VR World

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Taiwan-China Showdown:

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VR World
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LEADER

Taiwan's Problem, Taiwan's Solution.

Welcome to the inaugural magazine edition of *VR World*.

One of our feature stories in this issue focuses on the question if Taiwan has the ability to remain competitive against China's state-backed semiconductor and electronics sector.

Taiwan's semiconductor and electronics sector is competitive. There's a reason why Apple's latest iPhone is almost entirely sourced from Taiwanese components, and following the same logic there's a reason why Samsung's chip fabrication business and display business are struggling.

But across the Taiwan strait, capitalism has a different set of ingredients. In China, the vast majority of large companies are state-owned, and while there is certainly private enterprise in the Middle Kingdom it usually has the full support of the government when dealing with foreign competition. Those with an eye on China have seen this numerous times in the last year: Apple (NASDAQ: APPL), IBM (NYSE: IBM) and Qualcomm (NASDAQ: QCOM) are all examples of firms that have had the market in China turn on them thanks to the will of China's government.

While Taiwan's HTC (TPE: 2498) has long lost the war in China against both local and foreign rivals, it's an entirely different situation for Taiwan's semiconductor design and manufacturing industry. China's firms are competitive, especially as Intel (NASDAQ: INTC) has become closer to Chinese SoC manufacturers through acquisition and licensing. However, they haven't quite eclipsed their Taiwanese rivals yet. The difference is state capitalism. It puts China's firms at an unfair advantage allowing them to accelerate growth at an unfair pace. This is the nature of business in China.

Bi-lateral trade between China and Taiwan is estimated at just over $200 billion

Can Taiwan succeed in this challenge?

What will it take to remain competitive?

Find out more in this issue of ***VR World***.

Story

How Long Will Xiaomi's Growth Last?

China's wunderkind smartphone maker is now the third biggest smartphone manufacturer, but will its Chinese roots hinder its growth?

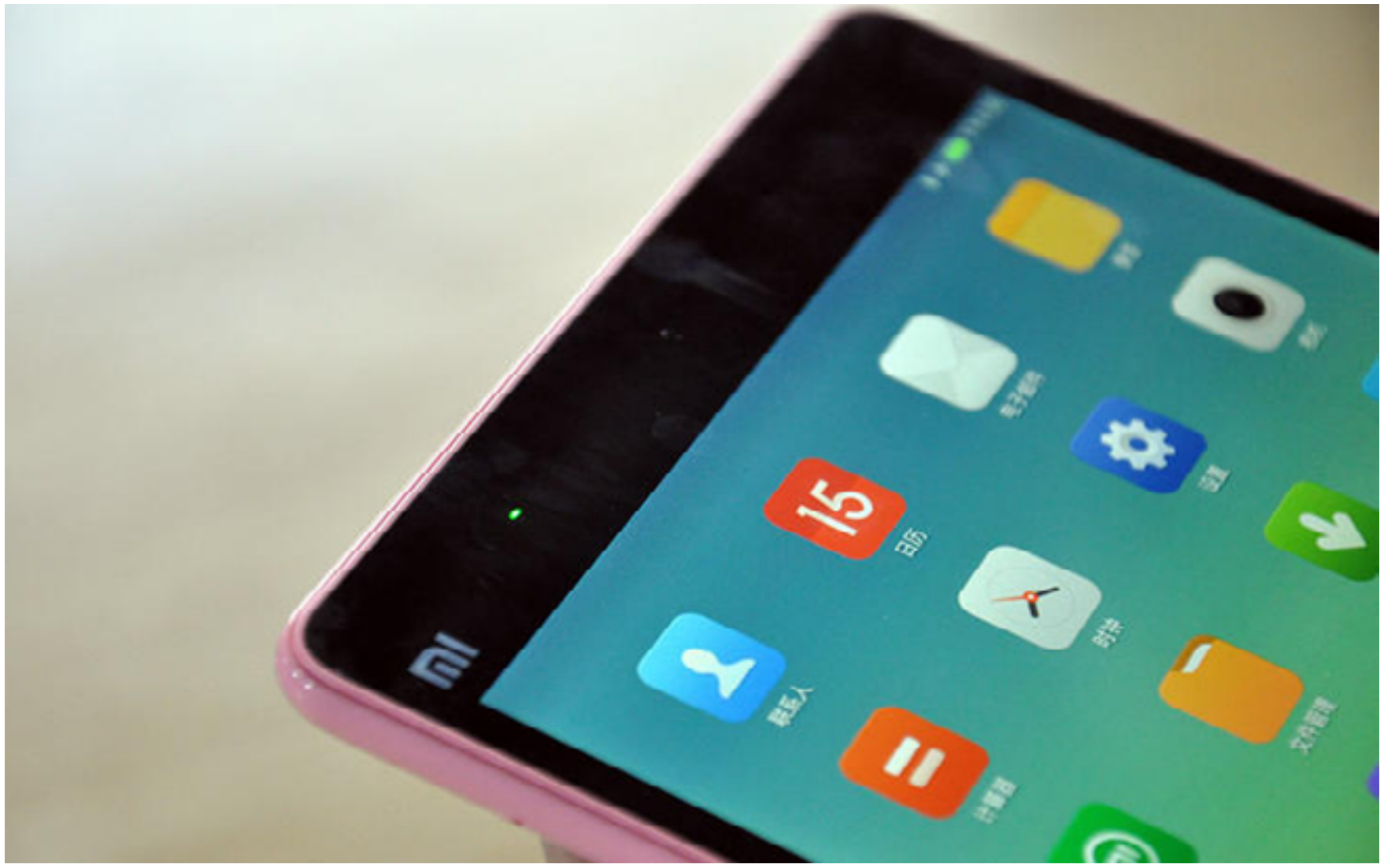
Sam Reynolds

Everyone knows that Xiaomi's growth has been remarkable, and now two separate reports from IDC and Strategy Analytics quantify it: the company is now the world's third biggest smartphone manufacturer thanks to growth in Asia's emerging markets.

According to data provided by IDC, Xiaomi accounted for 6% of the approximately 320 million smartphones shipped during the last quarter. In comparison, Apple claimed 12% of all handsets shipped while the market leader Samsung had a 23.8% grasp on the market. The biggest loser of the lot was Samsung, which saw its market share erode by 8.2% compared to the same quarter last year.

