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China's changing
pharmaceutical
E-commerce market



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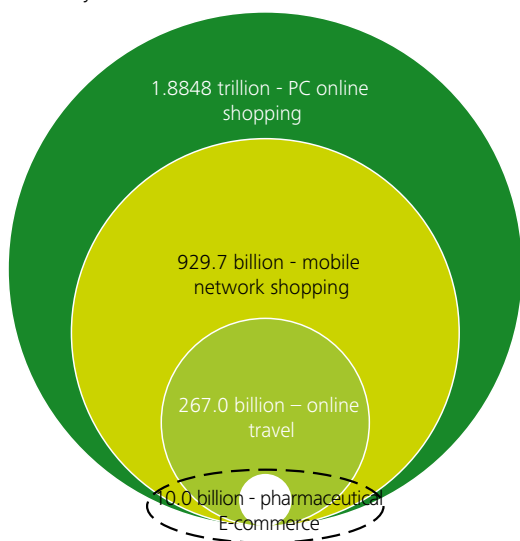
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Foreword

Healthcare providers and pharmaceutical companies operating in China have been slower than organizations in other industries (such as Consumer Products) to embrace the potential of mobile Internet and E-commerce to transform the marketplace (Figure 1). Roadblocks to widespread adoption include health care's complex, often fragmented, industry ecosystem, highly regulated operating environment, incomplete online technology standards, and underdeveloped consumer online purchasing habits.

Figure 1: General E-commerce vs. pharma E-commerce sales (2015E)

Currency:RMB



However, it should be noted that online drug sales and healthcare services can effectively optimize operating processes, minimize costs, satisfy increasingly diversified consumer healthcare demands, and optimize resource allocations – all valuable benefits in light of China's scarce healthcare resources and imbalanced distribution. Fortunately, the combination of a government reform policy that frees the healthcare and pharmaceutical industry to introduce a market mechanism based on an improved industrial policy and more standardized industrial

operation; foreign industry dynamics; trends including increasingly mature online technology and gradual customer cultivation, are driving the development, integration, and use of pharmaceutical E-commerce and online medical care, as well as the evolution of China's medical and pharmaceutical ecosystem.

Pharmaceutical E-commerce has entered the development stage, aided by gradual policy decontrol, although its development speed is slower than other commodity E-commerce. Ultimately, pharmaceutical E-commerce will facilitate the redistribution of stakeholders' interests, reconstruction of all links of the value chain, and offline enterprise transformation. Meanwhile, China's online medical system is flourishing. With the improvement of service quality, it is expected that online medical services will partially substitute for offline medical services and satisfy lower-level medical demands. The technology of mobile Internet will further penetrate hospital operations and service processes, and in the process of continuously optimizing online and offline services, the two will be closely integrated, gradually breaking through the barriers of regional and traditional process, and improving the efficiency of resource allocation.

Understandably, the integration of new technology and traditional industry is bound to face numerous obstacles, which can be overcome by policy change, stakeholder involvement, and public interest. Nevertheless, it should be understood that under the conditions of accelerated technology change and rapidly changing industry and operational models, it has become more and more important that enterprises become more adept in deciding their future path and bold in taking action.

We expect that pharma E-commerce and online medical care will have a bright future with the easing of China's prescribed drug policies and the influence of the following eight trends. We hope that this report will drive thinking and discussion to clarify direction and move the industry forward.

Trend I:

About RMB 150 billion in hospital and retail terminal drug sales are expected to transfer to online sales

At present, the primary drug sales channels in China are the hospital and retail terminals, with a ratio of approximately 8:2. The network/online (OTC) terminal accounts for only a tiny fraction of total sales. When hospital drug sales are viewed under the premise of policy decontrol, the hospital is very likely to retain control over in-patient pharmacy. The out-patient pharmacy will likely be transitioned to the retail terminal and online; however, injectable drugs cannot be purchased online limiting the online transfer rate to some extent. The retail terminal will be subjected to two-way influence – on one hand, it should benefit from the outflow of drugs from the hospital terminal; on the other hand, after the online sales policy for prescribed drugs is liberalized, the impact of pharmaceutical E-commerce on retail drugstores will be inevitable.

The government's policy decontrol should release suppressed demand and support substantial development of the pharmaceutical E-commerce market. Yet, since decontrol of prescribed drug sales will be gradual, the anticipated growth of the pharmaceutical E-commerce market will be steady as compared to the explosive growth seen in the traditional E-commerce industry.

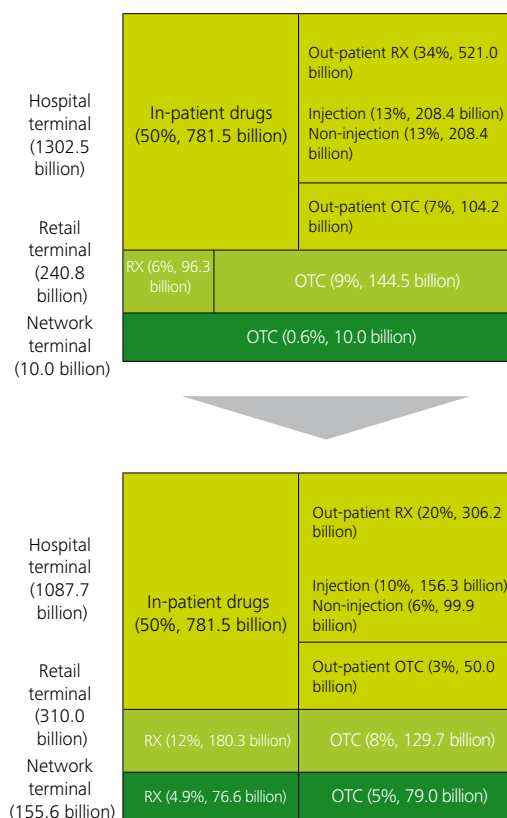
Based on estimated 2015 data (Figure 2), we have forecasted the scale change of pharmaceutical E-commerce. Once the prescribed drugs policy is liberalized, the existing drug market is expected to shift from the hospital and retail terminals to the network/online terminal:

- Hospital terminal: About RMB 70 billion in out-patient pharmacy sales will shift to the network/online terminal; in particular, out-patient non-injection drugs and OTC drugs.
- Retail terminal: About RMB 80 billion in drug sales will shift from the retail terminal to the network/online terminal.

