



The last two years have witnessed surging growth for online medicine in China, along with a series of business and management obstacles. Online medicine has arrived at a crossroads, however, further growth requires new policies, improved technologies, and a robust business model with clarity.

Online Medicine at a Crossroads

By / Yvonne Wu, Andrea Ding

Mark Weiser, the father of ubiquitous computing, said that the most influential technology is the one that recedes into the background of our lives. This description precisely fits the Internet. As it embeds itself in traditional industries, the Internet changes how information is distributed, reorganizes how factors of production are combined, optimizes marketing, and improves consumers' experiences. The Internet has permeated through every aspect of our daily lives, and restructured various sectors such as retail trade, tourism, finance and education.

Without a doubt, the impact of Internet will continue to deepen. What does the future hold for the healthcare industry in such drastic change?

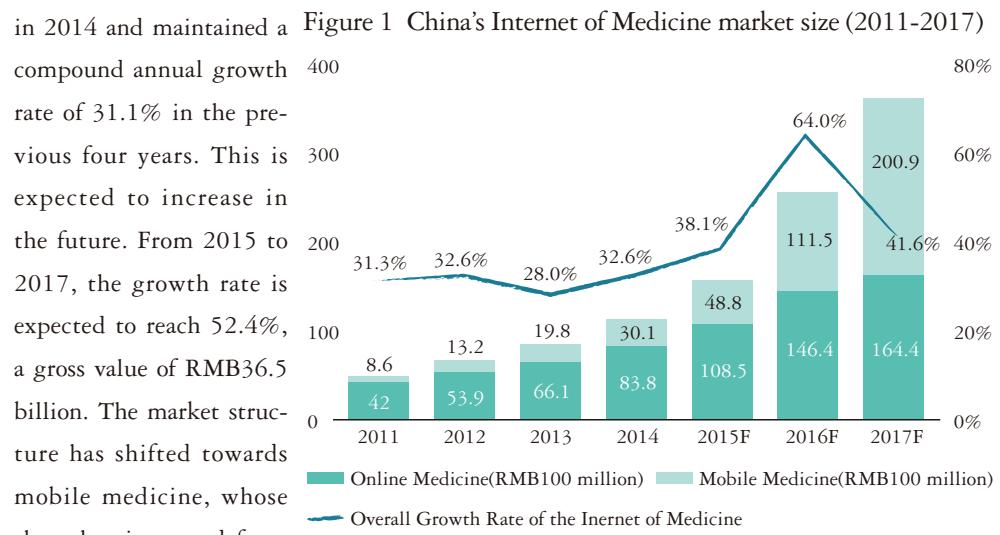
In China, healthcare demand is huge. However, there are many weaknesses in its healthcare system. There is great potential to help it overcome these drawbacks if technologies such as the “Internet of Things” can be applied to the medical industry. Over the last two years, we have seen rapid growth in online diagnosis, treatment and prognosis. It has attracted significant corporate investment and growing interest from private investors to medical professionals.

However, further investment and entrepreneurship in health care is blocked by the monopolistic nature of the traditional medical industry, the lack of a well-established system of professional medical evaluation and regulation, and the inability of online services to really diversify and distinguish themselves. As a consequence, online treatment is not yet well-entrenched within the medical system.

Internet-based medicine, therefore appears to be at a crossroads in China. New policies are needed, and relevant technologies need to be applied and improved. With its first stage of development, the online medical industry is ready for a new stage of development and integration, backed by clearly defined business models.

The Rise of Internet Medicine

Internet medicine originated in 2000, when many medical websites were launched and visited by a steadily growing number of users. With the application of mobile technology and the popularization of smartphones, online users have gradually shifted from PC to mobile platforms. Online medical companies have opted for mobile medical provision, and this has triggered a surge of investment. According to Analysys International, China’s internet medicine market was valued at 11.4 billion yuan



Source of Information: Analysys International, Deloitte Analysis.

17% in 2011 to 26% in 2014. Mobile-based medicine will surpass online medicine by 2017 with a market share of 55% and a value of RMB20 billion.

Since 2014, Internet medical startups entered in a booming stage. At that time, medicine had yet to be heavily impacted by Internet technology, and so Internet medical healthcare soon became a new hotspot for investment, with over 30 large direct investments since 2014. For example, Tencent injected USD70 million in DXY.cn during its Series C financing. Chunyu Doctor raised USD50 million from CICC and Temasek, and CID Group invested USD50 million in yapingguo.com in a Series A financing.

In the secondary market, public companies are also taking action: Lepu Medical entered the wearable devices market by acquiring e-care365.com. Furui Medical Science acquired Emperor Medical to support the expansion of its chronic diseases management business. Alibaba acquired CITIC 21CN to compete in the online pharmaceutical industry, and Sinocare increased its investment in Dnurse to enter the mobile medicine segment of diabetes management.