Top 5 Smartphone Vendors, Shipment, Market Share and Year-Over-Year Growth, Q3 2014 Prelimainly Data (Units in Millions)

vendor	2014 Q3 Shipment Volumes	2014 Q3 Market Share	2013 Q3 Shipment Volumes	2013 Q3 Market Share	3Q14 / 3Q13 Change
Samsung	78.1	23.8%	85.0	32.5%	-8.2%
Apple	39.3	12.0%	33.8	12.9%	16.1%
Xiaomi	17.3	5.3%	5.6	2.1%	211.3%
Lenovo	16.9	5.2%	12.3	4.7%	38.0%
LG	16.8	5.1%	12.0	4.6%	39.8%
Others	159.2	48.6%	113.0	43.2%	40.8%
Total	**327.6**	**100%**	**261.7**	**100.0%**	**25.2%**



IDC chalks up the success of Xiaomi to its successful launch of its flagship Mi4 smartphone, and expansion into India and Southeast Asia.

“Key to its success was the launch of its Mi4 smartphone in August, which was positioned as a high-end alternative to the status quo. What remains to be seen is how quickly the company can move beyond its home territories to drive volumes higher,” IDC said in a press release. “Despite rumours of a slowing market, smartphone shipments continue to see record-setting volumes.”

“Samsung continues to face tough competition from Apple at the higher-end of the smartphone market, from Xiaomi and Huawei in the middle-tiers, and from Lenovo and others at the entry-level,” Strategy Analytics said in its report.

Any way but Huawei

In many ways Xiaomi is beginning to run into some of the same problems that Huawei (SHE:002502) has experienced over the past three years: Sinophobia. Xiaomi has done its part to address these concerns, by promising to move data out of China and providing a feisty response to claims that the company engages in wholesale design theft from its competitors.

But as Xiaomi grows, these attacks are expected to intensify. Huawei — though not directly comparable — suffered through an onslaught of allegations that it was an extension of China’s official signals intelligence apparatus, but largely that has come from clever lobbying by Cisco (NASDAQ: CSCO). When put to the test by security researchers, Huawei’s gear was not a listening outpost for China’s spies — it was just buggy and poorly made. There’s no evidence that Apple or Samsung are engaging in the same sort of attacks against Huawei, but it wouldn’t be entirely implausible.

Perhaps, however, Xiaomi will avoid the pains of expansion that Huawei experienced. Hugo Barra, its global VP and face of the company, recently told The Wall Street Journal that his company has no plans to expand into the United States.

Story

As Facebook's Q3 2014 Winds Down, What Does Next Year Hold?

Facebook's Q3 2014 results exceed analyst expectations, but with 2015 being a year for investment, stock price dropped in anticipation of these big expenditures.

J. Angelo Racoma

Facebook (NASDAQ:FB) has published its third quarter 2014 results, beating analyst expectations for revenue, earnings per share and growth. However, with executives advising during guidance that 2015 will be a year for investment, stock price dropped 10% in after-hours trading in anticipation of said period of big expenditure.

In Q3 2014, Facebook's revenue of $3.2 billion, well past analysts' expectation of $3.12 billion. This comes mostly from advertising revenue of $2.96 billion and payments and other fees of $246 million. Ad revenue grew by 64% compared with the same quarter last year, while payments grew 13% compared to the same period. EPS is $0.43, beating the expected $0.40.

During this quarter, 66% of ad earnings are from mobile, compared with 49% in Q3 2013, signifying growth in Facebook's ability to monetize its mobile assets.

Facebook counts 1.35 billion users to date, up from 1.32 billion in the second quarter and up 14% year-on-year. According to the company, daily active users (DAU) grew 19% year-on-year to 864 million this quarter. Mobile DAU, meanwhile, grew 39% to 703 million.

Moving out of the box

Notable in this quarter is a stark change in advertising figures. Fewer Facebook ad impressions are reported, with impressions falling 56%. However, the company has earned more per ad, mostly due to the improvement in ad quality.

Earlier this year, Facebook expanded its advertising initiatives to applications outside of Facebook's own assets, which enabled third-party app and software developers to monetize their apps and content through Facebook. This is actually in line with the company's medium-term strategy of expanding its reach as a platform, rather than simply a walled-off social network.

This quarter, Facebook also shared figures from WhatsApp, the chat application it acquired for $22 billion. The chat network lost $138.5 million during the quarter and earned $10.2 million. However, with 600 million monthly active users, WhatsApp will be part of Facebook's mid- and long-term strategy of building a persistent platform for user engagement.

The Future

In this quarter's earnings guidance, CEO Mark Zuckerberg, COO Sheryl Sandberg and CFO Dave Wehner offered investors some insights into the company's strategies.
In the short term, the company aims to grow Facebook's assets to

mass scale, and then aggressively monetize these. “Over the next three years, our main goals are around continuing to grow and serve our existing communities and businesses and help them reach their full potential,” says Zuckerberg.

This also involves improvements in ad tech, which will ensure better-quality content and more value for advertisers. “To continue delivering value for businesses, we work to improve the quality of ads and news feed by reducing low quality content and improving our targeting to show more timely and relevant content,” Zuckerberg added. Thus, even with reduced ad impressions, Facebook gets better value per ad and per impression. Sandberg also advised the need for improved mobile ad relevance, noting that 40% of ads are mis-targeted, in general, and Facebook aims to refine its ad technology to address this.

“ Over the next five years, our goals are around taking our next generation of services, Instagram, Messenger, WhatsApp and Search and helping them connect billions of people and become important businesses in their own right. ”

In the mid-term, Zuckerberg says that messaging is a big priority for the company. “Over the next five years, our goals are around taking our next generation of services, Instagram, Messenger, WhatsApp and Search and helping them connect billions of people and become important businesses in their own right.” One highlight has been Facebook’s move to transition mobile users to its Messenger app by unbundling this service from the main Facebook application. This has resulted in faster response times — about 20% — compared to the main app and web, Zuckerberg notes.

Apart from growing its own assets, another mid-term goal is establishing Facebook as a platform

for growth and monetization. “Over the next few years, our goal is to make Facebook a cross-platform platform that allows developers to build, grow and monetize their apps across every major mobile platform,” says Zuckerberg. “This quarter, we opened our audience networks to all developers and publishers, allowing over 1.5 million advertisers on Facebook to extend their campaigns across mobile and for developers to begin monetizing their apps.”

The longer-term goal is where Facebook gets more ambitious. Management believes that virtual reality and related technologies will play a big part in the future of computing. “Every 10 to 15 years, a new major computing platform arrives and we think that virtual and augmented reality are important parts of this upcoming next platform,” he says. In this regard, Oculus, the virtual reality hardware and software maker that Facebook acquired earlier this year, will present a big opportunity for Facebook to be front-and-center of this development.

