Buyer's Guide

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Drones

- √ Exclusive interviews with top brands
- √ Key trends
- √ Pricing guide
- √ Industry overview
- √ 15 export-ready suppliers
- √ 10 trendy drones

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Buyer's Guide to drones

An exclusive and in-depth report on the key and emerging trends in drones, including a product guide, 15 profiles of export-ready suppliers, 10 trendy products, market forecast and exclusive interviews.

Big China brands drive drones growth

With emphasis placed on OBM, China is home to multimillion dollar corporations that are also the top global names in the fledgling industry.

Historically a military product, drones are poised to boom in the mainstream in the next several years.

In a 2014 market study, the Teal Group forecast that global spending for drone technology R&D in the next decade will reach $11.5 billion every year. At present, the annual investment is about $6.4 billion.

Leading the growth is China, which Teal estimates will account for 12 percent of global drones investment between 2011 and 2020. Xiong Yifang, Ehang Technologies Co. Ltd co-founder, said there are already more than 170 drone manufacturers in China. New players are joining the line, enticed by the low technical barriers, particularly in producing low-end drones.

Wang Jidong, deputy director of the helicopter institution Beijing University of Aeronautics and Astronautics, echoed this sentiment, adding that companies in China can easily purchase components and "assemble" a drone.

This does not mean, however, that all drone makers there are small. China, in fact, is home to some of the biggest drone brands in the world as companies aggressively pursue OBM instead of following the traditional China manufacturing mold where the focus is on OEM products.

Ehang is one of the top-tier homegrown drone brands. The company closed recently $10 million in Series A funding led by GGV Capital. Investors in the round are entrepreneurs Xiaoping Xu and Nick Yang, and PreAngel.

Ehang's Ghost quadcopter is controllable via smartphone app.

Shenzhen DJI-Innovations Co. Ltd, meanwhile, controls about 50 percent of the global market for small UAVs. The market is worth between $250 million and $300 million. DJI's sales have increased three- to five-fold every year since 2009.

Civilian drones rise

Globally, civilian drones and those used in various businesses will drive industry growth.

Gretchen West, executive vice president of the Association for Unmanned Vehicle Systems International, told iMedia that drone technology boosts an industry's efficiency. "With precision agriculture, for example, it can take pictures of fields so farmers can identify problems they wouldn't necessarily see walking through the woods."

This strong business growth potential is luring even more global giants into commercial drones. Google, for instance, has acquired drone manufacturer Titan Aerospace while Facebook spent $20 million to buy aerospace company Ascenta.

In China, Xiong of Ehang also noted the growing popularity of drones outside the military. In an exclusive interview with Global Sources (see page 97), he named several industries now adopting drones, including real estate, landscape mapping, express delivery services and entertainment. Drones designed for such applications, however, are quite expensive and require special skills to maneuver them properly.

Ehang's Skyway is an example of these high-tech drones. The professional-use hexacopter suits various industries, including agriculture, public security, telecommunications and forest protection.

Meanwhile, the DJI Inspire 1, DJI's latest, is the world's first flying 4K camera.

Guangzhou XAircraft Electronic Technology Co. Ltd is developing the XMission. The multitasking weather-resistant UAV system is for law enforcement, medical rescue, forest fire prevention, geological prospecting and exploration, surveying and arctic expedition.

This is not to say, however, that China's drones selection is limited to just sophisticated designs for commercial use. Because of the significant overlap between R/C toys and small civilian-use UAVs, many China toy suppliers are actually positioning their drones as high-end toys.

Drones basics

Drones are available in several types, including unmanned helicopters, fixed-wing and multirotor aircraft, airships and parawings. Depending on their use, such models can be classified as military, commercial or civilian drones.

This convertible drone from DJI has a 4k camera.

Military drone applications include military strikes, border patrol, crisis management, disaster monitoring, and search and rescue. The latter two can also be done using certain types of commercial drones.

Commercial types suit aerial photography, survey and mapping, transportation, plant and environment protection, agriculture, data collection and filming.

