How different companies use Quantum Computing?

QC Assignment 1

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Quantum computing is a rapidly evolving technology that has the potential to revolutionize many industries. Unlike classical computers, which use bits to store and process information, quantum computers use quantum bits, or qubits, to perform calculations. This allows quantum computers to solve certain problems much faster than classical computers, making them a valuable tool for companies in a variety of industries. In this assignment, we will explore how different companies are using quantum computing to solve complex problems and gain a competitive advantage. We will examine the specific industries in which these companies are operating, the types of problems they are solving with quantum computers, and the quantum computing platforms they are using. By the end of this assignment, you should have a better understanding of the ways in which companies are leveraging quantum computing to drive innovation and improve their operations.

Quantum computing is an emerging technology that has the potential to revolutionize many industries. Here is an assignment that describes how 10 different companies are using quantum computing:

1 JP Morgan Chase:

JP Morgan Chase and Co. is an American multinational investment bank and financial services holding company headquartered in New York City. As a "Bulge Bracket" bank, it is a major provider of various investment banking and financial services. As of 2021, it is the largest lender in the fossil fuel industry in the world. JP Morgan Chase is looking into how quantum computing would impact the financial services space. JP Morgan Chase is one of the first financial institutions worldwide to invest in quantum computing and to build an internal team of scientists to work on new quantum algorithms and applications to address business use cases in finance, AI, optimization, and cryptography.

2 Exxon Mobil

One of the biggest global oil and gas businesses that are publicly listed is Exxon Mobil. Transporting the world's energy goods around the planet is a challenging problem that could need a quantum solution. Exxon Mobil is investigating quantum algorithms in collaboration with IBM Quantum to address the challenges of shipping the cleanest burning fuel in the world. Exxon Mobil sought to ascertain which strategies are required to account for complex real-world constraints, such as capacity limitations and time windows, which govern the arrival and departure of shipments, as well as the extent to which maritime routing problems could also be addressed using existing quantum variational algorithms.

3 Boeing:

Boeing, the largest aerospace corporation in the world and a top producer of commercial jetliners, defense, space, and security technologies, provided the funding. To Harness the Power of Advanced Computing and Networks in Aerospace, Boeing Launched New Organization. Boeing will be able to create ground-breaking solutions in secure communications, artificial intelligence, and

complex system optimization thanks to the new organization's use of key technologies in quantum communications and computing, neuromorphic processing, and advanced sensing. Disruptive Computation Networks, a division of Boeing, focuses on enhanced sensing, neuromorphic processing, and quantum communications and computing.

4 IBM:

IBM has been a leader in quantum computing for many years and has made its quantum computers available to researchers and businesses through the IBM Q network. The company has used quantum computers to solve problems in a variety of fields, including finance, chemistry, and machine learning.

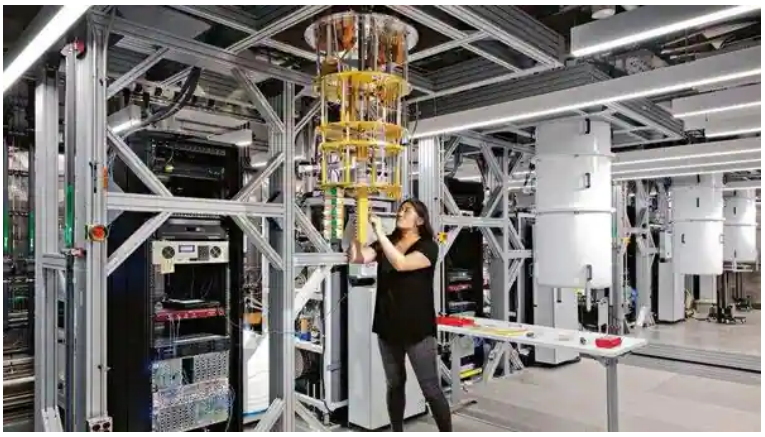

Figure 1: IBM Quantum scientist working with quantum computers

5 D-Wave Systems:

D-Wave is a Canadian company that has developed a quantum computer specifically designed for optimization problems. The company's quantum computers have been used by organizations such as NASA and Los Alamos National Laboratory to solve complex optimization problems.

6 Goldman Sachs:

One of the earliest industries to use big data was finance, and innovation is still a priority. Combinatorics computations, a specialty of quantum computing, are used extensively in the science underpinning valuing of financial assets. Given the importance of computer speed in the financial markets, Goldman Sachs has invested much in developing quantum computing technology. The calculations rely on techniques known as Monte Carlo simulations, which involve generating several predictions about hypothetical future market moves to determine the likelihood of a specific event.

7 Daimler:

A multinational automaker with its headquarters in Stuttgart, Baden-Wurttemberg, Germany is called Daimler AG (DMLRY). In 1926, Benz Cie and Daimler Motoren Gesellschaft merged to become the business. The Daimler Group, formerly known as Daimler AG, owns Mercedes-Benz. Through the use of quantum computing technology, Daimler AG transitioned from being a car manufacturer to a provider of mobility services. CASE stands for shared services, connectivity (connected), autonomous driving (Autonomous), and electric drive systems (Electric).

8 Quantum Machines:

Quantum Machines is an Israeli company that has developed a quantum computing platform called Q-CTRL. The company has worked with clients in a variety of industries, including finance and defense, to develop quantum algorithms and software.

9 Aliro Technologies:

Aliro is a California-based company that has developed a quantum computing platform called Aliro Quantum. The company has worked with clients in a variety of industries, including finance and defense, to solve complex problems using quantum computers.

10 PsiQuantum:

PsiQuantum is a California-based company that is developing a quantum computer specifically designed for use in the financial industry. The company has received funding from leading venture capital firms and is working with clients in the finance industry to develop quantum algorithms and software.

11 Cambridge Quantum Computing:

Cambridge Quantum Computing is a UK-based company that has developed a quantum computing platform called t—ket¿. The company has worked with clients in a variety of industries, including finance and defense, to solve complex problems using quantum computers.

12 IonQ:

IonQ is a Maryland-based company that has developed a quantum computer based on trapped ions. The company has worked with clients in a variety of industries, including finance and defense, to solve complex problems using quantum computers.

13 Quantronix:

Quantronix is a New York-based company that has developed a quantum computing platform called QuaNIX. The company has worked with clients in a variety of industries, including finance and defense, to solve complex problems using quantum computers.

Overall, these companies are using quantum computing to solve complex problems in a variety of industries, including finance, defense, chemistry, and machine learning. As quantum computers become more powerful and accessible, it is likely that more companies will adopt this technology to gain a competitive advantage.