

Quantum as a Service (QaaS) in Digital Disruption Era

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Abstract

Applications of the advanced computer technologies are becoming more realistic. Two challenges are taken into consideration when applying such technologies to the businesses including more complicated user requirements and exponential growth of data. Better and faster understanding of the user requirements are key to achieve competitive advantages. Structured and unstructured data processing are currently more demanding. Quantum technology which is instantiated in physics have been utilized in various fields including computer science. Even the real quantum computer is still in its early development but other concepts such as quantum information and quantum computing are making progresses. Furthermore, some quantum-based algorithms are analytically proven to have higher performance. According to such important milestones, quantum computing has been regarded to one of the key infrastructures of the future computing. However, development of quantum system requires very high investment. Only some companies are developing their quantum computers together with several development environments and access to the quantum computing services. This paper aims to focus on the main aspects of the quantum computing including its backgrounds and recent advancements in order to see the clearer picture. Its recent applications, challenges and opportunities are addressed. Several services offered by the quantum computing leading companies are also outlined.

Keywords—quantum technology, quantum computing, quantum application, quantum as a service