Civilian or consumer drones, on the other hand, are often smaller and more portable. They fly relatively shorter distances than their military and commercial counterparts, and are designed for recreational purposes such as taking pictures.

Drones have a variety of components depending on their intended use, but they share several key parts:

Power system: The power system consists of the motor, battery, fuel tank, solar panel and propeller. Military, commercial and civilian drones differ on the power source they use. Military drones normally run on fuel that powers an internal combustion engine although some types use solar energy. Certain commercial and smaller UAVs, on the other hand, have an electric motor and a battery.

Flight control system: The flight control system is the key component that differentiates drones from flying

R/C toys as it ensures stable and safe performance. Flight control and signal transmission chipsets, rudders, accelerometers, pressure sensors, ultrasonic altimeter, gyroscopes and GPS are among the components that make up a flight control system.

Functional module: Cameras, loading shelves and data collection devices are examples of functional modules. Drones can also be equipped with other functional modules, including a PTZ camera, humidity sensor and 3D scanner, depending on their application.

Others: Landing gears, LED indicators and anti-vibration bumpers are used for indication, decoration or protection. They also help provide users with better control of the drone.

The XAirway model from XAircraft works even in extreme weather conditions.

The table below lists the different types of drones available from China, and their key specifications and price range.

	Low-end	Midrange	High-end
Price	Below $30	$30 to $5,000	More than $5,000
Classification	Toy or R/C product	Low-speed UAV	Military or other functional drone
Engine type	Electronic motor	Electronic motor	Internal combustion or solar-powered engine
Battery life	3 to 10 minutes	8 to 60 minutes	30 minutes to 30 days or more
Load capacity	0kg	0.5 to 9kg	More than 9kg
Interaction	Eye contact	Real-time view	Real-time view, satellite
Function	Flight	Aerial, security, selfie, data collection	Survey and mapping, agriculture, tourism, communication
Sensors	None	Pressure sensors, utrasonic altimeter, accelerometers, gyroscopes, GPS	All sensors in midrange drones, thermal sensors, humidity sensors, radar, light detectors, obstacle sensors
Stability	Low	Normal	High
Control	Remote control	Remote control with signal sender and receiver	Professional control station
Signal transmission	PWM	IR ray, Wi-Fi	IR ray, satellite signal
Effective working range	Less than 15m	Less than 1,000m	Less than 30km
Working height	Less than 5m	Less than 1,000m	Less than 3 to 5km
Speed	1 to 3m/s	10 to 30m/s	30 to 400m/s

Supplier comparison table

Company name	Location	Year established	Number of employees	Total annual revenue for all products (US$ million)
Beijing Micropilot UAV Control System Ltd	Beijing	2002	11 to 50	Below $1
Digital Eagle Technology Co. Ltd	Wuxi	2013	30	$1
Guangdong Attop Technology Co. Ltd	Shantou	2002	500 to 549	$30 to $35
Guangdong Syma Model Air Craft Industrial Co. Ltd	Guangdong	2008	501 to 1000	$10 to $50
Guangzhou Ehang Technology Co. Ltd	Shenzhen	2014	100	Choose not to disclose
Guangzhou Walkera Technology Co. Ltd	Panyu	1994	1,000 to 1,499	$4 to $5
Guangzhou XAircraft Electronic Technology Co. Ltd	Guangdong	2007	More than 200	$16.2 to $32.4
Huizhou Iflight Model Co. Ltd	Huizhou	2014	52 to 100	$1
Shenzhen AEE Technology Co. Ltd	Shenzhen	1995	1,500	Choose not to disclose
Shenzhen Art-tech R/C Hobby Co. Ltd	Shenzhen	2002	400 to 449	$10 to $15
Shenzhen DJI-Innovations Co. Ltd	Shenzhen	2004	2,800	Choose not to disclose
Shenzhen Speedwolf Optoelectronics Co.Ltd	Shenzhen	2006	51 to 100	$1.6 to $8
Shenzhen X-Viki Technology Co. Ltd	Shenzhen	2014	51 to 100	$2.5 to $5
Shenzhen Zhehua Technology Co. Ltd	Shenzhen	1992	1,500 to 1,999	$25 to $30
Wuhan Aibird UAV Co. Ltd	Wuhan	2010	51 to 100	$1 to $2.5

