

Digital Therapeutics

EVOLUTION AND ENTRY INTO MAINSTREAM HEALTHCARE

Contacts

Beatriz Veyrat, Research Analyst at The Lawyer:
beatriz.veyrat@centaurmedia.com

Marco de Morpurgo, Partner and Global Co-Chair of Life Sciences at DLA Piper:
marco.demorpurgo@dlapiper.com

Contents

Introduction	5
Defining digital therapeutics	6
Cutting through the noise	7
What forms do digital therapeutics take?	11
A confluence of trends	12
Data feedback loops and the Oceanus river	14
Processing of personal data – how about consent?	16
Security	18
Opening the door to product liability	20
Monetisation and commercialisation: Do we partner up, acquire or license?	23
Partnering up or acquiring?	24
Acquire or license?	28
Monetisation: implicit or explicit?	30
Explicit monetisation	32
Implicit monetisation	40
Abbreviated bibliography – Key pieces	43



Introduction

“It is 2025 and digitally delivered therapies are now part of our regular healthcare experience.”

The authors of EyeForPharma 2019 white paper, *Digital therapeutics: pharma’s threat or opportunity?*, imagine a world in which smartphones, already the first port of call for many on matters ranging from news to health, “have been elevated to the role of personal health mentor and condition management guide.”¹

But why limit the scope of thinking to creating a mere health guru in pain and chronic condition management when, combined with medical devices, digital therapeutic solutions present the potential to become stand-in drug delivery services, administering for example insulin or monitoring and regulating heart rhythm (useful in preventing medical incidents i.e. heart attacks, or in revealing other healthcare risks)?

The products referenced in the aforementioned white paper make up an emerging field of therapies standing at the cross-section between the traditional healthcare, life sciences and technology sectors. They are digital therapeutics, and they differ from consumer wellness or consumer-grade healthcare products such as MyFitnessPal, FitBit, Clue by their focus on driving clinical outcomes. General health and wellness solutions have a role in improving health status, but digital therapeutics focuses on the use of digital solutions in the delivery of treatment, diagnostics or prevention.

Research undertaken by DLA Piper in conjunction with The Lawyer seeks to understand the current developments in the field of digital therapeutics, looking at key questions that need to be addressed if these products are to become mainstream components of health systems across the world.

These technological developments come with a myriad of legal challenges for their creators with issues such as intellectual property rights and regulation over data protection being two of the most pressing issues that require careful and thoughtful navigation. In addition, the creators of this new generation of medical devices need to understand how to bring their products to market, defining usage models and health claims, managing costs and methods of reimbursement to create solutions that work across the many different healthcare systems around the world.

Jonathan O’Keeffe, Chief Medical Officer at Machine Medicine says: “the ecosystem offered by start-ups offers the potential to impact millions and billions of patients,” before adding that the developments happening in the start-up sector, and specifically in digital therapeutics “is the most exciting stuff happening in medicine.”

¹ Andrew Stone, Writer, *Jim O’Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O’Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; Digital therapeutics: Pharma’s threat or opportunity, (S3 Connected Health and eyeForPharma) 2019; (Page 3, Para.1)*

Defining digital therapeutics

Digital therapeutics lack legal definition in the EU, or a unified common understanding of the concept. However most can agree on one thing: digital therapeutics differentiate themselves from the other denizens of the mobile and digital health industries because they focus on the delivery of clinical outcomes and must be evidence-based (basing their claims on a growing body of evidence, from randomised-control-trials (RCT) studies, clinical trials, and the collection and collation of real world data (RWD)). More simply, digital therapeutics are software products used in the treatment, diagnosis or prevention of medical conditions and use clinically validated methods of achieving or assisting in the achievement of clinical outcomes. They can be used either as standalone methods, or with certain hardware or other sensory or mechanic devices.

In 2019 the field of digital therapeutics is home to an incredible variety of products, including telemedicine platforms, mobile health apps, virtual and augmented reality, artificial intelligence, and wearable and ingestible sensors. Digital therapeutics have focused on a wide range of treatments, including moderate depression and anxiety, insomnia, substance abuse, chronic pain, irritable bowel disease, Crohn's disease, ulcerative colitis, diabetes (Type 2) and even schizophrenia.

Digital therapeutics may be described as encompassing three tiers of clinical claims:

- Digital services: digital therapeutics that aim to modify patient behavior but do not claim a specific therapeutic benefit.
- Adjunctive digital therapeutics: used alongside traditional therapies in order to improve clinical outcomes i.e. adjunct to medication.
- Digital drug replacements: digital therapeutics that replace a traditional therapy and provide clinical benefits directly, as a result of the technology itself.

Akili, a technology company, has developed a video game that, studies show, improve control and attention in pediatric ADHD patients. Some go further still, RITMOCORE – a public procurement project funded by the EU under Horizon 2020 – aims to develop personalised arrhythmia therapy for patients already using, or in need of, an implantable pacemaker. Part of its mission is to focus on remote cardiac care to increase patient activation and integrate fragmented Information and Communication Technology (ICT) solutions. RITMOCORE will encourage integrated care models through the combination of its services with wearables and mobile apps, connecting patients and the healthcare systems that serve them. The RITMOCORE strategies fit into both the second and third tiers of digital therapeutics – as identified by Simon Kucher & Partners – discussed above.



Cutting through the noise

There are over 260,000 digital health applications available for download and use across application clearinghouses. Of those, less than 1% are evidence-based – per a publication by Digital Health London (2018). It is in this context that Big Health CEO Peter Hames told McKinsey in a 2018 interview that the field was entering what he called “the quack medicine age,” due to the existence of a “huge morass of solutions with incredible variance in quality” for which, he noted, “there isn’t yet an established set of criteria.” However, that was then, this is now.

Over the last twelve months, significant steps have been taken to provide criteria which, despite not being regulatory or legally binding, are accepted by most market actors. In the UK, they are contained in the NICE Evidence Standards Framework for Digital Health Technologies – updated in March 2019. On an EU level, the EMA and Commission have published staff working documents that touch upon the topic and, although stopping short of official guidance, do offer some insight into ways in which digital therapeutics companies can ensure regulatory compliance and adherence to evidentiary standards. All of which would facilitate the continued development of digital therapeutics and their entry and market-expansion capabilities.

“The German approach is very different from the rest of the world, where the government has

recently introduced groundbreaking initiatives to put an end to the “Wild West” that now exists in some parts of the digital therapeutics industry, with the actual health benefits of digital therapeutics for patients and whether or not they comply with data protection standards often being unclear”, says Dr. med. Kokularajah Paheentharajah, a lawyer and a medical doctor from DLA Piper Germany. The new German Digital Healthcare Act (DVG) that entered into force on December 19, 2019, enables any physician or psychotherapist to prescribe low-risk digital therapeutics to the approximately 90% of the 83 million German population who are covered by the country’s statutory health insurance (GKV).

Digital therapeutics companies are now being given access to the highly lucrative German healthcare reimbursement system: for a period of up to 12 months, they have the chance to further test their digital therapeutic and gather real-world scientific data from patients on its

benefits, while the statutory health insurance will be required to fully reimburse the selling price of the digital therapeutics. However, if the benefit of the digital therapeutic cannot be demonstrated within the 12-month period, the digital therapeutics will be barred from the reimbursement system for at least another 12 months. The new legislation will force digital therapeutic companies to carefully assess the actual capabilities and the right timing for the launch of their product.²

In the US, the FDA has had an active pre-certification program in place since 2017 that aims to expedite approval pathways by focusing on the company’s established quality processes and infrastructure rather than the product itself.

Notably however, the FDA has received pushback from industry and Congress about whether it has the authority to operate its pre-cert program. As part of the 21st Century Cures Act, the FDA created

“Despite all regulatory challenges, the critical role of physicians in determining the success of digital therapeutics cannot be stressed enough”

– Dr. med. Kokularajah Paheentharajah, lawyer and medical doctor at DLA Piper

² Dr. Philipp Cepl & Dr. med. Kokularajah Paheentharajah (2020) *Germany’s push towards Healthcare 4.0 – A guide to the new fast-track pathway to reimbursement for digital health apps*

the Breakthrough Devices Program to streamline the regulatory approval process for new medical technologies that offer improved treatment or diagnosis for serious diseases that are currently unmet by existing alternatives. For instance, Dthera Sciences, a San Diego based developer of digital therapeutics for individuals with neurodegenerative conditions, received breakthrough designation from the FDA in 2018 for DTHR-ALZ, a digital “reminiscence therapy” for Alzheimer’s patients.

