Quantum Wargaming®

Company Overview

QUANTUM QWG WARGAMING

Where Quantum meets Strategy

Introduction

Dear friends!

During my 25+ years as a strategy and innovation consultant, I have seen a tremendous rise in the role of digital technology in creating competitive advantage and achieving market leadership. Digital capabilities drove nearly all disruptive innovations in this century. When new technologies appear on the horizon, it is impossible to foresee their potential impact on industries and competition. Many thought the first personal computers were just better and more efficient typewriters, while the internet was initially viewed as a more convenient messaging tool. We are about to witness a new technology revolution – Quantum Computing. The last thing we should do now is to argue whether fault-tolerant quantum computing is possible and when these computers can be built. Instead, we need to get ready and embrace a bumpy ride. Do you want to take a chance of being left behind?

Welcome to Quantum Wargaming, the best approach to learning the business of quantum computing and becoming quantum-ready!

Alex Kandybin

Founder

Quantum Wargaming®
Company Vision & Mission

Quantum Wargaming® is where Quantum meets Strategy

Vision

Quantum computing will disrupt many industries, offering companies and governments the opportunity to create significant value by accelerating the development of new materials and medicines, improving the efficiency of manufacturing and distribution processes, and solving complex environmental problems.

Mission

Our mission is to help companies and government organizations make informed, strategic, and financially sound decisions in the rapidly advancing quantum computing landscape. By providing comprehensive market intelligence, insightful business valuations, rigorous business case development and prioritization, and immersive wargaming, we enable our clients to confidently explore their options, make optimal choices to set strategic priorities and capture the transformative potential of quantum technology

Our Services

I

Quantum Market Strategy & Valuation

Gain a competitive edge based on deep insights into industry trends, competitive dynamics, geopolitical developments and financial assessment of quantum companies. This comprehensive service enables you to understand the competitive landscape and determine the current and projected value of quantum enterprises, empowering strategic decision-making and investment.

II

Quantum Business Case Developemnt

Identify and prioritize the quantum applications with the strongest business potential. We identify relevant use cases and prioritize them based on technical feasibility, market demand, and ROI potential, enabling you to set strategic priorities and focus resources on business cases with clear paths to value.

III

Quantum Wargaming® Simulation

Test, confirm and adjust your quantum strategy based on immersive wargaming exercise. These simulations allow your organization to explore quantum-driven scenarios, test strategic responses, and identify potential risks and opportunities. These sessions prepare your business for quantum disruptions and ensure proactive decision-making.

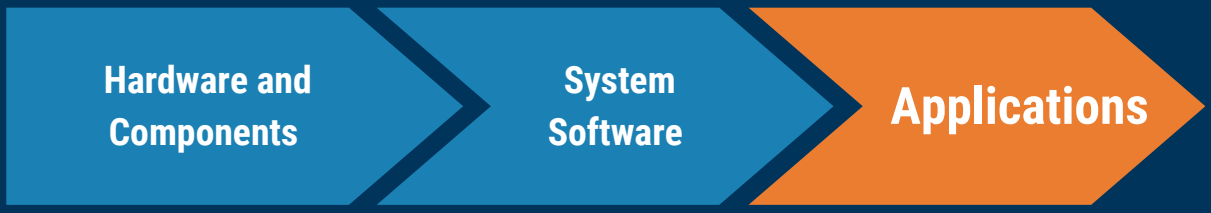
IV

Quantum Roadmapping

Execute your quantum strategy with a customized, actionable roadmap and define the capabilities required for sustainable growth. We create tailored plans for your prioritized business cases, detailing investment timing, resource allocation, talent and skills development, and strategic partnerships essential for quantum leadership