Percentage of exports	Main markets	Number of R&D employees	Output share (RC products vs. drones)	In-house brand	
31% to 40%	Asia, Africa	5 to 10	0% vs. 100%	N/A	
30%	N/A	20	0% vs. 100%	Digital Eagle	
75% to 79%	North and South America, Eastern Europe	60 to 69	98% vs. 2%	N/A	CONTACT SUPPLIER
90%	Western Europe, Southeast Asia, Middle East	Less than 5	97% vs. 3%	Syma	CONTACT SUPPLIER
More than 70%	US, Europe	40	0% vs. 100%	Ehang	
Over 50%	Eastern Europe	More than 99	0% vs. 100%	Walkera	CONTACT SUPPLIER
Choose not to disclose	Choose not to disclose	160	0% vs. 100%	XAircraft	
100%	South America, South Asia, Southern Europe	5 to 10	0% vs. 100%	iFlight	
Choose not to disclose	Choose not to disclose	500	0% vs. 100%	AEE	
More than 60%	Eastern Europe, North America, Middle East	More than 50	95% vs. 5%	N/A	
Choose not to disclose	US, Europe	About 500	0% vs. 100%	DJI	
More than 95%	Europe, North America	11 to 20	0% vs. 100%	Speedwolf	
90%	North America, Western Europe, Southeast Asia	5 to 10	20% vs. 80%	X-viki	
85% to 89%	North America	50 to 59	25% vs. 75%	N/A	CONTACT SUPPLIER
41% - 50%	Western Europe, Middle East, North America	5 to 10	0% vs. 100%	Aibird	

10 recently launched aerial drones

These 10 aerial drones from China, handpicked by our Market Analysts, are the latest civilian-use UAVs to hit the market.

China manufacturers are bolstering the production of UAVs or civilian-use drones, predicted to be the next $10 billion industry.

The latest selection boasts a range of applications, from agriculture, real estate and public safety to photography and cinematography.

Makers are launching user-friendly units, many of which can be controlled via smartphone apps and Wi-Fi. Some integrate intelligent features, including auto-return, -circling and -pilot

Models can cover a radius of up 4,000m and travel at speeds exceeding 10m/s. Flight duration ranges from 15 to 30 minutes.

The products in this gallery represent current trends in civilian-use drones.

Quadcopter controlled via smartphone app

Ehang Technologies Co. Ltd offers the model Ghost quadcopter that can be controlled via smartphone app. The app, which is included in the package, can maneuver the drone using a signal transmitter and receiver within a 1,000m radius at speeds of 6 to 15m/s. The model is equipped with a camera that rotates 360 degrees. Charging time is three hours while flight time is 18 to 23 minutes on a full charge. The UAV measures 360x100mm and weighs 650g. It lists at $650 to $700.

Convertible drone incorporates 4K 1,276MP PTZ camera

The Phantom Inspire 1 model from Shenzhen DJI-Innovations Co. Ltd is a convertible drone equipped with a 4K 1,276MP PTZ camera that provides a 360-degree view. The camera is replaceable. Nine lenses are also included in the package. The drone measures 438x451x301mm and weighs 2,935kg. It is powered by a 5,700mAh battery that is good for 18 minutes of flight. The model goes for $2,899.

UAV withstands extreme weather conditions

With its frame made of high-strength material, Guangzhou XAircraft Electronic Technology Co. Ltd's XAirway model is capable of carrying a maximum of 10kg within 20km. The UAV comes with an aerial-lifting platform, payload mechanism, autonomous landing platform and scheduling dispatch system. The drone's battery can support up to 40 minutes of flight. It can operate in extreme weather conditions, scan surrounding airspace and avoid obstacles.