Arguably, regulatory conditions in the US are more facilitative and propitiate digital therapeutics ‘solutions’ entry into the market – this explains why some European

digital therapeutics companies choose to take their products to market there instead of at home.

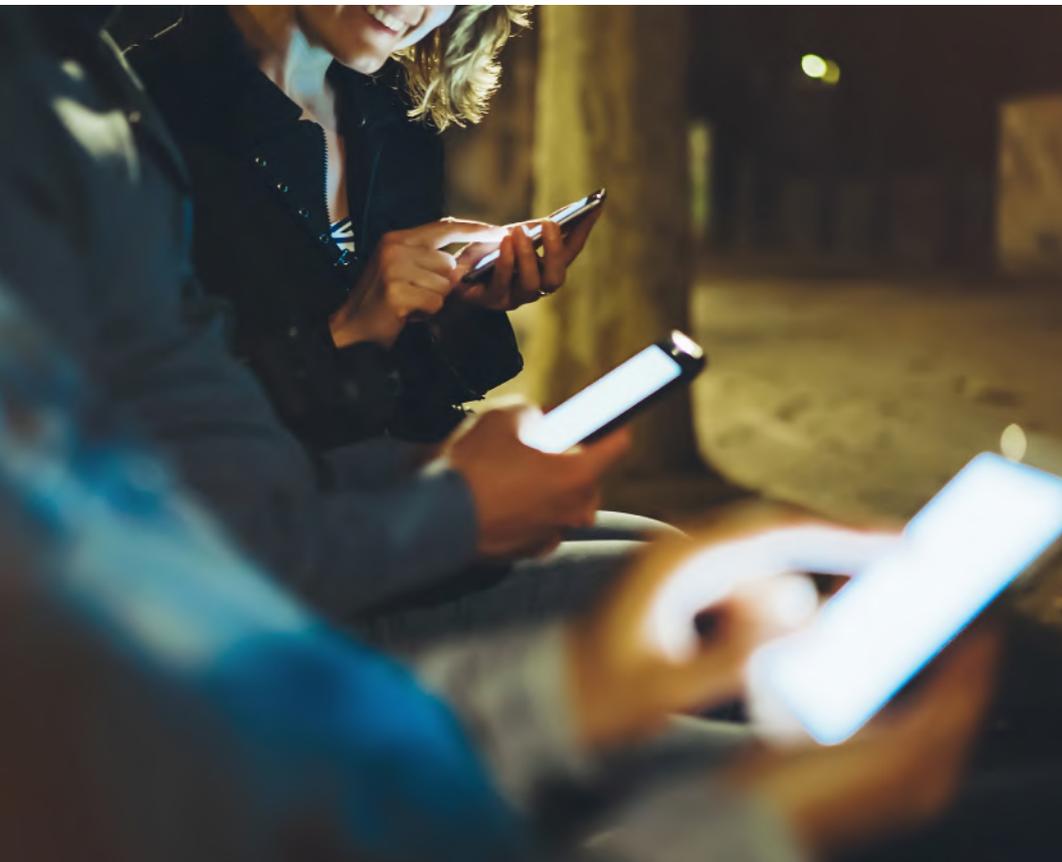
Ben Sadowj maintains that “even though the regulatory driver is right (It should be mentioned that the application of the Medical Devices Regulation (MDR) is postponed until 2021). The indirect impact is that you get a two-stage landscape, where it’s easier to enter the market and innovate in the US, whereas in Europe or the UK it’s a lot harder, and therefore patients in Europe aren’t getting access to digital therapeutics as fast; and that’s partly because of this more conservative regulatory framework and divergent approach.” It makes sense, therefore, that one

of the top concerns expressed by respondents to The Lawyer’s survey was a lack of dedicated legislation that considers all the particularities of digital therapeutics. However, as is the case in most rapidly evolving and emerging fields – the technology sprints ahead of legislation, with products and production and commercialisation changing at speeds that leave regulatory authorities playing catch-up.

Some of the interviewees concurred that clarity was among the most pressing issues. Machine Medicine’s Chief Medical Officer noted : “If we could get more clarity so that an early stage company developing software as a medical device could know what requirements need to be met, then that would be an enormous benefit”, also adding that “It (lack of guidance) seems to be a limiting factor. We are on the verge of a digital revolution, and how to use it in healthcare management, and there are lots of new regulations, but very little out there in terms of where the limits of them are, where you fall off the edge of them, and end up coming up against litigation, and on where the exposure is.”

However, some EU countries, such as Germany, have recently changed their legislation to facilitate the access of digital health applications to the market and the national health care reimbursement system and other EU countries may follow a similar path, says Dr. med. Kokularajah Paheentharajah, a lawyer and a medical doctor at DLA Piper.

This highlights the importance of industry standards and best



practices, developed and adopted by the market actors. They are essential to the autoregulation and development of the field. In that respect it must be said that digital therapeutics entrepreneurs and pharmaceutical companies, NGOs and working groups (Digital Therapeutics Alliance, MedCity), including the NHS – which stands to benefit from the ongoing development of digital therapeutics – are particularly proactive.

“Despite all regulatory challenges, the critical role of physicians in determining the success of digital therapeutics cannot be stressed enough,” says Dr. med. Kokularajah Paheentharajah, a lawyer and a medical doctor from DLA Piper. Physicians are often gatekeepers in the use of digital therapeutics and they traditionally view claims relating to digital therapeutics with skepticism. They want to make sure that they understand the functions, effects, risks and benefits of digital therapeutics to feel comfortable using them in their medical practice or recommending or prescribing them to their patients. Robust data are the only way to resolve the impasse.

Under the Medical Device Regulation, software in its own right – specifically intended to be used for one or more of the medical purposes set forth in Article 2 thereof – will qualify as a medical device. In particular, whilst most software will continue to fall within Class I, medical apps intended to provide information that is used to take decisions with diagnosis or therapeutic purposes will be classified as class IIa. Moreover,

where such decisions have an impact that may lead to death or cause an irreversible deterioration of a person's state of health, the relevant medical app will fall within Class III. In both of these cases, the manufacturer may no longer rely on a self-certification, but it will have to involve a designated Notified Body for the assessment procedure. It remains understood that software intended for lifestyle and well-being purposes will fall outside the scope of the Medical Device Regulation.

In light of the above, it will be of great interest to monitor the classification of new technologies such digital therapeutics – which appear capable of opening previously unexplored scenarios. In this sense, the development of software potentially destined to replace existing medicinal products may create an overlap between the rules on medical devices and those governing medicines.

Without pretending to be exhaustive, the described regulatory framework gives an idea of how hard it is for the EU and national legislators to keep step with innovation and new and improved products. In a context where the provisions contained in regulations, directives and national laws were conceived for “traditional” products, the competent authorities – such as the EMA and the European Commission – are called upon to take the lead and show the way forward to deal properly with the technological breakthrough. New borderline products may be on the horizon, triggering new regulatory and compliance challenges to overcome.

DLA Piper Insights

One of the many challenges digital therapeutics are facing concerns their regulatory classification. As mentioned, the impact of digital therapeutics on a market where regulation has not yet caught up to tech – such as the European one – makes it challenging for companies to ascertain which regulatory category digital therapeutics fit in.

A vast number of digital therapeutics are likely to meet the definition of medical device provided for both under Directive 93/42/EEC (Medical Device Directive) and Regulation (EU) 745/2017 (Medical Device Regulation), which is expected to apply as of 26 May 2021, repealing the Medical Device Directive.

With reference to the Medical Device Directive, the Court of Justice of the European Union (CJEU) [– in its ruling C-329/16 (“Syndicat national de l’industrie des technologies médicales (Snitem) and Phillips France v Premier Ministre and Ministre des Affaires sociales et de la Santé”) –] gave a broader interpretation of the definition of medical device included therein. In particular, the CJEU stated that the Directive also applies to a software that – although not acting directly on the human body – is aimed at achieving one of the purposes listed in its Article 1, thus paving the way for a classification as medical device of a considerably larger amount of products, including digital therapeutics.

