



Epidemic Response to COVID-19 in Pharmaceutical and Healthcare Industries Series Issue 1

Accelerating digital transformation to promote building new modes of medical delivery systems

The outbreak of novel coronavirus has been particularly fierce, delivering a serious blow to the population and to the healthcare and pharmaceutical industries. With Government leadership, the collective strength of society has been summoned to win the war against the pandemic. At the same time, we need to think about how to build healthcare systems for the future to better protect public health.

With crisis comes the need to face adversity and both adapt to the challenges and seek opportunities. Pharmaceutical and medical device companies are taking a variety of proactive measures to deal with this outbreak in the areas of R&D registration, production and supply chain and marketing. And a number of patient centric digital innovations have emerged from disease diagnosis and consultation, drug discovery and delivery, patient and public education and patient information management.

I. Consultation: Internet hospitals are expected to exceed their original scope of diagnosis and treatment

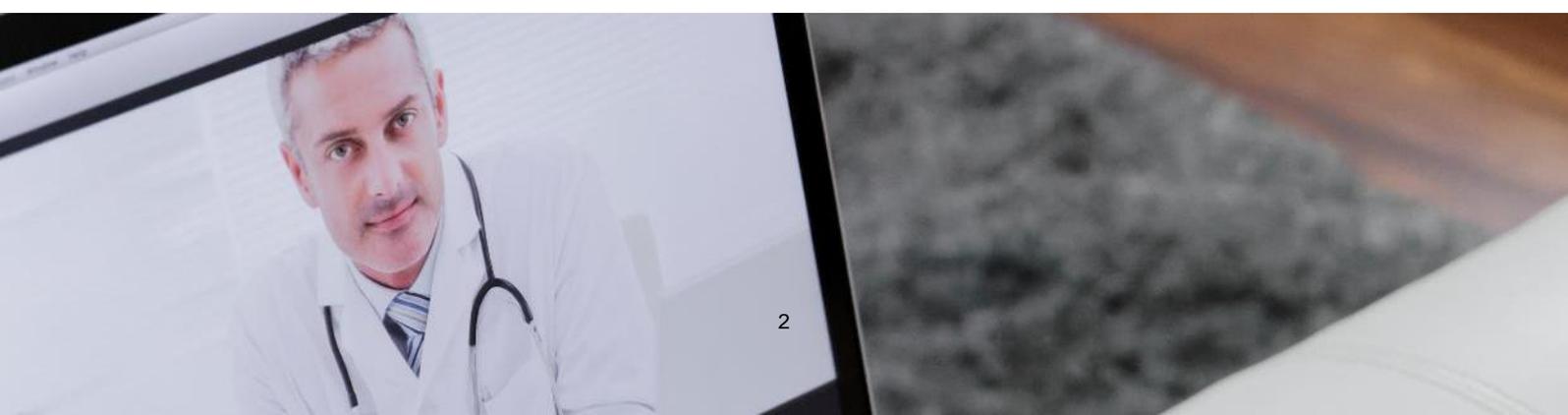
There are three basic modes of Internet+ medical treatment in China: minor consultations, Internet hospitals and remote consultations between medical institutions. In order to mitigate medical risks, the minor consultation model does not allow for diagnosis of diseases and the prescribing of medicines. Internet hospitals are aimed at the follow-up of common and chronic diseases, while remote consultations are initiated by hospitals rather than individual patients. Strictly speaking, screening for infectious diseases such as influenza is not within Internet hospitals' scope of treatment.

Physical hospitals are currently seeing a massive influx of patients due to the outbreak. Overcrowding of hospital fever clinics by patients increases the risk of cross-infection, further exacerbates the shortage of medical supplies and threatens doctor-patient relations. Some medical institutions, under the guidance of local health commissions, use Internet hospitals to provide free consultation services to the public (see Figure 1). Online consultation can effectively reduce the risk of cross-infection resulting from the gathering of crowds. Patients can also be grouped by risk level through disease screening, leading to offline diagnosis of suspected cases, optimised allocation of medical resources and eased pressure on hospital operations. This initiative has received widespread support and recognition from patients, hospitals and doctors.