Drone features level 5 wind resistance

Designed for mapping, firefighting, and aerial monitoring, Digital Eagle Technology Co. Ltd's model YFT-20A drone has a length of 1,100mm and a wingspan of 1,718mm. Flight time is between 40 and 60 minutes while maximum load capacity is 1.5kg. The UAV has level 5 wind resistance at a height of 1,000m. An FPV camera and a real-time video transmission system can also be integrated. Price is $10,483.

Quadcopter transforms into octocopter

The model Scout X4 drone from Guangzhou Walkera Technology Co. Ltd can transform easily from a quadcopter into an octocopter. The UAV's movements can be controlled via a single button. These include takeoff, route cruise, GPS hover, and auto-return, -follow up and -circling. It is powered by a 5,400mAh battery that is good for 25 minutes of flight. The drone can cover distances of up to 2km and incorporates a battery indicator. Product dimensions are 335x335x275mm while weight is 2,270g. Price is $1,548.

Drone transmits real-time images via Wi-Fi

Shenzhen AEE Technology Co. Ltd's TORUK AP10 model can be controlled by Android smartphones via Wi-Fi. Users can install the app on their smartphones and receive real-time images from the drone. The UAV can ascend up to 500m at speeds of 20m/s. The model's 5,300mAh can support 20 minutes of flight time. The drone returns automatically to its last known location once it experiences reduced Wi-Fi range.

Quadcopter equipped with HD FPV camera

Priced at $280 to $380, Shenzhen Speedwolf Optoelectronics Co. Ltd's model 1080HD FPV camera quadcopter can cover 800m at speeds of 35m/s. The UAV adopts a 10,000mAh battery for 30 minutes of flight. It can hold an additional 1.2kg with a maximum power of 616W. Overall dimensions are 370x370x92mm. Weight, excluding the battery, is 1,100g.

Octocopter designed for aerial photography

The Octocopter BAT X900 model from Shenzhen X-Viki Technology Co. Ltd is designed for aerial photography and utilizes a carbon fiber frame. The drone can ascend up to 300m and cover 2,000m at 10.2m/s. It weighs 3.35kg and has a maximum load capacity of 7.7kg. Flight time is 35 minutes. The product is quoted at $4,099.

UAV integrates 4.3in LCD

Shenzhen Zhehua Technology Co. Ltd's H301S model UAV uses a catapult to take off. It is equipped with a 1080p camera on the front and shows real-time videos on its 4.3in LCD screen. Its navigation system utilizes a compass and GPS that enables it to travel up to 1,000m. Flight duration is 30 minutes. The drone has a 1,000mm wingspan and weighs 355g. The model also comes with auto-return and -pilot functions. Price is between $235 and $260.

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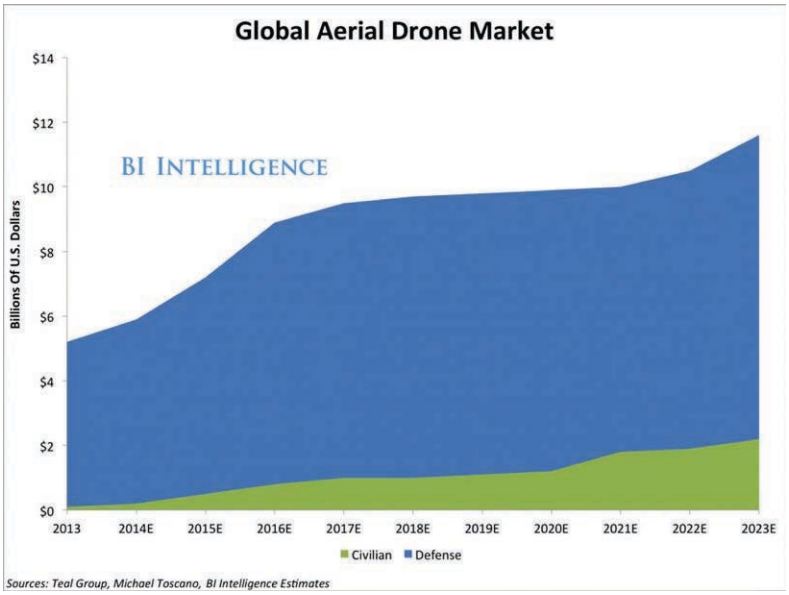
UAV travels at 110kph

Wuhan AIbird UAV Co. Ltd offers the model KC 3000 mapping drone that comes with fixed wings. It is catapulted to take off and can ascend up to 4,000m at a maximum speed of 110kph. Flight duration is eight to 10 hours. The model operates within a 60km radius and returns to its last position once out of range. It has a level 6 wind resistance and is powered by a gasoline engine. Users can preset the flight plan via a system app and the drone will cruise via the built-in chipset.

