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Companies Set to Next 5 Years



• BY the a&s Editorial Team

a&s again presents its Security 50 Ranking and Reports for 2019, in which the a&s Editorial Team ranks publicly-listed companies with a strong global presence in the security industry based on their physical security product sales revenue for 2018.

Upon an initial look, it's a bit surprising to see that the top five video surveillance companies rank pretty much the same as last year. However, looking deeper at their figures, including the sizes of their revenue, 2017-2018 revenue growth and gross margins, it's then unsurprising, or even safe to say that, with their strong market reach, ecosystem of partners as well as technological capabilities, these companies will dominate the security industry in the next 5 years. It's also interesting to point out the No. 1 and 2 companies, Hikvision and Dahua, emerge unscathed from the trade disputes between China and the United States, whose best efforts to sanction and contain both companies — including banning the two in government projects and restricting US companies from doing business with them — have thus far proven ineffective. Indeed, with their capitalization and high demand for security from the Chinese market, Chinese companies have greatly surpassed their competitors. With this, please enjoy this year's Security 50 report, which covers various topics, from technology trends to market status in different regions, to give a comprehensive overview of the physical security industry.

TOP 10 GLOBAL SECURITY MANUFACTURERS

(Based on 2018 product sales revenue)

| Rank | Company |
|------|------------------------------|
| 1 | Hikvision Digital Technology |
| 2 | Dahua Technology |
| 3 | ASSA ABLOY |
| 4 | Bosch Security Systems |
| 5 | Axis Communications |
| 6 | FLIR Systems |
| 7 | Uniview Technologies |
| 8 | Allegion |
| 9 | Tiandy Technologies |
| 10 | IDIS |



Will Chinese Companies Growth Begin to Slow the Next 5 years?

The last 10 years are the fastest growing time period for most of Chinese companies. The US blacklist has started to hinder these giants' growth in the US and also some other countries. It is wondered whether the Chinese companies will continue to grow exponentially in the next 5 years.

● BY Jill Lai & William Pao

This year's Security 50 sees another record high revenue from the top five companies, Hikvision Digital Technology, Dahua Technology, Assa Abloy, Bosch Security Systems, and Axis Communications. In total, these top five generate around US\$17 billion, which accounts for 68.4 percent of the revenue from the total 50 companies. Take video surveillance sector only. The top five, including the aforementioned four companies and FLIR systems, produced \$15 billion, which is about 74 percent out of the total revenue from 41 video companies. It can be concluded that the top five have dominated the global security market and it won't be a big surprise that these companies will continue to maintain their leading positions.

The two Chinese companies, listed in first and second place, have already become enormous. Another Chinese company, Uniview Technologies, which grew 31.3 percent from \$468.3 million in 2017 to \$614.8 million in 2018, also showed its great ambition to become the third biggest video surveillance company from China. The company was acquired by China TransInfo in 2018. China TransInfo, a publicly-listed company, mainly offers transportation and security system solutions to multiple local Chinese governments.

More IPO companies from China

Thanks to capitalization, and the fast growing domestic market and incentives from the government, we will still continue to see more and more big Chinese IPO companies in the security industry, regardless of the ongoing trade dispute between the United States and China. Though, we admitted it is not a fair game for many non-Chinese companies, based on the analysis on the figures we collect every year from most of the IPO companies worldwide.

Another new entrant to the top 20 of Security 50 list this year is Megvii Technology, which is a new AI start up unicorn based in China, known for facial recognition technology. It achieved growth of 529.4 percent from 2017's revenue of \$25.37 million to last year's \$159.7 million, clinching the No. 1



spot in terms of revenue growth. The company is preparing for IPO despite US blacklisting. Other well-known China-based AI start-up Unicorns, SenseTime and YITU, might follow their steps afterwards.

Hikvision and Dahua Retain Growth Despite US Blacklisting

Hikvision and Dahua reported 2018 equipment sales revenue of US\$7 billion and \$3.6 billion, respectively, at a growth of 17.14 and 25.58 percent compared to 2017. In particular, Hikvision still grew a total operating income of RMB 39.84 billion (around US\$6 billion), during the period of Q1-Q3 2019, representing a year-over-year growth of 17.9 percent, according to its latest announcement, despite a US



American city, including more than 1,000 front-end cameras, with complete transmission networks, cloud storage systems, video management platforms as well as big data applications in vehicle and human portraits to help the local police solve crimes and equipped with early warning capabilities dealing with potentially dangerous people and vehicles. The construction of the command center, including the LED screen, police command and dispatch system, has greatly improved the efficiency of the police work.”

Digging Deeper into Verticals

Yet beyond simple revenue breakdown by region, Hikvision and Dahua’s success has more to do with their own efforts to evolve. Both companies have taken a “go vertical” approach and realigned their product/solution positioning from that of security to more of an efficiency improvement and operation enhancement application. These, plus their extensive R&D on AI and deep learning technologies, have added to their growth in both domestic and overseas markets.

law banning both companies’ products in US federal offices, as well as being put on the US “entity list” restricting American companies from doing business with them.

China’s domestic market accounted for 71.53 percent in Hikvision’s operating income structure, compared to 28.47 percent overseas. Then, its domestic operating income was a 20.18 percent growth from 2017, compared to 15.9 percent for overseas. This shows that the domestic market maintains the company’s growth momentum.

What is worthwhile for us to notice is Dahua’s sales report during Q1-Q3 2019. It is RMB\$16.42 billion, and only grew around 9.30 percent compared to the same time period in 2018. Some US buyers admitted their concerns on working with these two giants

or Chinese companies, in general, which caused the revenue increase of other Asian manufacturers, such as VIVOTEK. The company grew 34.72 percent to around US\$189.6 million during Q1-Q3 2019.

