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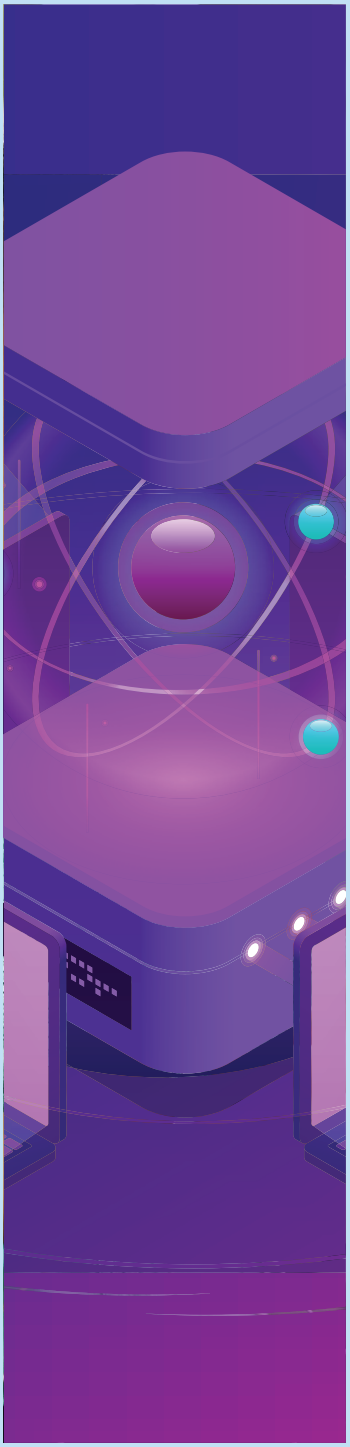

INFOSYS QUANTUM LIVING LABS ON AMAZON BRAKET

Abstract

Step into the future of computing with this comprehensive dive into quantum technology—a field poised to redefine what's possible. This article opens with an introduction to quantum computing and current market trends, setting the stage for its rapid evolution. We then explore our quantum living labs, collaborative spaces where groundbreaking quantum solutions take shape. A showcase of our vehicle routing optimization prototype reveals the practical power of quantum to solve complex logistics problems, followed by use cases that highlight its industry-wide potential. The article concludes by spotlighting our partnership with AWS Braket, harnessing their cloud-based quantum platform to bring these innovations to life, paving the way for real-world breakthroughs.

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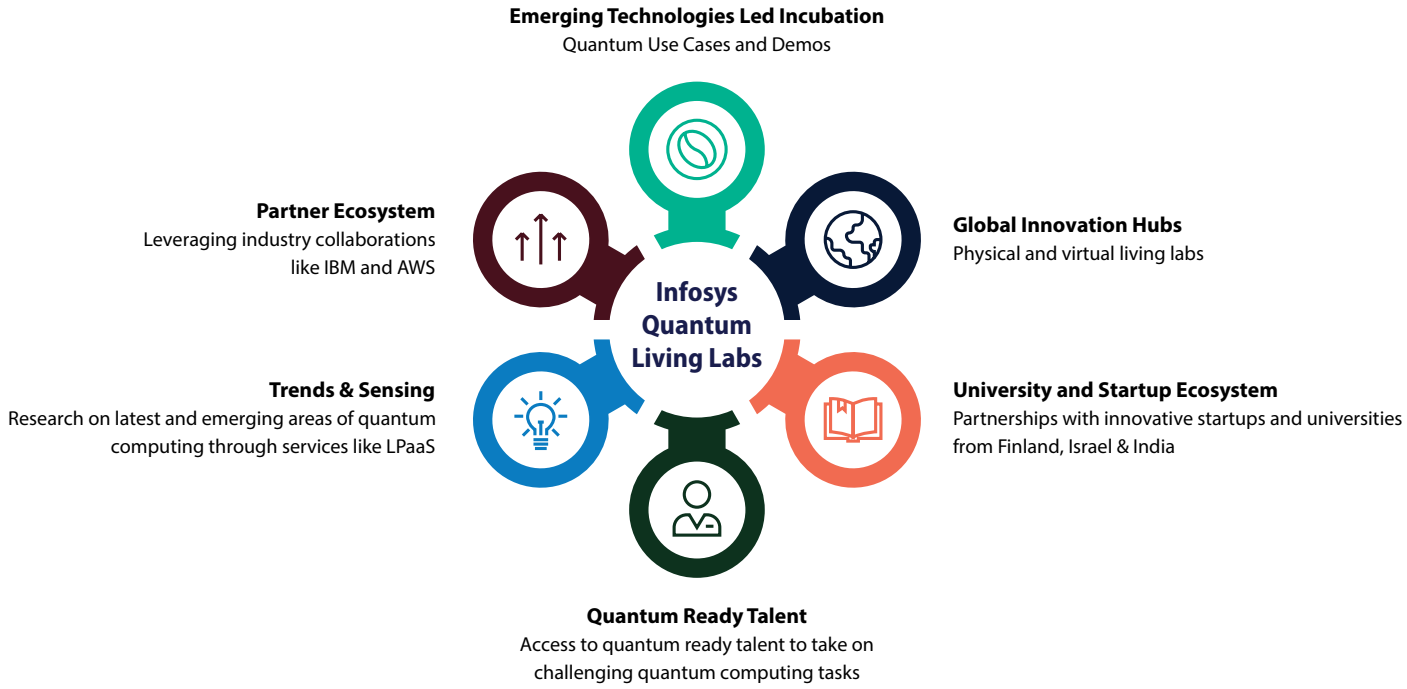
Introduction

