Technology Spotlight

Quantum Computing: The Investors' View

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HYPERION RESEARCH OPINION

An unusual event for a technical conference was held at the September Quantum Tech Congress in Boston: a panel discussion among various venture capitalist on their view of the industry, the investment outlook for the future, why they are interested in quantum computing, and advice for start-ups.

The panel's five members came from different backgrounds and firms with differing motivations for investing in quantum computing:

- Morgan Polotan – Principal, Comcast Ventures & Genacast Ventures
- Mark Cupta - Partner, Prelude Ventures
- Mark Danchak - Co-Founder, Quantum1 Group
- Dr. Jacob Grose - Investment Manager, BASF Venture Capital
- Geraldine Paulus - Associate, The Engine

Although these VCs were bullish on quantum computing, none believed a breakthrough was imminent. The consensus of this group was that quantum computing is now in or will soon be in a market winter. Not surprisingly, all are taking the long view on their investments.

SITUATION OVERVIEW

Quantum computing is currently experiencing an intense interest within the investor and technical communities, but primarily on the part of VCs interested in early-stage startups. Each of the firms involved in the panel are early investors, placing investments on the order of $10M to $20M into the coffers of QC startups.

But for QC startups to gain the next round of funding, the panel indicated that they will need to show progress, and that the needed investments to show promise will be large. Panelist Morgan Polotan, Comcast Ventures & Genacast Ventures, related a quote from an unnamed Google source, "it only takes a billion dollars and 10 years to build a quantum computer."

- At this early stage, the big money is still on the sidelines. Per panelist Mark Danchak of Quantum1 Group, the entire quantum industry has taken in less money that two scooter companies.

Panelists noted that even government has taken a wait-and-see approach. The US government only recently began to fund quantum research in early 2019 via the National Quantum Initiative Act, which calls for $1.25B over the next five years to support quantum technology research. The act also calls for the entablement of National Quantum Information Science Research Centers.

VCs' Motivation for Investing

The consensus of the panel is that fear is driving interest in quantum computing – the fear of being left behind if and when quantum supremacy is achieved. From an investor's perspective, it is this fear that drives better returns, rather than just greed. Fear drives acquisitions at higher multiples than seem to make sense for early stage companies. Autonomous vehicles were cited as a good example.

The fear of being left behind is driven by the promise of quantum computing to be highly disruptive, particularly in the area of cryptography (or rather the ability to break current encryption methods). But because the promised quantum breakthrough always appears to be ten years in the future, investors must take the long view.

What They Look for in a QC Start-Up

Members of the panel all said they look for a good team when investing – a team with both technical and business acumen that can start and run a business. Because QC talent is in short supply, startups need to hire and fire smartly, conserving both capital and talent.

A startup's business plan needs to be defensible, and clearly illustrate that they have a competitive edge over other potential players in their market space. And this plan needs to account for how the company can survive the coming market winter.

FUTURE OUTLOOK

All of the panelists see quantum computing as being potentially disruptive, enabling a new wave of innovation. However, none see a quantum breakthrough happening any time soon. They all take the long view. And all agree that a market winter is coming.

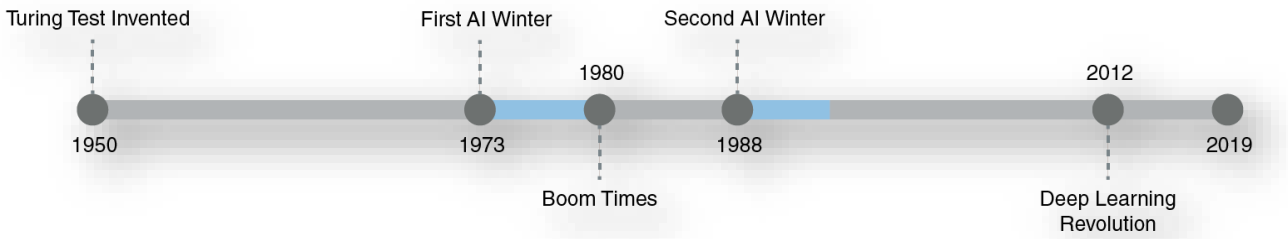
The Coming Quantum Computing Winter

A market winter refers to the phenomenon where leading-edge technology goes through a period of rapid growth and investor interest, but then interest and investment wanes as the technology hits technological or market roadblocks. For some technologies, this winter period can be followed by renewed interest and market success.