The company is working closely with developers, as well as mobile device manufacturers like Samsung in order to shore up support for the VR platform. Zuckerberg, however, believes that mass scale will be needed before VR-based platforms are considered important enough. “It needs to rich a very large sale — 50 million to 100 million units — before it will really be a very meaningful thing as a computing platform,” he says.

photo by Maurizio Pesce

“ Over the next few years, our goal is to make Facebook a cross-platform platform that allows developers to build, grow and monetize their apps across every major mobile platform ”

Facebook is also putting its Internet.org effort as part of its longer-term plan in bolstering the company’s “long-term goal of connecting everyone in the world.” Zuckerberg cites how governments and the private sector are increasingly working toward making Internet access a core priority in their respective jurisdictions.

All this comes with the need to expend more energy and resources, however. “We plan on 2015 being a significant investment year,” Sandberg advises. Wehner says this will involve accelerating the pace of hiring, as well as putting more resources into properties like WhatsApp, Instagram and Oculus. Management expects a 55% to 75% increase in spending for 2015, compared with expected 2014 figures, on a GAAP basis.

In July, Facebook announced it was buying Oculus Rift for $2 billion. The deal is comprised of $400 million in cash and 23.1 million shares of Facebook stock.

Story

Philippine Transport Authorities Impound, Fine Uber Car In Sting Op

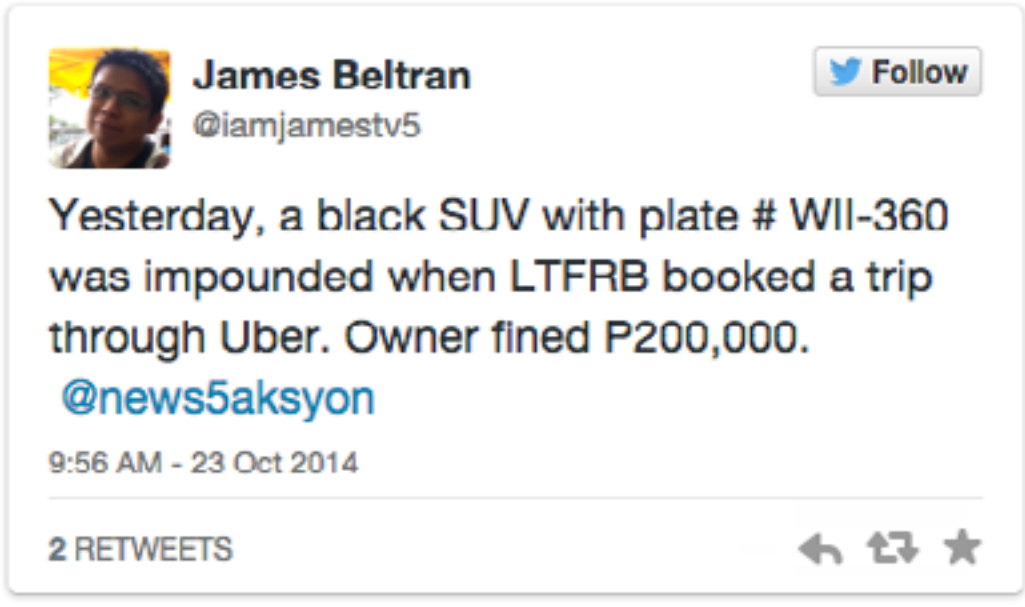
In a sting operation, the Philippines' franchise authorities have fined and impounded an Uber car for operating an unlicensed public service vehicle.

J. Angelo Racoma

Being an innovator, Uber has faced various legal hurdles, especially in relation to franchise and license regulations in certain jurisdictions. In Manila, an Uber car was apprehended through a sting operation run by the Philippines' Land Transportation, Franchise and Regulatory Board (LTFRB). The owner was fined PhP 200,000 (US$4,461), with the possibility of the car being impounded for up to three months.

It's the same story in Germany and certain cities in the US like Las Vegas, Portland and Little Rock. More often than not, the move to ban Uber is initiated by taxi operators, who understandably wish to protect their industry. Uber has established its presence in 128 cities globally, thereby disrupting the traditional franchise-oriented transport business models in these locations. While users have appreciated the convenience that a black car or inexpensive UberX ride can provide, resistance from the old guard is somewhat expected.

The Manila incident was initially reported by TV5's James Beltran, who said the black SUV was impounded with an LTFRB agent



posing as a passenger leading the bust.

"We are just being fair with legitimate franchise owners," says LTFRB Executive Director Roberto Cabrera, who says the agency understands the advantages of the new technology for users, but expresses concern for the safety of passengers. He says companies like Uber and Tripid (a ride-sharing app that facilitates carpools) operate a "public service" and are therefore required to have a franchise.

The agency had earlier received complaints from the Philippine National Taxi Operators Association about Uber running a "colorum" (illegal or without franchise) for-hire vehicle operation in Metro Manila. This is similar to how taxi operators in Berlin complained against the e-hailing service, citing that it does not provide adequate insurance to its passengers, whereas licensed operators do.

In stark contrast however, riding the public transport system in the Philippines — taxis included — is oft considered unsafe due to incidences of theft and reckless driving resulting in accidents. Independent taxi operators rarely — if ever — have insurance coverage for their passengers. Meanwhile, Uber supposedly works with established car rental services in the country to provide its unmarked cars.

LTFRB Chairman Winston Ginez has clarified that Uber in itself does not violate the law, but the practical application of its service does. "[Uber] doesn't need to secure a franchise because it's not a transport company, they don't carry passengers. But through its application, private unlicensed vehicles are able to engage in public land transportation without securing a franchise from LTFRB," he said.

In an interesting twist of events, the Metropolitan Manila Development Authority (MMDA), an inter-city governmental body tasked to enforce traffic rules and discipline in the metro, has sided with Uber, citing its benefits in easing traffic congestion. MMDA Chairman Francis Tolentino gave advice to the LTFRB in a statement saying government's role is to reasonably assist new transport services in complying with the law (or perhaps making amendments to the law), rather than summarily impounding vehicles based on archaic regulations.

"The muscle of the law and the procedural and technical arms of government agencies alone cannot resolve the lack of alternate means of transportation problem, they can only increase apprehension records, Uber or hybrid carpooling is a well-meaning technology-driven effort intended for public safety and convenience that's why people are patronizing it," said Tolentino. "We cannot curtail their mobility rights. This is similar to private bridal cars and private ambulances for rent which is a private transaction between the rider and the owner of the vehicle."

Uber Philippines has issued a statement, saying it will continue to support partners and users, and will "seek swift resolution to this incident."