Sudden mass public crisis are likely to have an influencing effect on the risk appetite of policymakers and the behaviour of users. The public tends to favour Internet hospitals supported by local top level 3A hospitals because of their fear of cross-infection. Meanwhile, the government has promptly approved and encouraged the practice of online medical treatment for febrile patients. On the 5th and 7th February 2020 respectively, the National Health Commission issued its *Notice on the Work of Strengthening Information-based Support for the Prevention and Control of Pneumonia in Novel Coronavirus Infections* and the *Notice on the Work of Internet Diagnosis and Consultation Services for the Prevention and Control of Infections*, to encourage medical institutions at all levels to roll-out online medical services to relieve pressure from offline outpatient facilities. These Notices also required local health committees to mobilise local hospitals in conducting Internet consultation services for febrile patients. The two documents may provide policy guidance for further expansion of the scope of consultation by Internet hospitals in the future. In connection with the *Guidance on Improving Internet+ Medical Service Pricing* and the *Policy on Medical Insurance Payment* issued by the National Healthcare Security Administration in September 2019, once Internet medical service is included in the scope of medical insurance payment, this will greatly enhance future users' awareness of Internet healthcare, as well as acceptance and sense of choice.

Figure1: Online consultation and disease screening by Internet hospitals amidst the novel coronavirus outbreak (selected cases)

Classification	Medical platform (examples)	Launch of online epidemic-related consultations
Minor consultation 	Ping An Good Doctor	The United Wuhan Health Commission provides a 24-hour anti-epidemic telephone service to provide free consultation and guidance to the public on the prevention of new types of pneumonia.
	Ali Health	Ali Health has set up a free clinic portal on Alipay for residents of Wuhan and launched a fast track to fight pneumonia. It also provides a free online minor consultation service for pneumonia.
Internet hospital 	Shanghai Shangying Internet Hospital	Under the guidance of the Shanghai Health Commission, the online Novel Coronavirus Studio provides an online consultation service for pneumonia, as well as consultation for common and chronic diseases.
	Ngari Health Internet Hospital	Online consultation services have been fully rolled-out in all sections of the Ngari Health Internet Hospital. Specialists in the analysis of epidemics also make live broadcasts.
Remote consultations 	Guangdong Medical Union	The office of the Guangdong Pneumonia Epidemic Prevention and Control Command has started up a long-range consultation centre, organising specialists from such departments as critical care and respiratory medicine for consultation with patients with novel types of pneumonia in the province.
	Guizhou Medical Union	Guizhou Provincial People's Hospital and Dejiang National Hospital of TCM conducted long-distance medical consultations to determine whether a patient in Dejiang County's Nationalities Chinese Hospital should take another nucleic acid test for the novel coronavirus; whether or not to release the patient from quarantine; and the next course of treatment.





II. Drug purchase and delivery: Software for drug availability and delivery makes it more convenient for the public to purchase relevant medicines

During the outbreak, there was a strong demand for drugs, disinfectants and protective medical devices to combat the virus, so pharmacies were often out of stock. The public urgently needs information platforms to find out about channels through which medicines and other supplies are sold. According to the *Zhangshang Yaodian* (“Handheld Pharmacy”) app, on 31 January alone, the number of new users increased by 2648.74%. The Shanghai Pharmacy and Beijing Yaotong apps, released by the Shanghai Food and Drug Administration and Beijing Drug Administration respectively before the outbreak occurred, are used to search for local pharmacies, pharmacy medical insurance qualifications, business hours and medicine inventory. They have also helped to increase consumers’ and patients’ awareness of ways to buy drugs.

After users have completed the steps of seeking out and purchasing drugs on the Internet, delivery service providers such as Dingdang Kuaiyao and Ele.me provide professional and efficient delivery services to people’s homes on behalf of pharmacies, reducing the risk of infection brought about by the gathering of people in offline pharmacies. According to news reports, from January 20 to 26, Dingdang Kuaiyao made 1.28 million medicine deliveries in cities such as Wuhan, Beijing, Shanghai, Shenzhen and Hangzhou, with an average delivery time of about 28 minutes. Unmanned medicine counters, vending machines and community delivery lockers have rolled out a “touch-free delivery” service model, further reducing the risk of infection arising from mobile delivery by couriers.

