



Embracing Digital Disruption in Pharma for Commercial Success

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A digital imperative for pharmaceutical companies

Industries such as banking and retail are integrating technology into their customer service portfolio, contributing towards the creation of an increasingly digital world. Greater access to information and digital services is reshaping the attitudes and expectations of customers and blurring the lines between product delivery and service delivery in the clinical environment.¹ Additionally, payers are implementing more payment restrictions and focusing on reducing healthcare spending and ensuring patient outcomes. Pharma companies have an increased need to deliver value beyond products, reassess traditional business models, and champion innovation, efficiency and value.

Although medicines remain the central offering of drug developers, digital services have the potential to be a source of product differentiation. According to Kai Gait (Senior Digital Director at GlaxoSmithKline) and Kasper Jerlang (Head of Digital Transformation Region International at LEO Pharma), digital transformation is happening incrementally in the pharma industry, rather than disruptively. To be disruptive, or at least gain from the disruption that is taking place, pharma companies will need to come up with a digital transformation 'checklist' to ensure that their digital teams are headed in the right digital direction and that they are equipped to pursue such a direction.

This report aims to provide an overview of the ingredients that go into making an effective digital transformation agenda, which include identifying the key areas where the opportunities for digital transformation could be optimised; setting the competence requirements of a digitally-ready organisation; and developing internal and external forward-looking relationships that welcome, nurture and leverage digital disruption.

Where opportunities for digital disruption lie

The benefits of digital technologies could potentially be drawn from specific healthcare and drug development areas. Clinical trials, customer experience, patient outcomes, and value added services are just some of the key areas where digital disruption can make the greatest impact.

Customer experience

Digital solutions are an enabler of information exchange. For healthcare, the information being shared and exchanged revolves around diseases, treatments, health and wellness, and stakeholder opinion. Compared to the past, patients and physicians have greater reliance on digital platforms and their expectations in terms of the volume and quality of information have elevated. Analytics capabilities can segment specific customer types, enabling pharma companies to better understand customer preferences and needs. Insights generated from such technologies can be used to improve pharma's ability to manage customer experience and be virtually there, where and when the customer needs them.

Access to engaging information has improved people's ability for self-diagnosis and self-management. For example, LEO Pharma developed the free web-based patient support programme, QualityCare, which aims to offer patients information and access to assistance as they go through the various stages of the disease journey, empowering them to self-manage. Consequently, health information via applications ('apps'), websites, and online forums has affected the nature of the doctor-patient conversation. "We see a shift in who is influencing the treatment decision—patients are increasingly relying on advice from other patients or other [non-traditional] sources," says Jerlang. "This is why it is important that we focus on helping patients and HCPs with high quality information where we can."

The integration of digital capabilities is increasingly becoming a trend in the development of health services, which is changing how patient touch points are being integrated to deliver a seamless patient experience.² On-demand healthcare, which involves web-based therapies, is expected to grow into a one billion dollar industry by 2017.³ Some examples of on-demand healthcare are virtual visitations with physicians through the organisation 'Doctor on Demand' and online consultations with therapists through TalkSpace's mobile-based therapy app.

Understanding the patient journey

Massive amounts of data relating to the patient journey can be identified, captured, processed, analysed, and integrated using advanced data management tools. Deep analysis helps expand pharma's understanding and knowledge of the patients' needs as well as informing the design of patient behaviour change programmes. "If a company is able to use the data gathered and develop insights, just like you see how Facebook and Google are doing it, they could really differentiate themselves because they would understand the customers at a whole new level and be able to offer new solutions that help patients accordingly," explains Jerlang.

For example, GSK developed a medical device called MyAsthma that helps patients to better understand their chronic condition. The device informs users who suffer from asthma about their risk levels and provides health tips based on certain factors such as the time of the year and individual triggers. The developers integrated elements such as pollen types into the app so that during the summer time the app would identify the different kinds of airborne pollens to which an individual may be particularly susceptible.

Additionally, digital solutions can be used to deliver value-added services, such as those that activate patients and promote medication adherence, patient outcomes, and brand loyalty. One example of this is Boehringer Ingelheim and Qualcomm's collaboration on a connectivity solution for an inhaler to drive adherence to daily treatment regimens for chronic obstructive pulmonary disease (COPD) patients.⁴

Physician engagement

The relationship between pharma and physicians is also affected by digital solutions. Although companies still invest heavily in operating the traditional model of sales, i.e. sending sales representatives in the field to speak to doctors about medicines and securing prescriptions, a portion of the dialogue with clinicians, as well as between them, has been shifted to the digital space. Due in part to many doctors allotting increasingly less time to pharma reps, companies have a greater need to locate other potential channels to more efficiently interact with healthcare professionals.