Quantum computing is a disruptive method of solving problems, which can be used to resolve problems of extremely high complexity and handle intricate data processing tasks efficiently. With more and more Fortune 500 companies pouring investments into this promising technology, it is rapidly gaining traction and is likely to transform industries, businesses, and the world. According to a research report from Market & Market, the Quantum Computing market value is $1.3B in 2024, growing at 32.7% CAGR to become $5.3B by 2029. McKinsey's recent research report estimates that the quantum ecosystem, comprising Quantum Computing, Quantum Communications, and Quantum Sensing, will be valued at $173B in 2040. The time has come to invest in the infrastructure needed to take advantage of this new future potential.

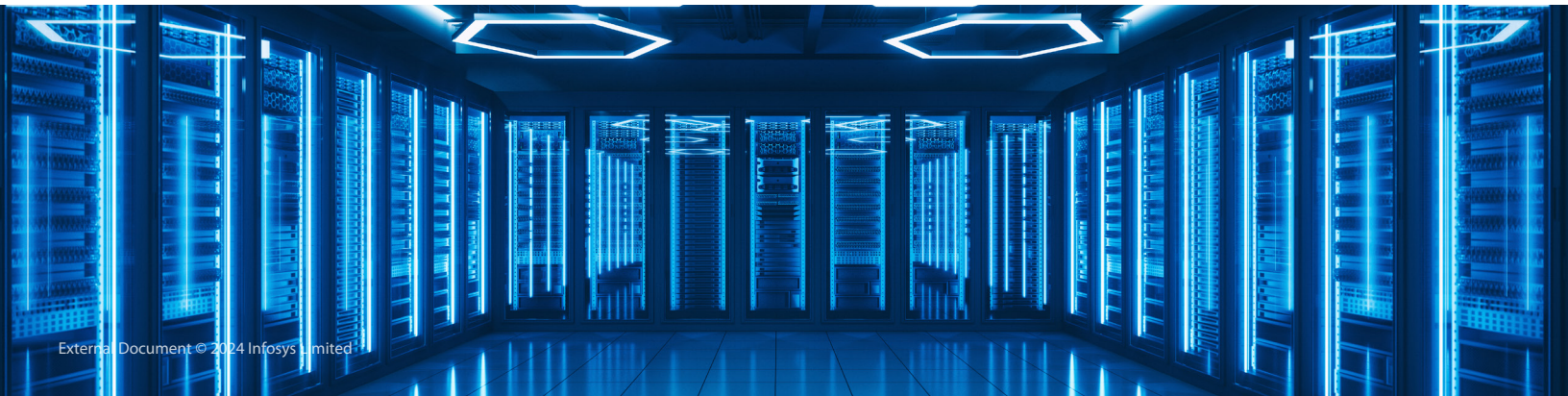
Overview of Infosys Quantum Living Labs

To capitalize on this opportunity, Infosys has established Quantum Living Labs (QLL) to provide its clients with a unique solution. This offering leans towards enabling the clients of Infosys to drive innovation processes in this escalating competitive landscape. Using powerful quantum computing technology, Infosys QLL explores the potential that follows the transformation of the client's company.

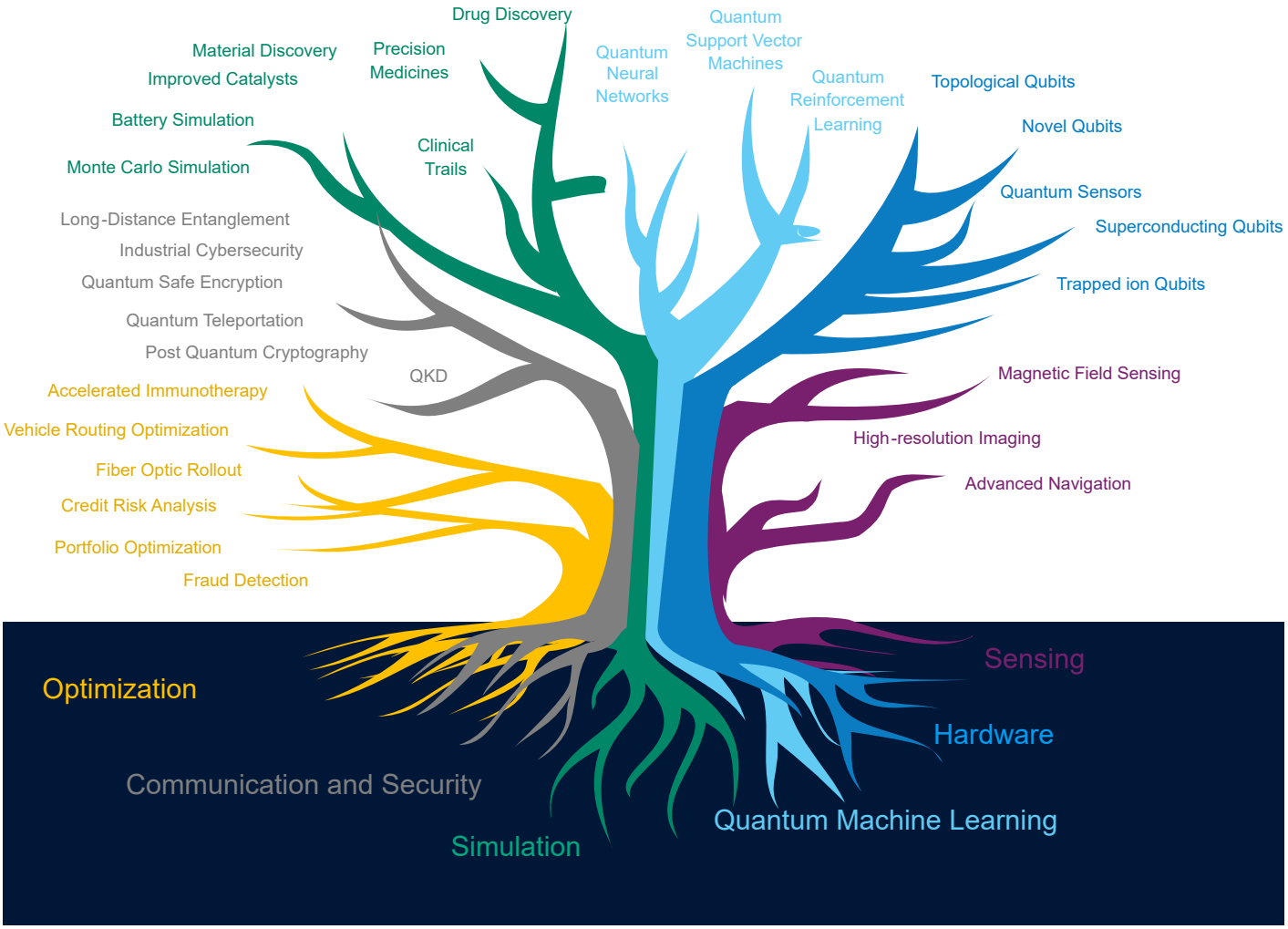
The Infosys Quantum Living Labs leverages the following six dimensions to create differentiating output for the client-specific challenge areas.



