The Digital Patient Ecosystem
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The Digital Patient Ecosystem

“Harnessing the power of digital technologies is essential for achieving universal health coverage”1 – WHO Director-General Dr. Tedros Adhanom Ghebreyesus.

The rise of digital technologies has changed the fundamental ways in which life science and healthcare companies operate; threatening them to either keep pace or risk becoming obsolete. Amongst the various digital themes fighting for the spotlight is one trend that the industry cannot ignore - the progressively important role patients play in directing their health and steering their treatment options.

Personalized care, tailored engagement, and data-driven insights based on Real World-Evidence (RWE) are now taking a front seat in what we call the Digital Patient Ecosystem. In this paper, we will discuss how the life science and healthcare industry is being revolutionized by a paradigm shift requiring a holistic, patient-centric operating model. We will review the key trends surrounding this Digital Patient Ecosystem and highlight some of the core solutions developed by Capgemini to support this changing landscape.

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Introduction

In today’s hyper-connected world, patients have the opportunity to (constantly) interact with a broad set of stakeholders to best understand their treatment options. Doctors, pharmacists, healthcare professionals (HCPs), friends and family, as well as life science companies play an important role as sources of information and advice. The traditional role-set up is significantly changing and data becomes an important asset. One of the key reasons for this disruption is rooted in the abundant availability of information that patients are used to, from their role as consumer (prosumer). They expect the same for their medication and treatment. In order to meet this demand, the industry must find an approach to capture data, contextualize it, and provide each patient with information and a tailored medication/treatment option.

This goal can only be achieved via a digitally-enabled enhancement of the operating model ranging from R&D, Operations to Marketing & Sales.

Consequently, we envision a very different set-up for the future, with one of the most crucial changes being a drastic shift in patient perspective, moving from a one-way information flow of traffic (doctor to patient), to a multi-lane exchange, where individuals actively participate and take a more active role in managing their personal health, and the health of their loved ones.²

This shift towards patient-centricity will allow for more emphasis to be placed on prevention, access and tailored treatment, employing digital tools to enhance patient reach, access efficiency, and reduce the overall cost-for-care. These requirements are only heightened by the unprecedented strain that healthcare stakeholders are facing, with aging populations, longer life spans and the increased prevalence of chronic diseases primarily caused by unhealthy lifestyles. Moreover, with around $7.5 trillion USD currently spent on healthcare globally—a figure that is expected to surge in the near future—the stakes surrounding industry transformation will only become more pressing.³

Recognizing the need to monitor and help steer healthy patient behaviour, companies have begun to develop digital solutions with a user-friendly approach, such as those addressing the needs of patients with diabetes, hypertension, kidney disease, chronic obstructive pulmonary disease, and other chronic illnesses. With the number of people developing chronic diseases soaring globally, a significant market gap exists for digital innovations that can help patients successfully manage their condition.

This patient empowerment requires life science companies to look for innovative ways to better communicate with their customers, harness the power of real-world evidence (RWE) data, develop better outcomes-based solutions, and implement these technologies under increasing regulatory scrutiny. Capgemini’s Digital Patient Ecosystem aims at providing solutions that meet the needs of life science companies and patients alike; leveraging our expert industry knowledge within the Business Technology Solutions Life Science and Chemicals team along with our extensive experience as a technology solutions provider and established partnerships within the IT realm.

Trends

Increasing patient awareness

- Increasing concern amongst patients about their current health position and future commitments towards leading a healthy lifestyle.

- Nowadays patients are better informed about the medical facilities available and expect support from external experts to effectively manage their conditions.