Figure 2 Investment cases into China’s Internet of Medicine

Date	Company	Venture Round	Amount (10,000 CNY)	Field	Investor
Jan, 2014	Alibaba Health	M&A	100,000	healthcare e-commerce ecosystem in O2O model	Alibaba Group, Yunfeng Capital
June, 2014	J1.com	Series A	30,000	E-commerce trading platform for medicine, healthcare products in B2B, B2C model	Shanghai International Group Venture Capital
June, 2014	dayima.com	Series C	18,600	Mobile application targeting female health with menstrual health at its core	Ce Yuan Ventures, Sequoia Capital, Bertelsmann Asia Investments
June, 2014	See You/Meet You	Series C	21,700	Female menstrual cycle service tools	SIC China, Matrix Partners China, K2VC
June, 2014	www.39.net	M&A	65,000	Comprehensive medical care portal site	Guiyang Longmaster Information
July, 2014	Huajian Health Checkup	M&A	Undisclosed	Health checkup service management center	iKang
July, 2014	962899.com	Series A	Undisclosed	Provide health and safety services to elderly and mentally ill people	NewMargin Ventures
July, 2014	Huakang Mobile Healthcare	Series B	Undisclosed	Both online and offline Internet interactive platform for medical and health services	Yunfeng Capital
July, 2014	gmei.com	Series A	Undisclosed	Mobile plastic surgery services application	Sequoia Capital, Matrix Partners China
Aug, 2014	5UDoctor	Series A	Undisclosed	Mobile medical service platform in private family doctor model	SAIF Partners, Trust Bridge Partners

Aug, 2014	Chunyu Doctor	Series C	31,000	Mobile medical care application	CICC, CCIG, Temasek, Pavilion Capital Pte Ltd
Aug, 2014	kanchufang.com	Series A	3,100	Internet Medical platform in P2P model	Sequoia Capital, Lightspeed China Partners, Lightspeed Venture Partners
Aug, 2014	Manyoubang.com	Seed/Angel	Undisclosed	Mutual aid community for chronic diseases patients	Tsinghua Technology & Innovation
Sep, 2014	iHealth	Series A	15,500	Provide health products on mobile, including mobile Internet blood pressure meter	Xiaomi Ventures
Sep, 2014	dxy.cn	Series C	43,400	Social networks and information platforms for medical professionals	Tencent Collaboration Fund, Tencent
Sep, 2014	quiyiyuan.com	Series A	Undisclosed	Medical consultations and services platform	SoftBank, Highlight Capital, SBCVC
Oct, 2014	diandao.org	Series A	1,00	Door-to-door healthcare massage services in O2O model	Banyan Capital
Dec, 2014	MisFit	Series A	12,400	Invent and manufacture wearable smart products	Shunwei
Dec, 2014	Soyoung.com	Series B	6,200	Healthcare and plastic surgery services	Undisclosed
Dec, 2014	anhao.cn	Series A	2,000	Integrated mobile application for medical consultations, doctor & treatment searching, hospital & pharmacy positioning, disease encyclopedia and health management	Undisclosed
Dec, 2014	health-100	Series F	7,600	Diversified business chains combining health checkup, management and consultation	ChinaEquity, GGV Capital, Beyondfund
Jan, 2015	111.com.cn	Series C	45,000	Integrated one-stop online pharmacy	Undisclosed
Jan, 2015	7LK.com	Series A	30,000	Internet medicine trade services	TusPark Ventures, Govtor Capital, Grand Yangtze Capital
Jan, 2015	yapingguo.com	Series A	1,000	Vertical B2C e-commerce websites for dietary supplements	Undisclosed
Jan, 2015	Easyhin	Series A	1,000	Mother & infant healthcare management service platform	SBCVC
Mar, 2015	anhao.cn	Series A	1,000	Integrated mobile application for medical consultations, doctor & treatment searching, hospital & pharmacy positioning, disease encyclopedia and health management	Longling Capital, Guohai Innovative CCI Capital

May, 2015	jumper-health.com	Series A	8,000	Gestation management encyclopedia	Undisclosed
May, 2015	1hu.me	Series A	4,129.2	Mobile platform for postoperative rehabilitation	China Growth Capital, Plum Ventures
May, 2015	上药云健康	M&A	21,212.5	Three O2O platforms of electronic prescriptions, medicine data and patient data, integrated one-stop medical care services	北京和谐成长基金；JD.com
June, 2015	yapingguo.com	Series B	31,000	Vertical B2C e-commerce websites for dietary supplements	CID Group
July, 2015	Huajian Health Checkup	Series A	6,200	Patient follow-up and management mobile application for doctors	China Investment Corporation
Aug, 2015	上药云健康	Series A	6,062.5	Three O2O platforms of electronic prescriptions, medicine data and patient data, integrated one-stop medical care services	IDG Capital Partners
Sep, 2015	NANA Panda	Series A	6,000	Mobile O2O platform for massage and physiotherapy matching services	Undisclosed
Sep, 2015	quiyiyuan.com	Series B	25,400	Mobile Internet medical treatment platform	Baidu Investment, Highlight Capital, SBCVC
Sep, 2015	sceson.com	Seed/Angel	2,000	Internet medicine trade services	kangmei Pharmaceutical, GF Xinde Investment Management
Oct, 2015	111.com.cn	Series D	100,000	Integrated one-stop online pharmacy	Undisclosed