**Marco de Morpurgo Partner,
Global Co-Chair of the Life
Sciences Sector, DLA Piper**



What forms do digital therapeutics take?

Patients engage mainly with digital therapeutics using mobile apps and devices, typically either in isolation or partnered with wearables or other medical devices.

Non-exhaustively, there are three types or forms of digital therapeutics may take, depending on the strength of their claims (may claim to assist clinical outcomes or improve the likelihood of achieving a certain outcome, and may claim to drive or effect clinical outcomes by virtue of the software/device mechanics).

Depending on which tier a digital therapeutics solution falls into, different levels of regulatory scrutiny and evidentiary requirements should be expected.

Digital services

These typically aim to modify patient behaviour in some way – whether by coaching or using cognitive or motivational stimulus to encourage behavioural change (for instance, using principles of cognitive behavioural therapy. In terms of evidentiary bodies, these will usually publish studies that show that the product can help drive a clinical outcome without claiming a specific therapeutic benefit by itself.

Adjunctive digital therapeutics

Simply put, this tier of digital therapeutics supports the use of traditional therapeutics. The trick is in the name adjunctive, as in next to, additional to, complementary to, concurrent. They indirectly assist and drive clinical outcomes by enhancing the effectiveness of their concurrent traditional therapy (pharmacological intervention).

When used in tandem with drugs or medication, “digital therapeutics can deliver interventions that improve patient benefits, including better symptom management, efficacy, safety, adherence, proper use of medication devices, improved quality of life (especially with chronic conditions such as COPD), better outcomes and preventative measures.”³ A further benefit is an “enhanced patient experience”⁴ and a feedback loop of self-updating data that proffers benefits to patient, clinician, device and software manufacturer alike.

Examples include applications that track sensors on smart asthma inhalers or used with glucose monitors, or as in RITMOCORE’s case, with pacemakers.

Digital drug replacement

Digital therapeutics in this tier seek to directly affect clinical outcomes, providing a clinical benefit through the digital technology itself, by virtue of the software or device mechanics.

Per Eyeforpharma’s white paper: in some cases, digital therapeutics may “entirely replace” traditional treatments such as “pharmacological interventions.” For example, digital therapeutics “designed for mental health or pain management, or that offer treatments for which no drug currently exists (tinnitus).”⁵

As might be expected, digital therapeutic organisations claiming to directly affect clinical outcomes would be subject to enhanced regulatory scrutiny and be expected to underwrite their claims on substantially more robust evidentiary bodies, including clinical trials and relevant authorised body approval.

³ Andrew Stone, Writer, Jim O’ Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O’ Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; Digital therapeutics: Pharma’s threat or opportunity, (S3 Connected Health and eyeforpharma) 2019; (Page 4)

⁴ Ibid.

⁵ Ibid.

A confluence of trends

Sanofi's Bozidar Jovicevic echoes the sentiment that despite barriers to its expansion, there is scope for the sector to continue to grow and expand in the near term. This is due to a "confluence of trends"⁶ driving demand for digital therapeutics. According to Jovicevic, the trends converging and driving the industry's continued growth are:

- Patients want a higher degree of control over their health. Smartphones and other devices give them access to information and capabilities that they have never had before.
- Existing drug treatments are proven to be insufficient for most chronic diseases, which require support, education, and monitoring to be effectively managed with minimal detriment to the sufferer. The rising demand means that health systems are struggling to manage rising costs and an increasing patient population.

In the US, payers and regulators are moving towards a pay-for-performance and value-based care model. This opens the door to innovative contracting and performance or results-based roll-out schemes, which have the potential to allow for data collection, feeding the feedback loop and providing evidence that drives

further innovation. This also allows for payers and healthcare providers to pilot schemes, contingent on results and outcomes, whilst at the same time helping digital therapeutics companies build relationships with patient populations, raising awareness and exposure; all of which contribute to the monetisation and commercialisation of products.

As one white paper put it: "the continued growth of the digital therapeutics market will inevitably be linked to the trends driving the consumerisation of healthcare. These include the ubiquity of smart devices and sensors and an increasing acceptance by patients of app-based healthcare delivery."⁷

"With the increasing consumerisation of digital therapeutics, where connectivity of devices is key, digital therapeutics clients are increasingly fearful of connected health litigation, particularly patent disputes based on the infringement of tech patents, e.g. semiconductors, telecommunications.

While traditionally owners of tech patents, often large multi-national tech companies, have been focusing on the enforcement of their patents against their competitors operating in the tech field, we are now observing that they are increasingly

going against digital therapeutics companies and we are very likely to see more patent disputes in the digital therapeutics sector in coming years," emphasises Dr. med. Kokularajah Paheentharajah, a lawyer and a medical doctor from DLA Piper.

Speedbumps on the road to expansion, and their legal implications

"Inherent conservatism in mainstream healthcare is an issue- a lot of it is structural. If you look at the NHS there is often very little incentive to make things more efficient," maintains Jonathan O'Keeffe, raising inherent conservatism as one of the barriers to further development of digital therapeutics. For him, the "inherent conservatism of clinicians regarding technology is an additional challenge, and regulatory conservatism means you end up in an environment that is antagonistic to product penetration into the digital health market."

Key concerns raised by survey respondents included product liability, monetisation and commercialisation, data protection, cybersecurity and patent and intellectual property protection. These are by no means exhaustive, but their offer a good starting point from which to begin our analysis.

⁶ Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; *Digital therapeutics: Pharma's threat or opportunity*, (S3 Connected Health and eye4orpharma) 2019; (Page 5)

⁷ Ibid.

Although there are many potential regulatory, liability, and data protection issues – survey respondents felt that monetising digital therapeutics was the greatest barrier holding back future development in the sector.

In an industry accustomed to solving complex legal issues, concerns over data protection and product liability do not stand in the way of a good idea. Finding direct revenue-generating applications for some of those ideas, however, is a greater concern.

Most of the concerns and legal implications raised by survey respondents correlate with perceived barriers to digital therapeutics' expansion at scale. Most of these issues stem from the fact that digital therapeutics' innovations move at a far faster pace than medical device regulation.

The problem is skillfully summarised by Eyeforpharma: "Medical device regulation, largely conceived in the pre-digital age, has been ill-suited to digital therapeutics innovations. Since they are primarily software driven, digital therapies can be developed more quickly than pharmacological products and benefit from agile development practices with ever faster feedback loops driving rapid improvement and iteration. In other words, products are continually changing and improving, despite the ongoing need to prove clinical efficacy and health economic value (which typically requires following a rigorous clinical trial process)."⁸

⁸ *Ibid.* Para 2.

Interviewees agreed that clinical validation and IP issues pose the greatest challenges to continuing development in the field.

DLA Piper partner, Gareth Stokes noted the importance of IP issues arising from data within this context. "Another question is the IP arising from that data – data can very easily go from one source to another and so you can end up with a whole load of conditional data and conditional value."

He added that: "It doesn't necessarily follow that the generated data stays with the original data, so it is possible to separate them, and may well be that the true value derived is owned by one party and not the other. So, if you get partnership and collaboration agreements with systems providers, or funding agreements wrong in that sense (separating that ownership question) then the value can leak out of the businesses."

On clinical validation and approval, Dr Isabel Van de Keere, Founder of Immersive Rehab maintained it is the key to everything, adding that: "Our current focus is on getting as many key leaders and hospitals working with us to validate on a long-term basis and to ensure patient outcomes and publish trial results and validate product and produce a full economic study alongside."

DLA Piper Insights

During a DLA Piper roundtable discussion held in September 2019, a group of industry experts shared their views on digital therapeutics and there was concern of red-tape for the supply of digital therapeutic products into the NHS. Whilst there are understandably hurdles to pass, guidance is gradually being released to assist businesses looking to develop and sell their digital health technologies into the NHS.

The revised NICE Evidence Standards Framework for Digital Health Technologies ("DHTs") published in March last year is at least a small step in the right direction setting out the requisite standards of evidence required for DHTs to demonstrate their effectiveness relative to two evidence frameworks based on (i) intended use and (ii) economic impact. The Framework provides for increasingly stringent requirements for DHTs proportionate to the relevant level of potential risk to users.