Physician-pharma engagement can be improved through digital solutions. Content-driven marketing strategies, for instance, can be utilised to monitor physicians' online behaviour, determine their educational and professional needs, and develop content solutions to address those needs via webinars, forums, peer-to-peer learning, and email marketing initiatives. Insights about physician content requirements can also inform the approach that sales reps take with individual doctors.

Digital solutions can be used to gather data about prescription behaviour and physician attitudes to build pharma's understanding of how to best support clinical practice.⁵ Electronic medical records and diagnostics tools can facilitate physicians' clinical decision-making. Health monitoring devices can help physicians effectively monitor patients, outcomes, adverse events, and conduct remote diagnosis. Pharma can take digital solutions as an opportunity to impact on the physician-patient relationship whilst remaining compliant.

Clinical trials

Digital solutions also have an increased presence in clinical studies. Due to the ability of digital tools to boost engagement from patients, paired with the persistent problem of participant recruitment and retention, many researchers have utilised smartphones or medical wearables to locate, recruit and manage patients for clinical studies.⁶

For example, GSK built an iPhone app using the ResearchKit platform, software tech giant Apple

developed specifically for medical research purposes. The app is being used for GSK's Patient Rheumatoid Arthritis Data from the Real World (PARADE) study to gather accurate and timely data. The app and its built-in sensors can also be used to conduct patient surveys, monitor patient activity, and track symptoms and quality of life measures.⁷

In the coming years, the Internet of Things (IoT) is also poised to change how clinical trials have traditionally been designed and conducted. Essentially, the IoT is a system of connected sensors, computing devices, and digital platforms that can capture and share information with each other with little or no need for human intervention. The communication between machines is instant, which expedites data capturing, processing and analysis. Since there is an "evidence gap" between what regulators seek in clinical trials and what payers need from value propositions in the real-world setting, the IoT could potentially simulate a real-world condition during the clinical trials stage, enabling the remote and continuous collection and analysis of patient and clinical data. This data could instantaneously be arranged and analysed to inform R&D initiatives and patient support programme designs.

One such example is Pfizer's partnership with tech giant IBM, which is aimed at digitising the deployment of the Phase III trials for a Parkinson's disease treatment by 2019.

The two organisations will develop a sensor- and mobile device-enabled patient monitoring system to remotely gather data from trial participants on a daily basis. The gathered data will then be fed into IBM's machine learning platform to generate important insights about the disease, the treatment, and the factors affecting the individual responses of patients. The expediency of information gathering and analysis that IoT can offer could potentially help streamline clinical trial processes across the industry.⁸

Challenges in embracing digital solutions

Embracing digital disruption has implications on how pharma traditionally does business. Some of the challenges that companies encounter include:

Measuring the return - Digital solutions characterise a relatively new type of investment and pharma companies do not currently have many industry cases that exemplify a clear return on investment. For the most part, companies will be investing in the unknown. Investing in digital infrastructures can also be very expensive and pharma companies need to balance their resources across many investment priorities.

Skills gap in pharma companies – Digital solutions require a new set of skills that are not common among pharma's top managers and senior leaders, whose background is typically comprised of scientific and business training and experience. Excelling in the digital space requires the knowledge and expertise of technology specialists.

Finding the right business model for collaboration with digital health companies – Companies need to scan the horizon within the industry and beyond to locate potential partnership opportunities. However, collaborating with external partners requires the sharing of data and resources, as well as adjusting organisational processes and systems. This is not easy to accomplish, especially within pharma companies that often operate in silos and are heavily governed by regulations. Leaders need to develop criteria for what makes a suitable partner.

Regulatory hurdles – Digital solutions provide a new way for drug developers to offer value to customers. However, companies operate in a highly regulated industry where communication between company and stakeholders is subjected to strict limitations. Digital solutions are still unfamiliar territory and there remain several questions that are yet to be clarified from a regulatory standpoint. Companies may be cautious of violations that come with massive penalties and are detrimental to their reputation.

Data security and privacy issues – Accessing patient records and utilising social media listening to capture customer information for analysis purposes continues to raise concerns among many patients, advocates, and experts.

Managing customers' expectations – The pace at which technology evolves is shaping the expectations of patients and healthcare providers. The algorithms of search engines, which impact on the links that first reach a person who searches for health information on the Internet, are changed from time to time, which greatly affects how pharma companies create and maintain their communication mix. Furthermore, the number and variety of tools being developed, which people can utilise to participate in the network of information sharing, constantly expand. According to Gait, “The biggest disruptions for pharma are keeping up with the pace of technological change and the demands placed upon them by the healthcare professional and the patient.”