Note: For transactions before 11 August 2015, 1 USD = 6.2 CNY; for transactions thereafter, 1 USD = 6.35 CNY
Source of Information: Wind, Public Information, Deloitte Analysis

Market Drivers of the Internet Medicine

The booming investment and fast growth of Internet medicine is largely due to the inadequacies of China's current healthcare market, such as the huge gap between supply and demand, resources misallocation, low efficiency, and the many challenges affecting the growth of key market players. The distribution of China's medical resources are heavily biased towards the cities in the eastern part of the country and large 3A hospitals, leaving the central and western parts of China and rural areas undersupplied. Moreover, grassroots medical institutions tend to be poorly supplied in terms of their technical capabilities and equipment; thus patients with major or minor diseases, acute or chronic, tend to go to 3A hospitals in big cities. The result is that quality medical resources are not used efficiently.

Much of the problem stems from a high degree of information asymmetry between patients and doctors, as well as patients' scant knowledge of healthcare and the medical system in general. Doctors also lack the ability to perform proper medical evaluations in some cases. Regulation has

further pushed up the cost of medical services. These challenges could be opportunities for Internet medicine, which aims to promote a free flow of medical information, and redistribute medical care more efficiently to serve a need where it exists.

Followings are some examples emerging of how the Internet of medicine can ease current stress points in the system:

- 1) Internet pre-diagnosis services could help patients understand their conditions better, and become more knowledgeable about which hospitals or doctors might possess relevant knowledge or facilities;
- 2) Online doctor and hospital rating systems can help patients find services or doctors who closely fit their needs;
- 3) The use of wearable devices paired with online diagnostic applications can supplement the monitoring and treatment of minor illnesses as well as chronic diseases, thereby freeing of-line medical resources;
- 4) Telemedicine can integrate medical resources across different regions and hospitals, thereby promoting a more efficient allocation of scarce medical resource, serving remote areas, and providing patients with more comprehensive services;

One can foresee that Internet technology will be applied to all links in the chain of medical treatment, with the potential to improve medical service efficiency and quality. Online and offline medical services will be more clearly defined, optimized and integrated, leading to better care for more patients in more areas.

The development of Internet medicine is well aligned with China's current policy and emerging needs. As a result of urbanization and population aging, China's medical infrastructure faces rising demand and costs. China's health spending was RMB3.68 trillion in 2014, and the figure is expected to rise to RMB5.79 trillion in 2019. With China's social security coverage reaching saturation and its depth of coverage increasing, finding cheaper ways of getting health care to the people has become a top priority challenge for the government.

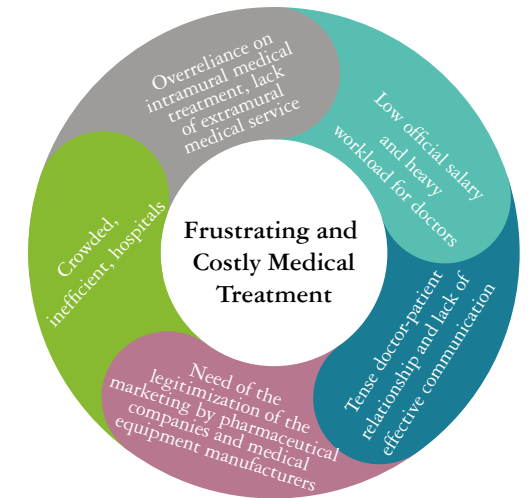
The experience of other countries should be instructive for China. According to McKinsey, telemedicine has helped to reduce 15% spending on diabetes treatment in U.S.

From a business point of view, the potential of Internet medicine lies in its ability to bring benefits to all the parties involved, not just some of them. For patients, it increases access to appropriate services. Besides, it not only makes in-patient diagnosis and treatment more convenient and less time-consuming, but also segments the market according to requirement and type of treatment needed, which cannot be done under the existing system. Such market segments include wellness enhancement, high-end customized services, post-operative rehabilitation, and chronic disease monitoring.

For doctors, Internet applications provide a way of using their fragmented time better, also provide better care of patients, better preparation of research data, and opportunities to increase

their income lawfully without having to rely on unlawful kickbacks. This will greatly increase the efficacy of the governments' campaign against such kickbacks. For medical equipment manufacturers and pharmaceutical companies, it provides an opportunity to market products transparently through lawful e-commerce platforms, while providing more background data on their products. This will help both doctors and patients to prescribe and use medication more precisely.

Figure 3 Pain points in China's medical system



Business Model of the Internet of Medicine

Basically, internet medicine targets three general stakeholder groups: potential and existing patients, doctors, and hospitals.