Cover Story

China Challenges Taiwan In Tech Hardware

Matthew Fulco

State support is helping Chinese firms catch up fast to their Taiwanese rivals in the China technology market, Matthew Fulco reports

China has long been paramount to Taiwan's technology hardware firms. It first offered them a low-cost manufacturing base for electronics components sold to global brands like Apple (NASDAQ: APPL), and later, as some transitioned into branded consumer electronics, a huge market that shares geographic and cultural proximity with Taiwan. The key Taiwanese firms in Apple's supply chain have flourished.

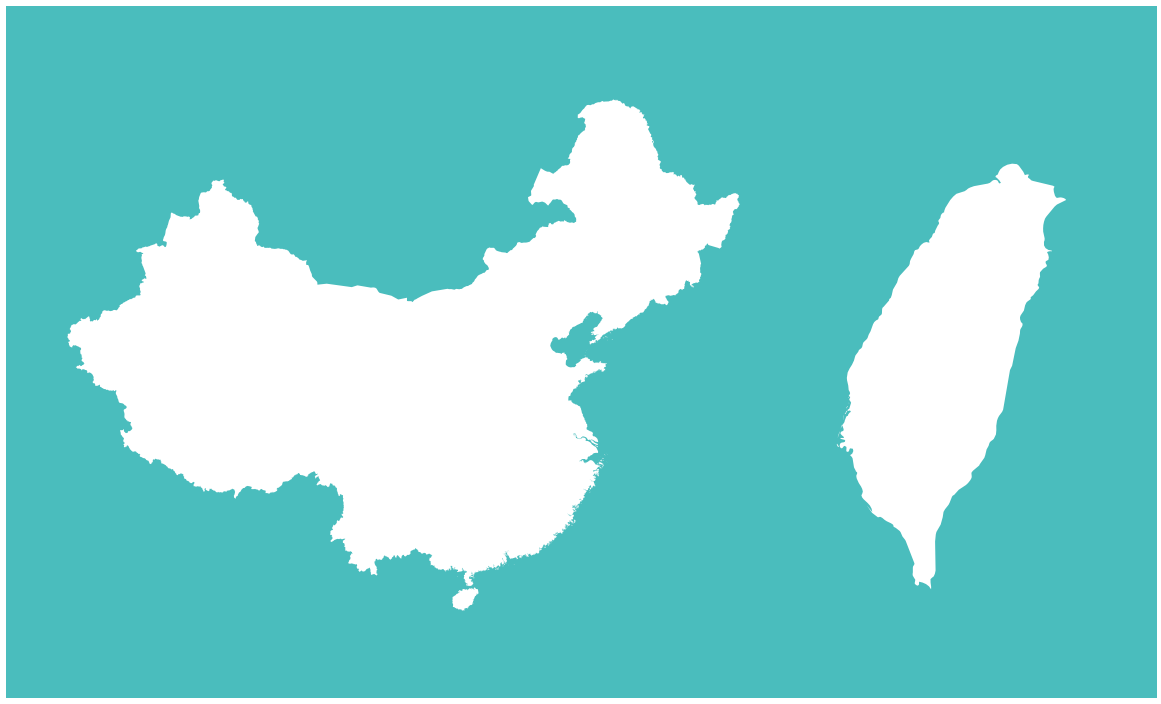
Hon Hai Precision Industry (TPE: 2317), also known as Foxconn, is the world's top contract electronics maker and Apple's largest supplier. From April to June, Hon Hai's profits rose for the third consecutive quarter to $673 million ($NT20.19 billion) . Taiwan Semiconductor Manufacturing Co (TSMC) (TPE:2330) is the largest contract chip maker globally and produces the microprocessors in Apple's smartphones and tablets. TSMC posted a record net profit in the third quarter of $2.51 billion (NT$76.3 billion).

But as China's own companies move up the value chain, Chinese wages rise and the renminbi appreciates, many Taiwanese tech firms see their competitive advantages eroding.

Chinese firms have a strong edge in their home market, the world's largest for technology products. Beijing provides its companies with low-interest loans, generous subsidies, government procurement and even judicial protection.

"Support from the Chinese government is the greatest asset Chinese tech firms have," says Avril Wu, an assistant vice president at TrendForce, a Taiwan-based market-research firm.

Beijing also restricts foreign investment in the telecommunications sector, which is an oligopoly dominated by the state-owned carriers China Telecom (HKG: 0728), China Unicom (HKG:0762) and China Mobile (HKG: 0941). Beijing's support, along with aggressive marketing and retail distribution strategies, have helped Chinese brands Lenovo (HKG: 0992), Huawei (SHE:002502) and Xiaomi grab smartphone market share from global competitors including Samsung and Taiwan's HTC (TPE: 2498).



" Support from the Chinese government is the greatest asset Chinese tech firms have "

Losing in China

Two years ago, Ray Yam, who then headed HTC's China operations, said the firm's goal was to be one of the top two handset vendors in China by revenue by 2015.

At this point, that seems unlikely. HTC has flagged badly since 2011, when it sold one in ten mobile phones worldwide and was the global leader in Android smartphone shipments. In China, it has just a 5% share of the handset market, according to TrendForce.

"HTC's new models lack innovation and outstanding features," says Vanessa Zeng, a senior analyst at Forrester Research in Beijing. "Compared with domestic brands, its products are a poor value and its brand is not clearly defined. So HTC is losing from the standpoint of both retail channels and end users."

Fu Cong, a 30-year-old account manager with a news distribution provider firm in Shanghai, bought an HTC smartphone in early 2013 and is unsatisfied with its performance. "It became very slow after a year of use," he says. "I don't see any clear advantage for HTC now either, since it is more expensive than domestic brands but uses the same Android operating system. I will consider buying a domestic brand in the future."

HTC will struggle to gain traction in China, says Wu of TrendForce. Chinese brands better understand China's consumers and equip their handsets with in-demand software and services, she says, adding: "HTC wants to position themselves as a premium brand and keep prices

up to maintain profitability, but they have neither the resources nor wherewithal to do effective marketing. They are a hardware-oriented company."

