From the water and steam power mechanized production of the First Industrial Revolution to the electric powered mass production of the Second, each builds on its predecessor. In the Third Industrial Revolution electronics and information technology were used to automate production. A Fourth Industrial Revolution is upon us. It is a new era that builds and extends the impact of digitization in new and unanticipated ways.\textsuperscript{1} Characterized by a fusion of technologies that are blurring the lines between the physical, digital, and biological spheres, the Fourth Industry will be influenced more by communication and connectivity.\textsuperscript{2}
The Fourth Industrial Revolution requires an intelligent and fully extensible framework to bridge the physical, digital, and biological spheres in order to transform the way people and engineered systems communicate and interact among themselves just as the Internet has transformed the way people interact with information. NeurSciences provides the solution as the Universal Framework of Things (UFT) for the Fourth Industrial Revolution.

The World Wide Web and its two-dimensional namespace exists as a working model in the UFT. For all of its benefits, the web has its limitations. Tim Berners-Lee who invented the web in 1989 recently stated "We demonstrated that the web had failed instead of served humanity, as it was supposed to have done, and failed in many places". Berners-Lee is now joining a growing chorus of users and organizations working towards a solution where users can own and control their own data to help ensure privacy and data security. While he is focused on using existing web technologies in his Solid framework, others are exploring a decentralized web using blockchain technology.

Blockchain technology involves a distributed ledger with decentralized authority. It provides a new era in the way we store and exchange value and it can play a pivotal role as one of the enabling technologies for a machine-to-machine economy. The use of blockchain technology can extend to numerous sectors including but not limited to governmental, financial, and to the web itself enabling a decentralized web. There is no standard framework for the thousands of current blockchains to interoperate, let alone to bridge the decentralized and centralized authority models.

Smart home appliances like Amazon Echo and Google Home, as well as smart phones, have limited intelligence and effectively only create a direct communication channel between the end user and the device manufacturer's services. These sandboxed solutions often do not interoperate. For example, you cannot use Amazon Echo to search Google or ask Google Home to order Amazon products.

The devices enabling the web are a subset of all the devices and sensors connected to the Internet. Collectively, all these devices are referred to as the Internet of Things (IoT). The lack of standards, interoperability, and an IoT framework raises serious issues especially around security concerns.

The Internet of Everything (IoE), first coined by Cisco, is a higher level abstraction that encompasses the IoT devices and sensors, their data abstractions, and the web along with its resources. Cisco estimates that 99.4% of physical objects that may one day be a part of the IoE are still unconnected. With only about 10 billion out of 1.5 trillion things currently
connected globally, there is vast potential to connect the unconnected. The Internet sector, even with its limitations, represents approximately 6% of the U.S. GDP and clearly is an important component of the economy.

To reach the full potential of Industry 4.0 the framework must interoperate with and also extend beyond what we know as the Internet of today to incorporate devices and systems that can communicate independently of the Internet.

The McKinsey Global Institute describes the Fourth Industrial Revolution as the age of Cyber-Physical Systems (CPS) that integrates computation, networking and physical processes. Built from, and dependent upon, the seamless integration of computation and physical components, CPS technologies are transforming the way people interact with engineered systems.

NeurSciences’ vision of the Fourth Industrial Revolution includes independently owned and operated cyber-physical AI agents in various form factors, some of which can untether from the network as needed. Agents will collaborate and self-assemble virtual extensions of the UFT as communities with domain specific ecosystems. These economic communities will be operated by and for the benefit of the agents working for individuals, households, and organizations.

NeurSciences' framework supports the technological achievements of the past, encompasses those of the present, and fosters the development of future systems and solutions. It provides a unified method for modeling everything from the smallest particle to complex life forms and abstract thinking. The framework is simple enough to be comprehensible, yet sophisticated enough to enable complex models of the World Wide Web, Neural Networks, IoT, IoE, Blockchain Technologies, and even human cognition.

Let the Fourth Industrial Revolution Begin.

Learn more: www.neursciences.com
Contact: brad.Jamieson@NeurSciences.com
1 https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/
2 https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/
3 https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503286
5 https://www.decentralizedweb.net
6 https://solid.inrupt.com
7 https://www2.deloitte.com/content/dam/insights/us/articles/4436_Blockchain-primer/DI_Blockchain_Primer.pdf
8 Melanie Swan, Blockchain: Blueprint for a New Economy, O'Reilly Media, Inc., 2015
9 https://www.gbaglobal.org/about/
10 A Google Home device can recognize 6 different voices, with each voice having its own account. https://store.google.com/product/google_home
11 https://www.w3.org/WoT/
16 https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=503286