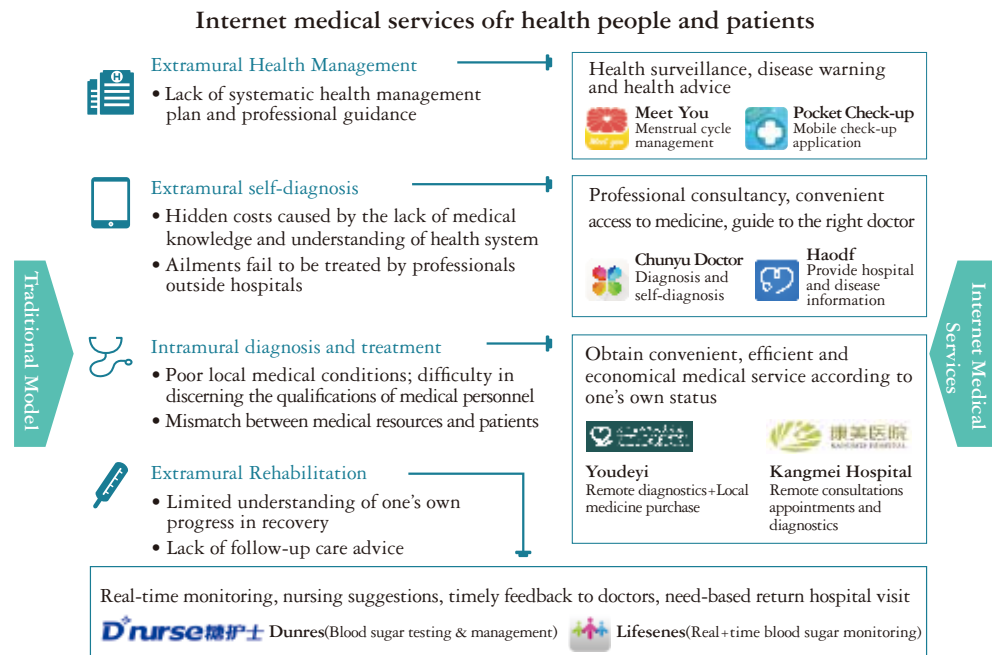
For healthy people and patients, Internet medicine will allow preliminary self- or assisted diagnosis followed by appointment and registration, online professional diagnosis and treatment, out-patient health management, rehabilitation and chronic disease management. Internet health management has become a primary mobile-assisted medical service. For example, Meet You and Dayima.com are specialized in female health management. Meimeida.cn and SoYoung.com offer plastic surgery services, and FitTime and 71kr.com attract fitness customers. As these applications have low barriers to entry and offer a uniform quality of service, those that offer multiple tiers of professional assistance and possess better function integration, and interactivity with customers will develop higher levels of customer loyalty and grow faster.

Some Internet medical services are already offering broader sets of services. Guahao.com and 91160.com, for instance, offer online appointment and registration services; Chunyu Doctor and Dr.Good, are platforms for self-diagnosis and online diagnosis and treatment; Dnurse and Lifesense support chronic disease management; and lkhealth.cn, offers medicine purchasing services. However, in the current policy environment, there are still many limitations for online services. Many parts of the market are still awaiting a green light from the government.

Internet-based medical services for doctors mainly focus on meeting their four core needs: scientific research, diagnosis assistance, doctor-patient communication, and peer-to-peer communication. Internet platforms facilitate the discussion among doctors and sharing of professional knowledge; Internet applications enable doctors to obtain and publish research with ease as well as offer access to pharmacopoeias, clinical guidelines and case management records to assist diagnosis; doctor-patient communication platforms help doctors manage patients more efficiently,

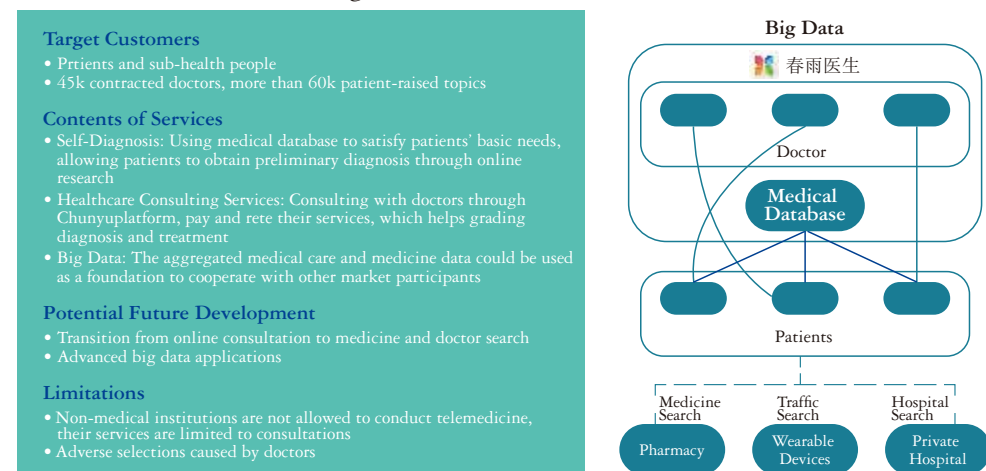
increase their incomes and raise recognition through online diagnosis. DXY.cn, Xingshulin, i-md.com, and medicool.cn. are several representatives of such applications.