When the share of drugs in the network/online terminal increases from RMB 10 billion to RMB 150 billion, it will account for 10% of the whole market, thereby enabling pharmaceutical E-commerce to enter a new stage of development.

Based on this forecast, we optimistically estimate that by 2020 the pharmaceutical E-commerce market could reach nearly RMB 400 billion in sales. The market should benefit from facilitating factors such as the continual expansion of the overall pharmaceutical market, continually easing government policy, further improvements in logistics and less time-based limits, as well as the development of customers' online shopping habits.

Figure 2: Transformation of pharmaceutical E-commerce market patterns (2015E)

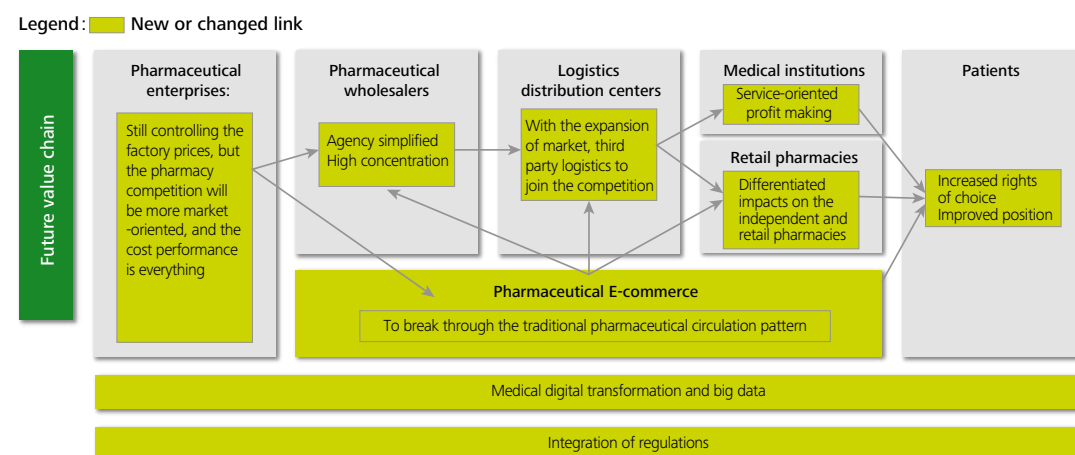


Trend II:

E-commerce will facilitate the reconstruction of the pharmaceutical value chain

The traditional pharmaceutical industry value chain is characterized by pharmaceutical companies with pricing power and a low concentration of wholesalers that use a complex, multilayered system of agents (national, provincial and municipal). Hospitals typically cover expenses with medicine revenues, exerting pressure on drugstores' profits. At the end of value chain, patients find themselves in an unfavorably passive position, facing sky-high drug prices. As illustrated in Figure 3, the development of E-commerce is expected to facilitate and accelerate the reconstruction of the traditional pharmaceutical value chain in seven key areas.

Figure 3: E-commerce will facilitate the reconstruction of the traditional pharmaceutical value chain



E-commerce will make drug prices more transparent and market-oriented.

With the hospital terminal currently dominating pharmaceutical sales, China's pharmaceutical manufacturers basically have no independent distribution channels. The existing model of multilayered links has reduced circulation efficiency, making drug prices artificially high, and rebates and commissions the norm. In addition, the model has increased pharmaceutical companies' selling costs, while the policy of markup percentage control has further promoted hospitals' preference for high-priced drugs. Pharmaceutical E-commerce is expected to drive the compression of intermediate links, making drug selection more

transparent and market-oriented, with prices depending on the drug and user demands.

The impact of E-commerce platforms on specific pharmaceutical companies may differ. Firstly, for generic pharmaceutical manufacturers, patients may use Internet platforms to identify and choose the most cost-effective drugs. In this case, E-commerce may enable those pharmaceutical enterprises with a historically weak sales force to expand their market shares. Secondly, newly-added Internet channels will enable large pharmaceutical enterprises to improve flow liquidity. The ability to push up sales for exclusive drug varieties will be the key to enabling an enterprise to retain its price advantages.



Centralization of the pharmaceutical wholesale agency industry

Currently, the pharmaceutical wholesale agency industry is highly fragmented: there are 16,300 domestic pharmaceutical wholesalers, with the top three pharmaceutical wholesalers accounting for 29.7% of the entire industry, and the top ten accounting for 36.3%. The small scale of wholesalers and decentralization have increased medicine circulation/distribution costs. For this reason, although the average gross profit rates of domestic wholesalers are higher than countries such as the United States and Japan (Figure 4), their average overhead rates are much higher, thereby maintaining the status quo of low profits.