Changing patient and healthcare interactions

- According to a study conducted by McKesson Patient Relationship Solutions, 86% of patient surveyed want live phone support and 83% are open to face-to-face pharmacist coaching.⁴

- Gartner predicts that by 2021, AI will be used to improve patient monitoring during clinical trials in 30% of the top 100 pharmaceutical companies.⁵

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⁵: Jeff Smith, Michael Shanler, Life Sciences CIOs, Accelerate Clinical Development With New Applications of Artificial Intelligence, 17 January 2019.
Need for loyalty schemes

- The healthcare industry needs to take its cue from the retail, banking, and technology industries by adopting a 360-degree perspective by rewarding patients who adhere to treatment regimens.
- According to a survey by Express Scripts, two-thirds of the 800 chronically ill adults surveyed were more likely to take good care of their health and adhere to their medications when rewarded for their efforts.6

Patient health literacy

- According to the Centers for Disease Control and Prevention (CDC), nearly 90% of adults fail to understand complex, unfamiliar health information.7
- By improving patients’ health literacy, life science companies can increase their patient engagement and improve health outcomes through adherence and consistent treatment regimens.

Partnership

- Some life science companies are partnering with tech players to design innovative digital solutions for improved medication adherence among patients with chronic disease.
- Life science companies are promoting the emergence of local experimentation and innovation as well as the co-construction of digital solutions with start-ups, incubators and HCPs.
- US-based Medisafe is working with Merck KGaA to help its cardio-metabolic patients better manage medication intake and adhere to prescribed treatment regimens.8

7: https://www.cdc.gov/healthliteracy/shareinteract/TellOthers.html
Key Trends in Developing a Patient Ecosystem

In the context of a Digital Patient Ecosystem, three major themes have been identified, all of which, will no doubt play a major role in leading digital transformation within the healthcare industry: Patient access to care, patient treatment adherence, and the use of real-world-data (RWD) and real-world-evidence (RWE) in shaping the industry-to-patient relationship.
Patient access to care

In the past, patients were exclusively reliant on doctors to provide them with a diagnosis and treatment plans, no questions asked. They needed to leave their homes, visit the clinic or hospital in person, and then take their prescriptions to be filled by the pharmacist. Today, patients are empowered to seek better ways to bring healthcare services to them. Changing demographics, including a higher percentage of elderly patients, as well as new family structures where children may no longer be living close to home, have all shaped the ways patients access care. For these reasons, developing new methods of accessing care are crucial factors in the healthcare industry reform.

At the forefront of this revolution have been mobile-enabled technologies. These applications allow patients to connect with HCPs, providing immediate support to patients in remote locations and free-up clinic waiting rooms. The UK’s National Health Services (NHS) has recently launched a digital initiative to integrate telehealth and telemedicine into part of their standard care services. This will allow patients to access reliable medical information via the NHS App, remotely speak to their doctor, check symptoms with a virtual health assistant, or even refill their prescriptions, all done from the comfort of their own home. This digital program is expected to replace up to 30 million clinic visits and save 500,000 lives per year.9

As baby-boomers begin to enter their golden years, more focus will be placed on ensuring they are cared for, while allowing them to maintain their livelihood and independence. Therefore, several digital solutions enabling at home care have taken off in recent years, giving caretakers piece-of-mind and empowering seniors to be more self-reliant when it comes to their health. Mobile apps reminding patients to take their medication, sensors that can monitor recovery from hip-replacement surgery or detect falls and interconnected medical devices that identify early warning signs for medical intervention are just a few of the technologies currently taking hold.

Helping patients to access care is a fundamental component of creating a holistic patient ecosystem. Although these digital solutions are not meant to replace or undermine the importance of face-to-face interactions, they can help complement it, supporting patients with various needs and creating a sustainable healthcare system for generations to come.

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Patient treatment adherence

Patients are becoming more vocal in their desire to be treated as partners in matters regarding their healthcare journey, with hurdles that need to be overcome by life science companies in order to fully embrace a patient-centric approach. Tackling the issue of patient adherence is currently one of the hot topics within the pharma industry, with some experts believing that pharma alone will not be able to address this challenge without the help of outside industry players.

