May 2024

G2Q Computing

Hybrid Quantum Computing

About us

G2Q is a deep tech company

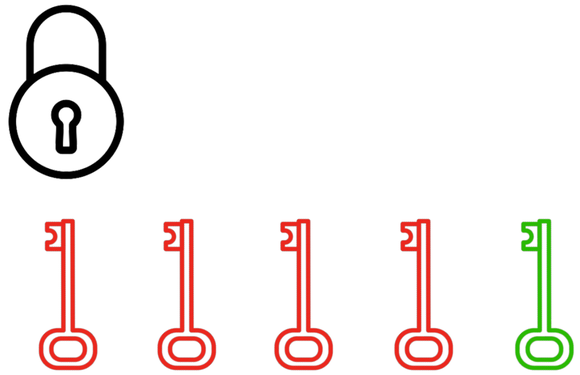
specializing in the development of quantum-enabled software solutions to help companies reduce costs, time and get better results.

We deliver:

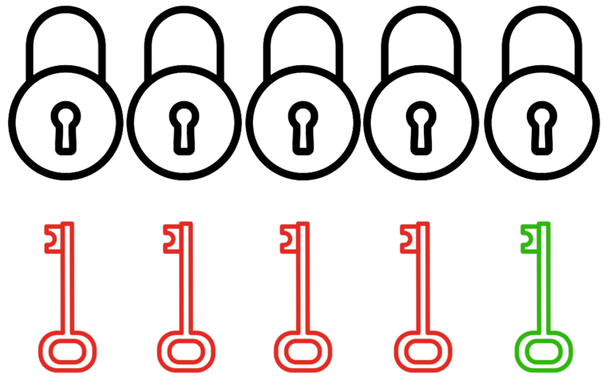
- A modular library of quantum and classical algorithms, ensuring **optimal performance and flexibility**
- A processing unit to optimally extract **maximum value** from integrated classical and quantum computation
- A platform to make **quantum accessible to all**

Why Quantum?

Increase Speed



Classic Computing
is time consuming and resources intensive



Quantum Computing
is time efficient and resources efficient

Improve Precision

Classic Computing
solution frequently missing the mark

Quantum Computing
solution always hitting target

Problem

Intractable Problems:

Some problems simply cannot be solved with classical computing techniques

Data Overload:

The explosion of data far exceeds the processing capabilities of traditional systems

Time & Power Constraints:

Existing methods are inefficient, requiring excessive time and energy

Skill Gap:

There is a high barrier to entry for developing quantum algorithms, with fewer than a thousand global experts

The Quantum Opportunity: Quantum Computing holds the key to overcoming these barriers, yet it remains underutilized due to a lack of accessible, practical applications

G2Q democratizes quantum computing, making powerful tools available and user-friendly for all!

Academic Collaborations

- **Italian Institute of High Performance Computing and Quantum Computing**: *Winners of the research grant with the Institute in order to develop new quantum algorithms and solve Industrial problems*
- **Centro Nazionale di Ricerca (CNR)** : *Researching improved methods in detecting complex climate events*
- **Indian Institute of Education and Research, IISER, Pune**: *Improve quantum algorithms with advanced Mathematical tools*
- **University of Naples (Federico II)** : *Helping to test Italy's first quantum computer*
- **University of Padova** : *Researching improved methods for QUBO formulations*
- **Engineering School of Le Mans University** : *Student exchange program*
- **Politecnico di Milano**: *Presenting workshops and seminars on quantum computing*

Founders

Ekaterina Polyakova
CEO

Background
Master’s in Quantitative Finance from Bocconi University

Expertise
Extensive banking sector experience
Passion for technology and mathematical modeling

Leonardo Chhabra
COO/CTO

Background
Mechanical Engineer and a Master's in Applied Mathematics from Warwick University

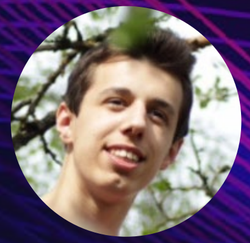
Expertise
Previous experience at the European Central Bank validating mathematical models for pricing exotic derivatives

Jamie Heredge
Advisor

Background
Oxford Graduate (BA/MMathPhys) and Melbourne (PhD)

Expertise
Former trader in Exotic Interest Rate Derivatives

Team



Clement Besoin
Quantum ML Algorithms

Master's degree in Quantum Engineering from Centrale Supélec

Maria Popovic
Quantum Opt Algorithms

Ph.D. member of the QuSys research group at Trinity College Dublin

Utkarsh Singh
Quantum ML Algorithms

Ph.D. in Physics (Quantum Machine Learning) from the University of Ottawa.