Innovation is growing around prescription drug e-commerce. However, considering prescription traceability, quality assurance in the drug distribution process and the security of medical insurance funds, prescription drug e-commerce has yet to be realised on a large scale. Recently, the personal electronic medical insurance card developed by Tencent may serve as a link connecting information from patients’ electronic medical records, prescriptions and drug stores, completing the integration of information on people, orders and goods. This will help supervisors in verifying the source of prescriptions, verifying the use of medical insurance funds and checking delivery records. Internet hospitals, e-health insurance cards, drug search software and medication delivery services combine to create a new experience for Chinese patients, namely Online Prescription—Cooperative Pharmacy Dispensing—Delivery to Home—Online Payment with Medical Insurance.

III. Patient/public education: A platform for education with brand influence is a scarce resource

Prior to the outbreak of the novel coronavirus, there were some success stories in the field of influenza using the online education of patients and the public. HEC’s influenza drug Kewei (oseltamivir) targets children, a group susceptible to infection, and teaches influenza prevention in an educational and entertaining way. In addition to traditional offline marketing activities, HEC has used social media and internet medical platforms to create a brand image that is trusted by children’s parents. The increase in consumer demand, coupled with HEC’s extensive coverage of hospitals at all levels, as well as primary and retail markets, enabled Kewei to earn 2.93 billion yuan in sales revenue in the first half of 2019, nearly six times higher than that for the same period in 2016.

The popularity of social and influencer-media provides the public with diverse information sources, but at the same time, one-sided and even misleading information can easily lead to excessive fear and blind obedience among the public. Professional education platforms have proven to be a reputable source in providing the public with guidance on scientific prevention and control, as well as in scotching rumours. For example, with the support of the National Health Commission, the Health Communication Working Committee of the Chinese Medical Doctor Association and Tencent News jointly released a novel coronavirus pneumonia real-time rumour platform, marking the results of every search as “true”, “false” or “suspicious” every day. Verified opinions and information from medical workers are important in stopping the spread of rumours.

In the future, drug companies’ patient education programmes will be important in choosing credible channels for the delivery of information, in addition to setting audience-appropriate content. A credible and influential information platform that stands out in major public health situations is a valuable resource that will play a key role in the medical and pharmaceutical industry in the future.

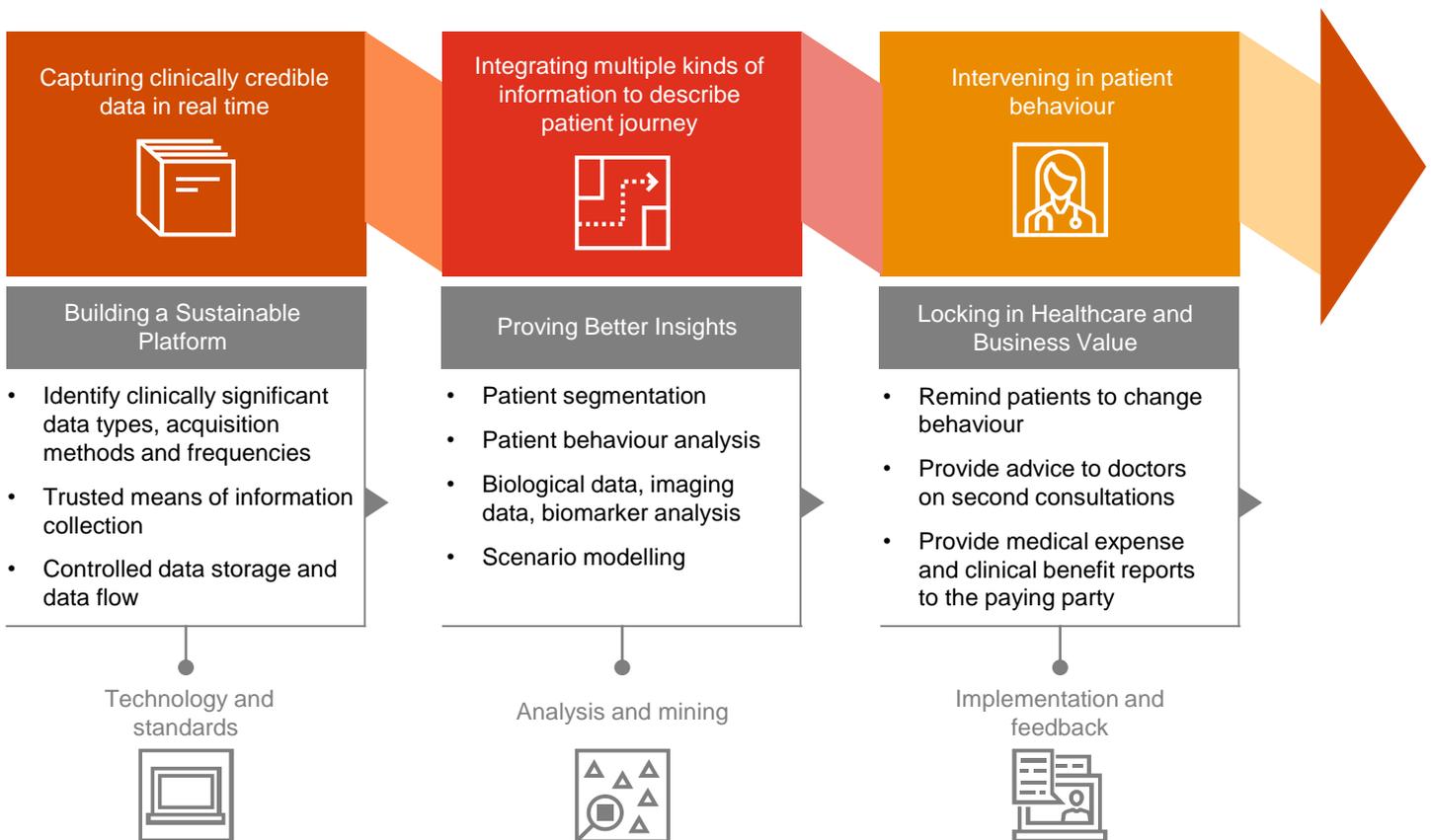
IV. Management of patient information: Digital service companies first set up outbreak information sharing platforms to provide a basis for scientific decision-making by the government, enterprises and individuals