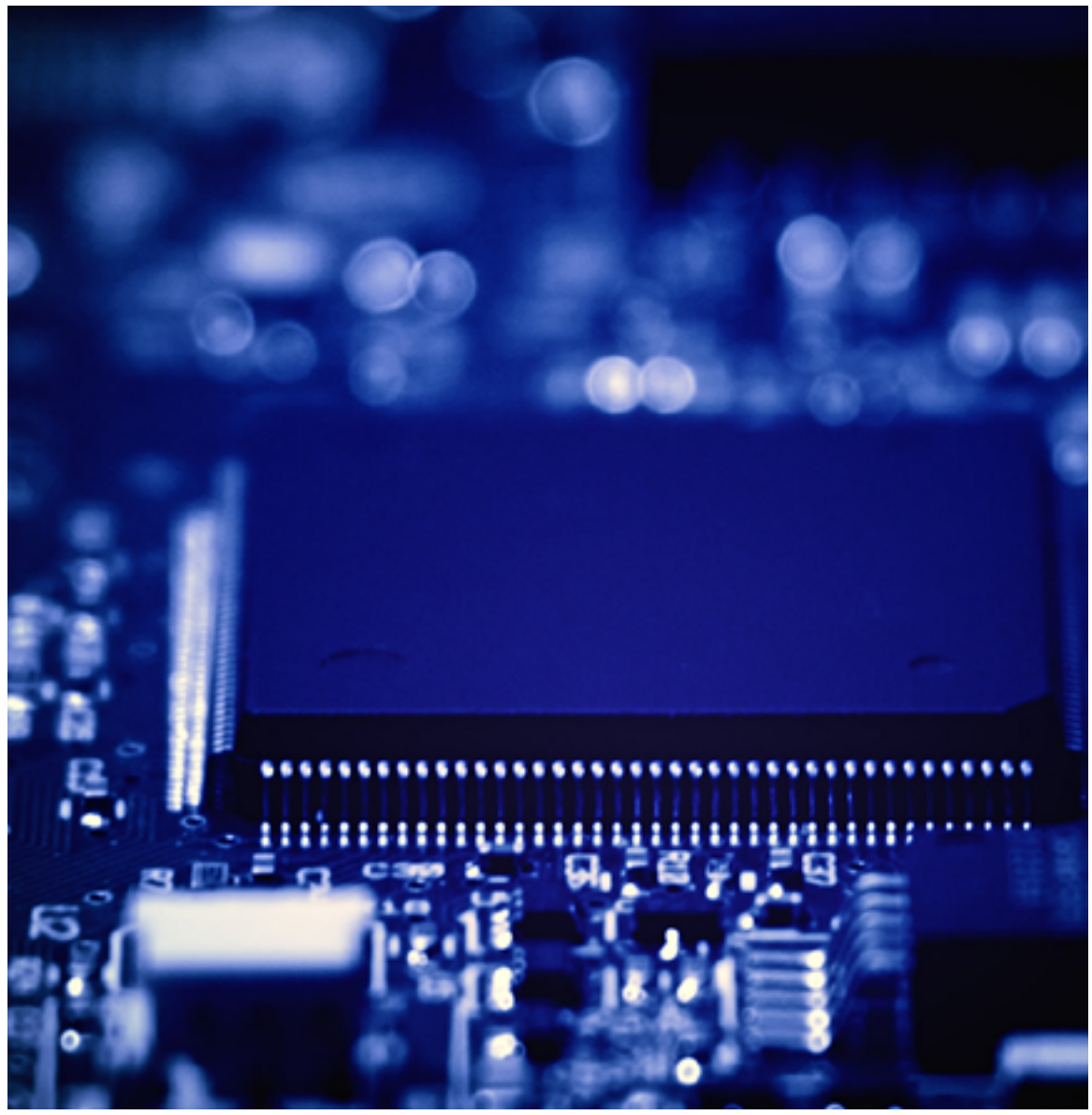


photo by Yuri Samoilov

Chips on the table

MediaTek (TPE: 2454), Taiwan's largest chip designer, also faces tough competition in China. MediaTek posted record profits of $420 million (NT$12.55 billion) for the quarter ending in June, as smartphone and tablet computer chip shipments rose. But Deutsche Bank downgraded its shares in September, citing unexpectedly tenacious competition in the China market.

US chipmaker Qualcomm (NASDAQ: QCOM) is China's top mobile phone chip supplier, with a 50% share of the baseband market, compared to number two MediaTek, which has 25%, according to a Credit Suisse report. Qualcomm also holds 80% of China's burgeoning 4G Long Term Evolution (LTE) chip market, according to data compiled by Digitimes.
"MediaTek is having trouble developing a power-efficient 4G chip," says Wu of TrendForce. "They are going to try to grab market share by undercutting competitors' prices, which will hurt profitability throughout the industry."

Meanwhile, local competition is intensifying, buoyed by funding from China's state coffers. The Beijing-backed private-equity firm Tsinghua Unigroup acquired local chipmakers Spreadtrum Communications and RDA Microelectronics a year ago for $1.78 billion and $907 million, respectively. Spreadtrum is China's second-largest chip designer and RDA its third-largest.

" But in the long term, China intend to dominate the market. "

In September, Intel (NASDAQ: INTC) took a 20% stake in Unigroup for $1.5 billion. Intel aims to penetrate the mobile chip sector by allying with Chinese rivals dominant in that industry as growth slows in personal computers.
This investment also gave both Spreadtrum and RDA access to the Intel Architecture for future system-on-a-chip projects.

Still, MediaTek is likely to hang on to its strong position in the Chinese market for now, says Arthur Liao, an analyst at Fubon Securities in Taipei. "Chinese firms are becoming more aggressive in the production of mobile chipsets, but it will be hard to threaten MediaTek in the next two to three years," Liao says. "But in the long term, China intend to dominate the market."

Ceding ground slowly

Indeed, Beijing has set its sights on the semiconductor industry. While China is the top consumer of chips in the world, accounting for 45% of global demand, imported integrated circuits comprise 90% of that consumption, according to the consultancy McKinsey & Company.

To strengthen the competitiveness of domestic semiconductor firms, the Chinese government is forming a special task that aims to boost their revenue at a compound annual growth rate of 20% until 2020. Beijing could pour up to $170 billion (1 trillion renminbi) into that project over the next five to ten years, McKinsey says.

China also intends to develop a world-class chip packager and tester. Taiwan's Advanced Semiconductor Engineering (ASE) (TPE: 2311) is currently the world's number one chip packager.

Ultimately, China seeks to build a team of semiconductor national champions and will move aggressively to acquire other companies in pursuit of that goal, says Jeff Pu, an analyst with Yuanta Securities in Taipei. In September, China's largest chip packager and tester Jiangsu Changjiang Electronics Technology, flush with funding from Beijing, bid to acquire the Singapore chip packager and tester Stats Chippac Ltd. (STAT) (SGX:S24) .

"China wants to use acquisitions to leapfrog up the value chain of chip packaging, which has a low entry barrier," Pu says. "Chinese firms could be competitive with ASE in one to two years."