Ilyas Mraza
M/L & Robotics Specialist

Ph.D in Robotics from Universitat Politècnica de Catalunya

Mustafa Orhan
Aeronautical Engineer

Master’s degree in Aeronautical Engineering from Politecnico di Milano

Adrien Martinez
Quantum ML Algorithms

Master’s degree in Enhìgineering of nanophysics and materials from ISMANS Groupe CESI, Le Mans

Michele Cattelan
Quantum Opt Algorithms

Ph.D in Quantum Technologies
Master’s degree in Applied Mathematics from Università degli Studi di Padova

Davide Fontana
Math Analysis & Modelling

Master’s degree in Theoretical Physics from University of Glasgow

Mehdi El Bakraoui
Math Analysis & Modelling

Master’s degree in Theoretical Physics and Mathematics from Mohammed V University in Rabat

Running POCs

Finance

Leading Italian Bank

- Detection of Credit Card fraudulent transactions *with 20% higher efficiency than the classical solution*
- Optimal allocation of cost-effective assets in collateral accounts factoring in funding and opportunity costs

Aerospace

Italian start-up

Digital Twin for Spacecraft Propulsion system:

- Accurate calibration of complex system of equations of motion
- Simulate the engine behavior in space
- Optimize engine performance

Climate

Italian Research Centre (CNR)

- Improve the identificaiton of complex climate phenomena by mapping ocean data on quantum graphs and make predictions us AI

Aviation

Italian start-up

- Development of digital Twins for fixed wing aircrafts: Accurate calibration of complex system of equations of motion

Mining

Leading Australian Engineering Company

- Identifying project delays due to external factors such as environment and politics

Material Simulation

Global leader in Computational Intelligence

- Plasma simulation for optimal turbine design
- Simulation of molecular arrangements under different environmental and physical conditions

Business Model

Custom Quantum Research and Development

On-demand quantum expertise for your company's research needs

Full stack Quantum Cloud Platform

End-to-end quantum computing solutions for all industries

SaaS Solutions

Industry-specific plug & play software

Why G2Q Platform?

Goal: bridging the gap between quantum computing and mainstream adoption

Vision: Equip companies and researches with the tools to enter into quantum era, transforming potential into action. Our platform offers:

Streamlined Access to quantum hardware providers

Validated Tools access to pre-validated quantum algorithms and POCs tailored to specific industry needs

Maximise value from computing resources (GPU, CPU and QPU)

Collaborative Ecosystem Active collaboration between in-house expertise and scientific community