The Chinese companies, meanwhile, are taking on safe city projects in overseas markets to meet local demands. “Particularly in Latin America, Asia Pacific and some other regions, the market demands for safe city is growing fast,” said Fu Liqian, Chairman of Dahua Technology. “One of the projects is that we provided a complete safe city solution for a Latin



Keen Yao, VP, Hikvision Digital Technology



Fu Liqian, Chairman, Dahua Technology



“Hikvision has been participating in various projects for business efficiency and automation in vertical industries, contributing innovative technologies, products and solutions, particularly in the intelligent traffic management and retail intelligent business,” said Keen Yao, VP of Hikvision Digital Technology. “In smart transportation, Hikvision’s portfolio of traffic solutions with AI technology incorporated has transformed standard video monitoring with features that alert operators about traffic issues in real time. This allows them to take immediate action to keep lanes clear and to keep traffic flowing. In retail, with Hikvision AI technologies, retailers can have a clear view of customer flow and optimize their store layouts, merchandise goods effectively to increase sales revenues, and enhance the shopping experience by reducing checkout waiting times.”

“Dahua has developed tailored solutions for safe city, smart traffic, smart retail and other key industries,” Fu said. “We also launched a series of smart front-end and server products to satisfy the smart application scenarios of the next generation, and comprehensively support the implementation of Dahua HOC (Dahua Heart of City).”

How about the Future?

Chinese companies have got hindered in developing their overseas markets. Whether these Chinese giants maintain their high growth in the next five years might depend on their domestic market sales and overseas buyers’ confidence.

Top 50 Security Companies Continue to Grow in Double Digit

The top 50 grew, on average, in double digit in 2018. The US and China are two main markets which ensure the growth for most of the companies in the list. However, most of the Taiwanese companies were still in the down-turn curve.

The top 50 grew around 16 percent on average in 2018. Overall, 37 companies registered growth, with 20 recording double digits or more. This confirms that the security industry wasn’t too bad last year, as indicated by some of these high-growth companies.

This year, the No. 1 to 10 revenue gainers in the Security 50 ranking are, respectively: Megvii Technology, CP Plus, Kedacom, Costar Technologies, Uniview Technologies, Identiv, IDIS, Dahua, ASSA ABLOY and Magal. IDIS’ ranking jumped from No. 25 last year to this year’s No. 10.

ASSA ABLOY’s US division made 9 percent growth. In its financial report, the company said, “Demand was strong in North America and robust in Latin America for most markets. Growth was extremely strong in the US for electromechanical locks in both the commercial and institutional customer segments, as well as in the private residential market. Profitability continued to be strong despite increased material costs.”

“The US security system market recovered from a short-term

slowdown in 2017 experienced by many companies, and returned to strong performance in 2018,” said Dror Sharon, CEO of Magal Security Systems. “EMEA and APAC regions also saw increasing demands in 2018 with heightened activity in the market resulting in more interest from potential end users.”

“All of the Costar Technologies business units saw increased sales opportunities across the Americas, and some units such as Arecont Vision Costar also witnessed growth in projects in the Middle East and Asia Pacific,” said Jeff Whitney, VP of Marketing at Arecont Vision Costar/Costar Technologies. “Security products, solutions, and technology are very much in demand, and multiple markets are increasing in demand as a result. In our case, having a mix of made-in-USA and other world-class products across a wide range of verticals results in continued growth in many spaces.”

Vertical-wise, growth was seen in all the major verticals as well. “Over the course of last year, we saw higher demand for our Hirsch physical access product line in multiple levels of



government — federal, state and local — as well as in the education space. For our 3VR video intelligence solutions and data analytics, we saw an upsurge in retail and banking. Interest in our web-based access control management solution, Liberty, mainly came from commercial small-to-medium businesses, retail, and small start-up businesses, while interest in Freedom, based on a software-defined architecture (SDA), came from IT, enterprise, K-12 school systems, and high-tech visionary/forward-leaning companies,” said Mark Allen, GM for Premises at Identiv.

Yet more importantly, more and more vendors are taking on projects for non-security applications in different verticals, helping end users achieve business intelligence or management efficiency.

“One of the largest verticals Axis is focusing on is the retail sector ... the demand for surveillance solutions is not only driven by the traditional need for security, but also the need for applications that improve customer experience and the entire business. Enabled by analytics, specific examples of how cameras could be used include store (layout) optimi-

zation, reducing checkout lines and handling peak shopping periods,” said Ray Mauritsson, President and CEO of Axis Communications. “We also see more and more interest in the development of safe (and smart) cities ... there’s on the one side the safety aspect that increases when cameras are connected to law enforcement and help police and other operators to keep the cities safe, but also the efficiency and sustainability aspects. For example can cameras help to regulate and optimize the traffic flow by connecting live images with other data sources.”

As for next year, it is expected that the aforementioned technologies will remain popular, while usage of security equipment in non-security applications will continue to be seen. As for the market, growth is expected as a report by Memoori forecasts a compound annual growth rate of 10.7 percent for physical security from 2019 to 2024. It however remains to be seen whether the trade restrictive measures issued by the U.S. will really take a toll on the Chinese companies’ 2019 sales, which should be made known during the first half of next year. **AVS**



Mark Allen, GM for Premises, Identiv



Ray Mauritsson, President and CEO, Axis Communications



Dror Sharon, CEO, Magal Security Systems



Jeff Whitney, VP of Marketing, Arecont Vision Costar/Costar Technologies



Security Growth Seen Across Regions Due to Strong Demands

Across the globe, security is still growing due to end users' constant need to stand ready against criminal or terrorist activities. More and more, end users are using security for non-security objectives as well, seeking to obtain a bigger return on investment.

• BY William Pao

Overall, growth is seen in the North American market as end users continue to spend on security, and this trend is expected to continue despite concerns of a recession in the short-term. EMEA and APAC are growth markets as end users continue to spend on security both for security and beyond-security purposes.

North America

Economically speaking, North America has seen growth in recent years, with the World Bank citing the US economy grew 2.9 percent in 2018 and is forecasted to grow 2.5 percent this year.

The performance of the North American security industry, then, is pretty much in line with this growth

trend. "North America is traditionally one of the largest regions for security players. Recently, the economy in North America has been strong, driving investments in security equipment. Growth rates of 5 to 7 percent are anticipated for this market," said Daniel Gundlach, GM and VP of Security at FLIR Systems.