Figure 4 Online services for healthy people and patients



Source of Information: Deloitte Analysis.

Figure 5 Case: Chunyu Doctor: Mobile medical application for self-diagnosis and healthcare consulting services

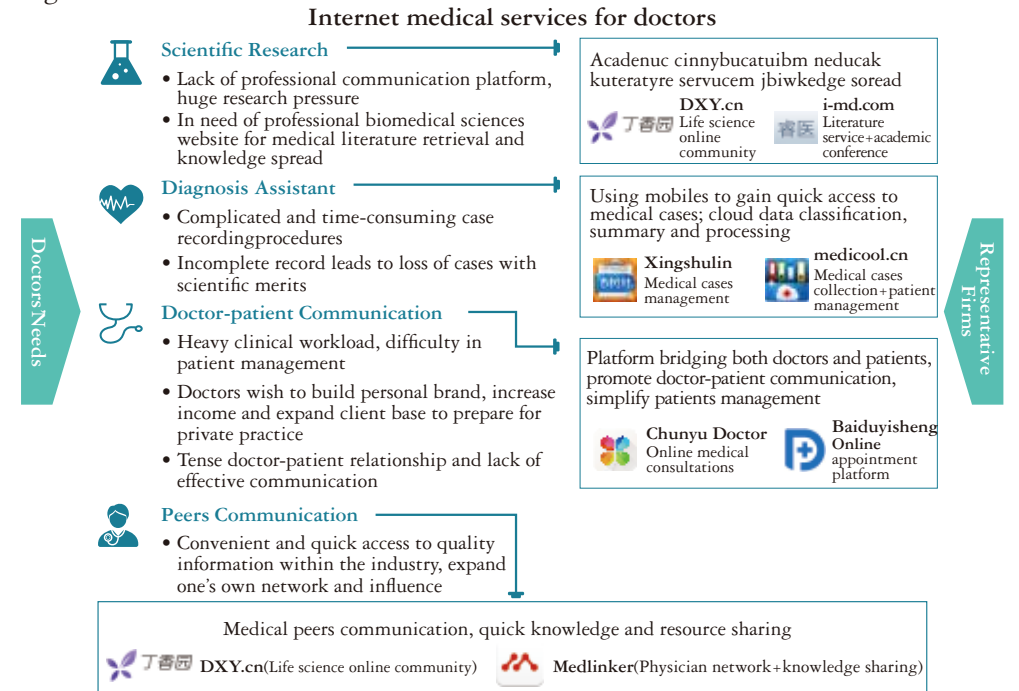


Source of Information: Deloitte Analysis.

These developments come at a time when China's doctors (especially in 3A hospitals) are feeling more squeezed than ever, and face more constraints on raising their incomes to levels commensurate with their responsibilities. Internet medical services will allow them to aggregate

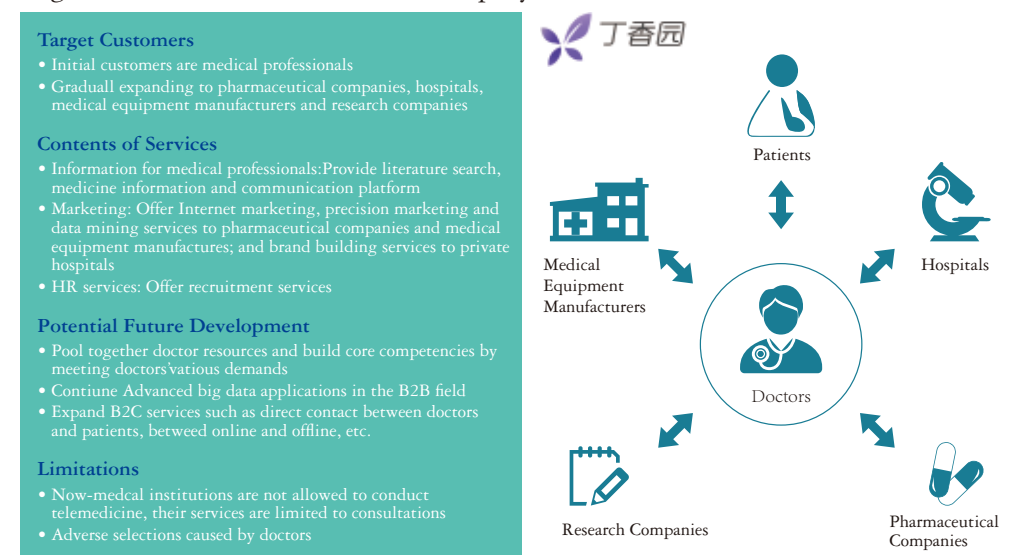
core resources within the hospital system and provide ancillary medical service online. This will enable them to increase their incomes by providing pharmaceutical companies with medical data and insurance companies with professional intermediation.