Quantum Computing Industry Will Create Significant Value

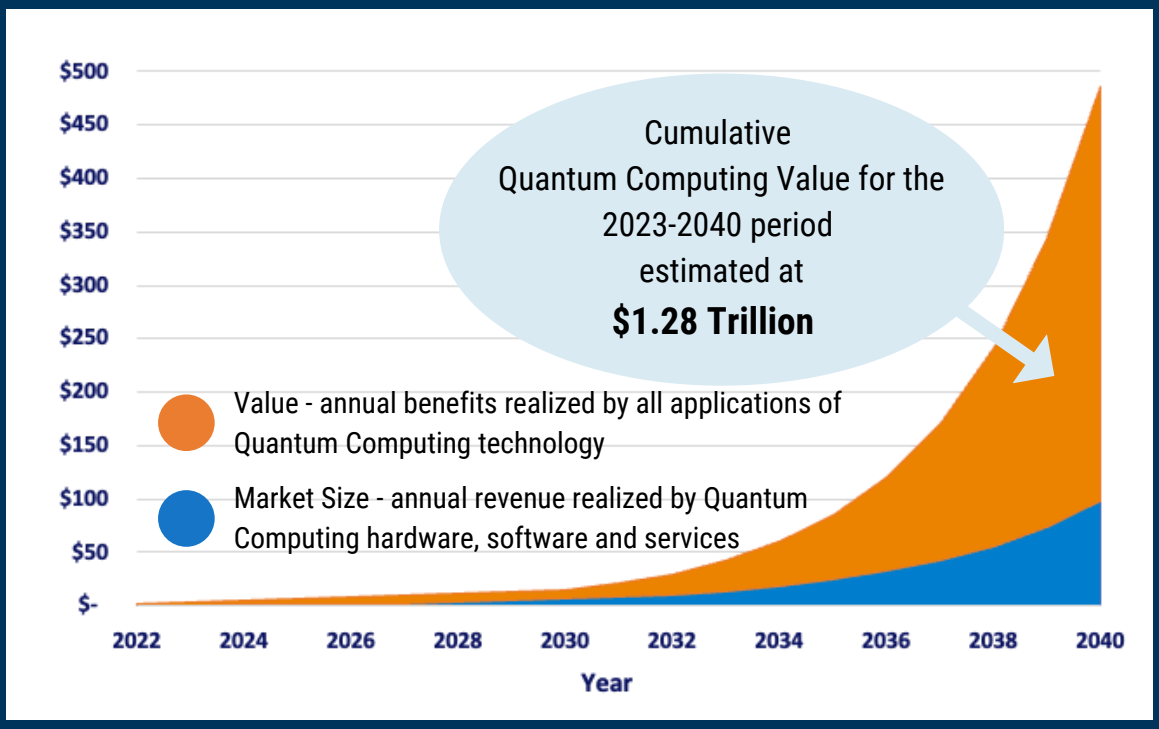
Quantum Computing Value Chain



Quantum Computing Market

Total Quantum Computing Value

Quantum Computing Applications Will Deliver Significant Value



What is YOUR STRATEGY to Capture Part of This Value?

QUANTUM QWG WARGAMING

To Capture That Value You Need to Act Now

We have developed an analytical tool to estimate the timing of specific quantum computing applications.

Number of Qubits and Gates

- We find available algorithms for solving the problem of interest in the existing literature.
- The description of the algorithm usually allows for estimating the number of qubits and the number of gates required to run it.

Gate Fidelity

- Based on the number of qubits and gates in the algorithm, we can estimate gate fidelity (required accuracy) to ensure that the execution of the algorithm is likely to produce the solution.

Error Correction

- The required gate accuracy and the error correction methodology allow calculating the "physical" to "logical" qubit conversion rate. Typically, for each logical qubit, we need from several hundred to a thousand physical qubits.

Timing from Roadmap

- Based on roadmaps published by many quantum hardware manufacturers (e.g., IBM, Google, IonQ, etc.), we can estimate when systems with the required number of physical qubits will be available.

Our analysis suggests that the first practical applications of quantum computing can be expected by the end of this decade.

It will take more that 3-5 years to build the necessary capabilities to achieve "quantum readiness."

Quantum Wargaming® - Experiencing the Quantum Future Now

What Is Quantum Wargaming?

Quantum wargaming for business is a dynamic, interactive, and strategic team exercise where you can operate in the simulated environment of mature quantum computing technology. You can develop and test quantum-based innovation and operations strategies to compete with several other players/companies. Unlike strategic planning, your strategic moves depend on the actions/moves of your competitors.

What Are the Benefits?