The four levels of evidentiary requirements range from those that provide no measurable patient outcomes but provide services to the health and care system, to those providing treatment, active monitoring, diagnosis and decision support. This approach reflects the challenges of developing traditional clinical trials for DHTs and the typically lower levels of evidence available. The scheme relating to economic impact now also includes a new 'basic' level for 'low impact' DHTs undergoing local service evaluation where a budget impact analysis, rather than economic analysis, would be appropriate.

However, a note of caution: the framework does acknowledge its limitations – it is less relevant for app-based DHTs which can be downloaded or purchased directly by users and it is not designed to apply to artificial intelligence which adopts adaptive algorithms, only those that are fixed.

Caroline Scott,
Senior Associate, DLA Piper

Data feedback loops and the Oceanus river

In an article published in the Financial Times ⁹ (The insidious threat of biometrics, Madhumita Murgia) highlighted the materialising risks associated with the collection and use of biometric data. In this case, “facial recognition data and over a million fingerprints were discovered on a publicly available site owned by Suprema (a company used by banks, governments and the UK Metropolitan Police).” ¹⁰

Many of the risks enumerated in this article can be applied to digital therapeutics, and by extension to any number of digital health solutions. However, due to the highly personal, protected nature of the data collected by digital therapeutics, the risks associated with hacking, theft and dispersion of such data deserve special attention.

Picture data as the river Oceanus from Ancient Greek mythology: immense and infinite, encircling the world, source of rivers and clouds.

In digital therapeutics’ case their particular Oceanus is the river of data from which a million tributaries flow, thereby creating a feedback loop.

For instance, patient data sent to a clinician to assist them in preparing concurrent therapies, more accurate diagnostics (as clinicians will have access to reams of data collected by the digital therapeutic in between face to face sessions to inform them,

rather than basing conclusions on isolated glimpses into a patient’s state and behavior) might be one tributary.

Another tributary might be data flowing back into the digital therapeutic product itself, for use to drive evidence and track user engagement and adherence.

In a similar vein, that same data stream, once anonymised might flow back out to an insurance provider or an employer, who may monitor adherence and usage in order to determine whether that solution is offered as a medical benefit.

Legal implications of data used by digital therapeutics

On data and its potential as a resource to unlock further value from the digital therapeutics, Mr. O’Keeffe notes that: “it’s a

double-edged sword that has huge potential, a large quantity of the data you require as an insurer your clinician may use to personalise treatment.”

The benefits of data collated by digital therapeutics to all parties involved are manifold and have the potential to be significant drivers of future innovation, with positive implications for patient care and for the maintenance of public health services. The value of such data streams should not be understated.

Real world data is incredibly valuable, both in terms of aiding commercialisation and monetisation, and in terms of their use by clinicians to coordinate adjunctive therapies, refine preventative care, reduce exacerbations from existing conditions, monitor adherence and, inform face-to-face sessions and advice (driving the rise of personalised medicine).

“A large quantity of the data you require as an insurer your clinician may use to personalise treatment”

– Jonathan O’Keeffe, Chief Medical Officer at Machine Medicine

⁹ Madhumita Murgia, *The insidious threat of biometrics* (The Financial Times), 21/08/2019

¹⁰ *Ibid.* Para 9

Data collected from patient use of these solutions is also being used to provide in-app or in-platform analytics for both patients and clinicians, aiding in disease management, monitoring and self-monitoring – all of which may prove beneficial to patients with manageable chronic conditions.

However, as with all personal data, emphasis ought to be placed on regulation and protection. As Madhumita Murgia puts it, you cannot change your biometric data, and it is far more difficult to change your medical data. This means that if lost, stolen, misappropriated or unethically used, the harm is more likely to be permanent.¹¹

Your mental health is not a password, you cannot simply reset it and change it. Likewise, rafts of data on cardiovascular, endocrine, psychiatric, psychological, neurological or inflammatory conditions are not equivalent to banking codes and passwords. Similarly, basal temperature data accumulated by digital therapeutics (natural cycles for example) solutions aiming to help patients take control of contraception are not in the same universe as someone's musical preferences.

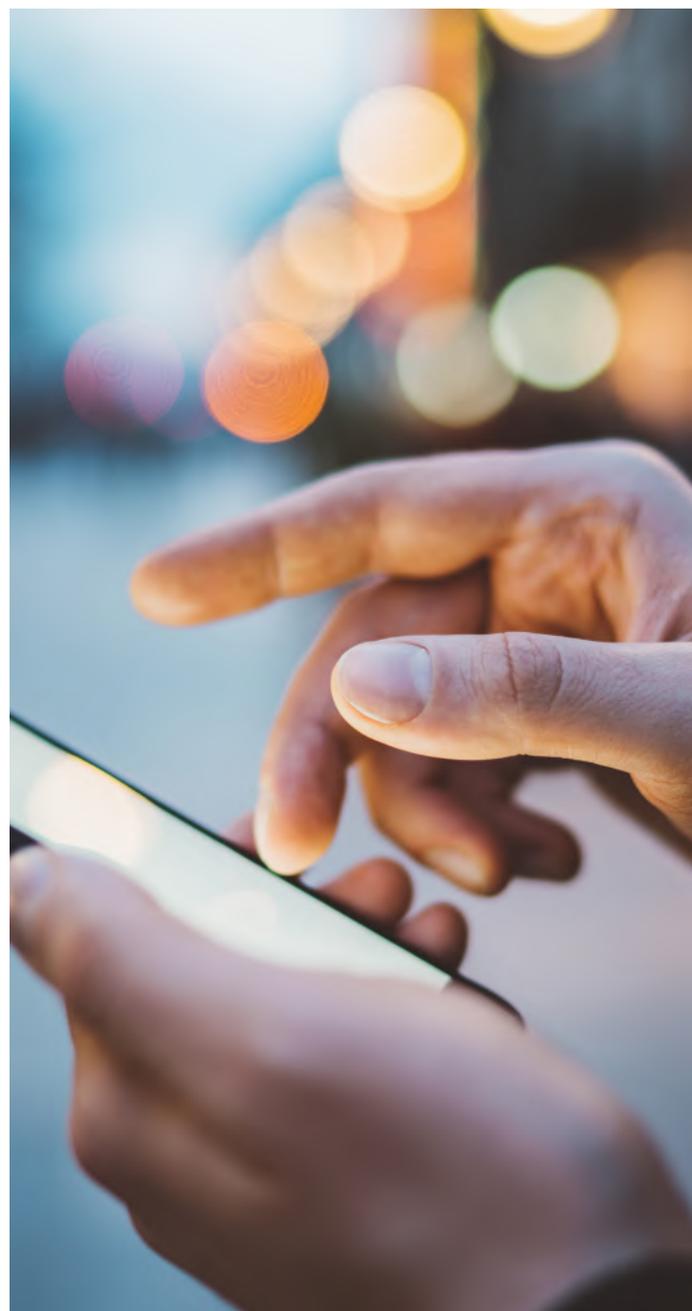
Take one benefit of digital therapeutics raised by eyeforpharma: "Growth of the digital

therapeutics market will generate data from which ever more value can be unlocked and will enable pharma and digital therapeutics developers to identify new products and services. Digital therapeutics will then meet hitherto unmet needs and achieve new milestones in managing conditions."¹²

How might players ensure that those data streams, inherently possessing huge commercial value, are adequately protected?

DLA Piper partner Gareth Stokes noted that: "there are ways of anonymising the data and still being able to use it for analysis that delivers statistically significant results. At which point you would then take it out of the scope of the regulatory regime i.e. at the point at which there is no way of linking data back to an identifiable data subject – even with multipoint analysis – then you can keep it and use it in the future."

Ben Sadowjy highlighted the positives associated with increased availability of real world data, noting that: "we should really be looking at the positives – the increased availability of real-world data means that proving patient outcomes and the healthcare outcomes of a product can be made much more compelling to investors and potential partners."



¹¹ Ibid.

¹² Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; Digital therapeutics: Pharma's threat or opportunity, (S3 Connected Health and eyeforpharma) 2019; (Page 20, Para 9)

Processing of personal data – how about consent?

Processing of personal data under GDPR is ruled by the principles of proportionality, meaning that data collectors may only collect the data which is strictly necessary for the achievement of their purpose, and may only process the data in a way which is proportionate to the aim being achieved.