In the early days of the outbreak, sources of information on the number of people infected with the novel coronavirus were confusing. Accurate patient statistics were urgently needed by governments, businesses and the general public. DXY.cn integrated the authoritative distribution channels of the National Health Commission, the Chinese Centre for Disease Control and Prevention and medical and health institutions in most provinces and municipalities across the country to launch an online outbreak map and real-time announcements for the novel coronavirus pneumonia on January 21. The number of visits reached 476 million one week after it went live. Alibaba, in conjunction with the Zhejiang Health Commission, developed a complete set of Novel Coronavirus Pneumonia Joint Prevention and Control Platforms on 27 January, which include four modules for residents, community streets, medical disease control and government administration, to roll out digital epidemic prevention and control. As of 6 February, 29 provinces, autonomous regions and municipalities across the country have partnered with Alibaba to build digital epidemic prevention systems.



In recent years, leading pharmaceutical companies have actively explored the management of patient information through digital means in the fields of chronic diseases and cancer. However, success stories have been rare. Practice has shown that an effective patient information management system must have three elements (see Figure 2). Take Alibaba's digital epidemic prevention system as an example. By integrating diagnostic case data from the medical industry and passenger information from the transportation industry, the public can inquire whether they have been in contact with novel coronavirus pneumonia patients. The disease control centre can also take quick action on these threads to block the path of next transmission.

Figure 2: The three elements of a patient information management system



Based on the above observations, we have reason to believe that the epidemic may be an important driver for the exploration and practice of digital transformation in the medical and pharmaceutical industry. However, the transition will not be easy. In this regard, PwC has three recommendations.

1. Formulate strategic goals for digital transformation and a cross-department consensus within the company

In recent years, the boom of the digital economy and digital medical entrepreneurship has greatly affected the managers of traditional pharmaceutical and medical device companies. More and more managers have unprecedented expectations for the move to smart digital information technology. Our project experience has shown that managers, when assessing the value of digital transformation programmes, should consider whether these innovative high-tech tools can achieve three key objectives (see Figure 3), differentiation, experience and synergy.

Second, even if the direction is clear, the design of the project objectives still needs to be aligned closely with product characteristics, rather than being generalised. For example, in an innovative patient-centred business model, pharmaceutical companies assess unmet needs in terms of patients' drug awareness, prescription availability, drug accessibility, drug affordability and compliance. It is not difficult to imagine that there are significant differences in the operational requirements for innovative and generic drugs, drugs for chronic diseases, cancer drugs and drugs for epidemics. A deep understanding of the business and patient needs can lead to an innovative digital solution suited to the product (see Figure 4).