Figure 4: Medicine circulation/distribution link expenses and profit margins in different countries

	China	USA	Japan
Average gross profit rate	Slightly high	~3%	~3%
Average expense rate	7%	~1.5%	~1.5%
Average profit rate	<1%	1.5%	1.5%

In the future, E-commerce is expected to have mixed impacts on China's wholesale agency industry. E-commerce will compress the intermediate links, which may reduce industry profitability. On the other hand, by leveraging scale and terminal resources, large agencies are expected to benefit from industry centralization and resource integration.

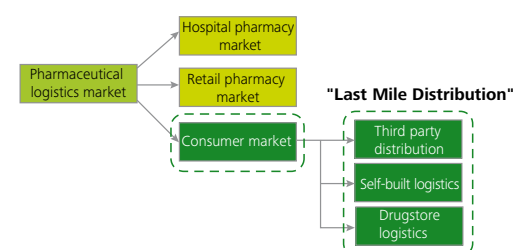


E-commerce will expand the pharmaceutical logistics market

Future E-commerce development will have four impacts on the pharmaceutical logistics market. Firstly, the decontrol of prescribed drugs will open the logistics market at the business-to-consumer (B2C) end and expand market size (Figure 5). Secondly, the features of customers'

purchased drugs, including factors such as dosage and dispersion, will increase logistics costs. This may prompt some pharmaceutical enterprises to outsource logistics to third-party organizations. The new government drug policy may allow enterprises to entrust third-party logistics firms to deliver the drugs; logistics enterprises may use the opportunity to build out the pharmaceutical logistics system, meet GSP system requirements, and connect with the pharmaceutical E-commerce supply chain to expand the third-party logistics market. Thirdly, drugstores will become an important part of the logistics process by delivering medicines to users. Finally, E-commerce is expected to transform the logistics value chain through innovation in information, standardization, automation, and processes.

Figure 5: E-commerce will expand pharmaceutical logistics

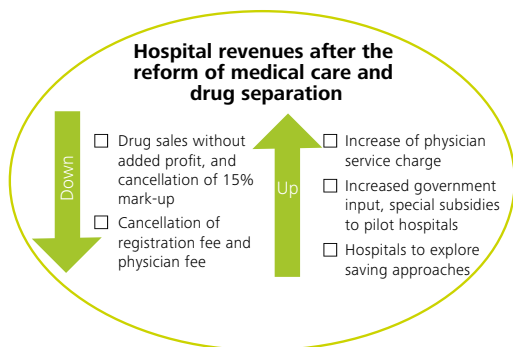


E-commerce will move hospitals from a "covering expenses with medicine revenue" model to a service-oriented model

Revenue from medicines accounts for 45%~50% of China's public hospitals' gross income and it is a deep-rooted practice to cover hospital expenses with medicine revenue. However, the general trend towards separating the clinic from the pharmacy should help pharmaceutical E-commerce to become an important channel of drugs for consumers. To compensate for reduced drug revenue, hospitals will need to raise their medical service prices and move to a service-oriented model (Figure 6).

A medical reform pilot to reduce the proportion of medicine-related revenue launched in Beijing Friendship Hospital, Chaoyang Hospital, Tiantan Hospital, Ji Shui Tan Hospital, and Tongren Hospital has shown positive results. By the end of November 2014, compared with the first half of 2012, the proportion of medicine-related revenue in the five pilot hospitals had decreased from 46.1% to 36.1%. In the medical reform model based on the successful pilots, the proportion of medicine-related revenue in public hospitals nationwide is expected to be lower.

Figure 6: Hospitals will move to a service-oriented model



E-commerce will improve retail drugstores profitability

Compared with retail drugstores, pharmaceutical E-commerce has obvious advantages: twice the average number of SKUs, price competitiveness, and consumer purchasing access unrestricted by time and space. The impacts of E-commerce development on independent drugstores and retail drugstores are mixed. E-commerce may drive further independent drugstore consolidation. These stores generally have weak upstream bargaining power, noncompetitive prices, and lower profits, which make them targets for a merger or acquisition. Chain drugstores, meanwhile, may benefit from the E-commerce tide. They have strong upstream bargaining power, their prices are fairly competitive, and they offer excellent customer service. Chain drugstores may choose to cooperate with E-commerce companies to take advantage of complementary advantages and capture online-to-offline (O2O)-guided traffic.

E-commerce will increase patients' purchasing power

Beyond doubt, patients will benefit from the development of pharmaceutical E-commerce. Medicine prices will gradually become more transparent and drug terminal prices will be reduced so that customers can buy drugs at more affordable prices and with more bargaining power. In addition, mobile medication management will make buying and taking medicine and disease prevention more timely and effective.

E-commerce will drive information innovation

The data produced by pharmaceutical E-commerce may not only assist in drug administration; its impacts may expand to the overall health industry. For many pharmaceutical E-commerce transactions, it is necessary for companies to establish user health files, integrate information, store that information in the "cloud" and provide clients with medication guidance and other value-added services. Pharmaceutical manufacturers, meanwhile, can use E-commerce data to analyze drug flow, sales volume, etc. Finally, medical institutions and production enterprises can improve their products and services by taking advantage of more transparent pharmaceutical industry data.