There is still uncertainty regarding the appropriate legal grounds for the processing of data in the context of health matters.

One possible question raised at this point regarding consent as legal grounds for processing of personal data is how far does that consent extend, can it be renewed or given again?

Martha Carruthers explained that in Medopad “we attempt to put in a secondary consent. The patient can use the digital therapeutics, and benefit from it, with a basic consent, and then we add in a secondary/ subsequent consent where the patient can consent (or not) to their data being used for i.e. research purposes, and that is where we get really specific as to what exactly their data will be used for.”

Can a patient consent to real world data being sent to their insurance provider in order to measure adherence and efficacy of the digital therapeutic; something which might condition whether or not the therapy is reimbursed? Given the potential for innovative contracting in these cases – it seems interesting to question what impact, if any, data protection measures might have on this mode of contracting as a value-creating instrument.

Martha Carruthers also added that: “we are seeing a switch towards an opt-out model as opposed to an opt-in. This is interesting, as you assume the greater good, and then you can opt-out of your data being used.”

Likewise, in the case of employer-sponsored offerings, can consent to having personal data collected and processed by digital therapeutics extend to having personal health data streams, collected and updated in real-time

transferred to an employer? The anonymisation of data may not be feasible in many cases; even though it would provide a simple solution for the uptake of patient data from the Digital Therapeutic for incorporation into the feedback for use as RWD evidence (to drive product development, for instance). The potential benefits of this kind of data sharing are described by CEO and Co-founder of Propeller Health (now owned by ResMed):

“Already, we’re seeing patients and providers use digital therapeutics to keep better track of their medication use and symptoms between appointments, communicate about exacerbations and changes to their treatment plan, and identify previously unobserved triggers based on symptom patterns’ ... ‘In the next five years, we will see digital therapeutics become increasingly ingrained in healthcare workflows and in the patient-provider relationship’.”¹³

¹³ 2019) *Digital therapeutics: Pharma's threat or opportunity*, (S3 Connected Health and eyeforpharma) – Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, *Digital therapeutics Alliance* (Page 20, Para.2)

However, when we consider the fact that in order to be of help to clinicians prescribing it or using it concurrently, alongside traditional therapies – anonymisation is a moot point. The key issue then becomes one of security.

Additionally, negotiation over data rights has become one of the most important points in data partnerships in the digital health space. Where HIPAA is applicable, de-identification of the data is required before the data can be sold, unless specific patient authorisation for the sale of their data is obtained (very unlikely).

However, in the US, the regulatory regime makes collection and use of information easier than in the EU (CCPA complicates this to some extent but does not go as far as the

GDPR). A question our global clients often grapple with is whether to apply the strict GDPR standards (or short of that, the CCPA standards) to their data practices more generally. As US states begin to adopt stricter data laws, we are likely to see many customers shift to more conservative data practices. There is also a lot of talk about the use of blockchain in healthcare to secure patient data and give access rights back to patients.

Dr Jossy Onwude, Chief Medical Officer of Bold Health noted that for him establishing collaboration between start-ups and healthcare providers is key: “the goal is to enter into a dialogue with healthcare providers, to get them to understand why you need the data, what the benefits are, and why they should let you collect it.”

“We’re seeing patients and providers use digital therapeutics to keep better track of their medication use and symptoms between appointments”

– David Van Sickle, Co-Founder and CEO of Propeller Health

DLA Piper Insights

Consent as a legal basis for personal data processing might not only be unnecessary, but even inappropriate. Much like the Data Protection Directive the GDPR provides alternative and equally valid legal grounds and exemptions both for plain vanilla and special categories of personal data (such as data regarding health). Moreover, opinions voiced in the past by certain data protection authorities seem to have been recently embraced by the European Data Protection Board and the European Commission.

The former has officially stated, in the context of analysing the interplay between the CTR and GDPR, that a person which is not in good health conditions cannot likely offer free consent for the processing of their data. While clinical trials are obviously a different beast, data privacy wise there are enough points of confluence to allow for analogies. We commend the transition from an opt-in-based model to an opt-out strategy, and draw attention to the potential applicability of other legal grounds: performance of contract, legitimate interest, in conjunction with the exemptions provided by Art.9. para 2 (h) and, or (i) GDPR. This is not to say that said grounds are always reliable, and it remains to be seen if data sharing with insurance providers for adherence and efficacy measurement will pass a balancing test or data protection assessment.

Finally, while the jury might be out on the topic of patient consent, there is little doubt that in the context of an employment relationship, consent as a ground for personal data processing is likely invalid due to the imbalance of power between employer and employee.

**Irina Macovei, Senior Associate
and Andre Stoica, Associate,
DLA Piper**

DLA Piper Insights

The conditions for the transfer of personal data are nowadays as relevant as possible and should pose additional burden on the developing and monetising of the digital therapeutics. As the Standard Contractual Clauses and the Privacy Shield are under the scrutiny of the European Courts, the uncertainty over US transfer may delay EU patient access to digital products initiated in the US.

Also, when looking at other large markets, localisation requirements in Russia may also involve costs due to design having to mind these restrictions.

Given its sensitivity, the data gathered through digital therapeutics may be extremely attractive to hackers, thus the EU privacy by design requirement should account for transfers and data security in the recipient countries.

The contracts and technical and organisational measures are easy to imagine, draft and sign – just throw a thirty-page data processing agreement at your processor. But it is the implementation that will give most headaches. When to perform audits to processors? How to perform them? What to audit? How to keep up with the technological developments and malevolent intentions (since TOMs should be a living tool)? And what to do when your supplier, a leader on the market, is not willing to use state of the art security measures?

These are questions to be answered before going live in order to keep liability at bay and maintain user trust.

Irina Macovei, Senior Associate and Andre Stoica, Associate, DLA Piper

Security

One way of monetising digital therapeutics is the licensing of data – in some cases to pharmaceutical companies, which raises the issue of security.

For Jonathan O’Keeffe, security is “the great limiting step for us as a tech company: doing IRB’s and ethics applications, HIPAA compliance in the USA, and GDPR compliance here in the UK. I’d say it’s a great limiting step, and it’s all coming from healthcare providers.”

The challenge in the US is that for healthcare providers subject to HIPAA, inclusion of treatment dates of less than one year is still considered Protected Health Information (PHI) even if other identifiers are removed. Therefore, in order to sell month- or date-level data to pharma, healthcare providers must obtain a determination from a statistical expert that the risk of re-identification of the individual from the data (or combined with additional data) is very small. Expert determination reports come with “conditions”, including a prohibition on combining additional data sets with the de-identified data set, which often poses a challenge in data licensing deals with pharma.

Anonymised data would fall outside the ambit of GDPR and solve the issue of patient privacy, at least to some extent. However, cybersecurity could remain a concern from other points of view (national security perhaps). Cybersecurity was flagged as a key concern by survey respondents and is echoed across the literature surrounding digital therapeutics.

Developers might be incentivised to do their best to avoid reputational damage stemming from hacks or security breaches. So much of the digital therapeutics model rests on the idea of direct-to-consumer (D2C) delivery, and its genesis is partly driven by the fact that we now live in a data-rich, interconnected world, marked by the ubiquity of smartphones and smart devices which facilitate the diffusion of information.

The digital therapeutics industry seems to rely on patient engagement a great deal. What levels of damage might be sustained therefore, if patient populations lost trust in their digital therapeutics’ providers? The damage would not limit itself to reputation, but would likely affect future product development, and limit monetisation opportunities.

The march of RWE and value-based contracting is labelled a “catalyst.”¹⁴ for growth in the digital therapeutics sector. What insurance provider or healthcare provider would partner with a digital therapeutics company who cannot secure their data?

An additional consideration that ought to be factored in is the potential impact of Brexit on data transfers between the UK and the EU. Currently, data flows seamlessly under the GDPR but once the UK exits the EU this will presumably cease to apply. How will digital therapeutics companies and associated actors handle incoming data streams when they require an adequacy agreement in order to be lawfully transferred from the EU to the UK?

¹⁴ *Ibid.*



Opening the door to product liability

Reputational damage aside; given how complex the application of common liability theories to emerging technologies is, what partner would want to risk opening themselves up to the kind of expansive liability claims launched by injured patients and other stakeholders such as insurance companies, hospitals or doctors?