Figure 3: The three strategic objectives for the digital transformation projects of pharmaceutical and medical device companies

Provide a unique, differentiated competitiveness for your products



- Management of patients outside of chronic disease hospitals
- Diagnostic devices equipped with digital solutions
- Targeted patient education and product/service recommendations
-

Optimise the experience of key stakeholders (including patients, doctors, etc.)



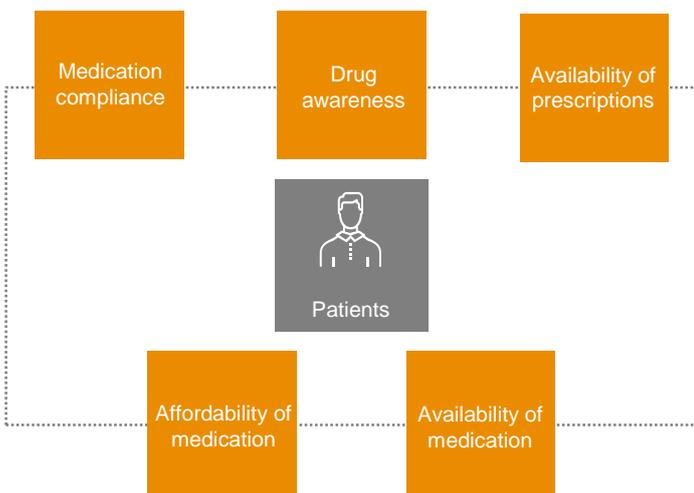
- Patient referrals based on electronic medical records
- Outflow of prescriptions supported by e-health insurance cards
- Internet hospitals and prescription drug e-commerce
-

Promote strategic synergy and operational efficiency within the enterprise through information sharing across departments



- Pharmaceutical supply chain management
- Equipment usage and spare parts management
-

Figure 4: Business requirements for digital transformation projects are tailored to closely match product characteristics and patient needs



Product type	Business issues to address (examples)
Medicines for epidemics	<ul style="list-style-type: none"> • Drug accessibility: Patients have high requirements for convenience and speed • Drug/channel awareness: Patients need to know where to buy drugs
Medicine for tumours and rare diseases	<ul style="list-style-type: none"> • Availability of prescriptions: The hospital has the ability to diagnose and follow up on disease • Drug affordability: Innovative means of payment are needed to reduce the burden on patients
Medication for chronic disease	<ul style="list-style-type: none"> • Drug accessibility: New processes to facilitate the safe purchase of medicines by older patients • Medication compliance: Following up and tracking patients, medicine taken as ordered

In addition, managers of traditional pharmaceutical companies and medical device companies need to pay particular attention to the costs of deploying new technology. After identifying the business needs, enterprises may also need to formulate blueprints for the future construction of IT systems; define the deployment architecture, data architecture and integration architecture;

and lay out a roadmap for the build of IT systems. This is to provide management with all the information they will need on initial investment, as well as the management and operating costs to support management decision-making.

2. Measure the value of digital projects to China's medical system, actively communicate with regulatory departments and obtain policy support