With the aim to improve patient adherence and persistence, various digital technologies are being explored. For instance, Merck KGaA partnered with US-based Medisafe to help its cardio-metabolic patients better manage medication intake and adhere to prescribed treatment regimens. Similarly, Walgreens Boots Alliance Inc. partnered with Verily, an Alphabet company, to develop a medication adherence pilot project.

Similarly, through interconnected devices such as the smart pill bottles launched by Pillsy, patients are able to manage, track, and set reminders to take their medication. This data is then sent to their smart phones and can automatically be shared with caregivers or loved ones, further assisting in treatment maintenance. Further innovations include ingestible smart-pills, such as that developed by Proteus Digital Health in partnership with Otsuka Life Sciences. This smart-pill called Abilify MyCite was approved in 2017 by the FDA to treat schizophrenia patients, helping to track when the pill has been taken through sensors that come into contact with stomach fluids and transmitting data to a mobile app.10

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10: https://www.accessdata.fda.gov/drugsatfda_docs/label/2014/ 021436s038,021713s038,021729s022,021866s023lbl.pdf
Alternatives being explored are various forms of mobile digital health platforms with built-in support programs. Novel examples include Boehringer Ingelheim’s partnership with HealthPrize Technologies to launch a digital adherence support program called RespiPoints for patients taking the chronic obstructive pulmonary disease (COPD) inhalation spray, Spiriva Respimat. This free online program offers engagement tools such as educational quizzes, dose self-reporting, and prescription refill verification, which upon completion allows the patient to receive reward points redeemable for electronic gift cards. Avella Specialty Pharmacy has also developed a patient assistance program to engage and educate individuals, using trained nurses to deliver outreach using video, screen sharing, text and traditional phone calls. This program helped it to achieve a 29% increase in medication adherence among those designated as “low-compliance patients”.11

According to a study conducted by Credit Suisse analysts on seven large-cap pharmaceutical companies, implementing an enterprise-wide adherence program could have a major impact on their sales and earnings. In the years between 2020-2026, these companies estimate that their revenues, as well as earnings per share (EPS) could increase yearly by up to 29.5% (reported by Lilly for their 2026 EPS).12

Unfortunately, few countries monitor treatment adherence and persistence at a country or system-level, making it difficult to derive statistical values on how lack of adherence affects patient therapy outcomes. Given this, deriving insights from RWE could prove an invaluable tool for monitoring treatment adherence, persistence, and encouraging patients to communicate with their HCPs regarding the best treatment options available.

Using RWD and RWE to connect industry-to-patient

Today we are more connected than ever, with an increasing number of people sharing everything from holiday pictures, to how many steps they took that day, and even documenting their weight-loss journeys on public platforms; digital engagement has shaped the way we interact and what data means to us. Patients as end-consumers in the life science industry are making their voices heard. They are demanding better health outcomes, better treatment experiences, and all of this at a lower price-point. In order to facilitate this, digital technologies such as smart sensors, inter-connected devices, automated designs and mobile applications have allowed the barriers between life science companies and patients to fall. This interconnectedness means science and medicine should have a personal touch, taking into account our uniqueness and desire for individualized solutions.

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The Digital Patient Ecosystem
The rise of more sophisticated forms of personalized medicine is ushering the life science industry into a new era of patient care. Since the completion of the Human Genome Project—which took 15 years and a price-tag of $2.7 billion USD—the time and cost for sequencing a complete human genome has fallen drastically, where several companies such as Ancestry, 23andMe, and MyHeritage are able to provide a full individual genetic profile in a few weeks and for around $100 USD. (ref: human genome project). This ability to acquire and analyze vast amounts of data is a major driver in the development of targeted patient treatments.13

The phrase “beyond the pill” already encapsulates the core thrust of the pharmaceutical industry towards broadening it’s portfolios beyond the traditional focus on drug research and production. This is also the segment which has drawn the interest of start-ups developing health-focused apps or driving further technological developments. The digital health revolution has also attracted the attention of unlikely players from outside of the industry, such as tech giants Apple, Google and Amazon along with smaller niche companies like Fitbit. One quickly emerging market – and major source for collecting RWD – is the rise of various smart watches or fitness trackers, commonly known as wearables. These devices enable users to become data sources themselves; monitoring activity levels, heart rate, blood glucose, as well as giving the user the possibility to sync with various apps and digital healthcare tools. The opportunity to log and share this RWD electronically could promote significant advancements for the creation of RWE-based treatments. Due to this, digital apps are poised to become a future goldmine for health data.