As was noted by DLA Piper partner Raymond M Williams and associate Jae Y Kim – when digital therapeutics enter the mainstream and become more commercialised, the likelihood of patient injury rises. This incidence may expose companies across the chain to product liability litigation.¹⁵

The nature of high-tech market evolution combined with the high levels of integration across production and distribution chains – both vertical and horizontal – means that applying the traditional paradigm of product liability becomes a vastly more complex exercise.

One example might be where a smartphone application connects

to a medical device and wirelessly controls its function, for instance RITMOCORE's pacemakers.

Imagine there is a cybersecurity attack at some point in the chain and data falls into the wrong hands. Injured patients will look to take an expansive approach to product liability litigation, as it maximises the chance of recouping at least some damages.

Identifying the 'product' at fault is an issue. Is it the app software developer (i.e. the digital therapeutic company), the smartphone manufacturer, the company who owns the application clearinghouse on which the app is housed (if we labor under the assumption that this particular tier 2 or 3 digital therapeutic does not provide its own platform from which clinicians can access the digital offerings and make their prescriptions), the medical device manufacturer who is liable? Is it some combination of them? Is it all of them?

In either case, how much liability do we attribute?

Consider the previous example, with a twist, what happens if an update or software security patch fails to go through? In the first place, who is responsible for its installation? And second, with whom does the duty to warn lie? Arguably, not with the patient given that digital therapeutics in some cases seek to directly replace pharmacological interventions. If we do not place the onus on the patient to modify their dosage when the treatment is a traditional one, it seems unethical to place it on a patient due to update their Digital Therapeutic solution.

Does the duty therefore fall to the software developer or the device manufacturer, or does it lie with both? Further given the digital context – can there be a recall of software in the traditional sense, or would patients have to delete the software from their smart devices?

How about if the patch is pushed out but the patient doesn't activate it? What warning accompanies the patch to put the patient on notice of its importance?

¹⁵ Raymond M Williams and Jae Y. Kim (DLA Piper); *Product Liability Implications in the Digital Health Industry* (Nov 2017)

DLA Piper Insights

There are two principal European Directives which deal with the compliance of products in the EU: (1) the General Product Safety Directive (2001/95/EC) (“GPSD”), and (2) the Product Liability Directive (85/374/EEC) (“PLD”).

The GPSD imposes a general obligation on all those who place products for consumers on the market to ensure that they are “safe.” ‘Safe products’ are defined in the GPSD to be any products which, under normal or reasonably foreseeable conditions of use, does not present any risk or only the minimum risks compatible with the product’s use, which are considered to be acceptable. Any product that is not a ‘safe product’ would for the purposes of the GPSD be considered to be a ‘dangerous product’ and must not be placed on the market.

The PLD sets out the circumstances in which a producer/supplier of a product may be liable for defective products should any damage be caused by such defect. Damage includes any injury to a person. A product is defective for the purposes of PLD when it does not provide the safety which a person is entitled to expect, taking into account all circumstances, including the use it could reasonably be expected to be put to. A producer would include the manufacturer of a finished product, the manufacturer of a component part and any company or person who, by putting their name, trade mark or other distinguishing feature on the product presents themselves as its producer.

Given the potential complexity of digital therapeutics products and the supply chains within which they are brought to market the risk of product defects arising which require remediation and the instigation of connected product liability cases is significantly heightened. The interrelationship between various parts also means that questions will need to be asked as to what part of the product is considered the “defect” and who would be deemed the “producer.”

**Teresa Hitchcock, Partner and
Taryn Jone, Associate, DLA Piper**

Another question arises when it comes to the treatment of injuries related to a defect in a product or another therapeutic solution. In many cases, patients would seek assistance from publicly financed healthcare institutions. Should such institutions be responsible for the treatment if the fault is attributable to the private entity? Would the answer to this question depend on exactly who the fault may be attributed to (the device manufacturer, the software developer, the data provider, or potentially even the patient)? Obviously, a healthcare professional should not refuse treatment, especially in the case of an emergency. However, it is not so obvious who should finally cover the costs of such treatment. There is no universal answer to this question as public healthcare systems are structured differently in different countries.

Imagine a patient affected by some faulty therapeutic solution who is receiving treatment in an institution operating within an insurance scheme. Can the insurer directly recover the costs of such treatment from the liable party (whoever that may be)? The answer would be different for private vs public insurers. The former would normally find it relatively easy to recover such costs. However, the situation of public entities is more complicated. Their position may be weaker as it depends on the nature of the public healthcare system (social health insurance vs tax-financed health systems), relations between public and private insurers, the nature of the basket that defines the healthcare services coverage (positive vs negative basket models), etc.

In practice, it may happen that due to the nature and legal structure of the healthcare system, public authorities will have some difficulties in recovering the costs from private parties. Therefore, public authorities and clinics try to be proactive, especially in the case of high-profile defects of therapeutic solutions or product recalls. A typical action would be to negotiate upfront all the treatment processes covering the required healthcare services, as well as the communication actions directed to patients. Such an approach by public and private entities would be – in many cases – necessary in order to resolve the uncertainties described above.

**Andrzej Balicki, Partner and
Jolanta Dabrowic, Senior Associate,
DLA Piper**

Monetisation and commercialisation: Do we partner up, acquire or license?

All sources concur that digital therapeutics is an emerging industry with practically unlimited potential for value-creation. Although there is no definitive number that encapsulates what the digital therapeutics market is worth right now, its value can be inferred from a variety of sources.

Investment into digital therapeutics ventures totaled USD12.5 billion in 2017/2018. It seems likely that this figure would continue to rise, spurred on by the entry of new market actors and the awakening of big pharmaceutical companies to a potential new source of business, competition and partnership.

Moreover, if we consider that the EU is already funding the Public Procurement of Innovation Project (RITMOCORE) – then we can ascribe yet more value to the market working off the premise that if one succeeds in capturing a patient population and demonstrating clinical efficiency etc., more will follow.

The involvement of supranational organisations such as the EU may also serve as precedent to encourage further investment by other States and public organisations – something which could be argued to result in a more facilitative regulatory landscape. This would in turn, boost investment

in the digital therapeutics market outside of the US and might encourage digital therapeutics companies to remain in Europe, therefore potentially allowing the European markets to mature and match the US's.

Divagations aside, insiders such as Jovicevic predict that within the next decade or so the overall digital therapeutics market will be worth somewhere between USD50 and USD100 billion; as given their “low cost and quick development cycles, digital therapeutics will come to be seen as ‘solutions without side-effects’.”¹⁶

Jovicevic's predictions appear to be supported by a recent report's findings; which place the valuation of “global Digital Therapeutic market at USD0.17 billion in 2018, and is

expected to reach USD0.89 billion by 2026 (compound annual growth rate 21.6%)”¹⁷

Survey respondents were split as to which approach was best-suited to developing digital therapeutics products. These findings mirror the current uncertainties within the industry itself.

Interviewee, Jonathan O'Keeffe added that: “the key to sustainable scaling with a product like Kelvin PD, is to get into clinical workflows as quickly as you can. The inertia and regulation make it hard to get in, and hard to get out. This means that there is an advantage to be had from being first-in-class.” Being the incumbent, he emphasises, means that you can turn the inertia to your advantage.

“The key to sustainable scaling with a product like Kelvin PD, is to get into clinical workflows as quickly as you can”

– Jonathan O'Keeffe, Chief Medical Officer at Machine Medicine

¹⁶ Andrew Stone, Writer, Jim O'Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O'Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; Digital therapeutics: Pharma's threat or opportunity, (S3 Connected Health and eyeformpharma; (2019)

¹⁷ Globe Newswire; Digital Therapeutics Market To Reach USD 0.89 Billion By 2026 | Reports And Data; July 2019

Partnering up or acquiring?

It could be argued that the market's apparent rising value will correlate with an increase in more traditional market actors forging a path in digital therapeutics, whether via acquisition of mature digital therapeutics start-ups or by partnering with them.

Survey respondents (pharma companies) were split on the best ways to enter the market. Somewhat surprisingly, nine respondents reported that they envisaged taking their investment into digital therapeutics in-house.