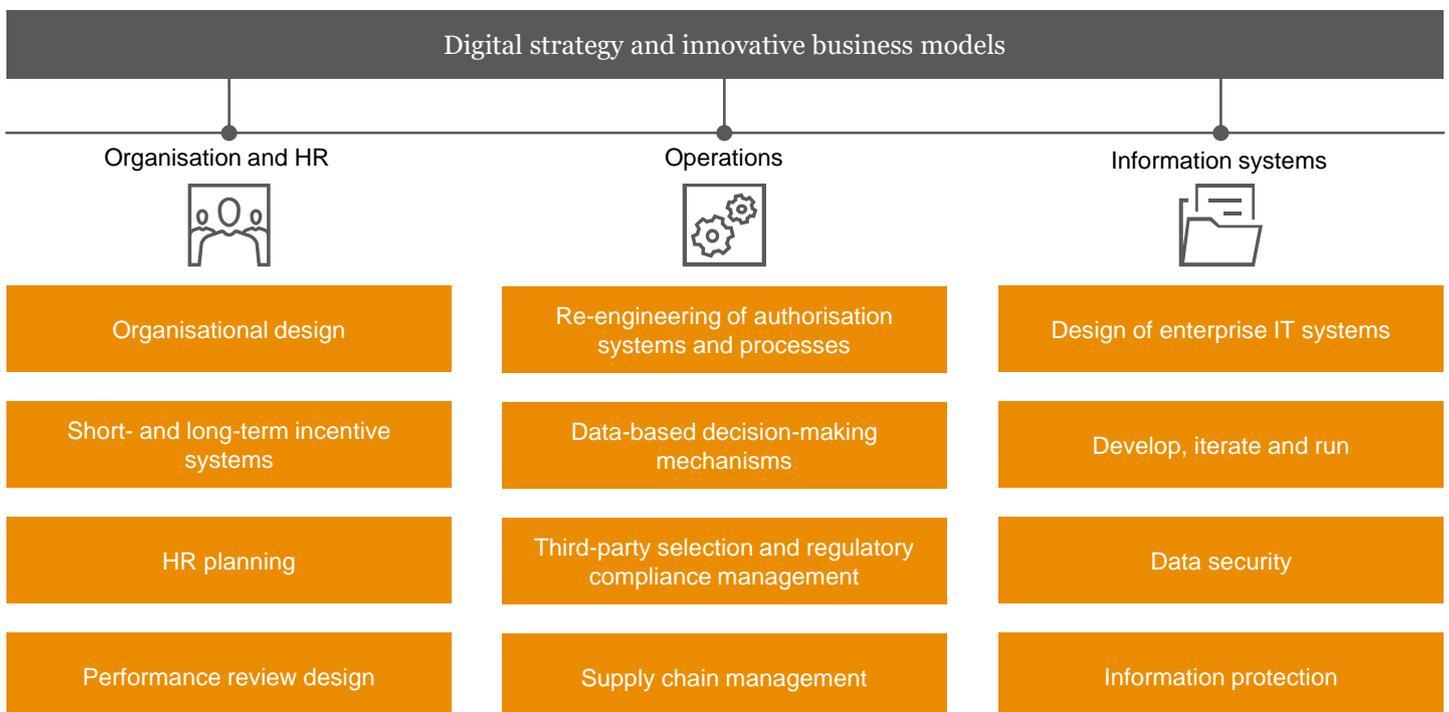
The deployment of new technologies may challenge the operational models of existing healthcare and pharmaceutical systems. For example, the use of Internet hospitals to screen for influenza cases as mentioned previously is one breakthrough in the original scope of operations of Internet hospitals. Industry leaders should not passively wait for policy liberalisation, but should take the initiative to communicate with regulators to obtain policy support in order to gain a pre-emptive advantage. The whole process can be broadly divided into three stages:

1. In the project design process, enterprises need to think out-of-the-box to identify the impact of digital transformation projects and activities across regulators, hospital administration, healthcare workers, patients, those paying and the organisation's expression of its values, and define and describe indicators to quantify the impact.
2. Data should be collected for a small-scale pilot to reflect changes against these indicators, in order to validate the operability of the project design.
3. Data is used to objectively present the benefits and costs of the digital transformation project and to analyse risks from the perspective of the various stakeholders, particularly the regulator. It also offers suggestions on risk prevention measures.

3. Guide and promote the building of new core capabilities within enterprises

The implementation of digital transformation on the ground requires systematic support at the organisational, personnel and process levels, in order to facilitate the linking of business and technology (see Figure 5). A common question is whether the digital technology implementation team should be a secondary unit within a traditional IT department or should technology enablement implementation teams be embedded within a variety of functions (e.g., marketing, medical, business operations departments, etc.), to support the digital projects of the department in question. Another common problem is that many traditional pharmaceutical and medical device companies lack the specialist expertise capable of understanding the medical system in depth. This causes them to consider their products as the centerpiece in their innovative business models, with insufficient consideration given to the needs of medical personnel and patients. Alternatively, they sometimes can hold a simplistic belief that certain new technologies can threaten to overturn existing medicine. It can be easy for external stakeholders to lose trust.

