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Editorial

Quantum for Business Enterprise

The global community produces 2.5 quintillion bytes or 1 billion gigabyte of data on a daily basis much of which unstructured, unsorted scattered data sets catalysed by the Internet of Things. The threat to classical computing capability to perform complex analytics at requisite quality, speed and scale and minimum resources – power/energy, time and cost – is a challenge for the enterprise as much as interrogating and deriving value from the data.

Classical computing is limited to the extent that it performs calculations with binary bits which can represent either 0 or 1, one event at a time – although machine learning algorithms like Linear regression, Logistics regression, support vector machine, k-means clustering, and naïve bayes classifiers take the sting out of the big data mayhem.

The future seems to lie in quantum technology.

Quantum computing is a prominent example of quantum technology which uses theoretical concepts of quantum mechanics to solve complex problems. Quantum computing conducts calculations with quantum bits, qubits, which can be 0 or 1, two events at the same time with differing probabilities.

Superposition and entanglement are two operational features of qubits that set quantum computing apart from classical computing.

Superposition explains a phenomenon where the quantum information a qubit holds is placed in multiple states or 'superposition' which enable groups of qubits to create multidimensional computational spaces in which complex multiple problems are represented in fresh or novel ways.

Quantum entanglement explains the relationship between paired or two enmeshed qubits where changes to one qubit directly affect the other (even if the paired qubits are far apart distance-wise).

Quantum algorithms leverage this relationship to find solutions to complex problems exponentially faster (see also IBM, 2018). These two features of quantum computing are cheering news for enterprise Big Data that requires complex analytics arising from complicated interactions among so many data variables.

In this volume of the *International Journal of Knowledge, Innovation and Entrepreneurship,* Deryn Graham's paper speaks to the technology innovation theme of the journal. The paper describes the current computational models of knowledge and (big) data, based on classical physics (classical computing) and the concepts of the quantum computational model (quantum computing) and its impact on business and the economy.

The volume is concluded with three book reviews. Hanna Hellgren's review of Anders Örtenblad (Editor) seminar work entitled *Against Entrepreneurship: A Critical Examination*, Tricia Mayer's review of the *Curious Minds: The Power of Connection* by Perry Zurn and Dani S. Bassett, and Özge Karaevli's review of the *Social Leadership in Early Childhood Education and Care* by June O'Sullivan and Mona Sakr.

So, despite of the challenges of the pandemic over the last few years, the *International Journal of Knowledge, Innovation and Entrepreneurship* still managed to maintain some level of regularity of publication even though getting authors to revise

and return approved papers for publishing were most problematic.

Enjoy.

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Reference

IBM (2018). 'Coming soon to your business – Quantum computing Five strategies to prepare for the paradigm-shifting technology', IBM Institute for Business Value: Armonk, NY, USA.