- Fast learning of quantum computing foundations and their business applications
- Alignment and shared vision on:
- Quantum-related opportunities, threats, and risks
- Capabilities required to achieve quantum readiness
- Insights on some specific strategies
- Improved perspectives on strategic priorities and investments in the future
- Organizational buy-in for developing and implementing a quantum computing strategy

How Does the Quantum Wargaming® Work?

- Game participants are assigned to teams: competing companies (3-4 teams), customers (market team), and technology oversight (control team)
- Control team defines the state of quantum technology and the quantum capabilities of competitors. It also ensures the technical feasibility of played-out strategies
- Competitor Teams assess technologies and their applications and make strategic moves (innovation, operations, acquisitions, etc.)
- Market Team determines the operational and market success of strategic moves announced by competitors
- Game is played through several periods

Quantum Wargaming Approach

Prepare

PHASE I

QWG and Client jointly
- Select the market, competitors (3-4), and the future start date
- Set up the Control, Market, and Competitors teams

Control Team
- Defines state of QC technology for the first period
- Defines Quantum readiness for each competitor

Market Team
- Defines the state of the industry/market for the start date
- Sets initial shares for all competitors

Competing Teams
- Develop proforma P&L and Balance Sheet models (jointly with the market team) to track performance over the game periods
- Sets the state of quantum readiness for each team (jointly with the control team)

Play-Out

PHASE II

Repeat over 3-4 time periods

Competing Teams
- Update proforma P&L statements
- Announce strategic moves (innovation, operations, investments, acquisitions, etc.)

Control Team
- Reviews strategies on technical feasibility.
- Disallows moves that don't meet the feasibility test
- Defines state of QC technology for the next period

Market Team
- Determines level of success/failures for strategic moves. Awards market shares changes

Capure Results

PHASE III

All Teams
- Summarize all actions and outcomes
- Capture key learnings
- Defines priorities going forward (roadmap)

About the Founder

Alex Kandybin
Founder

Alex Kandybin is a founder of Quantum Wargaming and is based in the USA (New York, NY, and Kennebunkport, ME). He is a former Lead Partner and Vice President of Booz & Company (Booz, Allen & Hamilton) and an Executive at IBM. Alex has also worked as an Adjunct Professor (Innovation Strategy) at the Columbia Business School.

During his 25+ years in strategy consulting, industry, and academia, Alex has developed expertise in innovation, business strategy, and quantum computing capabilities.

Alex holds two US patents and authored many scientific and business articles. Some of his publications in Forbes, Strategy + Business, HBR, and MIT Sloan Management Review are listed below:

- Alexander Kandybin, “Innovation Requires Both Challengers And Defenders. Which Are You?,” Forbes, September 2016
- Alexander Kandybin, “Diagnosing Dislocation,” Strategy + Business, Autumn 2016. Learn to recognize different types of disruption threats and design the best strategic response.
- Alexander Kandybin and Vessela Genova, “Big Pharma’s Uncertain Future,” Strategy + Business, Spring 2012.
- Alexander Kandybin, “Which Innovation Efforts Will Pay?,” MIT Sloan Management Review, Fall 2009, Vol.51 No.1
- Les Moeller and Alexander Kandybin, “Down – Following Consumer,” Harvard Business Review, January – February 2009
- Alexander Kandybin and Surbhee Grover, “The Unique Advantage,” Strategy + Business, Autumn 2008. To succeed in a mature industry, the trick isn’t being first – it’s being hard to copy.
- Alexander Kandybin and Martin Kihn, “The Innovator’s Prescription: Raising Your Return on Innovation Investment,” Strategy + Business, Summer 2004.
- Alexander Kandybin, Martin Kihn, and Cesare Mainardi, “Reinventing Scale: How to Escape the Size Trap,” Strategy + Business, Second Quarter 2002, Issue 27.
- Tim Laseter, Alexander Kandybin, and Pat Houston, “Marketing and Operations: Can This Marriage Be Saved,” Strategy + Business, First Quarter 2002, Issue 26.
- Alex led many large-scale business transformations to improve competitiveness, raise innovation effectiveness and build advanced digital capabilities, including AI/ML and quantum computing.

Education

MBA with High Distinction from the University of Michigan Ross School of Business
Ph.D. in Applied Chemistry and M.S. in Chemical Engineering from Moscow Mendeleev University of Chemical Technology

Thank You

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