"We continued to see strong growth in our business in 2018. Top line, we grew over 25 percent, inclusive of both organic and acquisitive growth. The feeling in the market overall was one of continued growth," said Mike Mathes, Executive VP of Convergent Technologies.

Threats, Regulation Trigger Spending

Security concerns are still a major force driving end users to spend on security, regardless of verticals. "Most companies continue to spend at a high rate, and government and state projects are steady," said Thomas Cook, SVP of Sales at Hanwha Techwin America. "The largest vertical is K-12. This sector is growing rapidly, due mostly to the urgency to secure these locations

from shooting attacks. This is an epidemic in North America, so schools use increased security as a preventive measure."

"Our high-end perimeter protection customers – airports, data centers and utilities – are investing in long-range thermal cameras and radar solutions for redundancy and expanded coverage to identify threats before they reach the fence line. Our commercial customers are investing in remote video monitoring and video verification solutions to better protect assets and reduce loss," Gundlach said. "Norman Y. Mineta San José International



Airport in Silicon Valley is a notable project using FLIR solutions for its perimeter intrusion detection system.”

Regulation also plays a major role driving demand in various verticals, from critical infrastructure to even cannabis. “Highly regulated markets continue to be big drivers of security investments. Airports, ports, financial institutions, and utilities are markets that are highly regulated in a manner that security systems can impact. These users are looking to not only meet their regulatory requirements, but to do so in a productive manner and with systems that are more cyber-aware as well,” Mathes said.

“We see an explosion of business as cannabis becomes legal in more states across the U.S. and in Canada. Stringent security regulations in this sector are also driving business growth,” Cook said.

Beyond Security

Meanwhile, North American end users are also starting to use security equipment for non-security applications, seeking to maximize return on their security investment. This trend is particularly noticeable in retail.

“End users are increasingly searching out advanced solutions that they can leverage for not only security, but to provide them insight to their operation. AI is having an impact in retail, allowing for a closer understanding of customers, as well as threats to the business,” Mathes said.

“The main vertical that wants to use security with business intelligence is retail even though there are others interested in this like shipping, manufacturing and processing plants. Retailers are increasingly using analytics to dynamically improve their customers’ experience while they are shopping,” Cook said.

Transportation, meanwhile, is another vertical where security equipment is



Thomas Cook, SVP, Sales, Hanwha Techwin America



Daniel Gundlach, GM and VP, Security, FLIR Systems



Sovan Hok, GM, S Era Automation

integrated with other systems to help with traffic management and smart parking. “We’re seeing examples of cities deploying our thermal cameras with Acyclica, our traffic management software, to improve mobility. While the thermal cameras detect vehicles, the software analyzes destination statistics, travels times and arrival on red or green lights. All of this data helps cities understand traffic patterns and congestion so that steps can be taken to improve traffic flow,” Gundlach said.

As for next year, North American security players will be operating in an uncertain economic environment where growth may be impeded by the ongoing China-US trade dispute as well as the US presidential election.

“2020 is a presidential election year in the U.S. Historically, there has always been a downturn in business during this year. The main reason is many larger corporations are conservative with their overall spending until the election is over, which isn’t until November,” Cook said. “Even without the election, most financial analysts have predicted a recession. We are in the longest timeframe of not having a recession, so if it happens, it will affect the overall economy.”

However, most players are optimistic that, at least as far as security is concerned, its current growth path will continue. “While we have heard concerns of an overall slowdown — perhaps in 2020 — we aren’t seeing any of our customers behaving in a manner that would indicate a slowdown of their spending next year,” Mathes said.

“Economic sanctions are one area that can significantly impact growth. At FLIR, we design and manufacture the majority of our products in house, and do not use components that are impacted by current or anticipated sanctions,” Gundlach said.

EMEA

EMEA is another growth market as end users continue to spend on security both for security and non-security purposes.

According to the World Bank, EMEA economies are set to grow 2.7 percent in 2020 for Europe and 3.2 percent for the Middle East and North Africa. This growth is reflected in companies' performance in the region. "Whilst it varies between countries, on average we hit 8 to 9 percent growth in the region with some locations growing by up to 18 percent," said Thomas Lausten, CEO of MOBOTIX.

The need for solutions that maintain the security and cybersecurity continues to be a driver. "The topic of security and cybersecurity has gained significance in 2018 due to the introduction of insecure hardware, as well as in response to the worsening geopolitical situation. I think the situation described above will pose increased challenges to the security industry over the coming years but will also help the security market to achieve double-digit growth rates," Lausten said.

Closely related to cybersecurity is the issue of privacy. With the adoption of GDPR, suppliers whose products and solutions are GDPR-certified can better compete and stand out in the market.

"We've invested a considerable amount of time making sure that our VMS is GDPR compliant, and I am pleased that we were the first major video management software product to obtain the highly sought-after EuroPriSe GDPR-ready certification," said Malou Toft, VP of EMEA at Milestone Systems, whose XProtect Corporate 2019 R2 recently obtained GDPR-ready certification issued by the independent EuroPriSe – European Privacy Seal institute. "With the GDPR-ready certification end users can be confident that they have the right foundation to build a GDPR compliant video surveillance installation. We are



Thomas Lausten, CEO, MOBOTIX



Patrick Lim, Director, Group Strategy, Ademco Security Group



Mike Mathes, Executive VP, Converjint Technologies



Malou Toft, VP, EMEA, Milestone Systems

also making an effort to make sure that the surveillance operators out there will know how to plan and deal with GDPR. We have offered trainings, so that if you are a security operator who does not necessarily know how to go about this, we'll provide support for all your operating managers to learn what to be aware of."

Non-Security Applications

Security aside, more and more end users across verticals have realized the value of using security for non-security applications. "The end users are, in general, becoming more aware of the options they have and that the ROI is no longer based on just security but instead takes data usage, information sharing and converged solutions all into consideration," Lausten said. "As well as the increased security needs, using high-quality imaging with a device can assist in increasing your sales or limiting your losses in terms of productivity and intelligence."

Toft illustrates this with various examples.

