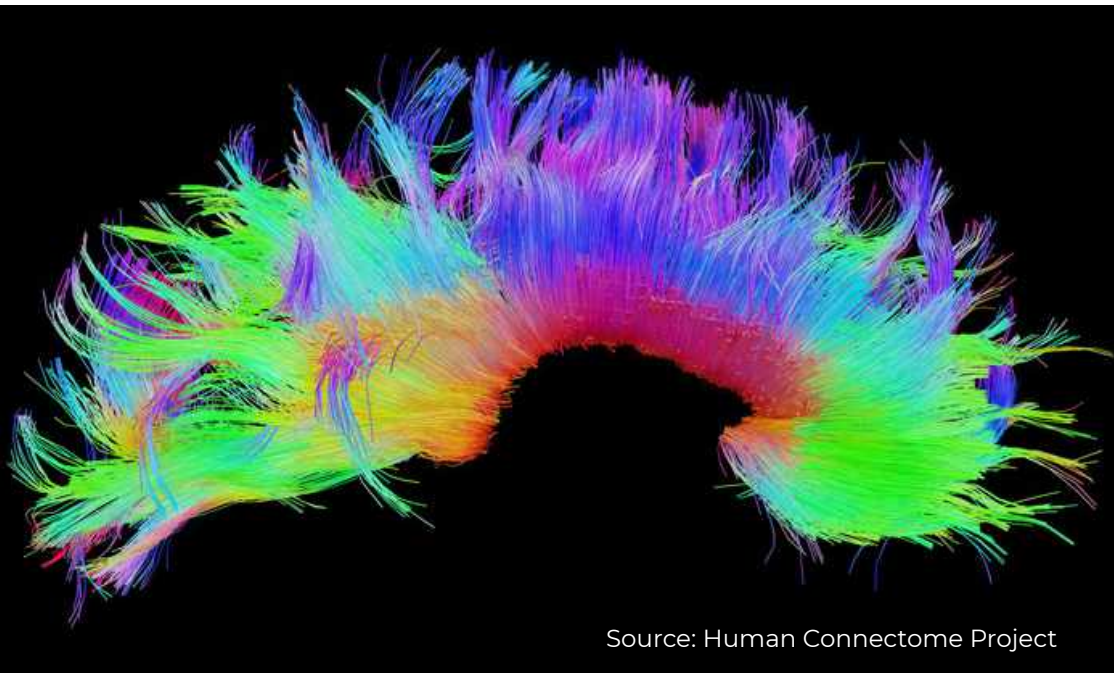
Carl Sagan

Our Brain.

The Body's Command Center.

This specialized organ responds for every thought, every feeling and most of our actions and qualities that define our humanity. It is unique and highly complex.

The average adult brain weighs around 1300/1400 grams, contains more than 100 billion neurons and is about 2% of the total body weight. Scientists have learned more about the brain in the last years than in all previous centuries because of accelerated pace of research. How the healthy brain works is the purpose of this basic introduction.



Source: Human Connectome Project

The Architecture of the Brain.

Our brain works like an expert committee. All parts work together but each part has its own special properties.

The **hindbrain** includes the upper part of the spinal cord, the brain stem and the cerebellum. It controls basic functions like respiration and heart rate. Playing piano or hitting a tennis ball activates the cerebellum.

The **midbrain** controls some reflex actions and is part of the control of eye and other voluntary movements.

The **forebrain** is the largest and highly developed part: the cerebrum and structures hidden beneath. It is the source of intellectual activities, holds our memories, allows planning, thinking and imagining. Recognizing friends, reading books and playing games is part of it.



Hindbrain



Midbrain



Forebrain



The Architecture of our Brain. Hemispheres.

The **cerebrum** is split into two halves by a deep fissure (corpus callosum), communicated through a thick tract of nerve fibers or bundle of axons. Each half is different: forming words lies primarily on the left hemisphere, the right seems to control many abstract reasoning skills. It controls the right side of the body and viceversa.

The **cerebral cortex** is the surface of the cerebrum and cerebellum. Most of the actual information processing takes place here. The folds add to its surface and increase the amount of information that can be processed.

The Triune Brain.

Neuroscientist Paul D. MacLean formulated a model of the brain in the 1960s, describing the brain in terms of three distinct structures that emerged along an evolutionary path. A highly simplified explanation of how our brain is organized and works, it provides an easy to understand approximation of the hierarchy of brain functions although it is known that neural activity relates to more than one of the regions described.

Primitive Brain (Reptilian Complex): survival functions.

Limbic System (Paleomammalian Complex): our “emotional” brain with key areas like hippocampus, amygdala and hypothalamus, our evaluation and response system to keep us safe.

New Cortex (Neomammalian Complex): our “smart” brain, all high-order conscious activity i.e. language, abstract thought, imagination.