Figure 5: Elements to support digital transformation projects





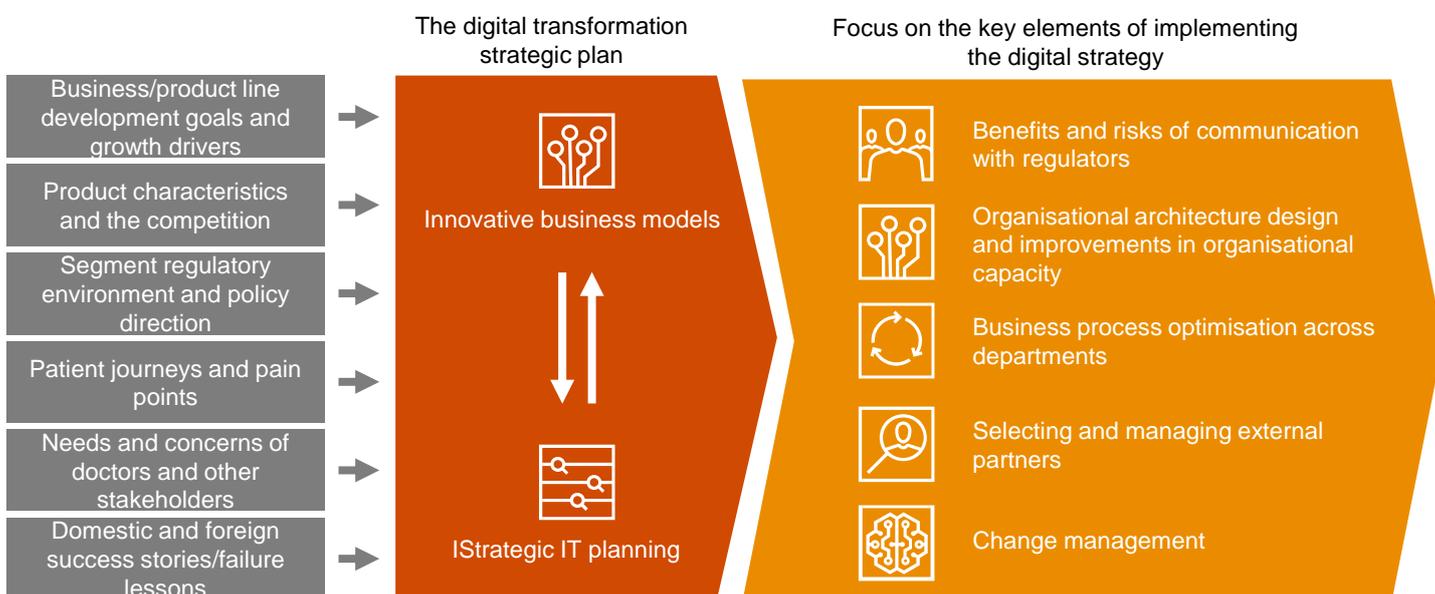
Communication between business and technology is another deciding factor for the success of digital transformation projects. The knowledge eco-systems of the two parties are relatively independent and there is a lot of jargon and technical and scientific terminology, making it difficult to reach a state of mutual understanding. It is particularly important to identify the right, capable project management team and work group at the beginning of the project. Medical specialists and digital technology professionals are brought together in the team to design communication and reporting mechanisms for the various work groups. The inclusion of more staff in the digital training curriculum, when appropriate, helps to enhance the capability of the entire organisation.