The ‘people’ aspect of digital transformation

An increasing number of pharma companies are getting serious about creating digital solutions, but to really transform digitally, companies need to be prepared for potential changes within the rest of the organisation. Pharma need to consider what Gait refers to as the “trinity” of people, process, and technology. “Companies need to invest in the right technologies to enable that digital transformation; next, they put the right processes in place to get the best out of those technologies; they then need the best people to help them put the technologies and the processes all together,” he explains. Putting these factors in place will help pharma companies develop strategies to overcome the challenges to embracing digital solutions.

Indeed, a digital transformation checklist should have well-defined goals and expectations for the ‘people’ aspect because people have the power to make or break the digital transformation opportunity. Pharma’s business model will be affected by the introduction of digital solutions, and the functional areas can

benefit tremendously, but first they need to have the attitude and capacity to embrace digital options into their individual workflow and into the interdependent relationships within the organisation. Some of the ways that digital solutions can augment the performance of each department include:

- **R&D** – improving access to scientific data and the analytic power for insights
- **Sales** – creating a more efficient sales model through modular training of reps and creation of remote touch points with physicians and healthcare professionals
- **Marketing** – enhancing the communication channel mix for patients, doctors, key opinion leaders (KOLs), and payers
- **Medical Affairs** – providing constant education and technical assistance for medical science liaisons (MSLs) and clinicians
- **Market Access** – synthesising data from various sources for robust evidence generation to justify the value of therapies and secure reimbursement and formulary placements.⁹

Notably, the leadership and culture in an organisation can hold back the uptake of digital solutions. As Jerlang explains, “A lot of the middle to senior leadership in many of the companies are people who grew up as sales reps. Deep down in their hearts, they believe that developing the best drug and building a personal relationship between the rep and the doctor is truly the way this business works, but it’s 2017 and things might have changed.” Digital projects can feel new and unproven to many senior leaders, raising the bar for proving ROI.

“The key thing for me is always influencing the stakeholders in the organisation who hold the purse strings for digital. Unless they can see the benefits that digital can bring and what it can add back to the business, you will never get the investment for digital. Therefore, digital [teams] really need to start showing what it is capable of delivering back to the business. I would say that is the number one thing on the [digital transformation] checklist,” advises Gait.

For Jerlang, however, the fixation on ensuring a clearly defined financial return may be one of the obstacles. Pharma companies hold themselves to high standards of quality. “There is no room for any quality errors in the way we work with drug development. We have a culture of high quality and checks, and double checks. This is now built into how we look at devices and apps, which sets the bar [for digital] very high,” says Jerlang. He further explains, “A non-pharma technology firm that creates incessantly and brings these creations to market creates an environment where ideas that need to move fast [are given the opportunity to actually] move fast, which is a method that could truly shake up traditional pharma and how we handle medical device development.

Companies can benefit from exploring, creating, failing and reiterating more frequently until a suitable digital solution that can offer a stronger argument in terms of business benefits is born. This is what LEO Pharma intends for their project, the LEO Innovation Lab, which is a group outside of the company’s main business. Its general objective is to identify and explore disruptive ideas that can help patients. “They do not have a short-term profit target so that gives them freedom to really try different things. They have financial support and have been able to implement new and much faster ways to develop solutions for patients,” shares Jerlang. Although the culture for having almost zero tolerance for product failure is rampant across the industry, LEO Pharma’s lab is an indication that pharma is slowly becoming more willing to consider and absorb the risks involved in the development of innovative solutions.

The Chief Digital Officer role

To drive the digital transformation at the senior leadership level, the creation of the C-suite position for the Chief Digital Officer (CDO) is one part of the necessary reorganisation that is taking place in some pharma companies in an effort to make room for digital transformation. Putting in place strong leadership will help pharma companies develop the strategies to overcome the challenges to embracing digital solutions. Part of the digital checklist, therefore, is identifying

the specific traits and skills that an effective CDO must possess. The individual taking the helm of digital solutions must have:

- ***A balanced perspective between technology and healthcare priorities***

Making strategic decisions and taking control of healthcare-related digital solutions in a company requires vast knowledge on the lifecycles of medicines and a great familiarity with the various organisational functions within the pharmaceutical organisation. At the same time, the digital leader must have the unique ability to spot opportunities for change. “It can be a tricky balance because you need the breadth and experience [in the pharma industry], but you also need that data-orientated thinking,” says Gait. In his experience as Senior Global Director in GSK, Gait makes sure to stay up-to-date with the emerging businesses in the tech and digital industries because these organisations tend to be a lot more agile – a trait that pharma could definitely improve on. “They are the ones who can have an idea that can be brought into pharma. You’ve got to be more in tune with technology, rather than just healthcare technologies, and look at the opportunities,” he adds.