Employing a patient-centric approach requires a company to reconsider how all business functions operate, effectively engaging patients and their families in order to understand their needs and concerns. Life science companies can benefit from this transformational shift in several ways, such as increased customer trust, a boost in reputation, and ultimately long-term growth built on customer loyalty. However, many patients lack the necessary knowledge to make sense of the detailed information populated in their healthcare apps, electronic health records, or other patient registries. Here is where tech companies could step in. Outsourcing this task to “third-party companies”, in the form of IT partnerships, could help consumers derive actionable insights from this vast data landscape. Combining clinical data, patient-reported RWD, and adding in a touch of AI or sophisticated analytical software, can help interpret and make smart choices for the health of patients.14

In addition, data directly gained from patients can be used to significantly improve treatment. Feeding information back into the value chain provides vast optimization potential. Key areas are:

- R&D helping to adjust API, composition, or the dosage form of the drug. Clustering information and leveraging meta data provides the basis to better identify trends or to reduce side effect
- Regulatory Affairs
- Manufacturing
- Sales

**Conclusion: Investing in digital technologies can help companies connect to their patients and enhance treatment outcomes**

As with any transformation initiative, the journey towards patient engagement starts with aligning executives on the business case and its urgency. With lost revenues resulting from poor adherence estimated at 36%, the potential benefits are easy to see, but it may be harder to obtain consensus on the ability of life science companies to significantly impact patient behaviors.15

We invite you to read some of the success stories we have gathered to gain a perspective on what can be achieved with drive and structure – as well as two of our enablers and solutions that could facilitate such a transformation by identifying your individual use cases.

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13: https://www.genome.gov/human-genome-project
14: David Blumenthal, March 15, 2019, A big Step towards giving patients control over their healthcare data https://hbr.org/2019/03/a-big-step-towards-giving-patients-control-over-their-health-care-data
Facing the challenges of creating a Digital Patient Ecosystem may seem daunting when faced alone. However, Capgemini provides a wide array of solutions to support clients during each step of the project journey. From creative design thinking to helping accelerate project planning, to industry-focused experts who assist with implementing custom digital solutions, we support our customers throughout the process. Close collaboration, trust, knowledge and innovation are some of the principles we live by. Take a look at some of our solutions below to find out how Capgemini can help your company launch their own Digital Patient Ecosystem.
How we foster collaborative environments

**The Accelerated Solutions Environment**

Capgemini ASE, the Accelerated Solution Environment, offers a comprehensive facilitation service, both offsite at your desired location, and at one of our 22 global network centers. It focuses on four key areas, comprising of: team alignment, business decision acceleration, risk management and group creative service. Together we can achieve rapid results during the first stages of ideation, aligning stakeholders and creating a solid base for accelerated project execution.

**Capgemini Design Thinking**

With our Design Thinking capabilities, Capgemini offers clients the opportunity to rapidly innovate in a customer-centric way. As a part of Capgemini, Idean – our global strategic design arm – best embodies this principle. By putting the needs and desires of the patient first, they are able to create high-value digital products and services that consumers love; thus, unlocking customer value and market opportunity for pharma and healthcare companies. Through their design-lead transformation they help companies to grow faster, work smarter, and uncover hidden growth potential.