Seven more respondents noted that they would be sticking to tradition and taking the acquisition route – it would be interesting to further examine how pharma companies could successfully integrate digital therapeutics start-ups into their wider corporate culture without inadvertently hobbling their ability to drive revenue and innovation. A key consideration here could be the differing lengths of production cycles: whereas a traditional pharmaceutical product faces a ten to twenty-year production cycle, digital therapeutics solutions run on a much shorter cycle and stand to develop quicker.

Tom Heylen, a partner from DLA Piper commented that “it will be interesting to see how expansion into digital therapeutics will take

effect in the short to medium term and whether we will see an increase in corporate venturing to fund digital therapeutics.

Corporate venturing is more traditionally seen in tech investments with investors providing funds to take a small stake or an option to enable development and clinical trials whilst reserving the decision on whether to go deeper into partnership or to exit for later development stages. There are several different models for corporate venturing of this nature and these structures could provide an alternative to having to fully commit at an early stage.”

Market insiders suggest that the likelihood of pharmaceutical companies wading into the digital therapeutics market by themselves is low, as they lack the culture and agility needed to match the nimbler startups.

They are also likely, according to Konstantin Mehl, Founder and CEO, Kaia Health to encounter difficulty attracting and retaining top talent. “The people who build digital therapies don't want to work for a pharma company.”¹⁸

The most common pathways into the market will therefore be (for pharmaceutical companies) to either acquire, fund or partner

with digital therapeutic start-ups, forming a mutually symbiotic relationship – a venture which is not without risks.

Dr Jossy Onwude added that “Resource disparity and a wildly differing corporate culture seems to be at the crux of the issue, according to Dr Onwude: ‘If you agree on a pilot with pharma – you don't have legal framework as a start-up, and risk ending up in a situation where the pharmaceutical company can terminate the contract at any time and can tie you into a non-compete agreement which limits your other possibilities.’”

This might not necessarily be the case for digital therapeutic companies, who might opt to take control of the entire process – from conception to proof of concept to production and distribution etc – and keep it all in-house. Kaia and Akili Interactive Labs are both examples of digital therapeutics companies who have opted to bypass pharmaceutical companies altogether in order to build their own end-to-end (prescription – procurement) structures.

Akili Interactive Labs CEO Eddie Martucci suggested that his company would be “bucking the trend” by “building its own distribution platform¹⁹” – as opposed to relying on relationships

¹⁸ Andrew Stone, Writer, Jim O'Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O'Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; *Digital therapeutics: Pharma's threat or opportunity*, (S3 Connected Health and eyeForpharma (2019); (Page 17)

¹⁹ Ibid. Page 17

and sales channels of established pharmaceutical companies in a more traditional partnership model. "Such ventures are not easy to undertake and could have their particular pitfalls, especially for start-ups, says Dr. med. Kokularajah Paheentharajah", a lawyer and a medical doctor from DLA Piper. Digital therapeutics companies, in many parts of the world, will be operating in very heavily regulated markets and they should be attuned to these rules as well as the medical requirements already when planning, developing and implementing digital therapeutics. This is not always self-evident for new comers to the life sciences and health care market.²⁰

Over the next few years, we would expect the landscape to settle; with several well-established players. Martha Carruthers (Medopad) highlights the fact that "there's a lot of movement in this space – a lot of partnerships – yes compared to their large business it's still a very small percentage, but it goes back to their business model, and how it's going to work, partnering a billion dollar business with businesses that aren't valued as billion dollar businesses yet."

Partnering up

Tom Heylen, a partner from DLA Piper commented that whilst the draw of established pharma

companies may create obvious links for digital therapeutics companies, this does create its own challenges, some of which are outlined in this report, and it would not be too surprising to also see some of the non-traditional players looking at digital therapeutics as a route to expanding and diversifying their existing offerings. Market entrants of this nature may be able to move faster than pharma companies and may offer a more attractive opportunity for digital therapeutics entrepreneurs who may have reservations in partnering with traditional pharma companies.

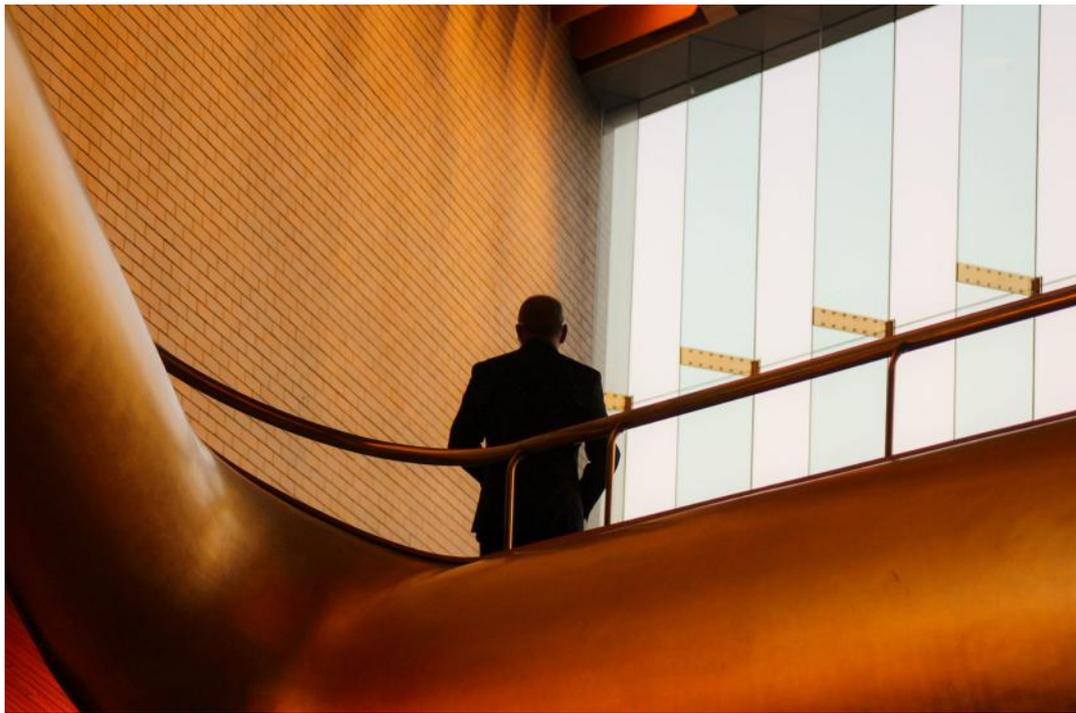
However, most Digital Therapeutic companies still see partnering with pharmaceutical companies as the best way of getting "affordable digital medicine to patients"; Propeller Health CEO David Van Sickle is one of them.

He adds that "routes to market are increasingly integrated into

ordinary clinical workflows and are more and more tightly coupled with medications."²¹

Symbiosis is the word which comes to mind when considering how pharma and digital therapeutics companies alike may approach partnership. Pharma companies offer "access to global scale, and existing patients and clinicians" – all of which constitute a platform for scalability and future development.

Access to an existing raft of patients and clinicians could also mean that digital therapeutics start-ups are better placed to launch clinical studies and gather evidence to support their claims, whereas, access to insurance providers already working with their pharma partner could result in the digital therapeutics solution gaining traction amongst payors; further aiding commercialisation and monetisation.



²⁰ Dr. Philipp Cepl & Dr. med. Kokularajah Paheentharajah (2020) Germany's push towards Healthcare 4.0 – A guide to the new fast-track pathway to reimbursement for digital health apps

²¹ Ibid. Page 18

For pharmaceutical companies partnering with a digital therapeutics start-up the benefits are access to digital solutions, and “an iterative, nimble approach to development and innovation” which some agree is lacking in mainstream pharmaceuticals culture; where R&D often find themselves partitioned away from other departments, such as commercial. In a rapidly evolving sector, such as digital therapeutics, these traditional splits are detrimental to the development of competing digital therapeutics solutions.

“Digital therapeutics touch every aspect of a pharma organisation, from R&D through to medical affairs and commercial. These groups, however, are often siloed across therapy areas and territories. Creating buy-in and a common approach is a challenge and doing this in a changing regulatory environment with fast-moving technology is an even bigger one.”²²

In that sense it is held by some that for partnerships between pharma companies and digital therapeutics start-ups to be successful, the start-up must be treated as an asset, contributing to the “top-line of the company.”²³

Certainly, this seems to be the view expressed by Ben Sadowy, Global Regulatory Manager – Innovation & Market Access at Reckitt Benckiser: “Partnerships would be a massive part of our strategy ...a lot of the larger players don’t have the technological capabilities to build these digital therapeutics solutions from scratch, so we need to work with partners who have that technical or software engineering background.”