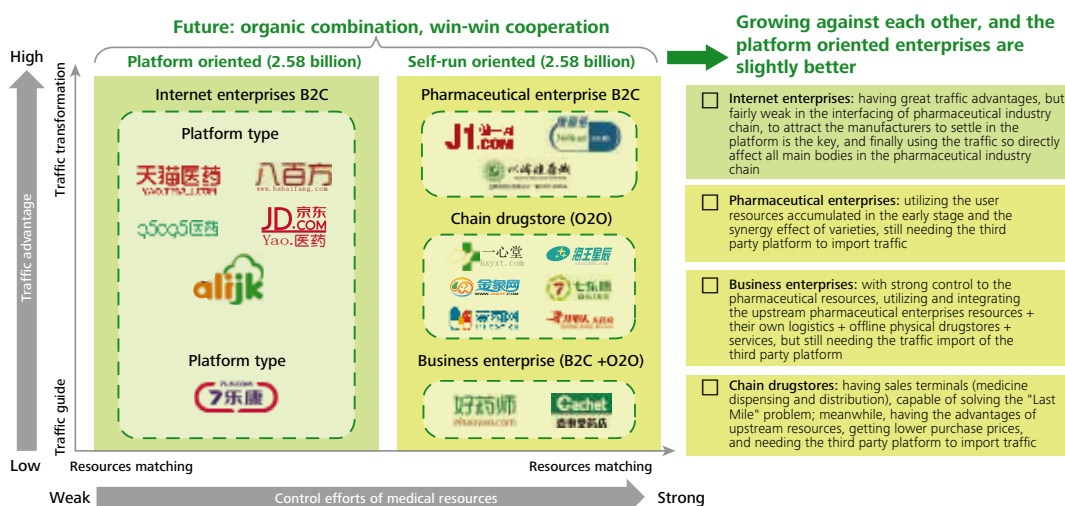
The future growth of pharmaceutical E-commerce requires that participants satisfy consumers' requirements for a seamless demand-side and supply-side relationship, a positive customer experience, and an easy-to-use pharmaceutical E-commerce platform. Other consumers' demands include affordable price, quick pickup, diversified drugs, high-quality service, and brand trust. Such demands have been the key drivers for enterprises to establish and improve their appropriate internal capabilities to enhance the E-commerce transaction flow and convert infrequent consumers into core customers.

Trend III:

Pharmaceutical E-commerce development will move towards a win-win model with organic interaction

The future development pattern of pharmaceutical E-commerce (Figure 7) will depend on the organic interaction of two key factors: pharmaceutical stakeholders' (producers) control of the medical resources and the availability of Internet enterprises to guide the conversion from offline to online traffic. Control of the medical resources traditionally includes leveraging upstream drug bargaining power; integrating downstream hospitals and drugstores; mastering logistics; and providing the medical resources (products and services). Internet enterprises provide value-added services and advertising; and establish, guide, and monetize online customer traffic.

Figure 7: Future transformation of pharmaceutical E-commerce pattern



Traditional pharmaceutical stakeholders control the medical resources

Pharmaceutical producers, business enterprises and chain drugstores have, to varying degrees, traditionally dominated the control of medical resources in the pharmaceutical industry value chain. The future E-commerce development patterns of these three mainstays may evolve in two ways. Firstly, pharmaceutical producers

with chronic-disease-related medicines will have prominent advantages, and are expected to seize their rivals' share if their E-commerce capabilities can be strengthened through in-house development or acquisitions. Secondly, chain drugstores and business enterprises, which generally operate in a fragmented manner owing to strong regional characteristics are expected to gain market opportunities from E-commerce, provided they can regionally integrate and expand to the whole country.



Traffic volume and user viscosity determine the form of the pharmaceutical E-commerce platform

Seen from the perspective of generating and guiding online traffic, large Internet enterprises possess strong advantages. However, their control and integration capabilities along the pharmaceutical industry value chain are weaker, so most carry out pharmaceutical E-commerce with the use of a third-party platform. Even so, Internet enterprises do have the power to directly affect the integration and collaboration of all parties in the industry value chain. In the future, the pharmaceutical E-commerce platform's form will likely be determined by traffic volume and user viscosity, with first-movers dominating the market and erecting competition barriers.



Collaboration leads to a win-win model with organic interaction

Pharmaceutical producers, chain drugstores, and business enterprises have sufficient strength and capacity to control upstream medical resources; however, developing their own in-house E-commerce platforms can be costly and they still depend on third-party, platform-oriented enterprises to attract customer traffic and expand coverage. Internet enterprises that collaborate with pharmaceutical producers, chain drugstores and business enterprises can build an E-commerce platform to satisfy all stakeholders' needs and enable better integration along the value chain. This organic interaction is a key factor leading to a win-win model.

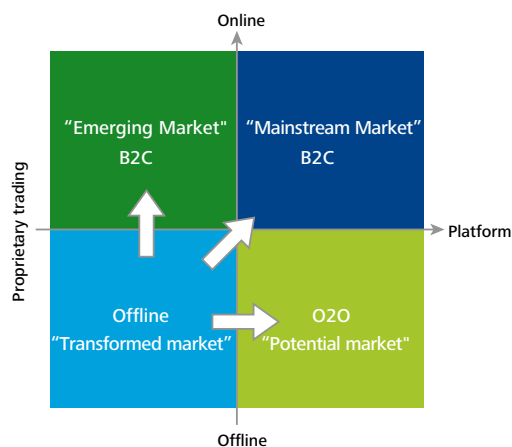
Trend IV:

Pharmaceutical E-commerce will facilitate enterprise transformation from offline to online

There is significant urgency to transition pharmaceutical commerce from offline to online

In 2014, China's drug retail market size was RMB 281.7 billion. However, due to today's weak economic environment, the sales volumes of individual cities have experienced negative growth, and quite a few drugstores have incurred losses and reduced the number of their stores. This, in turn, has prompted pharmaceutical producers to strip away offline pharmacy channels. In addition, pharmaceutical factories with medical resources are launching online platforms to expand their operating revenues. Recently, Tianjin Smith Kline & French Laboratories Ltd. rolled out a flagship store in Tmall – it is the first multinational pharmaceutical company to set up proprietary E-commerce channels in China. After the government policy is liberalized, offline pharmaceutical enterprises will have a good opportunity to develop online channels; in the meantime, offline enterprises can cover the shortage of sales channels. As companies transition pharmaceutical commerce from offline to online, they will select different operating models (Figure 8) depending on their organization's characteristics and market positioning.