Infosys Quantum Living Labs



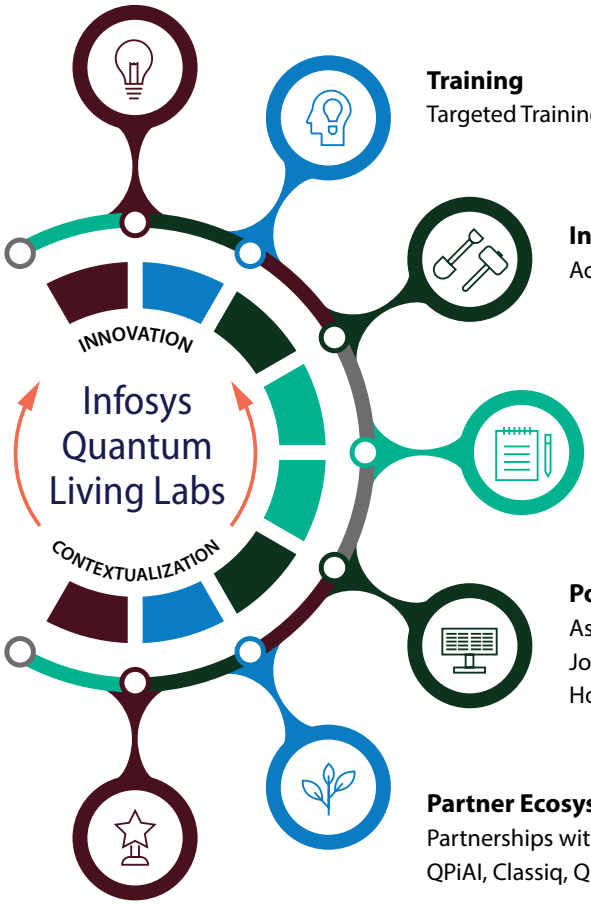
The quantum landscape is evolving rapidly, with several key trends emerging. Significant investments are pouring into research and development, driving advancements in quantum computing, sensing, and communication. While quantum computing is still nascent, there's a growing emphasis on practical applications and error correction. Quantum sensing demonstrates immense potential across industries, from healthcare to materials science. Moreover, integrating quantum technologies with other emerging fields like artificial intelligence and blockchain opens new frontiers of innovation.



Quantum Technology Trends Tree

Through the QLL offering, throughout the period of the engagement, we have industry leading SMEs (Subject Matter Experts) available to the client who assist in exploring the technology in the form of design thinking sessions, discussions, webinars, etc. We also help in researching for the required technology and the industry, to come up with the best solution or solutions for the client which would serve them best and help them stay ahead in the competition. Exploratory engagements of this nature take on average, 6-8 weeks, however, they can be tailored and customized depending on case specifics. Clients can also further extend engagements with Infosys to actualize the proof of concept for the proposed solution. Thereafter, the proposed solution can be deployed by the client with the aid of the partner ecosystem of Infosys.

Awareness
Sessions/Webinars on Quantum computing with industry partners (Amazon Braket/IBM)
of client choice Curated Lex courses for awareness



Training
Targeted Training and training content for client employees Experts' guidance and mentorship

Infrastructure
Access to Quantum infrastructure, SDKs, sandbox environment, hardware, etc.