- ***A well-defined vision***

Having a clear vision is important when one is filling the position of being the company’s compass for digital innovation. A vision is critical in defining how each function will work independently and collaboratively. “The Chief Digital Officer really needs to create a vision of the future for the business and then work completely across the business to align all the different functions, which can be one of the most difficult things to achieve,” says Gait.

Being vision-driven is also important to prevent an organisation from becoming too technology-focused, whereby the digital tools become distractions rather than solutions. According to Jerlang, “It is tempting to become too focused on technology. There are so many companies trying to sell you something but digital success is not only about the technology, but also about the processes, the people, and

the competencies. Understanding the new patient dynamics is [also] very important; and really going deep by collecting and focusing on the data and making insights that can be used across the organisation.”

- **An ability to manage cross-functionally**

Digital leaders must be equipped with case management skills since they cannot pursue a digital and technological strategy in isolation. LEO Pharma currently has no CDO position, but Jerlang heads the regional international multichannel marketing (MCM) initiatives. He points out that other companies may not need to specifically create a CDO position, but something equivalent to it may be enough. What is critical is placing at the top an individual who knows how to work with the rest of the business. “Companies could create a named role for a digital officer, but they would still need to really work with the rest of the business – the product teams, manufacturing, R&D, and so on,” he says. Companies can create a role to spearhead the digital agenda or consult with a digital specialist, but “what you really want is for the whole organisation to really take the digital vision and strategy in and become a digital organisation,” he adds.

Gait also shares that at GSK, “We aim to be integrated very tightly into and across business functions working as partners. When you are that intrinsic to the organisation, you are working to get the best out of the technologies, which is a win for all functional teams.”

Dealing with different teams and considering their goals and perspectives in the course of digital strategy development and implementation also extends to establishing external partnerships with tech and digital firms. “Digital people often have a great connection to outside businesses [and] bringing external knowledge in,” adds Gait.

Investments and partnerships

Investments in digital health are also bringing in waves of innovative solutions that are disrupting the services that pharma offers to patients, care providers, clinicians, and payers.

Pharma companies want to explore the potential to create value and broaden their presence across healthcare through telemedicine, wearables and medical devices, and the IoT. Hence, a growing number of pharma organisations are opening their doors to tech and digital companies to bring in novel ways of thinking and different modes of behaviour. According to Gait, newcomers bring an entirely unique approach to developing services and delivering value to healthcare stakeholders, which in itself can be a major cause of disruption.

Opening pharma’s doors to external data partners can happen in mainly three ways:

1. **Making major capital investments in digital solution companies**

Some pharma companies invest in the development of digital health solutions by acquiring a majority interest in digital solution companies (e.g. Roche acquired shares from cancer molecular information company Foundation Medicine)¹⁰ or developing an in-house innovation arm dedicated to conduct technological experiments and developments outside the purview of their normal operations (e.g. LEO Pharma’s Innovation Lab).¹¹ Digital developers and data scientists are brought in as consultants or as in-house experts to introduce new infrastructures, processes, and cultures.

2. **Funding digital health start-ups**

Companies can also enter into partnerships, venture investments, and minor capital investments to fund and support start-up tech companies that are developing digital health platforms or solutions in a process called ‘sponsored acceleration.’¹² Merck KGaA’s Merck Accelerator, for example, provides funding and mentoring for digital life science and healthcare start-ups to gain access to innovations that can supplement the company’s business

strategies.¹³ Pharma companies can also go into joint investments with venture capital firms to finance digital solution start-ups. For example, Novartis and Qualcomm created the investment company dRx Capital to support early-stage digital health companies such as diabetes digital therapeutics firm Omada Health.¹⁴

3. Collaborating in major projects with tech giants

The PARADE project between GSK and Apple's ResearchKit and the IoT system between Pfizer and IBM are examples of this type of external partnership. Tech giants like Apple, IBM, Google and Microsoft are technological leaders who have well-established digital platforms, smartphone software, data management, and device integration capabilities.¹⁵

Collaboration can also be unexpectedly achieved through other cross-industry efforts. For instance, digital teams in credit card companies face some of the same challenges as the digital teams in pharma in terms of data security and user protection. "You can collaborate to try and solve problems together that have a mutual benefit for both industries," suggests Gait.