"In many countries for example, the way you make schedules for public transportation, for example train timetables, is based on historic or small sample information often collected manually. With anonymized video metadata you could track where and when people density is high and thus plan train schedules much more effectively and data driven. That's just one of the processes you could automate and make more accurate," Toft said.

She added: "In our region, there's a retail chain where they are testing a new concept in its stores. Obviously it's a huge cost to redo your entire layout of a store, so what you would do is to have two, three pilot stores where you'd do alternative layouts and then you would use sensors and cameras available to test the flow and how customers are responding to your new design. Basically, the video data helps you experiment and

test your prototypes before rolling out a nationwide new concept. This way you would have more confidence in the decisions you'll make which obviously will have great impact to your bottom line."

APAC

For APAC, growth is also seen, even though the scale of growth differs from country to country. "We see low double-digit growth fueled by high-growth markets such as Vietnam, Philippines, India and Indonesia. Established markets like Singapore will have fairly low growth," said Patrick Lim, Director for Group Strategy for Ademco Security Group. "Hong Kong will be a strange phenomenon as their economy is likely to take a big hit from the internal problems, but with many infrastructure damages, replacement projects for security may actually give the security industry a mild boost."


"In the APAC region, our revenues grew by 22.5 percent. More specifically, we have had good success in transportation, data centers, public safety and law enforcement in Australia. In India, we are increasingly working with buildings and industrial customers, while in ASEAN, we have enjoyed much success with BPO, oil and gas, hospital and airports. We are also seeing a growing trend in safe cities/smart cities and an increasing number of airport upgrades and new construction," said Daniel Lee, Managing Director for APAC at Genetec.

Main growth drivers include efforts by regional governments to build smart cities, various infrastructure projects

and a general construction boom in the region. Government regulations requiring buildings and facilities to follow certain standards play a key role, too. "The main growth drivers of security are the government rules and regulations set for high-rise buildings and public areas like community malls. We have lots of high-rise buildings, hotels and residential development projects on hand," said Sovan Hok, GM of S Era Automation. "With the growth of high-rise buildings, hotels, community malls and government office buildings, constructions are key players for security demands."

While the consensus is that security will continue to grow in the region, there are certain influencers that may affect security negatively. "The U.S.-China trade war as well as a possible global economic slowdown are the factors that might have impact on the growth of

security business," Hok said.

"The U.S.-China trade war is a key issue as that has growth impact on the security market in China. If there is an increase in socio-political unrest and trade tensions, investment confidence will be low and it will have wide ranging impact across Asia," Lim said. "From mid-2019 onwards, there were a lot of hesitations due to the U.S.-China trade dispute. Uncertainties certainly slowed the market down significantly. For 2020, I believe there will still be much uncertainties as more Chinese products are under scrutiny, which will have an impact on cost and procurement dilemmas for projects." 

2019 Surpassed Expectations but Demand Structure in the Video Surveillance Business is Unbalanced

Memoori's 2019 annual report on the physical security business will show that the total value of world production of physical security products at factory gate prices in 2019 was US\$34.31 billion, an increase of 8.5 percent on 2018, whilst the compound annual growth over the last 5 years was 7.24 percent.



• BY Allan McHale, Director, Memoori Research

This is remarkable growth given that world GDP growth averaged around 2.7 percent from 2012 to 2017, so growth in the physical security business has outperformed it by a factor of 2.6.

Over the last 10 years the market has grown by a compound annual growth rate of 6.27 percent. We forecast the market will reach \$56.76 billion in 2024 at a CAGR of 10.72 percent, however significantly different rates of growth will apply in each of the three businesses (access control, video surveillance, intruder alarm) and geographic regions.

Video surveillance had the highest rate of growth at 9.74 percent over the last 3 years as Western manufacturers fought back against the Chinese competition, but they still have little possibility of penetrating the Chinese public sector business. China is by far the largest single market probably accounting for 35 to 40 percent of world demand.



Access Control was expected to deliver a slightly higher performance than 8.2 percent as it further expanded the IP network business, advancing deeper into biometric, identity management, wireless locking systems and ACaaS. This would have been the third consecutive year that it turned in the highest rate of growth of the three businesses, but price pressures are starting to bite, partially through consolidation and weaknesses in the supply chain. This has reduced growth when measured by value.

The intruder system business, the father of the physical security business, has long since reached maturity but its increasing use of radar, thermal and multi-sensor cameras, has contributed to growth of 3.8 percent in 2019. In addition, advances in sensor technologies, wireless technology and the integration with video surveillance, access and outdoor lighting have all contributed to its growth. We accept that there could be some video surveillance products that are being installed in PP/IA projects but are not being counted in this sector and this could have distorted growth.

Demand structure in the video surveillance business is unbalanced and unhealthy

We have shown in our report that the problem for overseas manufacturers getting a piece of the China market is not about technology or performance, at its core it is a political and geopolitical challenge.

The reason is that the communist political party has some control over even private video surveillance manufacturing companies and if they want public sector business (which today accounts for more than 50 percent of the Chinese’s video surveillance market) and support with long term cheap loans then they must comply with the states requirements and wishes.

For this the state ensures that foreign equipment will not be used on public sector projects. Not surprising this arrangement has distorted any

possibility of “open trade” and further has allowed the two major Chinese manufactures (Hikvision & Dahua) to build up 40 percent of the worlds video camera business, in part by operating a “race to the bottom “ on lowering prices that no other manufacturers could sustain because they don’t have the volume of production.

However there could be a sting in the tail. On the horizon are other Chinese companies that want a part of the massive investment in the public sector safe city projects. Huawei, one of the world’s largest communication companies, have announced a major push into video cameras and the new startup Megvii in AI video analytics intends to offer complete video surveillance solutions. There is no doubt they will eventually get established in the public sector market and take a share from the two present incumbents, and this could at least reduce the pressure on non-Chinese manufacturers operating in the more open world market.


