UNLOCKING
CONSCIOUSNESS

BRIAN MIND FORUM

Appendix 053

Creative Intelligence and Ever Larger Datasets

Creative Intelligence. Pattern Matching to Identify New Information.

In Chapter 4 we defined Information as regular and repeatable patterns of units of difference in objects, articles, artefacts, events, activities or behaviours over a fixed or determinable period of time.

Creative intelligence includes the ability to capture these patterns and effectively convert them into useful knowledge. A few examples illustrate the strengths and weaknesses of this ability. Far in our past our distant ancestors observed that the sun rose in the east each morning, sailed across the sky and set in the west. They promptly designated it as a god, and surmised that it was carried across the underworld each night on chariots. According to where you lived along the river Nile the lengths of these 'days' and 'nights' varied approximately every three hundred and sixty times per 'year'. The priests kept ever more sophisticated records.

The ability to forecast an eclipse was power indeed, and by the beginning of the Christian era the Greeks had invented a mechanical calculator, the Antikythera, to forecast eclipses and much else [with precision engineered cog wheels not matched again for fifteen hundred years]. A 'year' was not a complete number of days, but the number 360 was divisible into so many equal parts it was adopted as one of the first standards in science. Further record keeping of the annual flows along the Nile enabled farmers to plant and harvest their crops to take maximum advantages of the annual floods.

A hundred years before the Christian era Eratosthenes not only observed that the earth was a sphere but also computed its diameter with astounding accuracy. All from the painstaking observation and recording of patterns, and imaginative conjectures of what these patterns meant. Creative intelligence, each advance building on the corps of existing knowledge, step by step.

The entire body of science, of human knowledge, has been built using this process for the last two thousand years with spectacular success.

However, just as this wonderful facility is delivering its greatest harvests we are running out of brain power. The massive volumes of data that we can access far exceeds the capacity of our brains to process sufficiently accurately to identify the more complex patterns. For example

the volume of data generated by the large hadron collider in CERN is so enormous that all the scientists in the world working together could not process it. But our computers can. In fact, the ever-escalating volumes of CERN data has been a major driver to the computer industry to invent faster and more efficient data processing systems pushing out the frontiers of the whole industry. Sequencing DNA, likewise, has only been possible thanks to computing.

Thus, we have a partner. Whether we call this 'artificial', or 'machine' intelligence, or coin some other title like 'data mining', or 'big data', is irrelevant. A whole new era of human knowledge is opening up, where we can collect vast volumes of information and identify patterns and trends, particularly in medicine and economics.

Speech recognition, one of the holy grails of computers [Oh! To dispense with keyboards] has struggled for years with complex analytical algorithms without achieving sufficient accuracy. However, recognising patterns of speech in huge data banks is yielding encouraging results, Siri etc..

There is no limit to the potential size of information systems. There is potentially no limit to the power of computing systems to analyse that information to identify patterns of new information.

Thus a definition of pattern matching to identify new information is:-

The efficiency of the neural systems to categorise, describe and analyse large volumes of information then identify, obtain, retrieve and process regular and repeatable patterns of information in objects, articles, artefacts or behaviours over a fixed or determinable period of time, to solve problems and extend knowledge. Organise, report and explain this new information in a coherent manner that is understandable and useful to others.

Opening New Opportunities

But, as always, this door to new knowledge just suggests not only a powerful solution, but also a whole new field of science.

As we become more expert at analysing ever larger data sets we may be able to add dimensions like symmetry form and balance, and attributes of design that we find attractive. We might begin to find ways to describe, define, and even find ways of measuring some qualia that currently elude us.

We need have no apprehension that we will reach information storage and processing capacity ceilings. Quantum databases hold out the potential to access every item in a quantum database concurrently, however many items there are! Biological databases are on the horizon, which hold out the possibility of processing databases orders of magnitude larger than we can envisage in silicon, and DNA molecules are already being used as processors, if only experimentally at present.

The true breakthroughs will come when we learn to use these various skills together. It is interesting to see that the very foundations of human Intelligence – pattern matching as the first step in our intellectual history are so similar to the massive computer aided pattern matching systems that we are just beginning to develop.