How we design the solution

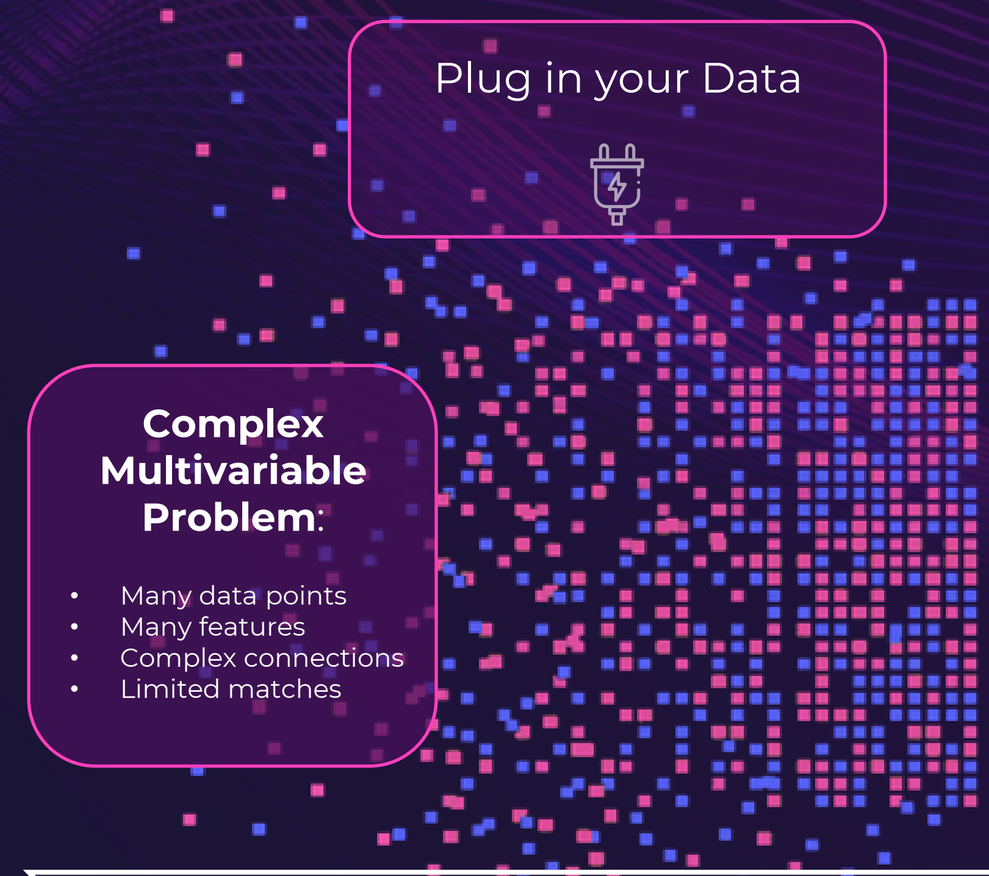
Plug in your Data

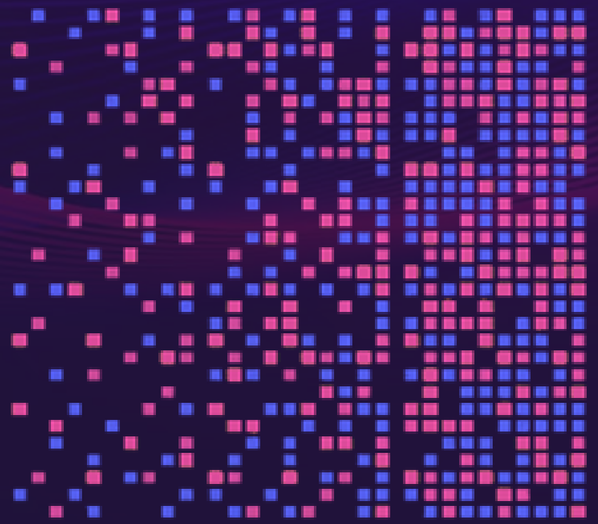
Machine Learning

Hybrid Quantum Engines

Complex Multivariable Problem:

- Many data points
- Many features
- Complex connections
- Limited matches





ALL MATCHES IDENTIFIED

CLASSICAL Computer

QUANTUM Computer

FASTER

MORE ACCURATE

Solution - Platform structure

Easy access to hybrid Quantum software validated on use cases that give quantum leap
Easy to extend to other specific industry problems

Quantum computers

INFN LNF
Università degli Studi di Napoli Federico II
D-Wave
AQT
atom computing
IONQ