Market Forecast to 2024

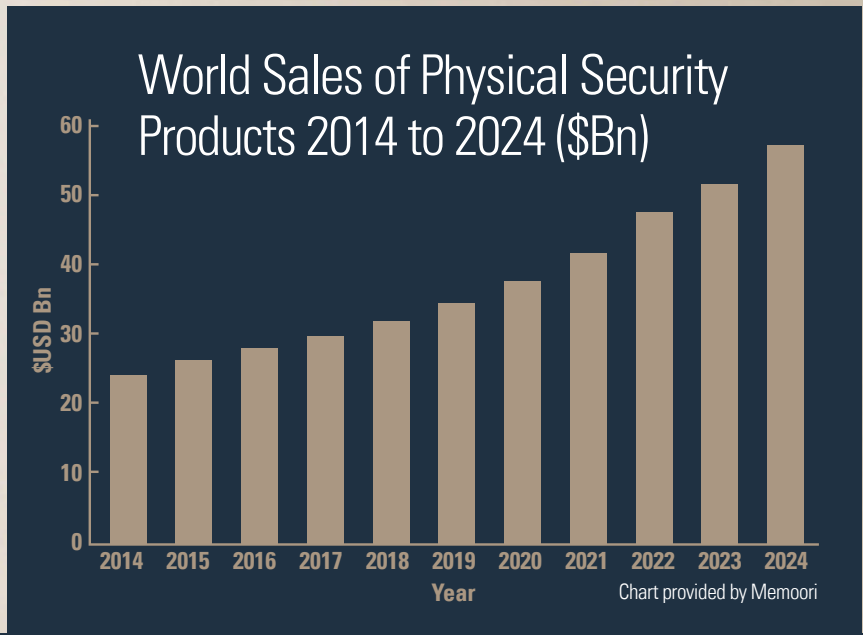
Our forecast for the next 5 years to 2024 takes into account that there will be no improvement in world trade and little growth in GDP for the next two years. The last 5 years shows that the

physical security business can achieve solid growth in an underperforming economic climate, because new technology is improving product performance and continually reducing the cost of ownership.

Terrorist activity is unlikely to be quelled during the next 5 years and government budgets to counter this will rise with consequent benefit to the physical security business. In the commercial world the demand for more comprehensive connectivity across all 3 of the branches of the physical security business and the business enterprise will grow, aided by IoT technology. This will become evident by the end of 2020 with a solid acceleration of growth through the following 4 years.

We forecast a CAGR of 10.7 percent in terms of value over the next 5 year period from 2019 to 2024. The main drivers will be AI video analytics software accelerating to a potential of \$3.5 billion by the end of 2024 from a miniscule size today and also creating further demand for more video surveillance hardware.

This has been taken from the eleventh edition of Memoori’s Annual Report “The Physical Security Business 2019 – 2024.” 



OPPORTUNITY

What are the New Opportunities in Security?

While the security industry has become more competitive than ever, there are still opportunities, which have been seized upon by vendors as they offer advanced solutions to fulfill SI and end user's various needs.

• BY William Pao

These opportunities include AI, edge computing, cybersecurity and a slew of other advanced technologies that are summarized as follows.

AI

Analytics based on machine learning, deep learning or AI are still a trending topic whose applications have become increasingly diverse and wide-ranging.

“The role of AI will continue to be

transformative in security. AI dramatically increases the effectiveness of security systems by focusing human attention on what matters most,” said Alex Asnovich, VP of Global Marketing and Communications at Avigilon. “Just as high-definition imaging has become a quintessential feature of today’s surveillance cameras, the tremendous value of AI technology has positioned it as a core component of security systems today, and in the future. By delivering true video content search, real-time alerts and automation, Avigilon provides effective security solutions that are helping to solve real-world challenges.

“At Genetec, we are actively using deep learning for purpose-built solutions that rely on identifying trends and dependencies between features present in the data itself. We are currently using deep learning in AutoVu, our ALPR system, to increase the accuracy and veracity rates of license plate tag reads,” said Daniel Lee, Managing Director for APAC at Genetec. “By applying computer vision algorithms, we have greatly reduced false positive reads for law enforcement officers when they identify and stop a vehicle of interest.”

Computing on the Edge

Thanks to advances in chip technologies as well as improvements in AI algorithms, more and more of these AI cameras have become available.

“The continuous development of



Alex Asnovich, VP, Global Marketing and Communications, Avigilon



Richard Huison, Regional Manager, UK and Europe, Gallagher Security



Joon Jun, President, Global Business Division, IDIS



Tracy Kemp, SVP and Chief Customer and Digital Officer, Allegion

higher-performing chipsets allows us to create products that are capable of processing the data at the ‘edge’ of the network, close to where the data is collected. For the surveillance industry, this means, the data is being processed within the camera itself. Not only can this reduce the bandwidth for transfer and storage, but it also makes it possible to efficiently deploy large scale smart systems. In addition, the data can also be anonymized and encrypted before it is transferred, addressing security and privacy concerns,” said Ray Mauritsson, President and CEO of Axis Communications.

“We know better than most video tech companies that many customers don’t want the complexity and associated of servers and IT setups, particularly small to medium sized businesses. When they needed to upgrade, they wanted IP CCTV that simply worked in the same way their old analogue systems did but with all the benefits of networked surveillance. Today, the same is true of deep learning analytics. And that’s why it’s important we deliver analytics that run on onboard cameras,” said Joon Jun, President of the Global Business Division at IDIS. “We are currently working on introducing a new range of 5MP AI cameras that will enable more accurate types of video analytics and allow deep learning applications on the edge.”

Cybersecurity

Cybersecurity, while nothing new, is still relevant as ever. Suppliers who can prove their solutions are hardened and secure against cyberattacks can therefore find more opportunities among integrators and end users.

“The ever-growing threat of cyber-attacks is front and center in many organizations. The demand for more robust solutions that reside on client’s networks prompts for better solutions to be specified. With that in mind, the growing verticals such as data centers, complex manufacturing and financial markets are all addressing these vulnerabilities,” said Richard Huison, Regional Manager for UK and Europe at Gallagher Security. “The defense of any system should be knowing if something does not feel right, having the Gallagher Command Centre constantly polling our encrypted edge devices means we are on top of any anomaly that may occur and in turn escalating these events to the appropriate teams.”