Figure 8: Selection of enterprise transformation model



Third party platforms should attract consumers

A third-party E-commerce platform, particularly one operated by an Internet giant, may use a subsidizing strategy to generate site traffic and build scale. The advantage of this model is that pharmaceutical producers will require less investments in human and material resources

to set up the platform. Because a third-party platform is characterized by low cost and high data transparency, it is easier to gain consumer trust; pharmaceutical producers need only focus on marketing and order fulfillment; other operational details may be handed over to the third party. Additionally, since the E-commerce platform generally does not exploit medical resources or engage in extensive customer cultivation, offline pharmaceutical producers may cooperate with the platform to supplement their resources.

The disadvantage of a third-party model is that the operator can utilize site traffic to force medicine distributors and chain drugstores to lower their prices which, in turn, can reduce their corporate profits. Also, after a critical mass of consumers have accumulated, the platform may increase enterprise settlement charges. Meanwhile, as the pharmaceutical E-commerce threshold is further lowered, getting approval for new third-party trading platforms is expected to become easier, which could increase competition between platforms. If this happens, offline enterprises may need to operate on more platforms, which raises their costs.



Online proprietary trading market is an option

Proprietary trading allows offline pharmaceutical producers to transfer their offline business' competitive advantages (including product variety and logistics) to an online platform. Pharmaceutical logistics requirements are quite different than those for general consumer goods; large pharmaceutical enterprises with established distribution and quality control capabilities may set up a proprietary pharmaceutical E-commerce platform. Proprietary trading E-commerce provides customers with personalized, differentiated service that exceeds the standardized service of third-party platforms.

The disadvantage of a proprietary trading model lies mainly in the high investment costs for the technology platform and customer acquisition. Looking at proprietary trading E-commerce platforms in other industries, successful operators are few, and most of them are making small profits. Therefore, a proprietary trading platform is more appropriate for large, financially strong pharmaceutical producers and chain enterprises.



O2O has offline and online benefits

Some consumers' medicine needs cannot be fully satisfied through the Internet. Online customers with specialized medication requirements will need to be directed to retail stores for professional pharmaceutical services. An O2O (Online to Offline) model can combine offline and online sales opportunities and capabilities: the online pharmacy can become the front door to offline sales by driving appropriate customers to the physical retail store and resolve the "final mile" problem by enabling the online pharmacy to help fulfill the potential of physical drugstores.

For offline enterprises, the O2O model can support online users and offline commodity services, and capture customer behaviors, enabling the participating enterprises to make decisions quickly. It is anticipated that, in the future, the third-party and proprietary trading platforms will join this market, increasing competition.

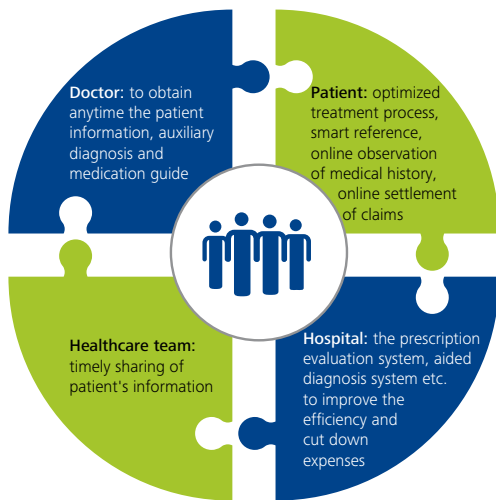
Trend V:

Mobile Internet technology will re-engineer hospital operations and service processes

The digital transformation of medical information has become an indispensable process in China's efforts to improve its health care services, develop medical technology and manage the increasing complexity of hospital operations. Most of China's hospitals have an information management system, but the percentage of hospitals with clinical information systems is rather low, with applications restricted to basic financial and billing processes. Meanwhile, since the hospitals are not motivated to share their internal data, there is an "information island" problem: all hospital systems are mutually independent, and lack standardized electronic medical records and business processes. Because of this, patients must navigate complicated transfer procedures among the hospitals' diagnostic and treatment systems, hindering the advancement of hierarchical diagnosis and treatment.

The integration of mobile Internet technology and traditional medical systems has injected new vigor into the development of hospital digital transformation. Mobile Internet can break through time, space and geographic restrictions, facilitate hospital information-sharing and resource allocation, promote digital transformation, and re-engineer existing hospital operating models and service processes. Supported by the participation of various health care stakeholders, particularly Internet giants with extremely strong technical and financial resources, the hospital information system upgrade is expected to accelerate. The integration of mobile Internet technology and hospital information systems enables real-time information sharing, facilitates doctor and patient interactions, and moves routine

administrative processes online, so that medical staff can concentrate on patient care. Physicians may, by means of mobile equipment, access patient information (including image archiving, blood samples, etc.) at any time; receive early warnings about diseases; and track a patient's rehabilitation status after hospital discharge. Using mobile Internet technology, the entire healthcare team may share patient information in real time to encourage cooperation and minimize the probability of misunderstandings. Through a prescription evaluation system and aided diagnosis system, the hospital can improve diagnosis and treatment, and control expenses. Patients, meanwhile, can use mobile Internet technology to view their medical history and complete registration, treatment, and claims forms, among other activities.