Classical computers

NVIDIA

Cloud API

G2Q Hybrid Engines

- Q Nodes
- Q Graphs
- Q Kernels
- Q NN

ML

Q Optimization

- Shortest Path Problem
- Knapsack Problem
- Graph Cutting Problem

Q Calibration

- Parameter estimation
- Optimally quantised VQE

Q Simulation

- Optimal quantum walks
- Extreme scenario gen

Current Vertical Solutions

Finance

- C/C Fraud Detection
- Collateral Management

Aerospace

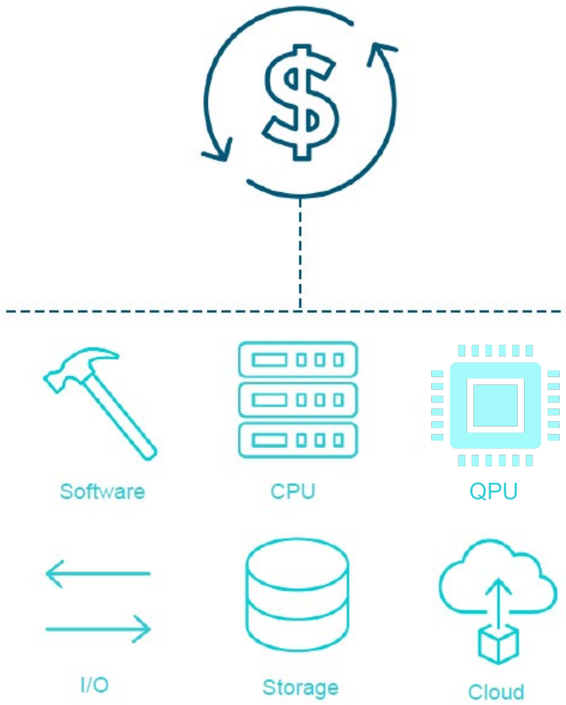
- Drone Flight Stability
- Digital Twin Space

Material Simulation

- Molecular Simulation

Quantum Integrated Processing Unit

Maximise value from computing resources



Manage all workloads with one quantum integrated processing Unit

Examples of other use Cases by Industry

Logistic

- Routes optimization
- Schedules optimization
- Inventory management
- Traffic management

Finance

- Bank branch optimization
- Credit scoring
- Transaction monitoring
- Anomalies detection

Communication

- Network optimization
- Bandwidth allocation

Insurance

- Reinsurance optimization
- Claims processing optimization
- Risk assessment

Energy

- Renewable energy optimization
- Grid optimization
- Demand forecasting
- Climate prediction