“Cyber-secure offerings in video management system software, whether local or leveraging the cloud for lower system costs and improved communications, are more important than ever as the threat environment continues evolving. A combination of better, higher cyber secure products along with user and integrator education continues to be key to deploying successful security solutions,” said Jeff Whitney, VP of Marketing at Arecont Vision Costar/Costar Technologies.

“At the very beginning stages of design and development of a product, a technique called ‘security by design’ is used in an effort to standardize cybersecurity protocols across the R&D department. Once a product is released, Vanderbilt continues to address potential vulnerabilities that are found through vulnerability testing. This includes analysis of the type of cyberattacks that can potentially attach, breach and disable a system,” said Ross Wilks, Head of Marketing Communications at Vanderbilt. “Vanderbilt has also implemented Flexible Secure Communications Protocol (FlexC), which is a multipath, multi-redundant, highly encrypted communications protocol that allows secure monitoring and control of IP communication paths. This protocol was built from the ground up solely with cybersecurity in mind.”

“Continuously improving our security posture means building security into our products and shifting our mindset. Some of our teams have started using Protection Poker – an agile game for mitigating risk – to assess potential risks associated with application features. This encourages the team to think about security issues early in the design process and to build mitigation plans for addressing potential gaps,” said Tracy Kemp, SVP and Chief Customer and Digital Officer at Allegion. “Cyber range competitions use gamification, intentionally vulnerable applica-





Daniel Lee, Managing Director, APAC, Genetec



Thomas Schulz, Director, Marketing and Communications, EMEA, ASSA ABLOY



Alex Tan, ASEAN Sales Director, Physical Access Control Solutions, HID Global



Ross Wilks, Head, Marketing Communications, Vanderbilt

tions and websites for hands-on hacking. Team members learn how applications are attacked by actively exploiting application elements of a simulation. Embracing modern tools in the marketplace and building cybersecurity knowledge and capabilities help Allegion to promote a secure and resilient operating environment.”

Closely related to AI and cybersecurity is privacy, as data is being collected from various sources to training and analysis purposes. How to keep this data secure and private, then, becomes an important topic.

“As the industry adopts best practices for meeting rigorous GDPR and other privacy guidelines, they will also need to address emerging issues as trusted identity solutions ingest growing volumes of new types of data so they can make more intelligent authentication decisions and train themselves to optimize the user experience,” said Alex Tan, ASEAN Sales Director for Physical Access Control Solutions at HID Global.

Access Control

As for access control, opportunities abound as well, thanks largely to IoT and the data connected devices generate. “There are new, more flexible subscription models such as access control services that provide mobile ID replenishment if users lose or must replace their smartphones. There is the opportunity to create more connected and seamless building experiences for users by removing integration barriers between access control systems and smart building applications, services and IoT use cases. And there is the opportunity to generate valuable insights from today’s access control solutions, using machine learning analytics to improve security, personalize the user experience and make better business decisions. We are pursuing each of these opportunities and more with our growing portfolio,” Tan said.

Wireless solutions, meanwhile, continue to bring opportunities in access control. “The major trend that translates strongly into sales is continued rapid growth of wireless solutions for access control. Wireless locking devices bring added convenience, lower installation and maintenance costs and reduced energy consumption,” said Thomas Schulz, Director of Marketing and Communications for EMEA at ASSA ABLOY. “Data picked up by a survey for ASSA ABLOY’s most recent ‘Wireless Access Control Report’ is relevant here. Among installers and integrators polled for the report, three-quarters agreed wireless solutions are easier, quicker and more cost-effective to install. The market increasingly understands these advantages, reflected in growing sales.”

Intrusion Detection

In the intrusion detection space, fiber optic technologies continue to be a popular for both fence-mounted and buried perimeter detection applications. “Magal/Senstar recently introduced the FiberPatrol FP400 fiber optic zone-reporting intrusion detection sensor for smaller perimeters. Each processor provides up to four zones of detection and supports non-sensing lead-in cable, enabling electronics to be installed up to 20 kilometers from the secured perimeter,” said Dror Sharon, CEO of Magal Security Systems. “The FP400 joins Senstar’s FiberPatrol product family which includes fence-mounted intrusion detection options for sites of all sizes, as well as a buried option. The product line is ideal for long distance security by means of advanced intrusion detection systems, for example, on borders and buried pipelines.”

Adding Intelligence to Improve Efficiency

Over the course of last year, security vendors have taken part in complex projects across verticals. In these projects, the end



user is aiming to have their security as well as non-security needs – for example process and efficiency improvement – addressed.

Retail

In retail, for example, storeowners are now in constant need to understand customer behavior, so as to optimize store layout and provide a better shopping experience amid higher competition. Various types of video analytics, from people counting and queue management, can help in this regard. Video integrated with POS, further, can help determine how many visitors to a store have actually made a purchase, thus helping the retailer figure out better sales and marketing strategies.

There are also integrated solutions that enable customers to better engage with products. “We just announced an expanded partnership with Les Bouchages Delage, a company that makes specialty bottle closures. We had originally worked with them in creating intelligent NFC closures for a luxury cognac brand, but now we’re bringing our NFC technologies into a wider array of Les Bouchages Delage caps,” said Mark Allen, GM for Premises at Identiv. “The idea here is to allow consumers to better engage with their product, the bottle of wine or spirits. Consumers can tap their Android or iOS device to the cap of the bottle and easily register their purchase and receive special offers. It’s about expanding the use of technology to increase customer engagement, which is a win for everyone.”

Utilities/Manufacturing

Then there’s utilities and manufacturing, where operators rely more and more on video integrated with other factory automation systems for inspection quality control and preventive maintenance.

“Today, utilities are starting to use our thermal security cameras for perimeter protection as well as our radiometric thermal cameras, integrated with temperature trending software, for predictive maintenance,” said Daniel Gundlach, GM and VP of Security at FLIR Systems. “The data from the software allows facility managers to remotely inspect equipment and identify any asset at risk of overheating prior to burnout. The result is substantial savings for the customer.”