Liao of Fubon Securities believes TMSC, with its superior technology, will dominate chip making for the next two to three years. After that, he says, it may have to contend with formidable Chinese competitors.

But because of the strength of its global distribution network and importance in Apple's supply chain, Foxconn will remain the world's preeminent contract electronics manufacturer, Liao says.

Increasing automation will also help Foxconn keep costs down and reduce the possibility of worker unrest at its factories, says Pu.
Still, for most of Taiwan's technology hardware companies, rising Chinese competition will be difficult to manage without government support, particularly given the lengths to which Beijing goes to strengthen the hands of its own firms.

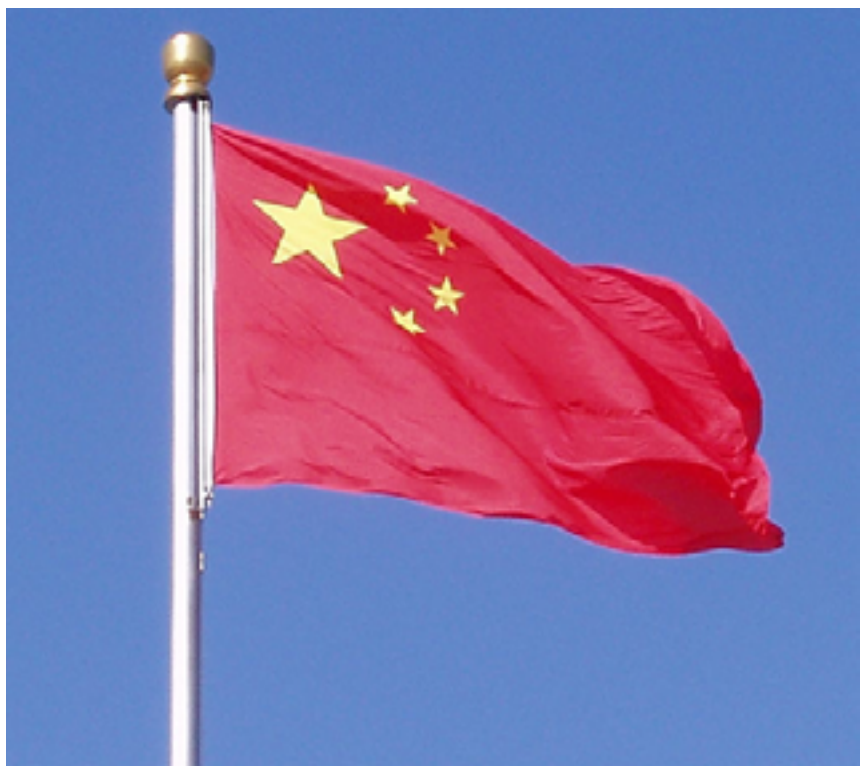


photo by Hector Garcia

Worryingly, amidst political gridlock between the ruling Kuomintang and opposition Democratic Progressive Party, the Taiwanese government appears unable to act on behalf of Taiwan's technology industry, wrote Kirk Yang, Barclay's Asia Pacific ex-Japan head of technology hardware research, in a report published in June. Yang said more projects like the Hsinchu Science Park, which was established in 1980 and became a center for global semiconductor manufacturing, are needed if Taiwan's technology firms are to remain global leaders.

Unfortunately, that type of support from the beleaguered Taiwanese government is unlikely to be forthcoming, says Pu. "I don't think that's where their priorities are," he says.

Feature

Intel's Richard Dwyer Talks The Intel Embedded Advantage in the Internet of Things

Without Intel's embedded technology there would be no Internet of Things. VR World talks to Intel's Rick Dwyer about the company's advantage in IoT.

Sam Reynolds

Behind the emerging market of the Internet of Things are embedded processors. Without these chips, such as Intel's Atom and Quark, there would simply be be no IoT.

In early October in Taipei Intel (NASDAQ: INTC) hosted its IoT Asia Tour to showcase some of its IoT solutions from partners in order to give an idea to industry stakeholders where the ecosystem is going.

As a testament to the confidence that Intel has in the staying power of IoT, Philip Cronin, the company's regional sales director for the Asia Pacific and Japan likened the rise of IoT to that of both cloud services and big data.

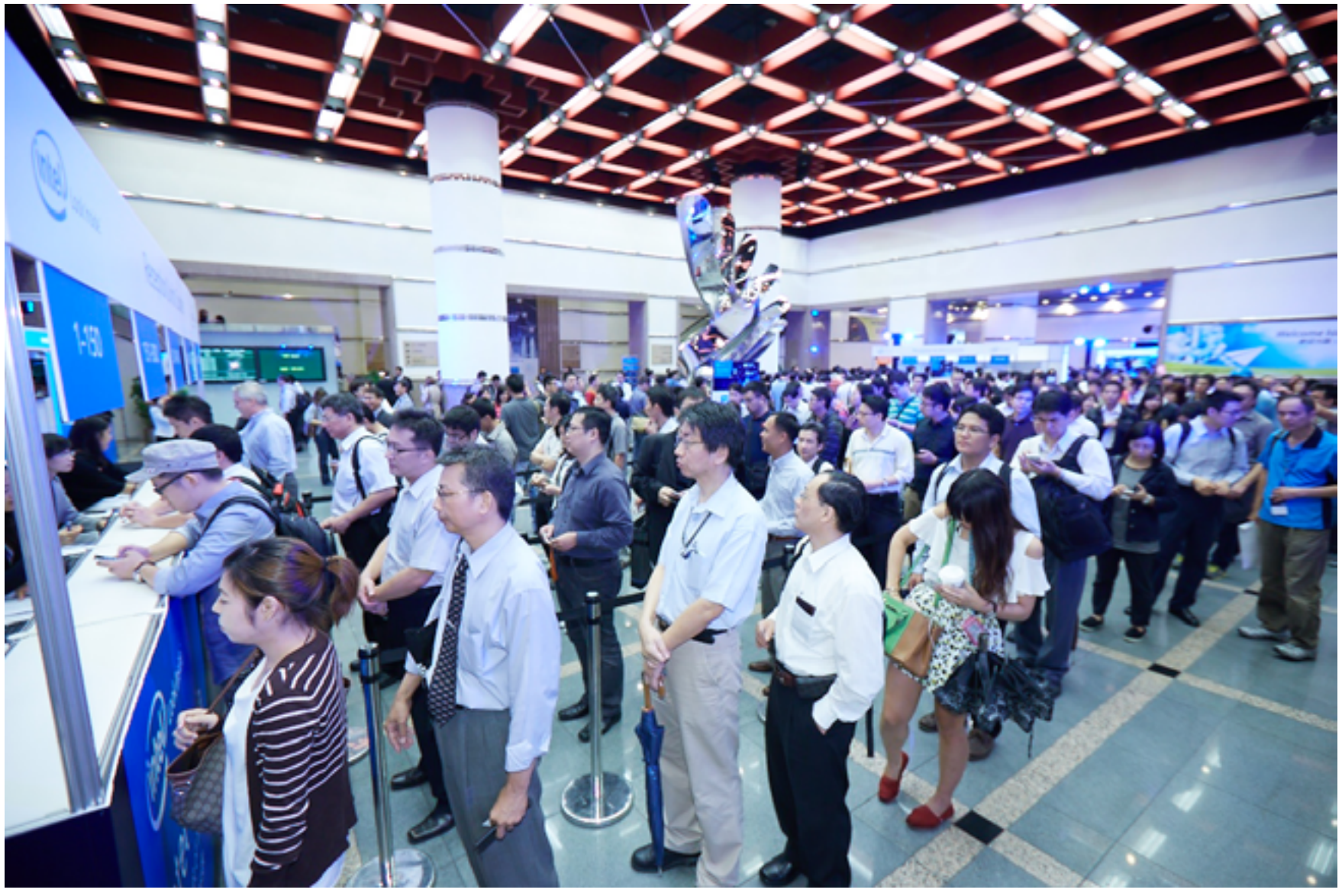
"Nobody is rejecting the concept of IoT," Cronin said on stage during the event's keynote.

