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QUANTUM COMPUTING FOR BUSINESS RISKS

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In an era defined by rapid changes and global connectivity, businesses must navigate a complex landscape of risks. Quantum computing, with its ability to process and analyze vast data sets, offers transformative potential for identifying, analyzing, and mitigating risks by leveraging news feeds, social media, and predictive modeling. This work explores how quantum computing can revolutionize risk analysis for businesses, highlights key modern cloud quantum technologies, and introduces basic concepts for modeling these scenarios.Quantum computing is emerging as a transformative tool in business risk analysis, particularly in processing vast datasets from news feeds and social media to model future organizational scenarios. Its ability to handle complex computations at unprecedented speeds offers significant advantages in identifying and mitigating risks. Deloitte in it's report [1] examines how quantum computing can enhance financial simulations, portfolio optimization, and risk management. It discusses the potential for quantum algorithms to process complex financial models more efficiently than classical computers. Bloomberg Law [2] explores the integration of AI and quantum computing in automating risk monitoring through the analysis of social media and news outlets. It highlights how these technologies can identify potential crises before they escalate, thereby improving organizational resilience. Risk.net resource [3] delves into the challenges and opportunities quantum computing presents in risk management, including its application in stress testing and scenario analysis. In the previous articles authore analyzed usage of Generative AI for risks analysis [4], however usage of quantum computing in the specific of risk analysis using sentiment analysis of news and social media was not well analysed yet.

Quantum computing's unique capabilities stem from quantum bits (qubits), which can exist in superposition, enabling the processing of multiple possibilities simultaneously. This allows quantum computers to analyze massive, unstructured datasets like news feeds and social media at a scale and speed unattainable by classical systems. Applications in Risk Analysis:

– Sentiment Analysis by analyzing real-time social media data and news articles, quantum algorithms can identify trends and public sentiment that may indicate emerging risks.
– Scenario Modeling by quantum simulations allow businesses to model multiple future scenarios, enabling decision-makers to prepare for a wide range of potential outcomes.
– Predictive Analytics via quantum machine learning (QML) enhances the ability to predict market trends and potential disruptions, offering a competitive edge.
– Several platforms provide accessible quantum computing resources for businesses:
– IBM Quantum offers Qiskit, an open-source framework, and cloud-based access to quantum systems.
– Google Quantum AI focuses on quantum supremacy and provides tools like Cirq for quantum programming.
– Amazon Bracket - cloud-based quantum computing service that integrates with machine learning frameworks.
– Microsoft Azure Quantum combines classical and quantum processing for advanced analytics.

These platforms enable organizations to explore quantum algorithms without investing heavily in proprietary hardware.

One of the most promising quantum algorithms for analyzing risk is the Quantum Approximate Optimization Algorithm (QAOA). It is particularly suited for solving optimization problems, such as risk-reward assessments, and can be adapted to complex decision-making scenarios.

Below is a simplified example of using quantum circuits to analyze trends in sentiment data:

```
from qiskit import QuantumCircuit, Aer, transpile, execute
from qiskit.visualization import plot_histogram

# Initialize quantum circuit with 3 qubits and 3 classical bits
qc = QuantumCircuit(3, 3)

# Apply Hadamard gates to create superposition
qc.h(0)
qc.h(1)
qc.h(2)

# Measure qubits
qc.measure([0, 1, 2], [0, 1, 2])

# Execute on a quantum simulator
simulator = Aer.get_backend('qasm_simulator')
compiled_circuit = transpile(qc, simulator)
result = execute(compiled_circuit, backend=simulator).result()
counts = result.get_counts()

# Display results
print("Sentiment Analysis Simulation Results:")
plot_histogram(counts).show()
```

This program simulates the initialization of a quantum circuit to analyze data in a superposed state. While it's a basic example, more sophisticated models can incorporate QML techniques like Variational Quantum Circuits (VQC) for advanced sentiment prediction.

Key advantages of quantum-driven risk modelling is speed and scalability as quantum computers can process vast amounts of data in parallel, significantly reducing computation time. Also it provides enhanced precision because quantum algorithms can uncover hidden patterns and correlations that classical systems might miss. Another advantage is dynamic adaptability as real-time data inputs ensure that models are continuously updated with the latest information.

Despite its promise, quantum computing faces challenges, including error rates in qubit manipulation and limited qubit coherence. However, advancements in error correction and hybrid quantum-classical systems are bridging these gaps.

Quantum computing is poised to redefine business risk analysis by offering unprecedented tools for processing unstructured data and modeling complex scenarios. With the rise of cloud-based quantum platforms, businesses can now explore these possibilities with minimal investment. By embracing quantum computing, organizations can turn uncertainty into opportunity, ensuring resilience in an unpredictable world. For businesses ready to lead in the quantum age, the future holds immense potential for innovation and growth.

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MARKETING IMPLICATION OF UNDERESTIMATING THE DIRECT THREATS OF ARTIFICIAL INTELLIGENCE DEVELOPMENT

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There are tree common ways how people perceive the future. The first one assumes that the future will be changing slowly and look like today's with a little improvements. The second way corresponds with the thought that the future will be the same or a little bit better. The third way perceives the future to be worst a little bit comparing with today's. But there are also the fourth way that is rare among people perception. The fourth way assumes that the future will change rapidly and be very different from its previous version. But the fourth way is the most rare compared with three others.

Most people are not prepared for the rapid changes of the future effectively by themselves in accordance with the fourth way. This also means that people don't use forecasting models for their own future and do not use forecasting in their professional activities too. For example, under the conditions of the pandemic of coronavirus disease (COVID-19) beginning, most consumers of the forecasting companies did not want to understand the processes of changes that were happening, but they demonstrated their increasing demand on the ready-made decisions to resolve various current problem situations and wanted to receive some clear road-maps and algorithms what they had to do in the future step-by-step to achieve their economic goals [1; 2]. The results of the marketing research, been conducted in 2023-2024 by us to study the perception of the risks from the rapid development of Artificial Intelligence (AI), demonstrate that most intelligent respondents (79 %) do not see and do not realize for themselves and for humanity as a whole the direct threat from AI development.

This common attitude to forecasting risks of AI development has some hidden threads. Firstly, it provokes vulnerability of a person, because this person does not concern about AI's direct impact on a human's brain. They continue to believe that technologies remain to be controlled and ruled by humans. But AI algorithms, for example, on social media as TikTok, Instagram, Facebook, YouTube and so on, are able to increase the number of typical information posts on particular topics. They impact on the human's brain the same way as advertising campaigns change consumer behaviour. However in contrast to advertising, AI may also isolate a human from other alternative information on these social media that develops different human biases. On the other hand, biases also correspond with AI too. And AI propositions to some particular person depend on information that has been accumulated about his or her behaviour on internet (search queries on various internet platforms, amount of time spent online, content viewed and so on).

Underestimating the direct threats of AI's impact on a human's brain develops some type of marketing myopia, when externalities are not studied enough. AI and its direct impact on human's brain are turning into a new field of scientific research. AI needs to be studied as a phenomenon when the tools for managing which are not yet investigated enough.

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