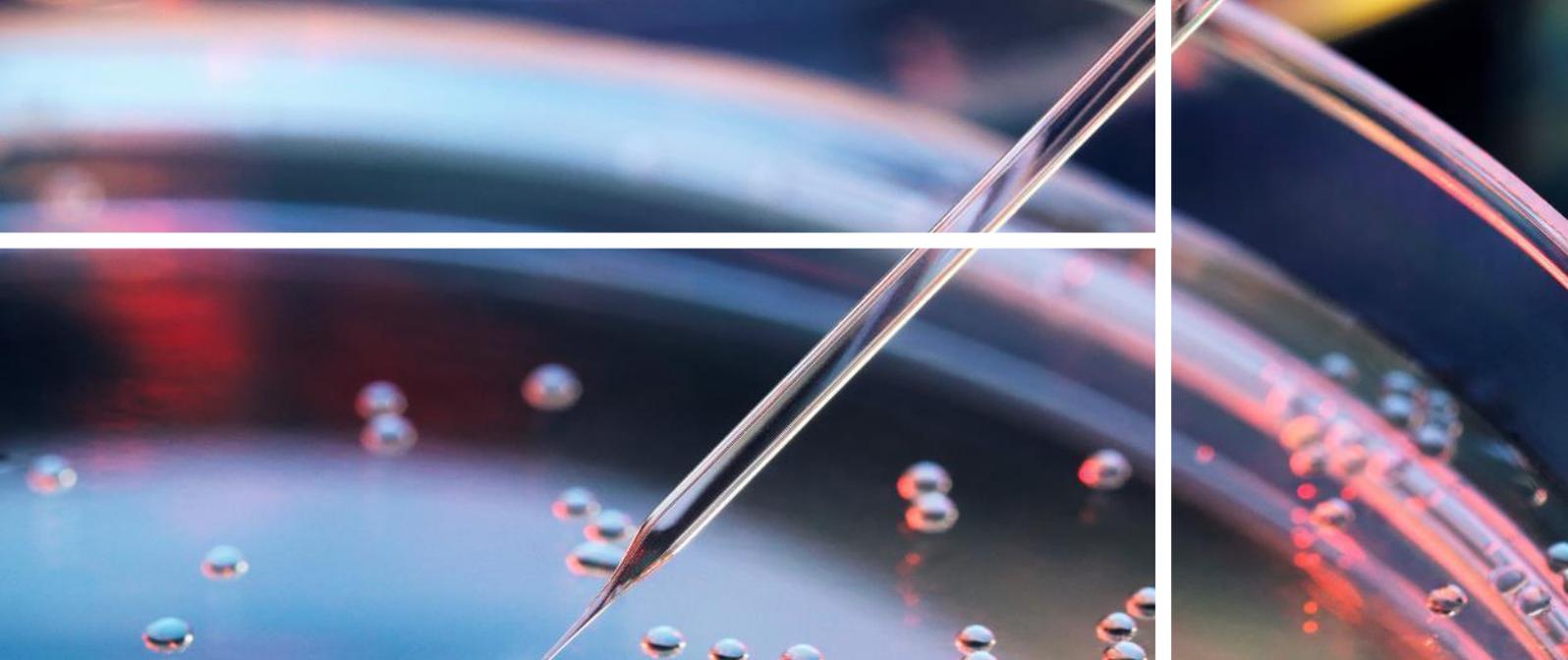
When building new core capabilities, enterprises need to take full account of external partners to jointly drive business model innovation and digital transformation.

In this outbreak, internet giants and digital service startup companies have demonstrated their reliability, agility and team emergency response capabilities. Traditional pharmaceutical and medical device enterprises should fully understand the participation of these emerging enterprises in the digital economy and cooperate on the basis of taking into account their own interests and concerns.

In conclusion, the novel coronavirus may accelerate the digital transformation of the medical and pharmaceutical industries. PwC has summarised its past project experience and provides services such as strategic planning, digital transformation, strategy implementation and change management for pharmaceutical and medical device enterprises to help them create new business models (see Figure 6).

Figure 6: A summary of PwC's experience in digital transformation projects for pharmaceutical and medical device enterprises





Contact us

Mark Gilbraith

Pharma & Healthcare Industry Leader,
PwC China
Tel.: +86 (21) 2323 2898
Email: mark.gilbraith@cn.pwc.com

Jia Xu Ph.D

Pharma & Healthcare Management Consulting Lead
Partner, PwC China
Tel.: +86 (10) 6533 7734
Email: jia.x.xu@cn.pwc.com

Jingyu Cai

Pharma & Healthcare Management Consulting Partner,
PwC China
Tel.: +86 (21) 2323 3005
Email: jingyu.cai@cn.pwc.com

Yi Shen, Health Management Consulting Manager, PwC China; Xiao Hu, Senior Consultant; Yifei Lu, Consultant; and Yuren Gao, Consultant also contributed to this article.

This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice.

© 2020 PwC. All rights reserved. PwC refers to the PwC network and/or one or more of its member firms, each of which is a separate legal entity. Please see www.pwc.com/structure for further details. PMS-001322