



The European Institute for the PCB Community

EIPC SPEeDNEWS

The Weekly On-Line Newsletter from the European Institute of Printed Circuits.
Issue 18 – June 2020

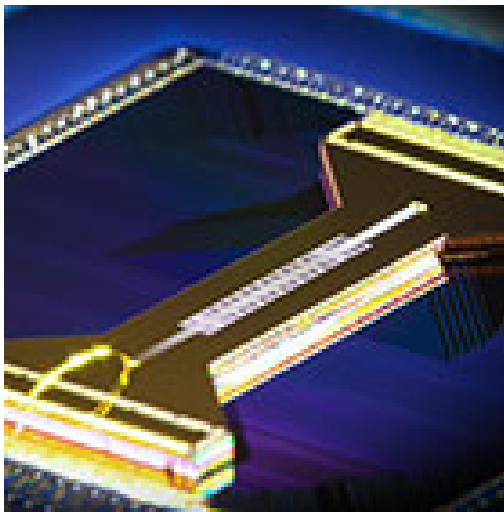
ELECTRONIC INDUSTRY NEWS

Honeywell Claims It Has Most Powerful Quantum Computer

6-qubit ion trap system hits a critical benchmark

By Samuel K. Moore

IEEE



Honeywell's Ion Trap Quantum Computer Makes Big Leap

"We expect within next three months we will be releasing world's most powerful quantum computer," Tony Uttley, president of Honeywell Quantum Solutions, told IEEE Spectrum in March. Right on cue, last week the company claimed it had reached that mark. The benchmark measurement, called quantum volume, is essentially a combined measure of the number of physical qubits, how connected they are, and how error prone they are. For Honeywell's system, which has 6-qubits, that number is now 64, beating a 53-qubit IBM system that had a quantum volume of 32.

The quantum volume measure isn't a universally accepted benchmark and has an unclear relationship to the "quantum supremacy" goal Google claimed in 2019, which compares a quantum computer to the theoretical peak performance of classical computers. But Uttley says it's the best measure so far. "It takes into account more than just how many physical qubits you have," he says. Just going by the number of qubits doesn't work because, "you don't necessarily get all or even any of the benefits of physical qubits" in real computations.

Honeywell's computer uses ytterbium ions trapped by an electromagnetic field within a narrow groove built in a chip. The qubit is represented by the spin state of the ion's outermost electron and that of its nucleus. The qubits are manipulated using lasers and can be moved around the trap to carry out algorithms. Much of the quantum volume advantage of this system comes from the length of time the qubits can hold their state before noise corrupts them and crashes the computation. In the ion trap, they last for seconds, as opposed to the microseconds of many other systems. Uttley says this long "coherence time" allows for mid-circuit measurements—a quantum version of if/then programming statements—in quantum algorithms.

Because of COVID-19, most of the United States went into lockdown within weeks of Honeywell's March prediction. So hitting the mark took a different path than expected. "We had to redesign physical layout of labs to keep social distance," including adding plexiglass dividers, explains Uttley. And only 30 percent of the project team worked on site. "We pulled in a tremendous amount of automation," he says.

The quantum computer itself is designed to be accessed remotely, Uttley explains. The company plans to offer it as a cloud service. And partners, such as the bank JP Morgan Chase, are already running algorithms on it. The latter firm is interested in quantum algorithms for fraud detection, optimization for trading strategies, and security. More broadly customers want to explore problems of optimization, machine learning, and chemistry and materials science.

Uttley predicts 10-fold boosts in quantum volume per year going forward. His confidence comes from the nature of the ion trap system his team has developed. "It's like we built a stadium, but right now we're only occupying a handful of seats."

Hon Hai maps out five-year plan to drive growth

HIGHER MARGIN: *The company would focus on electric vehicles, digital healthcare and robotics to boost its profit margin, the Hon Hai chairman said*

Hon Hai Precision Industry Co (鴻海), Apple Inc's largest iPhone assembler, has mapped out a five-year plan to drive growth for the company, chairman Young Liu (劉揚偉) told shareholders at an annual general meeting in New Taipei City yesterday.

Highlighting a three-step plan revolving around digital transformation, Liu said the company is focused on developing three core technologies: artificial intelligence, semiconductors and new-generation communication.

"To improve our profit margin, we have set our sights on three new industries: electric vehicles, digital healthcare and robotics," Liu said.



Members of the media attend Hon Hai Precision Industry Co's annual general meeting at the company's headquarters in New Taipei City yesterday.

Photo: Reuters / Ann Wang

Upon succeeding Hon Hai founder Terry Gou (郭台銘) as chairman last year, Liu has vowed to increase the company's gross margin from about 6 percent to 10 percent within five years.

“With a compound annual growth rate of more than 20 percent ... output value from these industries are estimated to reach US\$1.4 trillion by 2025,” Liu said, expressing the hope to claim up to 10 percent of market share.

Pointing to saturation in the information and communications technology industry, Liu said that the company would see little growth if it focuses only on its main assembling business.



Hon Hai Precision Industry Co chairman Young Liu attends the company’s annual general meeting in New Taipei City yesterday.