To get a sense of how Intel's embedded technology is driving the IoT — as Intel has been pushing IoT with some effort for over a year now — we sat down with Richard Dwyer, Intel's VP and general manager of its embedded sales group, when he was in Taipei.

Intel's Richard Dwyer speaks in Taipei.

VR World:
In the embedded space, how would you compare Intel's efforts to those of ARM and AMD. What are Intel's strengths?

Richard Dwyer:
First and foremost, we are the preeminent microprocessor silicon manufacturer in the world — we're pretty proud of it. We've made a number of investments over the past three-to-five years in assets that help us differentiate those transistors and microprocessors that we build in ways that go beyond what our competitors offer in the marketplace.



One of the things that I think is truly unique — it's not just because we bought McAfee (now referred to as Intel Security) so we have 15 to 16 security workloads we can apply to different applications — but we have the ability to do hooks in the silicon with that software. We have Intel Security, we make the microprocessors, we create hooks that tightly couple that security environment with the software stack that sits on top of it. That's a pretty unique offering and position. That allows us to do things like establishing root of trust and passing that root of trust up through the chain of command before the processor boots.

Another differentiation is having a common architecture from the very low end such as Quark all the way up the architectural stack to Xeon's in the data center. The common architecture creates code compatibility and scalability from device to cloud as well as enabling more secured system. Couple core expertise with the IP and the assets that we've acquired, such as Wind River, McAfee, Mashery, Aepona as well as internally developed IP from our SSG and labs R&D efforts, Intel is able to create significant value with integrated system up the stack, from devices to data center.

So, our strength and differentiation is based on our ability to take transistors and the assets that we've purchased — such as Wind River from an Operating System perspective, or a hypervisor — and couple those assets with the security-based IP we've acquired from McAfee as well as that we've acquired from our own research. We've created this offering that leverages the silicon technology all the way up the stack.

I think our strength is our strength. Period, full stop. We will continue to build assets and IP that differentiates us from the competition.

I don't approach a customer that's approaching other architectures — there are many other architectures. I go into the discussion first and foremost trying to understand what's the problem the customer has, what's the business and engineering issue we're trying to solve, and then we have a discussion about what our strengths are. Our strengths are our strengths: I think they are formidable and we will continue to invest in them. But I'm not going to disparage the other guys.

VR World:

You've mentioned before that the Internet of Things is happening first in Asia. Why is that?

Richard Dwyer:

I think that Asia is an "IP incubation melting pot" of capability, intellect, and manufacturing that is unmatched in other places around the world. There were 1000 people [at the Intel IoT event] today. This set of people create things. They create solutions: there were ISVs, SIs, hardware manufacturers... this melting pot of talent is what percolates and generates wonderful things.

That's not to say that there is not innovation and invention in other parts of the world. But things happen and come to life first here. I think there is a desire for risk taking here. People are willing to take bets, and to run fast and run hard. It's an exciting place to be because there is so much capability here.

VR World:

For IoT to succeed — or any platform really — there needs to be open standards. The problem is, there are competing open standards (for example with wireless charging). In large IoT environments a certain degree of hardware and software agnosticism is required — which is the case for using open standards. What's Intel doing to ensure that competing open standards do not hamper the development of IoT or provide an annoyance to end users?

Richard Dwyer:

Our position is that we realize that we cannot do this on our own. We participate in industry consortia with other companies — the biggest companies in the world — so that the standards we are involved with and helping to define we aren't doing alone. We have, for example, the Industrial Internet Consortium which has members that are the "who's who".

Our focus will be to continue to participate in consortia that has the best, brightest and biggest companies in the world so that the standards we are involved with become ubiquitous. So that we are able to deliver solutions that are interoperable, that are multi-vendor oriented. The only way we can describe how we're doing that is name the consortia we're involved in and those peers that sit on the consortia with us.

Open standards are always open, there just may be some differences. At the end of the day, it's likely that one may win. Which one will win? I think the one that will win will be the one that has the most market momentum and mass behind it based on who's participating — but that's Rick's opinion, not Intel speaking.

VR World:

Thanks for your time.

This interview has been edited for clarity and length.

Review

EDITOR'S RATING

8

Tesoro proves it can be competitive with the best of the best with its new Gandiva H1L mouse.

TESORO PROVES IT CAN PLAY WITH THE BIG BOYS : GANDIVA H1L GAMING MOUSE REVIEW

With LED backlighting, an angular design and 8200 DPI laser sensor, Tesoro's Gandiva H1L delivers on most fronts in the highly competitive gaming mice segment.

Harish Jonnalagadda

Review

GANDIVA H1L GAMING MOUSE

In a field dominated by Razer and SteelSeries, Tesoro is aiming to differentiate itself by offering products that are aggressively styled. The Gandiva H1L is a testament to that, and if you've seen any Mad Catz designs from over the years, Tesoro's mouse will feel like it was cut out of the same cloth.

With an angular design, 8200 DPI laser sensor, eight programmable buttons and 128 Kb of built-in memory for storing user profiles, the Gandiva H1L is aimed squarely at enthusiast gamers. On the subject of aiming, Gandiva's name has its roots derived from ancient Indian mythology.