Figure 6 Online services for doctors



Source of Information: Deloitte Analysis.

Figure 7 Case: DXY.CN: Platform company that relies on doctors as resources

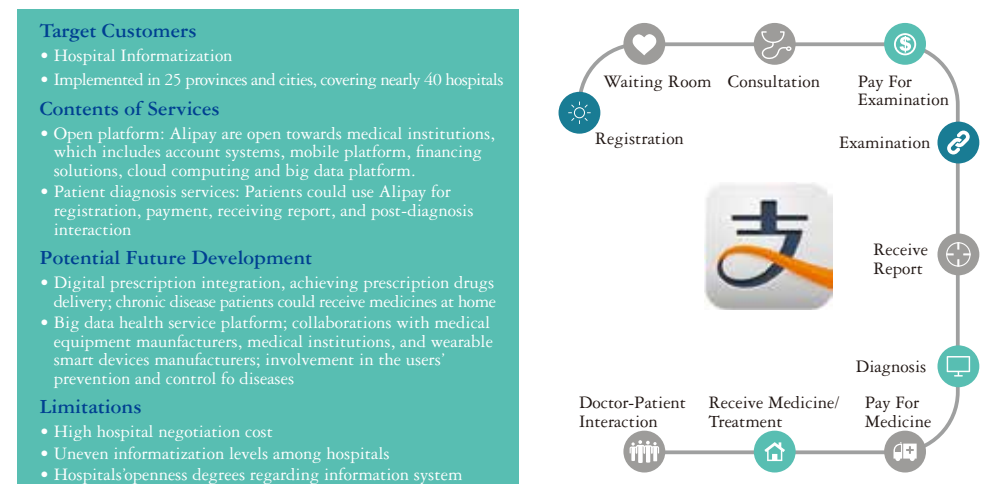


Source of Information: Deloitte Analysis.

With regard to serving hospitals, there are currently two main types of services. One is medical intelligence navigation services, e.g. “Future Hospital” operated by Alibaba and “Intelligent Medical” operated by Tencent, through which hospitals can offer smoother and less time-consuming procedures. The second type of service aims at hospital cost control, such as through management pharmacy benefits more efficiently. Given the government’s strict cost control measures and restrictions on reimbursement under the current medical insurance system, the road to commercialization of this service seems smoother.

The key for services targeting hospitals is to support a greater integration of information, so as to support the delivery of an entire chain of services. Information might include medical data, patient profiles and drug administration, and all of this could be subject to big data analysis which would support the integration of the entire value chain, starting from the hospitals.

Figure 8 Case: Ali Future Hospital with hospital process optimization at its core



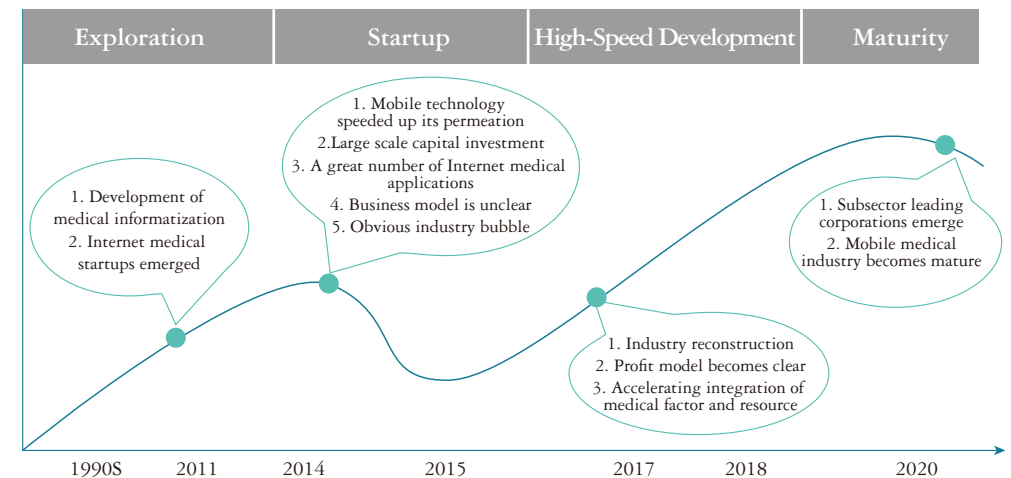
Source of Information: Deloitte Analysis.

What does the Future Hold for Internet Medicine?

Given the policies, technologies, needs and capital, the Internet-based medical industry has made an impressive start and attracted much attention; at the same time, there are clear signals of a rapidly changing external environment, fierce competition and an evolving industry structure. Existing companies will need to make massive injections of capital to enlarge the market, aggregate traffic and integrate resources, even while they face challenges from new enterprises backed by magnates outside the industry.

As a result, within the space of a few short years the Internet-based medical industry is set to enter its next stage of development, where only the fittest will survive. Victory will come to the companies that accurately grasp industry trends, understand the true needs of key stakeholders, exploit their advantages and develop strong execution capabilities.