Global consumer drone market to reach $130 million in 2015

Drones are typically visualized as being large, commercial or military aircraft costing millions of dollars with equally complicated and expensive control systems.



However, 2014 saw the introduction of a wide variety of small, relatively inexpensive, consumer-oriented drones, typically controlled by a simple control system or even using a smartphone or tablet. These consumer drones typically feature a high definition camera, a means of transmitting video or other data to the cloud or device, and a price tag of $500 or less.

According to the Consumer Electronics Association, the market for consumer drones in 2015 is expected to grow to as large as $130 million, up 55 percent from 2014. Overall, the association expects an average selling price of consumer drones to dip as low as $325, a fairly significant reduction from 2014. The overall market is still in its infancy, with only four companies exhibiting at CES in 2014 and 16 exhibiting in 2015 – a far cry from the hundreds of vendors present in the many other categories at the show.

What is driving the industry? In part, the technology has become far less expensive and software developers have made the interface much simpler. Autonomous capabilities and IP have become more widespread and the spillover from military and commercial autonomous drone research has also become a significant enabler for the industry. Second, but no less important, is the adoption of drones. While many new drone companies like Trace are focusing on extreme sports despite being an inherently small market, some are trying to break into other markets. Parrot, a market leader in the enthusiast space who sells its smartphone-controlled UASs for about $500, has seen significant success in this market. Agriculture, real estate, sporting or other events and even the ubiquitous selfie trend, are increasingly seen as viable markets for drones to expand into.

Enabling this trend are the increasing ubiquity and inexpensiveness of a variety of sensors. The smartphone revolution, with the accompanying increase in the density of sensors, has made the component level much less expensive for prospective drone makers.

On the other hand, there are some concerns that could restrain the industry significantly, and the biggest by far is government regulation of airspace. While small consumer drones like Nixie are unlikely to run into trouble, larger drones are more likely to come under scrutiny from government agencies such as the FAA in the US and the European Commission in the EU. Larger consumer and commercial drones used in the agricultural industries have already been scrutinized, and sometimes banned, due to concerns about airspace usage.

The other concern is price; despite the expected drop in price for camera-equipped consumer drones in 2015, the lowest-priced drones in 2014 were still around $400, a price that is quite expensive unless the buyer is a true enthusiast. Driving prices down must be a key facet of every company in the industry if large numbers of the devices can be expected to be sold.

DJI dominates civilian drones line

The company talks about being among the industry's leaders, and its current selection and future plans.

Shenzhen DJI was established in 2006 and has since grown to become one of the leading brands of civilian-use drones in the world. Models from the company span a variety of applications, ranging from farming, real estate and firefighting to tourism, wildlife monitoring and archeology.

The company produces both professional and consumer-grade units. Future R&D endeavors are geared toward cultivating consumer-grade drones.

Below are excerpts of Global Sources' exclusive interview with PR manager Michael Perry about the company's strengths and future plans.

Global Sources: What are the main functions of drones and which market segments are these products targeted at? Does DJI see new functions and target markets emerging in the near future?

Michael Perry: New applications of this technology are emerging. In real estate, for instance, agents are using our drones to get aerial views of houses for sale or get a vantage point from a high-rise building. Archeologists are using our drones to get a bird's eye view of ancient structures. Miners and farmers use our aerial systems for 3D mapping and instant surveying.

Even performing arts outfits, including Cirque du Soleil, and rock icon John Cale have used our drones in their performances. Football teams at Stanford and UCLA are using the DJI technology to train and map out plays. Educators use our aerial systems to help teach students about science, technology, engineering and math.