BAT Giant Layout Case

Baidu 百度 Baidu's "Medical Brain" project will combine big data, artificial intelligence, machine learning and other technologies, to assist the doctors in developing the diagnosis and treatment schemes. Up to now, Baidu Brain has been able to diagnose some skin diseases automatically, and is expected to enter into more complicated filed.

阿里巴巴集团 Alibaba's "Future Hospital" Plan will full open up its platform to medical institutions, helping the hospitals set up the mobile health care system, and patients may accomplish registration, report pick-up, payment and interaction after diagnosis via the Alipay Wallet. Until now, it has come to cooperation intention with about 50 third-grade Class A hospitals nationwide.

腾讯网 Tencent's Intelligent Medical Program is proposed to set up the "hospital in the pocket", enabling patients to register, pay the fees, check the health records and examination reports etc. on the WeChat public platform. In November 2014, Tencent joined hands with Bureau of Health of Guangzhou Municipality to open the WeChat public number of "Guangzhou Health Bestone", making its citizens the total service of WeChat platform. More than 60 Guangzhou hospitals have participated.

“Subject to scarcity of national medical resources, outpatient doctors had to treat 60-70 patients each day 20 years ago, and now at least 120 patients a day. In this case, it is fundamental to improve the doctor’s work efficiency and upgrade the hospital operation mechanism. Only in this way can patients enjoy more convenient and comfortable medical service. The technology of mobile Internet is of great value in this respect. For instance, we can comprehend the patient information and status before and after the operation at any place and time, make full use of fragmented time to improve our work efficiency, know the operation qualifying process rather than wasting our time to wait, or if the information is networked in the future, we can see a complete past history of the patient’s illness, keeping the diagnosis and treatment more quick, comprehensive and safer.”

—Zhang Chongyu, Associate Chief Physician of Urology Surgery, Shanghai Ruijin Hospital

Trend VI:

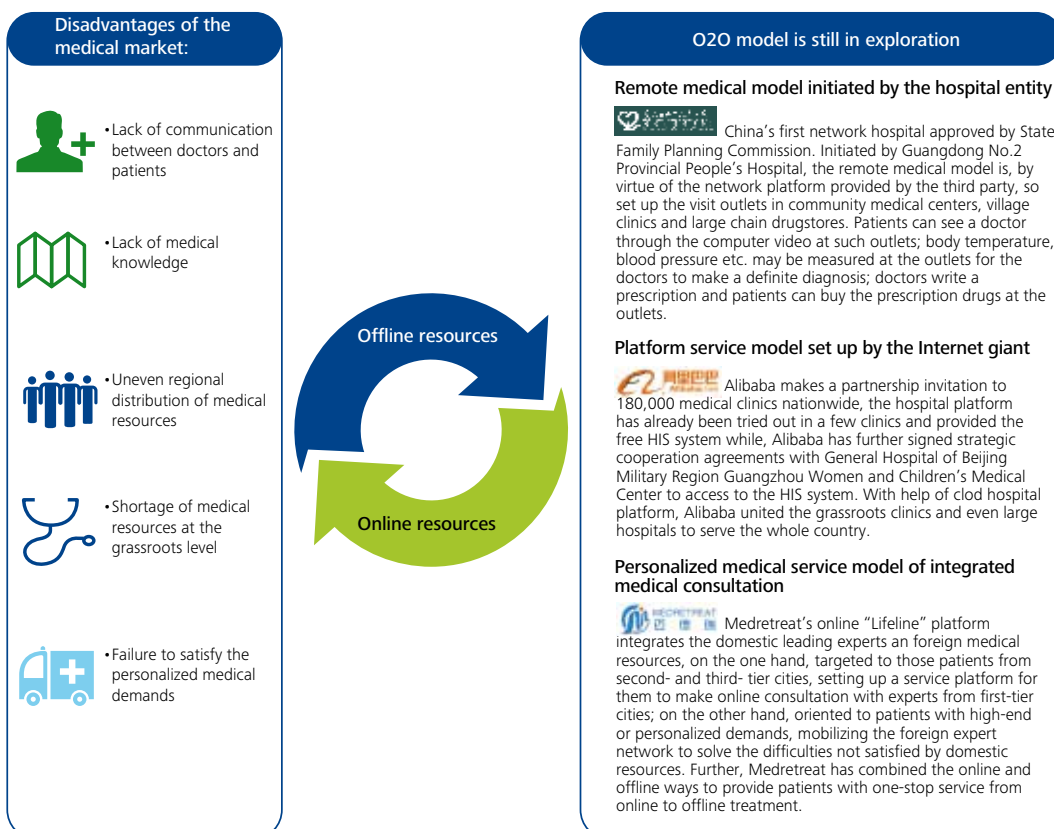
The Internet medical system will focus on patient-centered care

Patient-centered care will be the focus of China's Internet medical system operating model. Enterprises will organically combine offline and online resources to address the needs of stakeholders, including patients, hospitals, pharmaceutical enterprises, and health insurers.

Online services will augment some traditional offline services. Patients may get professional medical advice, buy drugs, and share their experience online. "Chunyu Doctor" is the pioneer in this sector. It provides users with a "self-examination + inquiry" function, and has accumulated 48 million activated users and 60,000 registered doctors. Chunyu satisfies patients' low-level medical service demands; this saves patients' time and eases the shortage of medical resources.

