



## TOD™ Operational and Strategic Options

*“The Age of Tissue Computing has Arrived™”*

# Neural Enabling and Mining of Big Data

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**Purpose:** To cost-effectively and incrementally move existing data and Big Data processing to a more advanced class of computers – neural, the next step beyond digital. The move to real neural computers, powered by living neurons, will assure that the term “Big” in Big Data will no longer refer to how costly the data processing and data storage is – but rather, the scope of the opportunity for significant breakthroughs, data mining insights, and monetization of Big Data enabled by natural neural intelligence.

**Process:** The foundation for enterprise data asset building and intelligence gathering is the continual collection, errorless assembly, and processing of all relevant accessible data, which may be voluminous, rapidly arriving, or be an ever-expanding number of new files or sources. All these issues can result in the need for enormous Big Data systems, resource commitments, and costs.

Given these conditions and ever-increasing amounts of data, and rates of new data collection, the potential magnitude, diversity, and complexity of collecting and processing digital data, image sets, and analog sourced data, can quickly impose limits on Big Data processing opportunities and asset exploitation. They can also drive massive costs in providing immediate, final, definitive, and accurate results to any Big Data mission.

Data Mining requires an effective data research and analysis model, processing structure, and data storage-retrieval system that enables rapid and accurate results from any relevant form of obtainable data. The effective application of capabilities such as artificial intelligence, machine learning, and natural language processing is fundamental to Data Mining success at the level of insights. In the world of ‘mining’, data is the new gold. Further technologies such as the metaverse, blockchain, non-fungible tokens (NFTs) and various forms of cryptocurrencies are also important mechanisms for commercial exploitation – monetizing the ‘gold’ to benefit the enterprise and its stakeholders.

**Solutions and Strategies:** The forthcoming availability of a family of Tissue Operating Device (TOD™) neural computers will create opportunities for a massive change to Big Data acquisition, processing, storage, mining and monetization.

TOD™ Tissue Computers (TCs), powered by living neurons, are the only strategic solution for Big Data. TOD™ will explore, learn and ultimately provide correct answers to Big Data questions and challenges, based on limited guidance and partial information. Trained neurons will naturally think, and intuitively apply accumulated knowledge to fill-in missing gaps, steps, logic, calculations, or procedures. This will remove many of the restrictions and obstacles currently facing Big Data enterprise solutions.

In a similar manner, TCs will greatly expand Big Data storage and retrieval capabilities. User programable access to natural and powerful neural learning and memory, and the organized rapid retrieval of data from single neurons and the wider neural networks they live in, will prove greatly superior to, and much less costly than existing digital information storage and retrieval.

Within the DNA of every living neuron (found throughout the Animal Kingdom) is a near infinite storage capacity. Individual neurons 'remember' (store and retrieve) information, but the way they connect and operate with other neurons to form neural networks, the storage capacity of the neural network increases exponentially with neural population growth. This makes virtually infinite data storage a powerful reality – readily available and accessible to users of all TOD™ models. Estimates are that all of the data currently in existence could be stored in just a few grams of neural DNA. Within this context, TOD™ Models offer from 16 million to over 5 billion neurons operating in living neural networks. For more information on this subject see the BCM website TOD Article and Press Releases.

Big Data, prepared for Data Mining, can be structured, unstructured, and semi-structured. As of these data structural options, plus the ability to handle analog images, sounds and other naturally occurring information, other than just digital 'data' (reduced to binary zeros and ones) are fully compatible with all TOD™ Models.

TOD™ offers users access to adaptive thinking, based on the ability of living neurons to form direct connections to one another. This process allows neurons to create and adapt their own neural networks. The result is a consolidated pool of thinking, learning, accumulated knowledge, and intuitive neural intelligence.

Digital computers only perform tasks they are programmed to perform by the user or application programmer. This will also be true of digital neural networks built with silicon chips designed to imitate real neurons. In the case of living neurons, the user or application programmer only needs to train the neurons on the general parameters of the task at hand, including the specific objectives and high-level goals of the Big Data challenge. Thereafter, the neural network may need further general guidance or support from the user's human intelligence, to guide TOD™ toward the answer.

This is a radical change in data processing – one that opens a wide window of opportunities in the realms of problem solving, data analyses, information management, knowledge management, and creative insights.

Living neurons use adaptive thinking, combined with the process of continually assembling knowledge acquired from experiences, events, actions, data, metrics, formuli, trial-and-error results, learning, memory, and other sources. Thereafter, they naturally use their cumulatively assembled knowledge to understand matters, generate ideas, make decisions, form opinions, and solve problems.

For maximum processing efficiency, TOD™ offers both sensor or digital inputs and data transfers. The sensor direct format allows direct input of optical, audio, video, RF, inferred, thermal, sonic, and seismic data.

Depending upon the specific applications, both of these unique neural data transfer capabilities can result in a massive reduction in processing time, and required processor resources, because conversions from one form of data format to another are totally unnecessary and thus eliminated.

These TC system management powers, and neural control abilities can be employed to focus and push the limits of neural intelligence to unimaginably higher levels of performance and the controlled expansion of computerized problem solving, data analyses and mining, and data monetization.

For additional information on Tissue Computing, TOD™ design, neural training, learning, Adaptive Thinking, Assembled Knowledge, Intuitive Neural Intelligence, and related subjects, please visit the BCM Industries website or contact BCM.

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