Photo: Bloomberg / Ashley Pon

Heavily reliant on Apple’s orders of iPhones, which are mostly still assembled at its China plants, Hon Hai has witnessed an 89.49 percent drop in net profit for last quarter due to the COVID-19 pandemic.

The company has trimmed its outlook for this year following a dampened smartphone market. Liu said Hon Hai is cutting down on management and operational costs to recover from losses. Hon Hai’s shareholders approved a plan to distribute a cash dividend of NT\$4.2 per common share.

Liu said that the company would hold a technology forum in about October to showcase new developments by the company’s research institute, which comprises five centres specialising in artificial intelligence, semiconductors, next-generation communications, cybersecurity and quantum computing.

Coronavirus turmoil fuels the rise of AI-powered companies

Rajesh Kumar Singh

CHICAGO (Reuters) - For the past seven years, a Munich-based firm called riskmethods has tried to interest companies in buying software that allows them to track all their suppliers in a way that minimizes risks in operating globally spread supply chains.

Until recently, that has been a tough sell. But in the wake of mass disruption caused by the coronavirus pandemic, riskmethods' subscribers have increased by 20%, and requests for trials of its risk-intelligence services in the current quarter have surged by more than 200% from a year ago.

With pandemic-induced lockdowns cutting off supplies of critical raw materials and components, and social distancing guidelines increasing the cost of manual labor, business is booming at companies like riskmethods that offer digital tools to help map out supply-chain risks, run factories and even forecast demand.

In modern multi-tier supply chains, production processes are often spread across dozens of firms operating in multiple countries in a bid to maximize economic efficiency. A study in 2014 found that Japan's Toyota Motor Corp (7203.T) employed 2,192 suppliers in its production process.

As many companies discovered during the initial wave of lockdowns, any break in this complex and elongated supply chain can cause production interruptions. Still smarting under the shock, they are now scrambling for tools to protect operations from future disruptions. In the aftermath of the outbreak, riskmethods launched an application that was focused on providing intelligence about the contagion's impact on supply chains.

The response from companies and even suppliers to the application was "overwhelming," said Bill DeMartino, chief customer officer at riskmethods, adding that the pandemic has rendered investments in supply-chain risk management a "mainstream requirement."

Similarly, Instrumental Inc - a digital startup in California - is fielding a threefold jump in inquiries from electronics manufacturers for its artificial-intelligence platform that enables companies to maintain control of production processes at distant and offshore locations without sending engineers on site.

"They are not looking for a solution nine months from now," said Anna-Katrina Shedletsky, chief executive and founder of Instrumental, referring to manufacturers contacting her company. "They want something next week."

A survey by PricewaterhouseCoopers of chief financial officers at U.S.-based companies last month showed more companies are planning to use automation in the supply chain in response to COVID-19.

Orders at Minneapolis-based Hartfiel Automation, which distributes robots and automation hardware, are up 20% within the past two weeks, and inquiries are up 40%, said CEO Myron Moser. The orders and inquiries are mostly from businesses that were shut down at the height of the pandemic, he said.

Longer-term, setting up autonomous guided vehicles, robotics welding or material handling systems could contribute to further job losses even as the U.S. unemployment rate languishes in double-digits.

Automation could put more pressure on millions who lost jobs to the pandemic. At the same time, riskmethods has bolstered its overall team by nearly 33% globally this year. It plans to increase headcount by another 12% before the fall. Instrumental, which had 30 employees as of February, wants to expand its workforce by 25%.

Before the pandemic, many companies tended to have limited visibility of all but their top suppliers, and the process of tracking them was mostly manual.

Now, some companies are deploying vibration sensors in the factories of their critical suppliers to track if they are running or not, said Justin Rose, managing director at Boston Consulting Group.

At Vermeer Corp, an Iowa-based equipment manufacturer, the virus' spread from China to Europe and then the United States and Mexico left the company's managers uncertain whether factories could operate from one day to the next.

Chief Executive Jason Andringa said his team has been working the phones for the past four months to track down potential broken links in the supply chain.

"It has been a daily and hourly thing that we have been worried about," he said.

The cloud technology units of companies such as International Business Machines Corp (IBM.N), Microsoft Corp (MSFT.O) and SAP SE (SAPG.DE) are seizing the moment, as are a new breed of service companies like riskmethods.

The applications sold by riskmethods provide early warning signals of potential supplier disruptions like mass factory shutdowns, force majeure and bankruptcy to clients such as AGCO Corp (AGCO.N), Cummins Inc (CMI.N) and Douglas Dynamics Inc (PLOW.N). They also help clients monitor the operations of their customers.

DIGITALIZATION DRIVE

Ecolab Inc (ECL.N), a St. Paul, Minnesota-based cleaning and pest-control services company, has been heavily investing in digital applications for the past six years. The investment has allowed it to monitor over 30,000 customer sites.

Chief Executive Doug Baker said this ability enabled it to remain effective while operating remotely and serve customers even at the height of the health crisis.

In response to the virus-induced business turmoil, Ecolab has slashed capital spending for the year by half. But the budget for digitalization remains intact.

The company is speeding up plans to automate facilities where human workers run the risk of infection and now aiming to implement the plan in next 12 months instead of two years.

Reporting by Rajesh Kumar Singh in Chicago; Editing by Joseph White and Matthew Lewis