

We are a catalogue of billions of bits of data

by Mark Pavilons

Everything we do or think is produced by the human brain.

Sitting on our shoulders is the most complicated, and mysterious object in the universe.

And I have to wonder why it's so extraordinary, operating in rather ordinary human beings.

Aside from the work it does every second, our brains hold all of our memories ? our personal diaries that we carry with us.

While the exact capacity is debated, estimates range from 10 to 100 terabytes, comparable to computer hard drives.

According to Christopher Ravn (Optoceutics, How Much Information Can The Brain Hold), some studies suggest the brain capacity could be as high as 2.5 petabytes (PB). With the estimate of 10 TB, it could store around 3 million digital photos or 3,200 hours of HD video. The higher estimate of 100 TB could store approximately 30 million photos or 32,000 hours of HD video.

The most extreme estimate of 2.5 PB could store around 530 million photos or 670,000 hours of HD video. Unlike digital storage, the brain does not store information in a linear or file-based manner but uses complex networks and associations to encode and retrieve information efficiently.

Yahoo's 2.0 petabyte computational centre, which can process 24 billion ?events? a day, is a jaw-dropping 20% smaller than the capacity of a single human brain.

The brain can process words at a rate of 400 to 800 words per minute, see between 10 and 100 images daily.

Neuroplasticity is how the brain adapts to changes in response to new learning and memory demands. This process involves the formation of new neural connections and the strengthening or weakening of existing ones, which allows the brain to reorganize and adapt to new information and experiences. The brain adapts to new information through learning new information, pruning connections to allocate resources, generating new neurons, reorganizing functional areas to compensate for changes, adaptation of one brain area, adapting to sensory deficits, and the ability to adjust.

The brain is believed to hold up to 450 years of memories and can store and gather information at any given time. However, when the brain reaches its capacity, it will go through neural pruning and forgetting to manage and store information. Neural pruning is when the brain removes unwanted neural connections to make way for new information.

One has to wonder why our brains were built to hold so much, when our time here is very much limited. We would never use such capacity, so why did the Creator give it to us?

It's estimated that we have roughly 50,000 thoughts per day. Over the course of a lifetime, scientists estimate that our brains will hold up to 1 quadrillion pieces of information.

So, this vital organ is stupendous. But what happens when our bodies give out and we die?

Six minutes without blood flow typically means catastrophic loss.

We have a soul, but where is it located?

René Descartes claimed the soul was separate from the body, interacting through a tiny gland in the brain ? the pineal gland.

Physician Duncan MacDougall believed he had scientific proof of the soul's existence. By weighing patients before and after death, he claimed to have recorded a precise loss of 21 grams ?the supposed weight of the soul leaving the body.

Aristotle and Plato understood the soul as an incorporeal form but closely related to the physical world.

Most religions teach that the soul is an eternal essence that transcends the body. In Christianity, Islam, Judaism, and Hinduism, the soul continues beyond death, entering either paradise, reincarnation, or union with the divine. Buddhism, however, challenges the idea of a permanent soul, instead describing an ever-changing self shaped by past actions (karma).

According to Mark Travers (Psychology Today), a team of researchers captured approximately 15 minutes of brain activity leading up to, during, and just after one patient's death. It involved an 87-year-old Canadian man who died during an EEG in 2022.

The EEG recorded an abnormal surge in gamma waves. These are the highest-frequency among all brainwaves, and they primarily occur within the hippocampus (the brain's memory centre). Typically, these oscillations are associated with memory retrieval, dreaming, and deep meditation.

This spike in gamma wave activity ? in tandem with other oscillations such as delta, theta, alpha, and beta ? created a brainwave pattern that looked remarkably similar to what we see when someone is deeply remembering something, or dreaming vividly.

In light of these findings, one of the professionals involved in the study, said:??Through generating oscillations involved in memory retrieval, the brain may be playing a last recall of important life events just before we die.?

Looking for some sort of reassurance, I'm hoping to find some solace in these findings, and of course, religious teachings.

The universe itself likely holds answers to questions we haven't even thought to ask.

I don't want to go quietly into the night, and slip away without much ado. I?don't think that's a fitting way for any of us to leave. We should be accompanied by regal bands, bagpipes and a symphony of stringed instruments, marking our departure and offering thanks to our life-long contributions.

When I?pass, my body and all that it holds, will wither, fade and cease. What will happen to all those billions of images of smiles, laughs, family gatherings, friends, campfires, loved ones, pets, lake-front and ocean-front experiences?

What of me?