“In one particularly challenging application, IDIS surveillance needs to integrate with remotely controlled bridge cranes, in order for operators to accurately synchronize between real-time video images and the operation of the cranes,” Jun said. “Camera views had to be aligned with the laser positioning system and the entire new system had to be deployed within the tight window of the site’s 20-day annual maintenance shutdown. Now, as an operator control the crane, the system switches views

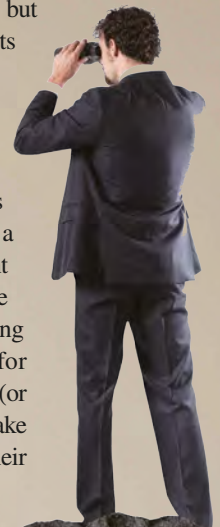
automatically between camera presets, while IDIS real-time IP video transmission allows the crane movements to be optimized with no delay. The result is not only improved performance and safety, but now all processes are backed by a full visual audit trail.”

Transportation/Smart City

In transportation, security equipment is often used to smoothen traffic flow or perform other management tasks. Cameras integrated with a traffic management system, for example, can allow self-adaptive traffic light to adjust the length of red or green signals based on the present traffic condition, or help operators make better transportation plans. “We’re seeing examples of cities deploying our thermal cameras with Acyclica, our traffic management software, to improve mobility,” Gundlach said. “While the thermal cameras detect vehicles, the software analyzes destination statistics, travels times and arrival on red or green lights. All of this data helps cities understand traffic patterns and congestion so that steps can be taken to improve traffic flow.”

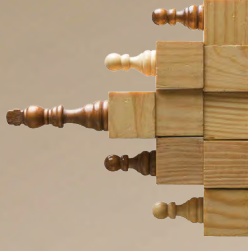
Venue Management

More and more, access control can be integrated with other technologies to enhance not only security but also management. “Recently, Vanderbilt used its ACT365 cloud-based access control and video management solution to help the Lawn Tennis Association (LTA), which wanted to maximize the use of their facilities by getting as many people on to their courts every day as possible. The ACT365 solution integrated with a platform called ClubSpark, a venue management tool from Sportlabs. It allows tennis courts to be booked through a simple process, while allowing users to have remote management control for analyzing door status within a specific facility (or chain of them),” Wilkes said. “Tennis players make and pay for bookings using ClubSpark from their mobile devices, then receive a text message with a pin code that is also communicated to ACT365. When players arrive at the court, they enter the code into a reader that opens the court gate.” 





Special Feature



TOP 50 GLOBAL SECURITY COMPANIES

| 2019 | 2018 | Company | Headquarters | Product Group | 2018 Revenue (US\$ Million) | 2017 Revenue (US\$ Million) | Revenue Growth (2017-2018) | 2018 Gross Profit (US\$ Mil.) | Gross Margin 2018 | 2018 Net Profit (US\$ Million) |
|------|------|---|--------------|------------------------------|-----------------------------|-----------------------------|----------------------------|-------------------------------|-------------------|--------------------------------|
| 1 | 1 | Hikvision Digital Technology | China | Multiple | 7038.96 | 6008.80 | 17.14% | - | - | - |
| 2 | 2 | Dahua Technology | China | Multiple | 3574.88 | 2846.59 | 25.58% | 418.91 | 11.7% | 391.9 |
| 3 | 3 | Assa Abloy (Electromechanical and Electronic Locks) | Sweden | Entry System | 2897.21 | 2362.06 | 22.66% | - | - | - |
| 4 | 4 | Bosch Security Systems | Germany | Multiple | 2334.91 | 2272.41 | 2.75% | - | - | - |
| 5 | 5 | Axis Communications | Sweden | Multiple | 1180.94 | 988.46 | 19.47% | 616.07 | 52.2% | 116.9 |
| 6 | 6 | Flir Systems (Commercial, Government and Defense) | US | Video Surveillance | 1057.80 | 1128.31 | -6.25% | - | - | - |
| 7 | - | Uniview Technologies | China | Video Surveillance | 614.80 | 468.28 | 31.29% | - | - | 71.0 |
| 8 | 7 | Allegion (Electronic Products and Access Control) | US | Entry System | 573.66 | 505.72 | 13.43% | - | - | - |
| 9 | 9 | Tiandy Technologies | China | Video Surveillance | 544.14 | 476.72 | 14.14% | 54.57 | 10.0% | 54.1 |
| 10 | 25 | IDIS | Korea | Video Surveillance | 505.43 | 398.17 | 26.94% | 138.46 | 27.4% | - |
| 11 | 8 | Hanwha Techwin | Korea | Video Surveillance | 505.10 | 527.55 | -4.26% | 236.89 | 46.9% | - |
| 12 | 16 | TKH Group (Vision & Security Systems) | Netherlands | Multiple | 457.71 | 421.98 | 8.47% | - | - | - |
| 13 | 11 | Aiphone | Japan | Entry System | 419.63 | 408.54 | 2.71% | - | - | 20.7 |
| 14 | 12 | Infinova | China | Video Surveillance | 320.60 | 274.39 | 16.84% | - | - | - |
| 15 | 15 | CP Plus | India | Video Surveillance | 229.95 | 169.22 | 35.89% | 50.35 | 21.9% | 9.4 |
| 16 | 17 | Nedap | Netherlands | Multiple | 181.86 | 178.38 | 1.95% | - | - | - |
| 17 | 20 | Kedacom | China | Video Surveillance | 175.40 | 131.28 | 33.61% | - | - | - |
| 18 | 14 | VIVOTEK | Taiwan | Video Surveillance | 168.23 | 182.62 | -7.88% | - | - | - |
| 19 | - | Megvii Technology | China | Video Surveillance | 159.70 | 25.37 | 529.40% | 103.47 | 64.8% | - |
| 20 | 21 | KOCOM | Korea | Home Security | 148.66 | 130.01 | 14.34% | 40.63 | 27.3% | - |
| 21 | 19 | Milestone Systems | Denmark | Video Surveillance | 147.88 | 139.44 | 6.05% | - | - | - |
| 22 | 18 | Raysharp | China | Video Surveillance | 144.22 | 140.68 | 2.51% | - | - | - |
| 23 | 22 | Commax | Korea | Entry System & Home Security | 131.21 | 127.38 | 3.01% | 27.99 | 21.3% | - |
| 24 | 13 | Optex (Security Sensors) | Japan | Intrusion Detection | 130.23 | 126.20 | 3.20% | - | - | - |
| 25 | 23 | Tamron (Commercial / Industrial Use Optics) | Japan | Video Surveillance | 115.36 | 107.11 | 7.70% | - | - | - |
| 26 | 26 | TVT Digital Technology | China | Video Surveillance | 92.11 | 78.88 | 16.77% | 0.56 | 0.6% | 0.6 |
| 27 | 24 | Napco Security Technologies | US | Multiple | 79.74 | 79.44 | 0.39% | - | - | - |
| 28 | 27 | Mobotix | Germany | Video Surveillance | 78.27 | 77.23 | 1.36% | - | - | 0.5 |
| 29 | 30 | Suprema | Korea | Entry System | 77.10 | 67.74 | 13.82% | 37.63 | 48.8% | - |