A little bit of history

Gandiva was the bow of Arjuna, one of the five Pandavas who used it to great effect in the battle of Mahabharata. Designed to make the wielder invincible, Gandiva was said to invoke thunder every time an arrow was unleashed.

Overview

Now onto the mouse itself. Designed to feel like brushed metal, the Gandiva H1L is made out of plastic, with dimensions of 116mm x 72mm x 44mm and weighing in at 130g. The Tesoro logo as well as the gaps in between the plastic overlays feature LED backlighting, which make the mouse light up. The default color is blue (which looks like something out of the Tron universe), but the color of the LED can be changed through the software configurator.

Included in the box is the mouse itself, as well as a quick start guide, a disc containing the drivers and a set of additional glide pads.

The left mouse button on the Gandiva H1L is slightly protruded, which again adds to the overall angular look of the mouse. The right side of the mouse is devoid of any button barring the right mouse button, with the left mouse button featuring two buttons that by default can be used to adjust the DPI. There's an additional button in between the two mouse buttons for switching the DPI, which is redundant. These can however be configured through the included software. The left side also features two thumb buttons that can be used as forward and back buttons within Windows or a browser.

The rubberized scroll wheel is quite prominent, and feels great to use. The wheel also has LED backlighting, and highlights the cavity that exists between the two mouse buttons. Coming over to the bottom, the Gandiva H1L features four glide pads located on either corner of the mouse, with the sensor itself present in the bottom-right hand corner.

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Features

The mouse is designed for right-handed usage, and comes with eight configurable buttons in total, which include an on-the-fly DPI adjust button that let users set the desired DPI to either 800, 1800, 4000,6400 or 8200. The default setting is 1800 DPI. The mouse also offers a 1000Hz polling rate, and four adjustable weights. Powering the mouse is an Avago ADNS-9800 laser sensor, which is used in similar gaming-focused mice such as Corsair's Vengeance M95, Logitech G600, Roccat Kone [XTD] and the Steelseries Sensei MLG edition among others.

The 128 Kb on-board memory can store 40 macros, which can be assigned through the configurator. The Gandiva H1L features a braided cable that has a gold plated USB connector. The braided cable is a nice touch and adds to the durability of the mouse.

Software

Available as a download on Tesoro's website or through the bundled disc, the Gandiva H1L offers a wealth of settings to users looking to configure the mouse the way they want.

The default screen features the eight button configurator, through which users can reassign the buttons, as well as a profile chooser. Users can store a total of five different key profiles. Clicking on the arrow on the left opens up another panel of settings, which features three tabs: Macro, Advance and About. The macro tab lets users create, save and load macros, while the advance tab features a wealth of settings that lets users change the LED color scheme, liftoff distance, DPI levels and acceleration.

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For all the features offered by Tesoro's configurator, the software itself feels half-finished. Tesoro certainly has to put as much focus on its software design as its hardware if the brand wants to hold its own among the established vendors in this category. As for compatibility, Tesoro's configurator works with all Windows versions from XP onward.

Conclusion

Designed for gamers with a claw grip, the Gandiva H1L focuses more on aesthetics than ergonomics, which means that it scores an average when it comes to overall comfort during extended gaming sessions. There are a few minor niggles with the design, particularly to do with the left thumb pad, which is not extended enough to fully support the thumb. Also, the extended left mouse button means that you have to adjust the way you hold the mouse, and high liftoff distance could be an area of concern for some gamers. Onto the positives, the buttons are very responsive and the matte texture makes it easy to grip the mouse. The design of the mouse is such that users may instantly like it or hate it. As for ourselves, we quite like the direction Tesoro has taken with the Gandiva H1L, although the vendor should look into polishing the software.

EDITOR'S RATING

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Connecting the CPUs and GPUs: Battles of Choices Are Coming

Modern high end CPUs are pretty fast these days: an Intel Xeon E5v3 (Haswell-EP) can pack up to 18 cores and two thirds of double precision teraflop in floating point power, while the 2015 Shenwei Alpha from China, with upwards of 32 vector-assisted cores per die, will crunch even more numbers per second. On the other hand, the GPUs have accelerated their own compute roadmap, with both Nvidia (NASDAQ: NVDA) and AMD (NYSE: AMD) devices in the 2015 schedule breaking through the 3 teraflop DP ceiling. Of course, both CPUs and GPUs of this generation come with well tuned, high bandwidth memory systems too.

The same of course applies to Intel's (NASDAQ: INTC) Xeon Phi compute accelerator, with the next years' Knights Landing 3 TFlop DP version matching nicely to the next generation Broadwell based Xeon E5v4. Knights Landing Xeon Phi, with its 16 GB 3D stacked memory on the package, will bring new levels of low latency ultra high bandwidth in-memory processing capabilities.

But the problems come when trying to connect these CPUs and GPUs together – the PCI Express link, used now in 99% of the cases, drastically impairs the connection, with its maximum 20 GB/s achievable net bandwidth and up to 1 microsecond roundtrip latency, over an order of magnitude slower latency what Intel QPI, AMD HyperTransport or IBM POWER8 peripheral buses and Nvidia NVlink do – and for many short transfers common in HPC, that latency can mean a lot. These other connections enable coherent shared memory between all those CPUs and GPUs, rather than messaging and copying between separate memory spaces.

So, even though the 2015 Knights Landing will still have to rely on PCIe V3 for connection to its Xeon cousins, the 2016 variety could – hopefully – use the far more efficient QPI. They better do, as, by then, the Nvidia "Pascal" GPU generation, the one after Maxwell, will team up with IBM Power8+ and Power9 to use common NVlink for tight, low latency, shared memory connection between IBM CPUs and Nvidia GPUs in computational environs.

Mind you, that need not apply just in some large supercomputers, but even in your own high end Linux workstations. If the speculated OpenPower expansion to China bears fruits soon, and we see an inexpensive Power8+ lookalike from there, with NVlink on board, making high speed heterogeneous yet shared memory ultrafast 20 – 50 TFLOPs workstations will become a reality within a year or so.

However, there's a company that could have done it all, much earlier – you guessed it right, AMD. Remember HyperTransport, the most faithful follow-on of the Alpha EV7 bus, ahead of QPI and such? Well, why didn't they put HyperTransport on their Hawaii and later high end GPUs, and let the GPUs coherently share each other's memory and that of the matching Opteron CPUs? Even CrossFire stuff would operate far, far faster and neater.

It's not too late for them, though. If AMD does decide to again (hopefully) produce top end CPUs, and connects them via HyperTransport to its own arrays of GPUs, they could be back in business.

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