GS: Describe domestic and international drones demand.

MP: Our company has seen revenue increases of three to five times each year. This speaks volumes on the growing popularity of these products.

GS: What are the factors driving growth in the industry? How about hindrances? How does DJI deal with challenges?

Michael Perry, PR manager at DJI

MP: For our vision to succeed, we need to bring in the best and the brightest engineers and creative thinkers. In the past several years, we have recruited the top engineering talents in the region to ensure that our products are the most groundbreaking and of the highest-quality in the field.

GS: What are your main products and target markets?

MP: We have the Phantom series, which has become the benchmark for all small quadcopters because it provides everything out-of-the-box. It is reliable, high-performing and easy to use. Our star product, Phantom 2 Vision+, is a smart unmanned, RC aircraft with an integrated, stabilized and high-definition video camera.

Our newest product is the DJI Inspire 1, the world's first flying 4K camera. The DJI Inspire 1 features a built-in HD video transmitter that allows midair transformation, stabilization and maneuverability without the use of GPS.

User-friendly controls, smart features propel Ehang's drones

The company talks about how smartphone-controlled releases bring them closer to mass consumers.

Ehang Technologies Co. Ltd's releases abandon conventional remote controls in favor of smartphone apps. This allows the company to launch drones that require no special skills to operate and integrate intelligent features that can be done only via software. The company views this as an effective strategy to popularize its products to end-users.

Below are excerpts of Global Sources' exclusive interview with co-founder Xiong Yifang about the company's main goals and R&D thrusts.

Global Sources: Discuss the primary functions of civilian-use drones. What are the main target markets? Does your company see new functions and markets emerging in the near future?

Xiong Yifang: The technology involving drones is developing rapidly that it is no longer exclusively for military use. Today, many industries are using drones, including real estate, landscape mapping, express delivery services and entertainment. These releases, however, often take special skills to maneuver and are expensive. Most are limited to professional use.

Ehang's goal is to bring drones closer to the end-consumers by making the units easy-to-control and by incorporating smart features. Our company makes it possible for users to control UAVs via smartphone apps. Features include point-to-point flight and an auto-follow and tilt mode, that allows users to change the direction of the drone just by tilting their smartphones.

GS: What are your company's main products? How about target markets?

XY: Ghost is a quadcopter targeted at the mass market, including filmmakers, photographers, sports enthusiasts, travelers, adventurers, GoPro owners and

Xiong Yifang, co-founder of Ehang

first-time or inexperienced drone users. Ghost Aerial and Ghost Aerial Plus come with a 2D gimbal system and a sports camera for an optimal aerial filming experience.

Skyway, meanwhile, is a professional-use hexacopter that can be used in various industries, including entertainment, agriculture, public security, telecommunications, electronics and forest-protection.

We are integrating more intelligent features in our products because we believe that this is the main R&D thrust in the industry. Rather than complicated remote controls, our products can be maneuvered using simple smartphone apps. This will greatly help in the popularization of drones.

GS: What are you strategies moving forward?

XY: We are confident that our company's rapid growth will continue in coming years. To achieve this, we must constantly find ways to perfect our products. Innovative features and user-friendliness are key.

XAircraft parades multifunction UAVs

The company talks about its product selection, which includes multitasking weather-resistant drones.

Guangzhou XAircraft Electronic Technology Co. Ltd was founded in 2007 and specializes in the design and manufacture of civilian-use UAVs and flight-control systems. It is based in Guangzhou, Guangdong province and has branches in Beijing and Australia. The company's releases boast a range of applications from aerial photography and cinematography, mapping and surveying to law enforcement and public safety.

In an exclusive interview with Global Sources, co-founder Justin Gong highlights the company's releases and the role it plays in the developing drones industry. Below are excerpts from the discussion.

Global Souces: What are the primary functions of drones? What is the product line's target market? Do you see new functions and target markets emerging in the near future?

Justin Gong: Most civilian-use drones are primarily used in aerial photography. These devices can also be utilized in law enforcement, medical rescue, forest fire prevention, geological prospecting and exploration, surveying and arctic expedition.