| | | | | | | | | | | |
|----|----|---|--------|------------------------------|--------------|-------|---------|-------|--------|------|
| 30 | 31 | Fermax | Spain | Entry System & Home Security | 73.84 | 66.36 | 11.28% | 42.11 | 57.0% | - |
| 31 | 33 | Identiv | US | Entry System | 71.99 | 56.40 | 27.64% | - | - | - |
| 32 | 29 | Wanjiaan Interconnected Technology | China | Video Surveillance | 70.90 | 67.87 | 4.47% | - | - | - |
| 33 | 28 | DynaColor | Taiwan | Video Surveillance | 68.72 | 73.36 | -6.33% | 24.52 | 35.7% | 9.9 |
| 34 | 32 | Synectics (System Division) | UK | Video Surveillance | 65.23 | 61.42 | 6.21% | 5.05 | 7.7% | - |
| 35 | 36 | Costar Technologies | US | Video Surveillance | 58.91 | 44.27 | 33.07% | 21.75 | 36.9% | -2.9 |
| 36 | 38 | C-PRO Electronics | Korea | Video Surveillance | 54.07 | 46.63 | 15.94% | 14.96 | 27.7% | - |
| 37 | 34 | GeoVision | Taiwan | Video Surveillance | 49.10 | 52.65 | -6.75% | 16.37 | 33.4% | 1.9 |
| 38 | 39 | IndigoVision | UK | Video Surveillance | 45.96 | 42.10 | 9.18% | 26.40 | 57.4% | -0.4 |
| 39 | 46 | Magal Security Systems | Israel | Multiple | 37.09 | 30.65 | 21.00% | - | - | - |
| 40 | 41 | Hitron Systems | Korea | Video Surveillance | 37.04 | 34.14 | 8.52% | 7.16 | 19.3% | - |
| 41 | 42 | Vicon Industries | US | Video Surveillance | 27.73 | 26.65 | 4.06% | 11.20 | 40.4% | - |
| 42 | 45 | Hi Sharp Electronics | Taiwan | Video Surveillance | 25.42 | 24.99 | 1.73% | 5.26 | 20.7% | 0.5 |
| 43 | 43 | ITX Security | Korea | Video Surveillance | 25.14 | 28.25 | -11.02% | 4.25 | 16.9% | - |
| 44 | 35 | Zeno Technology (Videopark) | China | Video Surveillance | 21.86 | 48.84 | -55.25% | -4.65 | -21.3% | -4.4 |
| 45 | 44 | ACTI | Taiwan | Video Surveillance | 19.34 | 25.74 | -24.87% | 7.88 | 40.7% | -2.1 |
| 46 | 47 | EverFocus Electronics | Taiwan | Video Surveillance | 14.08 | 18.84 | -25.28% | -0.14 | -1.0% | -6.1 |
| 47 | 49 | AV TECH | Taiwan | Video Surveillance | 11.75 | 12.83 | -8.49% | - | - | - |
| 48 | - | iCATCH | Taiwan | Video Surveillance | 9.53 | 10.75 | -11.35% | 1.38 | 14.4% | -0.3 |
| 49 | 50 | HUNT Electronic | Taiwan | Video Surveillance | 8.19 | 9.05 | -9.48% | 1.84 | 22.5% | -0.7 |
| 50 | - | Everspring Industry | Taiwan | Intrusion Detection | 7.62 | 11.73 | -35.05% | - | - | - |

ABOUT SECURITY 50

For 17 consecutive years, a&s Security 50 has been ranking the top 50 companies in the entire security industry, which have the highest product sales revenue in the world. The ranking aims to demonstrate the dynamics of the security industry throughout diverse market variables. And these industry leaders beat the market and world economy by addressing core solution needs.

a&s Security 50 is more than just technology and product promotion; it is also about forging stronger bonds among global security elite and presenting unique, original views on corporate management, R&D, business development, brand building, partner selection and much more.

a&s team ranks global manufacturers solely by product sales revenue, gross profit, profit margin, and net profit, which were listed in their public financial reports for the 2018 fiscal year. Participants range from exclusive manufacturers to end-to-end solution providers.

Eligibility of a&s Security 50 Candidates for 2019:

- Electronic security equipment and software systems providers, including video surveillance, access control, intrusion detection, key component, and multiple product segments
- Security companies or pure manufacturers with their own products, systems, brands, or solutions
- Distribution, systems integration, reselling, dealing, installation, guard service providers, information security, and fire safety companies and other related revenues are excluded
- Ability to provide FY 2018 and FY 2017 financial statements, audited/endorsed by certified accountant or accounting firm
- Publicly-listed companies as well as a small portion of privately-owned, multinational companies who are willing to share their certified annual reports. Their qualification will be carefully verified by the a&s editorial team, in terms of their brand awareness and market share in the international market.

Notes to the Financial Figures:

a&s bears no responsibility for the financial information provided by any individual company. For fair comparisons, non-US currencies were converted using midmarket exchange rates from yearly average currency exchange rates announced by Internal Revenue Service (IRS), the US tax collection agency and administers the Internal Revenue Code enacted by Congress. This is an unbiased list based on the willingness of participants to share their sales performance.