Morgan Polotan of Comcast Ventures & Genacast Ventures gave an example of a market winter – artificial intelligence or AI. In the case of AI, Polotan noted that AI went through two market winters: after the initial promise of AI, interest and investment cooled off in the early 70s, followed a boom in the earlier 1980s. This boom period was followed by a second winter in the late 1980s that didn't recover until the on-going deep-learning revolution. (See Figure 1, next page)

FIGURE 1

AI EXPERIENCES TWO MARKET WINTERS BEFORE SEEING SUCCESS



Source: Comcast Ventures & Genacast Ventures Hyperion Research, 2020

The consensus of the panel was that quantum computing is now entering or will soon enter a market winter. Because a true breakthrough in quantum computing still appears to be ten years in the future, large investors are not ready to make a play, waiting for the promise of the technology to become apparent.

Panelists' advice to quantum computing start-ups is to prepare for the coming winter, conserve cash, and possibly look at other related activities that can produce revenue and conserve the technical team.

- The example of f Zapata was given (in which all of the panel is invested), that is able to generate revenue by helping customers develop quantum algorithms in preparation for the arrival of quantum supremacy.

Panelist Geraldine Paulus of The Engine pointed out that classical computing experienced a virtuous cycle of reinvestment, whereas companies developed and sold new technologies, they reinvested profits to sustained research and development to fuel future products. Quantum computing has yet to achieve this cycle, so investors need a long view.

INVESTOR OVERVIEW

About Comcast Ventures & Genacast Ventures

Genacast Ventures was formed in partnership with Comcast Ventures. Comcast Ventures states that it invests in innovative businesses that represent the next generation of entertainment, communications and digital technology by partnering with entrepreneurs who have the vision, passion and tenacity to succeed. Most investments are in the advertising, consumer, enterprise and infrastructure sectors. Comcast Ventures indicates that it provides its portfolio companies with countless resources, relationships and know-how to help them perform at the highest possible levels.

About Prelude Ventures

Prelude Ventures is a venture capital firm partnering with entrepreneurs to address climate change. The firm states that since 2013, it has invested in over 40 companies across advanced energy, food and agriculture, transportation and logistics, advanced materials and manufacturing, and advanced computing. Prelude Ventures states that they have a long-term commitment to the sector, accept informed risks, and couple a fundamental emphasis on venture-level returns with an understanding of deep-tech and hardware development timelines. Prelude Ventures manages capital exclusively for Simons family philanthropic entities and is a founding member of the Breakthrough Energy Coalition.

About Quantum1 Group

Quantum1 Group states that it is a venture capital investor focusing on Quantum Computing, Deep Tech, Enterprise SaaS, Big Data, and other emerging technology opportunities.

About BASF Venture Capital

BASF VC considers itself a corporate venture capital company that invests worldwide both in promising young enterprises relevant to BASF's current and future business fields. Besides innovations in the fields of chemistry, new materials and sustainability, their areas of focus include digitalization and new business models. They state that they support their portfolio companies through selective interactions with the global research, partnership and customer networks of the BASF Group.

About The Engine

Launched by MIT, The Engine states that the firm seeks to bridge the gap between discovery and commercialization by empowering disruptive technologies with the long-term capital, knowledge, network connections, and the specialized equipment and labs they need to thrive. The Engine indicates that tech companies have historically been underserved and underfunded, leaving many breakthrough inventions stuck inside the lab, and that is why they focus exclusively on pioneering technology with the genuine ability to transform the planet.

About Hyperion Research, LLC

Hyperion Research provides data-driven research, analysis and recommendations for technologies, applications, and markets in high performance computing and emerging technology areas to help organizations worldwide make effective decisions and seize growth opportunities. Research includes market sizing and forecasting, share tracking, segmentation, technology and related trend analysis, and both user & vendor analysis for multi-user technical server technology used for HPC and HPDA (high performance data analysis). We provide thought leadership and practical guidance for users, vendors and other members of the HPC community by focusing on key market and technology trends across government, industry, commerce, and academia.

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