Figure 9 Development trajectory of the Internet-based medical sector



Source of Information: Analysys International, Deloitte Analysis.

Four Possible Trajectories of the Internet-based medical industry.

Expansion of Vertically Integrated Business Models

Focused vertical service businesses have the following features: 1) the company focuses on the business operation in a specific disease domain, and enhances brand value by its differentiated positioning and specialized operation; 2) the company does not limit itself to one single node or stage of the medical procedure, but rather integrates a series of medical services to form a complete service chain which then becomes a closed-loop service for the customers / patients; 3) the company creates a medical ecosystem that connects doctors, patients, hospitals and other service providers and intermediaries, offering a unique value proposition to each so as to retain their cooperation.

Welldoc, an American mobile medical company founded in 2005, specializes in chronic disease management is a good example of this ‘focused vertical service’ model. Welldoc has developed BlueStar, the first FDA-approved mobile application which is allowed to recommend prescription medication and is qualified for reimbursement by insurance companies. Within this framework, Welldoc has constructed the mobile and cloud diabetes management platform. Patients use their mobile phones to store blood sugar and other data in real time on the cloud, and obtain personal feedback for drug administration and daily guidance. These data are relayed to doctors on a regular basis to support the decisions that are generated by the application.

Uniquely, this mobile application allows doctors to prescribe prescription drugs, and pharmacists to approve the prescription. Welldoc then provides home visit personalization based on patient’s condition. There are two keys to Welldoc’s success. The first is that the service is backed by deep knowledge of diabetes, clinical support based on big data; and customized real

time guidance, backed by capital and technology including hardware and software. Secondly, Welldoc has successfully constructed a collaborative environment connecting doctors, government, insurance companies and pharmacies.

In China, several companies have started to explore this ‘focused vertical service’ business model. For instance, Lepu Medical, focuses on cardiovascular medicine, with multiple mobile medical platforms, including ixinzang.com for appointment and registration, online consultation and healthcare management services, e-care365.com for wearable devices, and aaa-link.com for family medical healthcare services. It is planning to acquire e-medical companies, build an online community of patients and doctors, and construct a cardiovascular healthcare system covering key parties.

Furui Medical Science is another example. Focusing on hepatopathy, it has developed a liver fibrosis diagnostic system (FSTM), which is expected to become a necessary diagnostic tool for doctors. It also supports chronic disease management, e-medic and mobile applications (<http://www.eyisheng.com/>) for follow-up services to patients. In sum, it has built a comprehensive system for hepatopathy that connects and meets all parties’ needs.

Focused vertical service models are relevant because they are built on the reality that medical treatment is actually a chain of services, and thereby relieves patients of the inefficiency and inconvenience of switching between different service providers with their own interfaces. Focused vertical models integrate the entire service chain from a single entry point, and thus, its users are more loyal and its visitors are more likely to convert to permanent users. For a medical service provider, vertically integrating the service chain helps to ensure data flow, and to focus the delivery of services more precisely. Focused research into relevant sub-sectors therefore makes services more professional. An integrated service system that supports various sub-service providers both online and offline, can thus become a solid foundation for success.



Closing the Loop between Payment Platform and Medical Insurance

Medical insurers are emerging as critical partners for B2C Internet-based medical service providers. For search engines that aim at medical procedure optimization (e.g. “Future Hospital” by Alibaba and “Intelligent Medical” by Tencent), the key to large-scale application is to achieve real time settlement of social insurance. Internet companies have already accelerated their schedules for bonding with social insurance. As the Chinese government is increasing its support for commercial insurance and upgrading social insurance management, the link between Internet medical services and social insurance is likely to get better established.

With respect to obtaining reimbursement from commercial insurance, strong support is needed from government to make it possible for Internet medical service providers to charge insurance companies. By purchasing Internet medical services (e.g. from BlueStar, which American insurance companies are willing to pay for) and making use of their background data, Chinese insurance companies can reduce costs, design customized insurance products, reduce claim risks and expand market size. With respect to social insurance, attempts to collaborate with mobile medical services have already been made, e.g. Alibaba announced that it had enabled social insurance settlement to be made via Alipay in Guangzhou Overseas Chinese Hospital and planned to incorporate such social insurance settlement into the second phase of its “Future Hospital”, which would allow patients to fully settle their social insurance payments before leaving the hospital.