Use Cases
Exploring use cases relevant to client areas of interest

PoCs / Showcases
Assisting/Building client PoCs and showcases
Joint IP development
Hosting Living Labs showcases in client environment

Partner Ecosystem
Partnerships with platform partners like Amazon Braket/IBM, Startups partners like QCWare, QPiAI, Classiq, QuintessenceLabs, etc. and other University partners from Finland, Israel, India, etc.

Branding
Thought Leadership Articles / Research papers / Point of Views
Press Releases

Infosys Quantum Living Labs Outcome

Solution Details

We have identified industry applications and opportunities and created prototypes that have performed significantly better than their classical counterparts. Through our POCs of quantum vehicle routing, arbitrage, and portfolio optimization, we have seen substantial improvement in the results.

Vehicle Routing Optimization

Last-mile delivery is the critical final step of getting a product from a warehouse to the customer's doorstep. It's crucial because it directly impacts customer satisfaction and brand reputation. In today's fast-paced e-commerce world, consumers expect fast and reliable deliveries. Efficient last-mile delivery ensures timely, accurate arrivals, reduces costs, and boosts logistical efficiency. As online shopping skyrockets, mastering last-mile delivery is essential for businesses to stay competitive and delight customers.

Infosys' quantum-powered prototype will revolutionize delivery route optimization by combining user inputs—such as factory and vending machine locations—with a Quantum Approximate Optimization Algorithm (QAOA); the system computes the most efficient routes. This results in optimized routes, cost savings, time reductions, and fuel efficiency. Reach out to us to get a detailed walkthrough of the prototype.

Use Cases

Infosys Quantum Living Labs has explored multiple domains, including BFSI, logistics, telecom, security, etc. Below are a few of the interesting use cases:

Infosys Use Cases

AWS Partnership

In a bid to expedite the progression of scientific studies and development of quantum software, Amazon Braket, a quantum computing service fully maintained by AWS, accelerates the research process. It has a cloud-based quantum computers, a pay-per-use pricing model that permits the use of a quantum circuit simulator and development of hybrid quantum and classical algorithms, also Jupyter Notebook for vast application. Since September 2021, Infosys has had Amazon Braket as their sole provider for this purpose to assist researchers and developers in analyzing advanced algorithms.