The Internet medical system is expected to satisfy the market segment that the traditional medical system currently fails to support. China's medical resources are concentrated in

the hospital setting, which means that fewer resources are available for general healthcare, outpatient rehabilitation, etc. The rise of the Internet medical system has brought an opportunity to expand overall medical service. Judging from current offerings, online medical service already has covered most of the links in medical treatment and healthcare, including health management, outpatient self-diagnosis and hospital guidance, rehabilitation assistance, post-diagnosis patient monitoring, and more. Typical applications include the Pocket Check-Up, Meet You health management, Go to Hospital, HaoDF for hospital guidance, Dnurse, and I Health BPM for rehabilitation monitoring.



Moreover, online and offline medical system integration will be continuously strengthened. This will enable some patients to use online resources to self-diagnose and treat certain conditions or combine online and offline professional services. The Internet medical system will help to break through hospital and regional barriers to identify doctors with the needed skills for specific cases, organize a medical team for patients, and satisfy multi-level medical demands, from minor diagnoses to severe cases. At present, medical market participants are trying to integrate online and offline resources to improve service, and to match the appropriate online business model to their specific needs and resources. For example, Guangdong No.2 Provincial People's

Hospital will provide patients with online service with its medical resources; Alibaba will use its platform advantages to combine offline clinics and hospitals; and Medretreat will integrate personalized medical services using an online platform. In the future, online and offline medical services will become more clearly defined and further integrated. Future medical service will not be limited to a hospital or region; it will be a comprehensive service that combines online, offline and different regional resources. Patients may, depending on their needs, choose the doctor team and treatment location using online, offline or a combination of resources, which should increase service and treatment effectiveness.

"China's medical resources are characterized by uneven distribution and doctor-patient information asymmetry, which are generally accepted pain points; however, national medical reform is a long process. This has in the short run created a new market space - packaged integration of the medical resources using the technology of mobile Internet to satisfy the market space of patients' refined requirements. For example, we may, by means of online service, break through the space and traditional process limitations, achieve the integration of offline resources, narrow the domestic regional disparities and utilize the international resources of high quality."

—Li Hongzhao, CEO for International Medical Treatment of Medretreat

Trend VII:

Intelligent wearable devices will drive a new generation of health and medical services

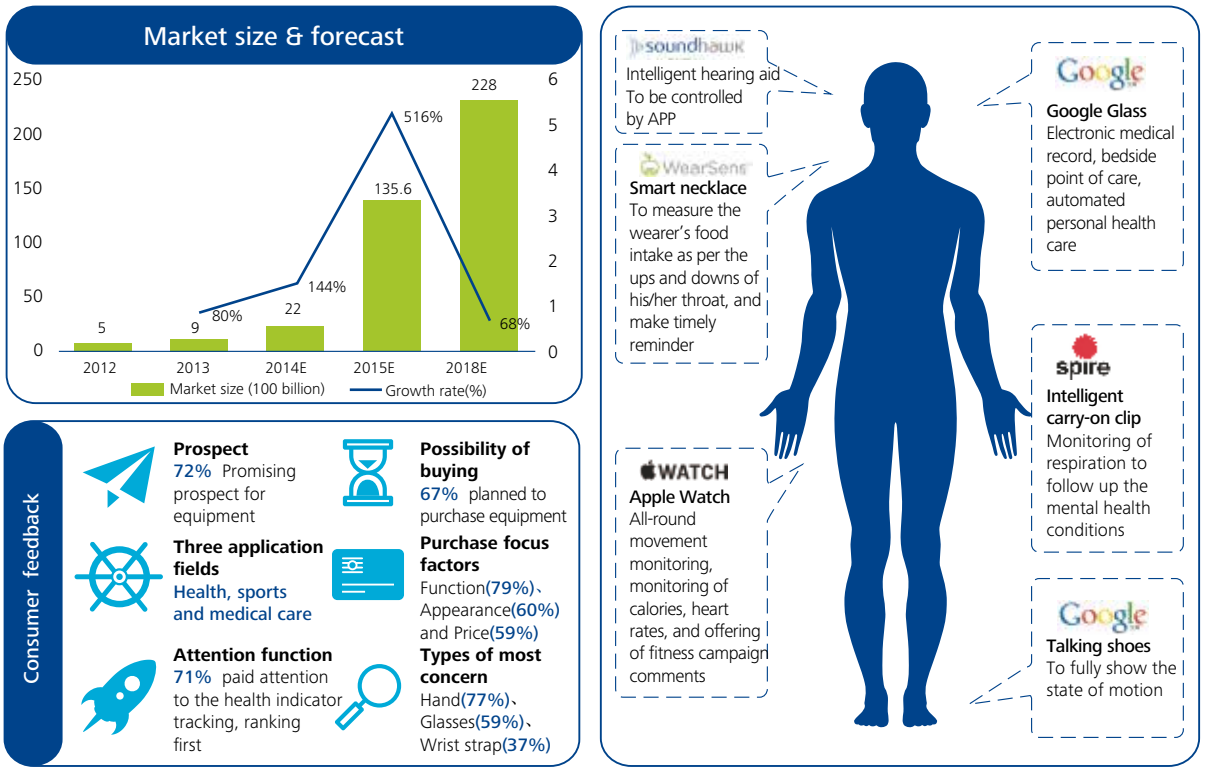
In the era of the Internet of Things (IoT), intelligent wearable devices will receive more attention as a way to tightly connect consumers, data, and medical health services. These devices may be worn by users or integrated into routine items such as watches. Device software will monitor users' physiological status and transmit data to a proprietary platform or the cloud, enabling users to quickly view information, get early health warnings or share information with others, including their physician. Characterized by hands-free operation, environmental perception, convenience, intelligence, durability and focus, intelligent wearable devices are expected to drive a new generation of health and medical services. According to the EnfoDesk data, China's market size for wearable devices was RMB 900 million in 2013, and is estimated to grow to RMB 22.8 billion in 2016.