Figure 10 Collaborations between Internet-based medical and commercial insurance companies

Commercial Insurance	Internet Medical	Collaboration Contents
		<ul style="list-style-type: none"> Implement the online purchase, claim, audit and direct payment function for CPIC Allianz’s existing health insurance products Design new products for Ali cloud hospital’s patients Explore reform policies such as hierarchical diagnosis and treatment system
		<ul style="list-style-type: none"> Forming its healthcare network “健康云” based on health insurance business, online health management, and medical data and customer information accumulated from smart device business Combine insurance with its own medical, pharmaceutical and information network, forming closed loop payment
		<ul style="list-style-type: none"> With the professional knowledge of physicians from Chunyu Doctor, providing readily available conversational services with doctors
		<ul style="list-style-type: none"> Launched China’s first medicine insurance that fully covers online medical model Users consult healthcare professionals via telephone, purchase corresponding medicines from Tmall; insurance company will refund the purchase price unconditionally
		<ul style="list-style-type: none"> Matching with MetLife’s travelling and sports injury insurance products Users could gain points by taking exercises and trade them for insurance products

Source of Information: Deloitte Analysis.

It is noteworthy that medical insurance cost control will remain the focus of those who pay, with respect to both commercial insurance and social insurance. An ideal partner should possess the following two abilities: the first is ability to achieve a cure, reduce medical fees and increase the efficiency of medical procedures; the second is the ability to prove the efficacy of Internet-based medical services with sufficient data.

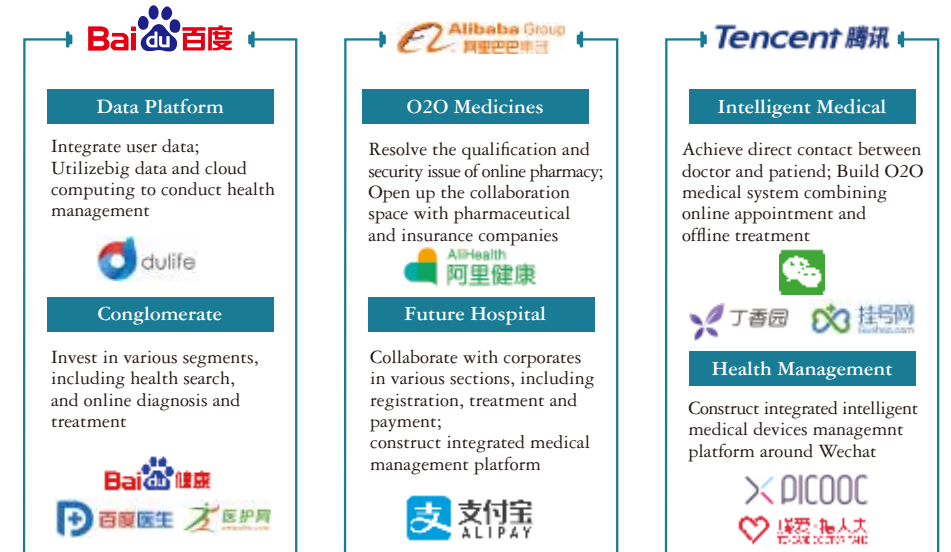
BAT's Entering will Influence the Market Structure Profoundly

The Internet-based medical industry has vast room for market development and, in this light the BAT (the Big Three Internet companies of China: Baidu, Alibaba and Tencent) have already put down stakes, playing off their respective strengths. Alibaba has built "Future Hospital" with the payment platform Alipay as its core, using AliHealth as a platform to expand O2O pharmaceutical business. Tencent has implemented "Intelligent Medical" based on Wechat, invested in DXY.cn and Guahao.com to gain doctor and patient resources to develop on medical procedure side, and constructed an integrated intelligent medical devices management platform with Wechat as its vehicle by conducting R&D and collaborating with hardware vendors to develop the health management side. Baidu has constructed its open data platform based on its technical strength in Chinese search, data mining and analysis.

As huge companies with abundant capital, solid technical strength and rich experience of the 'Internetization' of traditional industries, BAT will influence the market structure of the Internet-based medical industry profoundly. Against such a backdrop, for smaller companies, developing strategic cooperation with BAT would seem a wise course to follow. For instance, leading mobile medical platforms in the appointment domain, such as Guahao.com, hk515.com, quiyiyuan.com, 91160.com, and yihu.com, all have built strategic cooperative relationships with BAT.



Figure 11 BAT's current investments in Internet medical industry



Source of Information: Deloitte Analysis.

From Disorder to Integration, the Emergence of an Oligopolistic Market

Due to its inherent characteristics and constraints, the development of the medical industry is relatively slow compared to other traditional industries. However, with companies integrating resources and spreading out broadly in the market, over time they will find business models that can make full use of their respective advantages. The development of Internet-based medicine is accelerating this stage of integration where the market will separate the wheat from the chaff. Early movers who have accumulated resources and loyal users will likely experience first-mover advantages and expand via equity investment, M&A, green field projects and other ways of expansion. The entry of BAT has further intensified competition, promoting market integration.

It's foreseeable that in the future, a few 'giants' will emerge in different subsectors of the Internet-based medical industry. As happened in the development of the group-buying and car rental industries, in the Internet medical industry, venture capital will cast a wide net at its inception, then select major projects and make more investment, using their capital to support both online and offline projects so as to wipe out competing narrowly based medical services and products. While it is important for Internet-based medical companies to expand, another way to success is to find powerful strategic partners and obtaining financial support to outlast and out-compete others in the market.

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