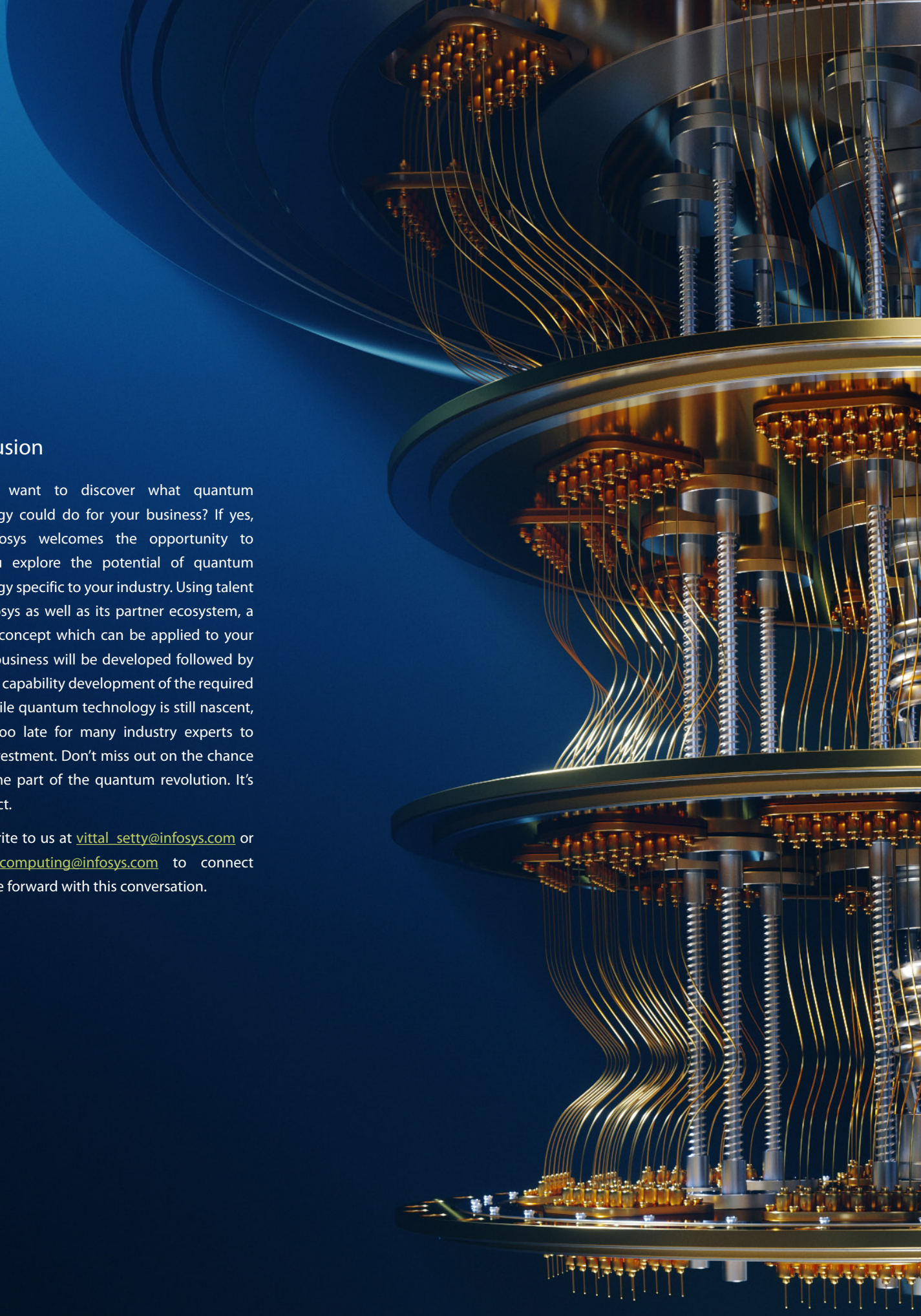
In addition, Infosys announced through a press release that they aim to use the service to offer quantum exploration services as they get the business ready for a quantum-revolutionized world. As part of the joint GTM activities, a fireside conversation between leaders was organized. The experts spoke about the increasing popularity of Quantum Computing and how enterprise's view quantum processes as the next enabling technology that will significantly change the landscape.

Infosys Quantum Living Labs has also been made available on AWS Marketplace, customers can reach out by clicking on this link.

Conclusion

Do you want to discover what quantum technology could do for your business? If yes, then Infosys welcomes the opportunity to help you explore the potential of quantum technology specific to your industry. Using talent from Infosys as well as its partner ecosystem, a proof of concept which can be applied to your specific business will be developed followed by quantum capability development of the required scale. While quantum technology is still nascent, it's not too late for many industry experts to begin investment. Don't miss out on the chance to become part of the quantum revolution. It's time to act.

Please write to us at vittal_setty@infosys.com or quantumcomputing@infosys.com to connect and move forward with this conversation.



Author Bio

Aseem Rajvanshi is a Senior Associate Consultant working in iCETS. His main objective revolves around researching various industries for trends and emerging technologies like Quantum Computing, AI, Blockchain, etc., as well as their impact on several industries. He is a technology enthusiast who enjoys exploring and learning about new and emerging technologies.

Vittal Setty is working as a Product Line Manager in iCETS. Vittal is the Head of Quantum COE and has created multiple working prototypes to demo quantum computing applications in different verticals. Vittal has created multiple IP solutions based on AI/ML while working on generative AI solutions. Vittal is a technocrat with 20 years of experience delivering large transformation projects.

Vijay Prasanna is a Principal Solutions Architect at AWS and works closely with Infosys to build solutions and platforms on AWS. His responsibilities include defining tech strategy and providing technical guidance and best practices to partners and customers. He joined AWS in 2020 and has enabled several enterprise customers with their cloud strategy, adoption and roadmap across FSI, Retail, and CPG industries.

For more information, contact askus@infosys.com

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