**Digital Business Model**

Together with Fahrenheit 212, an acquired innovation strategy firm, we explore novel, outcome-driven yet competitive business models for our clients. This approach can assist clients in visualizing key elements related to their business strategy; for example, bringing focus to a new patient-centric model or helping to align business activities required to achieve this new strategy. With a focus on new technologies and services for the pharma and healthcare industry, Capgemini and Fahrenheit 212 can help foster creative approaches to the challenges of the future.

**Our in-house approach – the digital health platform**

While digitalization is recognised by Capgemini as a key enabler, we take a very holistic perspective during the design of a Digital Patient Ecosystem. As outlined in this publication, there are several hurdles within the scope of creating an effective Digital Patient Ecosystem. Helping consumers access care, increase adherence, and contributing to RWD are fundamental topics for which digital transformation is of crucial importance.

The digital health sector has finally seen lagging political frameworks catch-up to the rapid technological developments, with the issue of data privacy having been significantly improved through the establishment of the General Data Protection Regulation (GDPR). The establishment of the GDPR will especially help to harness the data contained within the electronic patient record in a data-compliant manner allowing for RWD to be collected and subsequently, the establishment of streamlined RWE from this data. Our vision for the creation of a digital health platform would be to unite the various stakeholders currently operating within the healthcare environment, including HCPs, hospitals, pharmacies, insurance...
providers, healthcare regulators, and life science companies, with the patient as the focal point between these players. The insights generated as a result of secure data exchange between these players will help to establish an evidence-based approach towards product improvements, consumer trends, and boosting patient treatment outcomes.

The Digital Health Platform is currently being developed by Capgemini and Berlin start-up MADANA, having entered into a partnership in late 2018. Combining the characteristics of a platform solution with blockchain technology provides a unique set-up, creating a holistic healthcare solution to bridge the gap between patients and various players within the healthcare industry. The platform will allow users to share blockchain-encrypted health data while maintaining data privacy through certified technology compliant with GDPR regulations. In other words, data sovereignty stays with the data owner. Moreover, once data access has been granted it does not extend to copying or transferring, preventing uncontrolled data perpetuation. For the moment, the focus will be to establish an anonymous working interface (mobile application for users, and desktop application for life science companies), allowing for two-way interaction aimed at providing product support on medication, as well as collecting user RWE.

Capgemini’s recent acquisition of LiquidHub further strengthened our customer engagement solutions portfolio; delivering marketing, sales, commerce, and service solutions across the entire customer journey lifecycle. Partnering with healthcare brands, LiquidHub supports innovation and drives business results via the collection and insightful analysis of RWD. Through their Specialty Pharma Insights platform, LiquidHub helps track the patient journey from script to adherence, bringing together data from social media, the market, patient-reported and company programs to gain a holistic view of the patient and align interactions across all industry players. Furthermore, their Customer Acquisition Platforms assist pharma marketing and sales activities by facilitating secure digital communication in a regulated industry context, allowing life science companies to reach their clients through web, mobile and other digital channels.

Nearly 90% of office-based physicians have an electronic health record (EHR)\(^1\)

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How we partner to create solutions

As part of Capgemini’s commitment towards creating a Digital Patient Ecosystem, partnered solutions such as that provided by Digicare and Odigo allow for a complete 360° approach to patient care technology.

With a focus on patient engagement, Digicare’s next generation web and mobile app empowers patients to take charge of their healthcare journey, while simultaneously providing an opportunity for HCPs and companies to interact with their customers. From a HCP perspective, Digicare provides several features that continuously monitor and analyze health data, as well as enabling patient-outreach programs. Treatment follow ups, trial enrollment and a customized care pathway are some of the solution highlights.

The patient experience is also encompassed within Digicare, providing remote care assistance, interconnected health devices, as well as 24/7 direct mobile access to HCPs powered by Odigo chatbot AI and tele-services. Digicare connects patients with healthcare stakeholders to ensure a well-rounded support system and thus facilitates communication and increases successful treatment outcomes.