The important factor to consider when investing or entering external partnerships is that they are aimed at creating collective disruption, which befits the current and very dynamic landscape for innovation in healthcare. Pharma has yet to reach a point where it takes advantage of digital opportunities as much as other major industries have, such as manufacturing, retail, logistics, and banking. For example, as Gait points out, the smartphone remains a source of missed opportunity in healthcare. There is underwhelming regard by patients and physicians for health-related apps because many digital health app developers do not fully optimise the gadget's built-in sensors, camera, and location capabilities. "The smartphone is the most powerful computer that you carry on you daily because it knows everything about you – what you are doing, where you are going, and what you are about to do," he says, "but patients and healthcare providers want the reassurance that the application on the phone is a high quality, evidence-based solution that aims to improve outcomes."

Investing in digital health start-ups	Corporate venture arms	Large corporate equity investment deals
<ul style="list-style-type: none"> Pharma provides start-ups with financial resources, the ability to scale and grow, credibility, regulatory experience, domain knowledge, databases and customers. In return start-ups gain access to proprietary technology, a new mind-set and an agile way of working. The majority of activities are currently around accelerators, partnerships, venture investments and minority equity investments rather than M&A. Pharma can partner with an institutionalised venture capital (VC) fund that specialises in digital health. Syndicated deals can provide pharma with access to cutting edge technology that fits with their business strategy. 	<ul style="list-style-type: none"> Set up by large companies to experiment in areas outside of the company's core competencies. Merck Global Health Innovation (GHI) fund stands out as a leader in pharma corporate venture specifically set up for digital health investments. Experts note that it is the biggest dedicated digital health venture capital fund and has invested in more than 25 digital health companies from connected diagnostics and health analytics to digital therapeutics. 	<ul style="list-style-type: none"> Roche has made corporate equity investments focused on big data and analytics, including: Roche led a Series C investment in Flatiron Health of \$175 million (January 2016), building on Series A and B rounds led by Google Ventures; and Roche acquired a \$1.03 billion majority stake in Foundation Medicine, a company that uses genomics data to select drugs for patients with cancer (2015).
Joint venture capital funds and syndication	Collaboration with tech companies for R&D and value-added services	Collaboration with cancer research network
<ul style="list-style-type: none"> Joint venture capital funds are an emerging area of pharma investment in digital health – a pharma company joins with a capital firm to combine resources and a significant capital commitment in a joint fund for a common goal. dRx Capital is a partnership between Novartis and Qualcomm, which has invested in Omada Health (digital health in chronic disease prevention), Science 37 (Network Oriented Research Assistant: NORA) and Cala Health (wearable therapy for hand tremors). DigiTx Partners was formed by Astellas Pharma and early-stage VC, MPM Capital. LEO Innovation Lab (LEO Pharma) and PHS Capital syndicated a deal to invest in SkinVision. 	<p>Examples include:</p> <ul style="list-style-type: none"> Galvani Bioelectronics: JV between GSK and Verily to develop research on bioelectronics medicines. Onduo: JV between Sanofi and Verily to build a digital behaviour change platform for diabetes management that will involve software, hardware, services and medicine. Boehringer Ingelheim and Qualcomm collaboration to add new digital technology to connected inhalers. 	<ul style="list-style-type: none"> Celgene and Takeda are working with M2Gen on the Oncology Research Information Exchange (ORIEN) Avatar research programme. The companies gain access to de-identified clinical and molecular data generated at 12 cancer care centres signed up to ORIEN. M2Gen set up ORIEN to turn data from patients with advanced cancers into a precompetitive resource. Celgene expects the data to provide better understanding of the molecular characteristics of disease. Takeda expects the data to assist with identification of the right cohort of patients with specific biomarkers for clinical trials.

Conclusion

Most of the concerns about digital solutions revolve around costs, transparency, and lack of technological competence and infrastructure. However, as time passes by, more and more tech giants and medical device start-ups enter the healthcare space. This continuous disruption to the traditional way of doing business within pharma appears to show no signs of slowing down. Rather than resist the growing presence of tech firms, pharma companies need to learn to embrace the potential contributions these firms can make to healthcare.

The world has become increasingly digitally dependent and pharmaceutical companies can be key players in digital disruption. The impact of digital solutions on the patient journey and the drug development lifecycle cannot be undermined for much longer. An agenda for effective digital transformation needs to be created and implemented in collaboration with internal people and external partners who can find their place within that agenda and utilise it to enhance individual and collective performance. Sitting at the helm of the agenda should be a truly digital person who possesses the competence, leadership prowess, and vision to optimise digital disruption and secure all the items in a pharma company's digital disruption checklist.

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