Triune Brain Theory

Lizard Brain	Mammal Brain	Human Brain
Brain stem & cerebellum	Limbic System	Neocortex
Fight or flight	Emotions, memories, habits	Language, abstract thought, imagination, consciousness
Autopilot	Decisions	Reasons, rationalizes



The Triune Brain in Evolution, Paul MacLean, 1960

Our hard working brain. Making connections.

Neurons love company. They link up in complex structures all across the brain. A network of networks. Moving a finger, balance memory, moral judgement, imagination - it all stems from connectivity.

With more than 100 billion neurons the brain makes 15.000-200.000 connections each. In 1 cm³ of brain tissue there are a billion synapses. The length of myelinated nerve fibers in the brain is 150.000-180.000 km. Neurotransmitters are chemicals that brain cells use to talk to each other.

The place where the signal passes from one neuron to another cell is the synapse. Chemicals known as neurotransmitters cross the synapse and attach to receptors. They can change the properties of the receiving cell. Some are *excitatory*, others block the cell activity and are called *inhibitory*.

A mental event - a thought, memory, emotion, action or perception - involves the firing of many neurons in organized patterns, called neural networks. Connectivity changes over a lifetime. In the first decades change is most dynamic. Then synaptic pruning thins neuron connections while myelination stabilizes communication.



When we learn, remember, and form habits, existing synapses are strengthened or weakened, and new ones created.

The brain is an incredible pattern-matching machine.

Jeff Bezos



Neuroscience in Business.

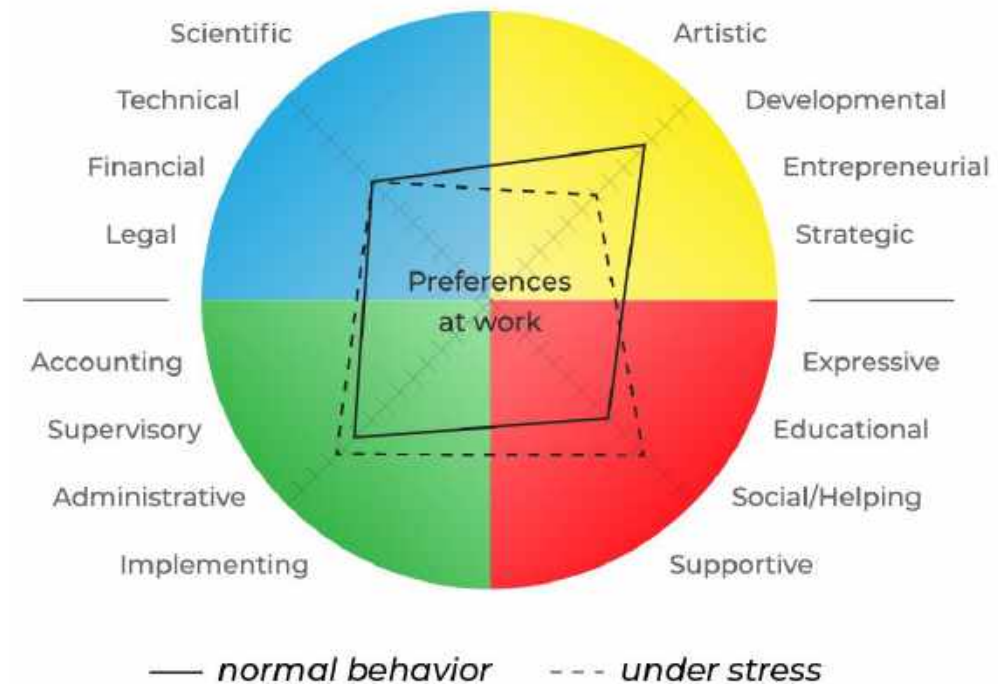
If we can understand the brain, we can obtain a better understanding of the behaviors of the people we work with and discover ways of making the workplace a better place to be.

Knowledge of the brain has entered mainstream, everywhere. From education to business to pop culture. New trends in employee engagement and leadership today require a basic understanding of the brain and neuroscience.

GPSinnovation : we help companies to optimize their business outcome through their most valuable tool, their Whole Brain ® Thinking.

Whole Brain® Thinking.

Ned Herrmann (1922-1999) created the Whole Brain® Thinking Model, a metaphor or framework that allows companies to harness thinking diversity. Our brain works in four ways - we work in four ways. The Herrmann Brain Dominance Instrument ®(HBDI®) is a thinking preference profile. It identifies the degree of preference for analytical, structural, emotional or strategic thinking. How we think affects how we make decisions, communicate, solve problems, manage and work with others. The HBDI helps us identify areas of lesser preference to develop as well as helps us harness our preferred thinking styles. It is extremely valuable as it measures how we act/ work under pressure or in a crisis situation. This powerful assessment is a catalyst for team alignment, productivity, efficiency, creative thinking and collaboration.



Thanks!

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