EnfoDesk's 2014 consumer survey shows that the top three fields for intelligent wearable devices are health, sports, and medical care. The application of wearable devices in the health management and medical assistance fields should expand even further, based on changing consumer attitudes, the evolution of wearable devices, improvements in supporting technology, integration of background systems, and enhancement of intelligent data analysis capabilities. Thanks to the close monitoring of wearable devices and seamless data-sharing with medical staff, some patients that previously needed to be treated in the hospital may now rehabilitate at home, freeing-up hospital beds for more acute patients. In addition, consumers will be able to use wearable devices to track their health status and apply smart suggestions from online medical services based on big data

analysis findings. As a result, the medical services model may change its emphasis from treating the sick to promoting prevention and care management.

The full value of intelligent wearable devices in the medical field is far from realized. That situation will change, thanks to the continuous progress of cloud computing and big data analysis, which will anchor the intelligent medical platform and electronic health service ecosystem. We expect wearable devices to be applied to pharmaceutical development, doctor-patient communication, hospital operations, consumer self-monitoring, and other fields. While hardware sales are the foundation of today's profit model, in the long run, device software and big data-based services will see significant growth.

Figure 9: Highlights from EnfoDesk's Consumer Survey



Source: EnfoDesk Consumer Survey 2014 <http://www.analysis.cn/view/home/home.html>; Deloitte analysis

Trend VIII:

Big data will lead the medical system into the age of wisdom

Hospital digital transformation, regional medical information-sharing, and advancements in mobile and sensing technologies are driving explosive growth in medical data. In addition, the rise of commercial insurance and mobile medical enterprises, programs around national medical insurance cost containment, pharmaceutical producers' R&D marketing, and efforts to increase doctors' efficiency are expanding the market for big data applications. By applying analytics capabilities to structured and unstructured medical data (images, photos, etc.), the medical system will transition from data collection to data analysis and, finally, to data application. Big data will penetrate each link of the medical value chain, change every participant, and lead the medical system into the age of wisdom.



Medical institutions

Most medical activities take place in hospitals which, therefore, serve as the main source of medical and pharmaceutical information, and are in a key position to acquire and integrate medical big data. For data application, hospitals' main appeal for digital transformation lies in improved medical safety, increased efficiency, and reduced cost. Big data's application in hospitals can be very extensive and may involve internal management processes, service processes, clinical support, hospital costs, doctors' diagnosis and treatment behaviors, and even resource integration between hospitals.



Online medical enterprises

The rapid rise of online medical enterprises will generate another source of medical data. Whether they are pharmaceutical E-commerce or online medical service providers, these enterprises will accumulate extensive medication and health data, providing rich content to big data applications. In the meantime, online medical enterprises will remain the main force behind big data application, particularly when hospital doctors are extremely dominant in the system. In these cases, the provision of packaged service for pharmaceutical producers' R&D-marketing, medical insurance enterprises, and other organizations that use data analysis is expected to be quite profitable.



Pharmaceutical producers

Big data application will advance the transformation of pharmaceutical producers to practise precision medicine, which selects the pertinent clinical pathway depending on the patient's condition. Future development of this capability will be based on gathering patient information and marketing data, as well as using online and offline channels for target marketing.



Commercial insurance and medical insurance cost-containment companies

Based on a patient's diagnosis, treatment, and medication information, commercial insurance and medical insurance cost-containment companies will be able to develop payment standards and benefit plans that better support their business models. For example, they can use big data to segment customer groups to target service offerings and keep pricing more accurate.



Government entities

Applying big data and analytics will help the government make more scientific health care decisions. For instance, the government has done its utmost to practice medical insurance cost-containment, but did not provide data to support the reimbursement prices for drugs and treatments. In the process of liberalizing drug prices and advancing medical organizations, the government hopes to strengthen monitoring but lacks the necessary resources to do this. Big data applications should address this issue and enable government decision-making to be more accurate and effective.

The medical industry will usher in the age of big data

Government

- To provide the scientificity of decisions made by administrative departments
- To effectively control costs and strengthen the monitoring to the medical & pharmaceutical system
- To network the medical institution and system, respond quickly to the public emergency



Patients

- Convenient and fast
- Effective
- Respected
- Cheap
- Individualized demand

Medical institutions

- To support the clinical decision, keep the medication and treatment more accurate and safer
- To support the management decision, and improve the management and operation mechanism of medical institutions
- Information networked, to realize the optimization and allocation of resources among institutions at different levels



Pharmaceutical producers

- Accurate industry market position
- Drug R&D innovation based on sector demand
- Precise marketing



Online medical enterprises

- Its core lies in medical big data
- To provide service to the traditional medical system participants by means of data integration and analysis
- To provide individualized service to patients/healthy groups based on data

Commercial insurance

- More accurate insurance pricing
- To promote the insurance company's customer segmentation and product customization
- To make the launching of more commercial insurance products possible



Medical insurance cost containment companies

- Its core lies in medical data
- Based on the patients' medication information and professional drug management capability, to assist the insurance company in implementing reasonable expenses and the employer to develop reasonable benefit plans, etc.

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