Our Odigo partnered solution brings together digital communication as a customer interaction hub. This contact center is built as an omnichannel distribution solution, allowing businesses to adapt and analyze their customer interactions. Using natural language processing and artificial intelligence, Odigo Concierge chatbots provide life science companies with the ability to rapidly respond to product-related difficulties, improve clinical outcomes and help reduce the number of treatment-related complications through immediate assistance.

Creating value for our clients by means of digital transformation is at the core of what we do. Leveraging our industry expertise and the technologies encompassed by Capgemini’s Digital Patient Ecosystem, we can assist life science companies in creating solutions to better engage with their customers while increasing patient adherence and enhancing quality of care.

Future Outlooks

Despite recent advances in digitalizing healthcare, life science companies need to abandon their traditional mindset and adapt to the changing landscape. Patient centricity will be a key driver in steering future digital transformation; with emphasis on helping patients access care, supporting treatment adherence and harnessing the power of RWD at the forefront of this journey. Establishing a Digital Patient Ecosystem will also require advanced computers with the processing power capable of handling Big Data, employing technologies such as IBM’s Quantum Computing. This technology will exponentially increase the processing memory and speed needed for the collection and analysis of high data volumes connected to the Digital Patient Ecosystem. With our team of technology and industry experts, Capgemini can support clients in realizing their Digital Patient Ecosystem goals, from idea generation in our Accelerated Solutions Environment, to development and implementation of technical solutions using agile methodologies. Together, we can shape the future of healthcare – one app at a time.
Breast cancer 4HER mobile application

Challenge

• HER2-positive breast cancer patients often feel overwhelmed with information from diagnosis through treatment.
• Patients spend 30 minutes to an hour every week in an infusion center.
• Creating an approachable, companion app that provided information, relaxation and a way to connect to other patients on the same journey.

Solution

• Design an app inspired and co-designed by patients, that enables patients to relax and connect during their weekly transfusion, packed with games, meditation sessions, and educational content.

Results

• Over 300 patients connected in the first month and 5,000 downloads in the first 3 months.
• Innovation award for the app.
• Several brands are planning to follow suit in implementing a similar patient connect feature.

www.capgemini.com/client-story/connecting-breast-cancer-patients-to-ongoing-support
AbbVie campaign for patients and healthcare providers

**Challenge**

- A rare disease in which puberty starts too early in children.
- A lack of education and awareness was inhibiting critical early diagnosis for successful treatment.
- Raising awareness, increasing patients on therapy, and improving overall treatment adherence.

**Solution**

- Tactics: unbranded website, educational videos, banner ads, HCP ads, in-office promo materials, and an interactive philanthropic social campaign.
- Every user action on the campaign site added “cookies” to a virtual cookie jar. When the goal of 10k cookies was reached, AbbVie pledged a donation to a related pediatric health organization.

**Results**

- Reached 100% of goal in under 5 months, ahead of projections.
- Reps can customize sales aids to fit individual doctors based on needs, leading to increased sales and engagement.
- Fostered successful partnerships with key advocacy groups.

www.capgemini.com/client-story/abbvie

Online solution for the London Borough of Croydon
Active Lifestyles’ Exercise Referral Program

**Challenge**

- The London Borough of Croydon (LBC), along with the UK’s National Health Service (NHS) Primary Care Trust decided to implement a plan to improve the health of their citizens by encouraging regular exercise as preventative medicine.
- Required a partner who understood the requirements for launching an online initiative of such scope.

**Solution**

- Capgemini aligned with stakeholders to deliver an effective online management system that tracks participants on the Active Lifestyles’ Exercise Referral Program.

**Results**

- The LBC Active Lifestyles’ Team now has a fully operational online system that manages the Exercise Referral Scheme.

www.capgemini.com/client-story/croydon_council_lbc
About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients’ opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of over 200,000 team members in more than 40 countries. The Group reported 2018 global revenues of EUR 13.2 billion.

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