Currently, we are developing the XMission, a multitasking weather-resistant UAV system with the aforementioned functions. XAircraft is also working with an international logistics company in developing a low-altitude airspace logistics UAV system, which we expect to be huge in the market in coming years.

GS: How does XAircaft deal with industry challenges?

JG: Our close cooperation with research institutions worldwide in developing drone-related technology has helped XAircraft in dealing with challenges. We also plan to assist the China government in creating

Justin Gong, co-founder of XAircraft

rules and regulations for the industry. We are likewise working with insurance companies in case accidents happen.

GS: Discuss your market share.

JG: We focus on commercial-use UAVs. The company turns out 20, 40 and 70 percent of all civilian- and commercial-use, and logistical UAVs in the market, respectively.

GS: What are the company's main products and target markets?

JG: XAircraft has two major flight control systems, namely the Super X and the MiniX. We also have the X650 model, which is a multirotor UAV. Our newest model, X Mission, is a multifunction weather-resistant UAV. Our products are mostly utilized for commercial applications and scientific research. Some branches of the government also use our designs.

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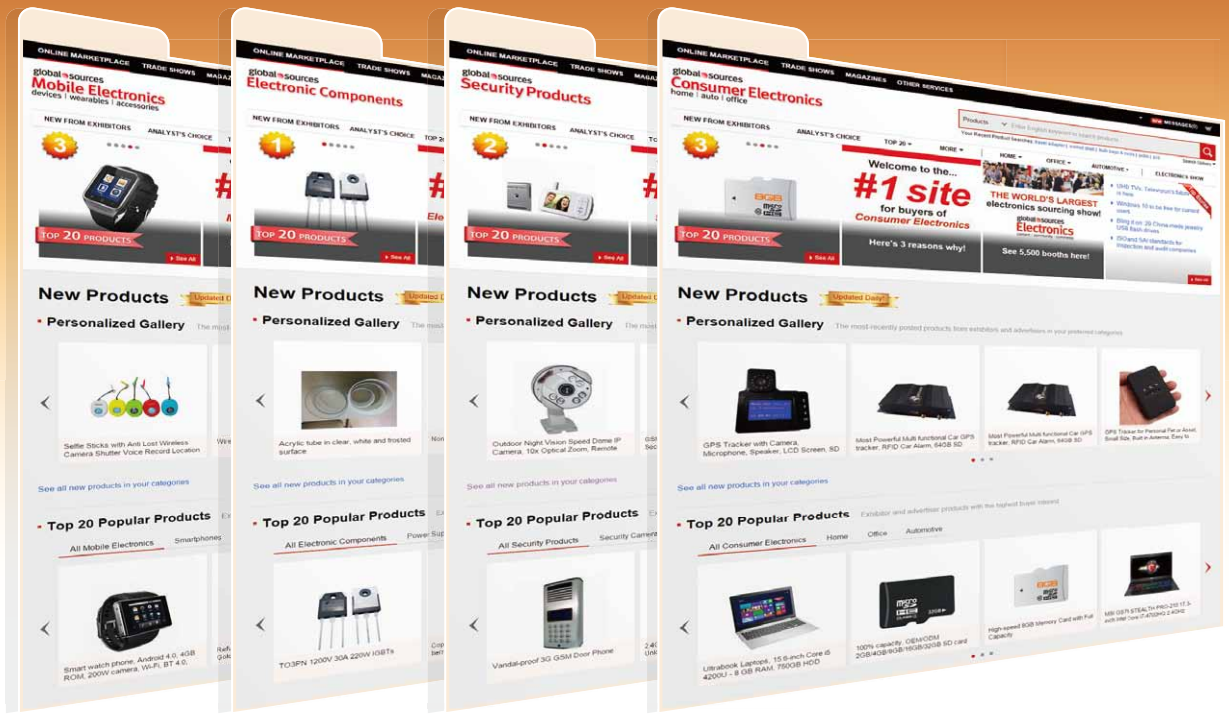

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