Gas

- Pipeline network optimization
- Leak detection
- Asset monitoring

Traction - 2024

Revenue streams

$150K Revenues

New POCs*

Jan 2024 — April 2024 — July 2024

** Cannot be discosed due to NDAs in place*

Grants

ICSC
Centro Nazionale di Ricerca in HPC, Big Data and Quantum Computing

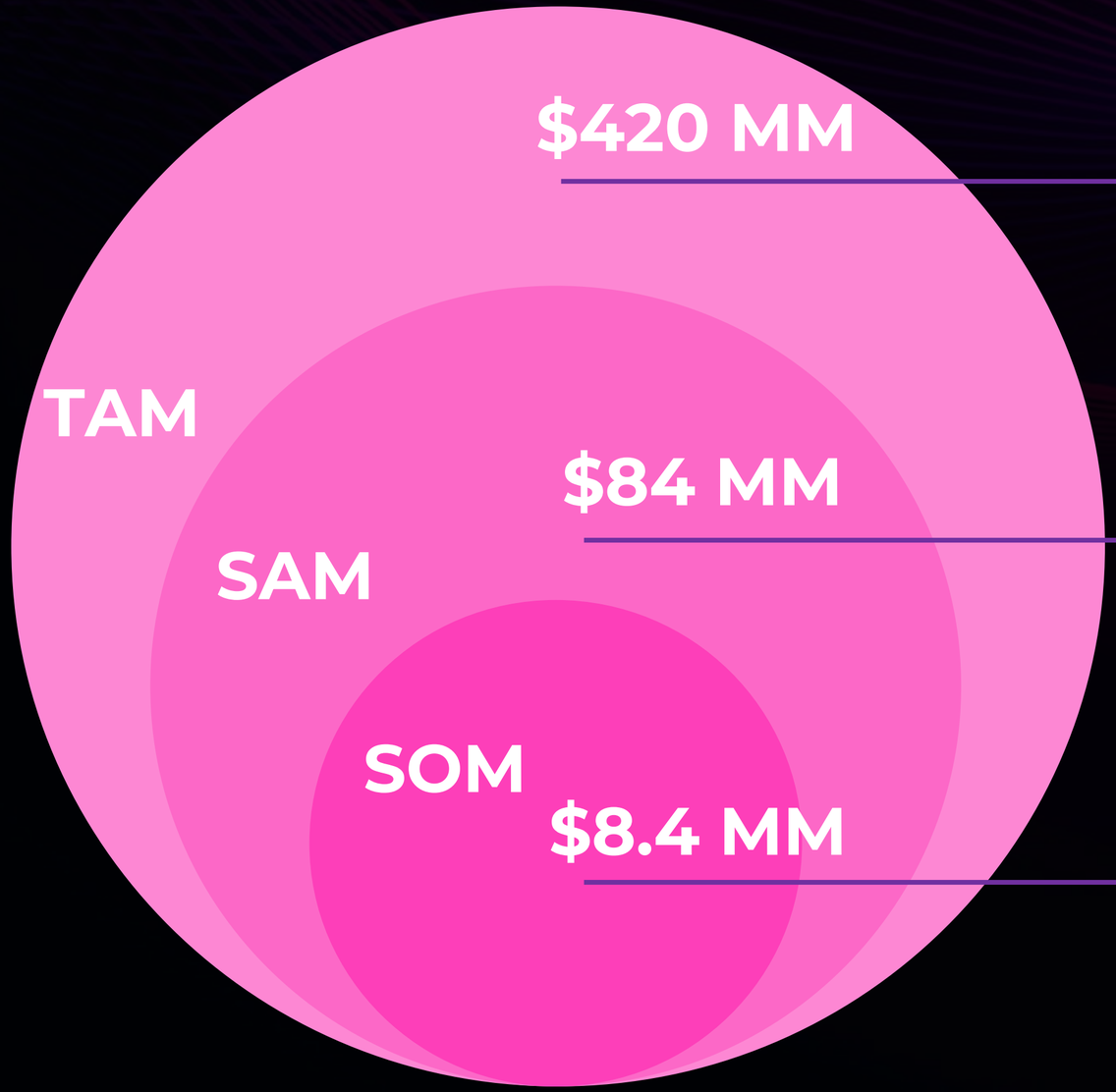
- **190K euro**

Investments

techstars_

- **18K euro**

Bottom-Up Market Analysis: Multi-Industry Global Focus



TAM:

- Finance: €225 million
- Aerospace: €75 million
- Material Science: €120 million

SAM: 20% TAM

- Finance: €45 million
- Aerospace: €15 million
- Material Science: €24 million

SOM: 10% SAM

- Finance: €4.5 million
- Aerospace: €1.5 million
- Material Science: €2.4 million

Assumptions:

Geography:

- Global Scope

Market Segments and Industries:

- Finance
- Aerospace
- Material Sciences

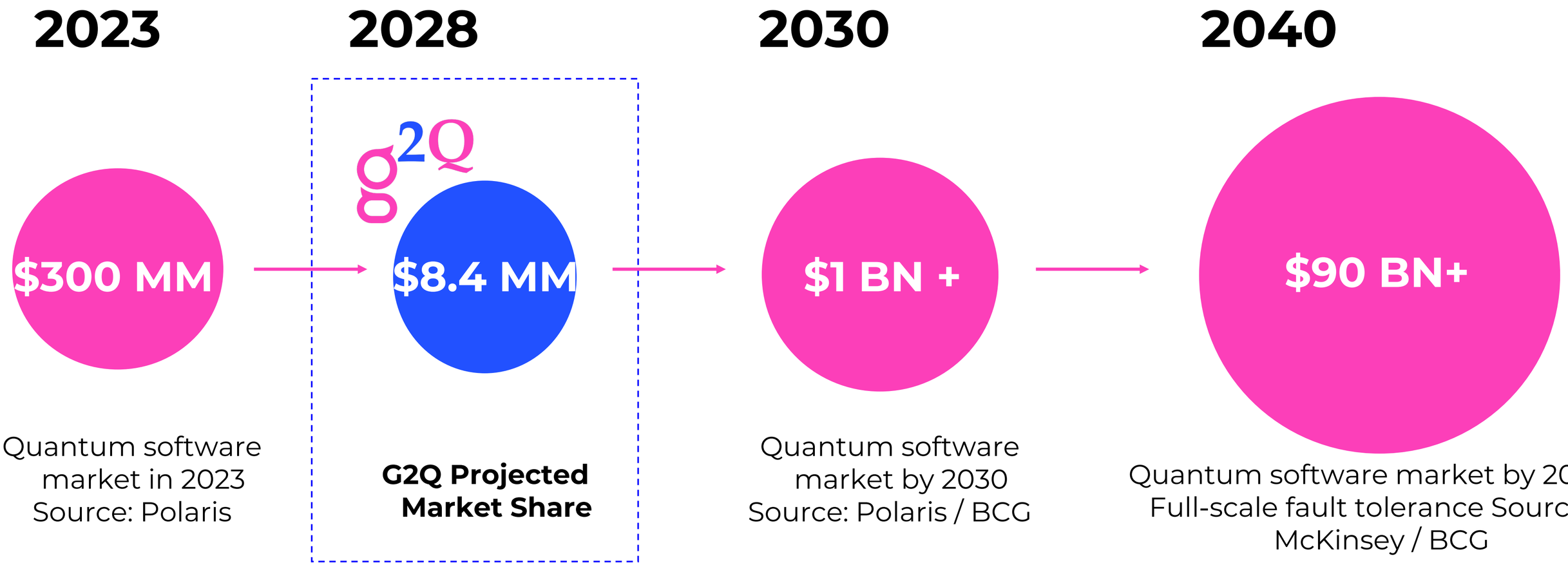
Number of potential customers globally:

- Finance: 1,500
- Aerospace: 500
- Material Sciences: 800

Average Revenue Per Customer (ARPC):

- €150,000 per year per customer

G2Q Projected Market Share



Competition

Features	g2Q	MULTIVERSE	Terra Quantum	SANDBOXAQ	IBM	algorithmiq
Multi-industry Approach	✓	✓	✓	✓	✓	
Proprietary Quantum Algorithms	✓	✓	✓	✓	✓	✓
Hardware Agnostic	✓	✓	✓			✓
Full-Stack Cloud Platform	✓	✓	✓	✓		
Plug & Play Solutions - Modular Algorithmic Library	✓			✓		
Strong knowledge of Financial Sector	✓	✓			✓	
Focus on tailored solutions that meet the specific needs of each industry	✓					
Italian Market knowldge	✓					

Funding Needs

Pass to the next growth stage: from “for hire” Quantum Research team to mainstreaming of quantum tech to community via Plug & Play and Vertical Software Solutions

$2 MM

G2Q Funding Needs

Platform Build-up

- **Objective:** Develop a robust quantum computing platform to serve as the foundation for all future applications and services
- **Funding Needs**: Investment in software development, hardware acquisition, and technical talent to create and deploy the platform

Expand Marketing Reach

- **Objective:** Increase brand visibility and market penetration across diverse sectors to attract new clients and partnerships
- **Funding Needs**: Budget for marketing campaigns, including digital marketing and trade shows. Hiring of marketing specialists and content creators

Convert Proof of Concept (POC) into Licensing

- **Objective:** Transition successful proofs of concept into licensable products and services for commercialization
- **Funding Needs**: Capital for product finalization, legal fees for patenting and licensing agreements, and business development

Projections

Short term

- Reach a solid base for applications and scaling

Medium term

- Large scale quantum development projects

Long term

- Major hub for a wide range of companies to connect to quantum

Why Now?

- **First-mover Advantage:** **Investing now** secures a **leading position** in the emerging Quantum Computing market, maximizing potential returns:
  - *$1.7 BN invested in 2023 by VC funds.*
  - *30+ governments committed over $40 BN to quantum technologies for the next decade*

- **Immediate Value:** Quantum hybrid systems offer **short-term value for businesses**, promising rapid returns on investment:
  - *Companies are facing data processing limitations, driving the need for quantum solutions*

- **Growing Market:** Quantum computing solutions are in **high demand** across industries, ensuring substantial market growth:
  - *Advancements in hardware and software are facilitating the transition of quantum computing* ***from theory to practical application***

- **Disruptive Potential:** Quantum computing offers the potential to **revolutionize problem-solving**, unlocking groundbreaking solutions across various fields.

“Doing is a quantum leap from imagining”

Barbara Sher