He adds that there is in his view a ‘nice balance’ in terms of the benefits which both parties bring to the table in such partnerships.

Despite the challenges, Van Sickle believes partnership to be the best route currently available to pharma and digital therapeutics players alike, as pharma companies, payers and healthcare organisations “are ‘incentivised to manage costs and drive better outcomes’, one of those ‘better outcomes’ for a digital therapeutics company might be higher and more widespread adoption rates – taking advantage of global pharma’s geographical range and scaling capabilities would arguably present clear benefits for those facing an uphill battle to prove scalability to investors.

Partnering with pharma also lends credibility to the proposition that the digital therapeutic is either a drug-equivalent or a significant value add as a drug adjunct – essential for coverage and adequate reimbursement.

As was put by Akili’s CEO and Co-Founder Eddie Martucci: “there’s a little bit of a psychological assumption that the pharmaceutical industry must partner and deliver this for it to be a legitimate medicine”²⁴ Arguably, this is a pitfall which could be mitigated through partnering with pharmaceuticals companies.”

For pharmaceutical companies, partnership also offers other benefits, such as access to valuable data collected by digital therapeutics in real-time – “which will enable pharma and digital therapeutics developers to identify new product and services.”²⁵ Partnership or licensing deals entered into with digital therapeutics companies would give “the nimbler pharma players²⁶” the opportunity to develop lasting relationships with patients, by virtue of granting access to the valuable digital real estate occupied by digital therapeutics.

²² *Ibid.* Page 17, Para 9, Quote attributed to Jim O’Donoghue, President, S3 Connected Health

²³ *Ibid.* Page 17, Para 7, Quote attributed to Corey McCann, CEO, Pear Therapeutics

²⁴ *Ibid.* Page 18, Para 1, Quote attributed to CEO and Co-Founder of Akili Interactive Labs, Eddie Martucci

²⁵ *Ibid.* Page 20

²⁶ *Ibid.* Page 20

DLA Piper Insights

There are many ways to commercialise digital therapeutics products, but most routes to market can be broadly categorised as either stand-alone or bundled with other therapies (most obviously where the digital therapeutics product augments a medical device or pharmaceutical to improve outcomes).

Stand-alone methods of monetisation of digital therapeutics products often involve persuading consumers, insurers and/or commissioning bodies of the value of the product in its own right. With digital therapeutics still being in its relative infancy, this isn't always easy and tends to require much evidence of clinical efficacy. In turn, this tends to lead to even longer lead times between product development and the first point that the product returns a profit. Whilst digital therapeutics "start-ups" that are really skunkworks projects or 'digital garage' developments by existing medical devices or pharmaceutical companies of substance may be able to benefit from a long investment period, independent start-ups do not have that luxury.

Much more so than in the fast-pace tech start-up investment community where the route to the 'hockey stick' graph of revenue growth needs to happen quickly if the start-up is to satisfy an investment community used to turning out 'unicorns', independent digital therapeutics start-ups must husband resources for a slower burn. Defraying development costs by relying on collaborations with academia (and the grant-funding associated with that field) can be one good way to get better bang for the buck. The quid-pro-quo is that the digital therapeutics start-up must walk a tightrope in agreeing its collaboration agreements – will it be free to use (and ideally claim ownership of) the new intellectual property rights created via the collaboration to improve its products? Arrangements with other funders (whether debt or equity) also need to be constructed carefully, so that this longer period before a return on investment is realised is baked in.

Bundling can provide a quicker route to profit and is easiest when the digital therapeutics operator has a formal collaboration arrangement with the manufacturer of the medical devices

or pharmaceuticals that the digital therapeutics augments. The digital therapeutics can then be sold as a higher-value package with the other treatment. This often has benefits as it tends to be easier to persuade healthcare commissioners to fund, or persuade insurers to reimburse, the cost of the traditional and digital therapeutics therapeutic package. In this scenario the collaboration will be between the digital therapeutics and the other therapeutics provider. Here, things might be quicker but likely more cut-throat than when negotiating collaborations with academics. Both the ownership of IP in the combined package and/or the interfaces between the digital therapeutics and the other therapy, and data generated by the digital therapeutics will be in issue. Product liability also tends to be a concern, and (notwithstanding that "unlimited" indemnities provided by a start-up with limited funding might not be of much value in practice) often the larger provider of the traditional therapy within the bundle will demand full cover for any claims arising out of use of the digital therapeutics with their product.

Caroline Scott, senior associate adds that: "A further complication is where the technology involves multiple decision makers or components from a number of different suppliers, which makes proving liability for a defective product trickier – this is all the more reason to make at least the contractual liability as between the parties clear (provided it is consistent with the overarching regulatory framework)."

Negotiating this between parties with varying levels of bargaining power can be a challenge. Equally challenging is the difficulty of establishing a causal link between the harm suffered by the user and the defendant, especially with digital therapeutics products where there is a reliance on data inputs from the user (and perhaps other actors such as medical professionals) – how do you prove that harm was caused by an incorrect algorithm? How do you prove it wasn't caused by incorrect data entry/use by the user? If the AI technology itself made an independent choice after it was in use, is it attributable to a flaw in its original design? These complexities call for a less traditional

liability structure in contract and tort. Many of these questions were considered in a recent European Commission report on liability for AI and other new technologies, which analyzed the adequacy of existing liability regimes in a number of different Member States: "Emerging digital technologies make it difficult to apply fault-based liability rules, due to the lack of well-established models of proper functioning of these technologies and the possibility of their developing as a result of learning without direct human control."

One of the report's recommendations is that producers and manufacturers incorporate within their innovative products (as long as it is appropriate and proportionate, taking into consideration a variety of different factors), a means of recording information about the operation of the technology to help determine which party should have to prove fault and causation of harm in the event of a claim.

Bundles also tend to require the parties to deal with the vexed question of exclusivity. If the digital therapeutics is of potentially wide application and could function alongside multiple competing products in a market segment, the digital therapeutics provider would be wise to keep its options open. From the perspective of a traditional medical devices or pharmaceuticals company looking to create a bundle with digital therapeutics, exclusivity to 'lock in' the competitive advantage may be important. Digital therapeutics companies would be wise to consider the wider impacts of exclusivity though – does it not just close off other routes to market in the short term, but also close off future possible corporate sales opportunities, therefore curtailing exits for the investors in the digital therapeutics' provider?

Immersive Rehab founder Dr Isabel Van de Keere added that: "Pharma going for the more loosely regulated kinds of digital therapeutics makes sense; as the less stringent regulatory requirements means it should be easier to get more global reach, for instance for diagnostics products to get a bigger scale, pharma involvement might be beneficial, because of the scale pharma already enjoys; they could push it forwards much quicker."

Acquire or license?

The pharmaceutical sector has long been known for its ability to acquire mature start-ups in the place of R&D (for instance, in the biotech sector).

Arguably, this would be a straightforward way for pharma market actors to step into the digital therapeutics market. Pharmaceutical companies have ample resources, and therefore may be best placed to acquire maturing digital therapeutics start-ups and leave them to operate as autonomous units under the umbrella of the parent pharma company; an opinion shared by market actors such as Kaia Health's CEO and Co-Founder Mehl.

However, despite being called the "more natural route for pharma" – the quandary faced now is whether to acquire or license?

One of the challenges "pharma faces when it comes to acquisitions, is that it is still very difficult to put valuations on digital therapeutics start-ups" – might it not be simpler than, to enter into a license agreement with them instead. From a risk advisory point of view, perhaps. Licensing agreements would allow pharma companies to mitigate some of the risks associated with entering a nascent sector.

A further challenge to those contemplating going down the acquisition route is whether a digital therapeutics start-up can be effectively integrated into the pharma corporate culture without losing the impetus and modus operandi which made it an attractive acquisition target in the first place. Konstantin Mehl, Founder and CEO of Kaia Health suggests letting acquired digital therapeutics start-ups "continue as before, rather than trying to subsume them within the corporate culture" ²⁷ as digital therapeutics touch every aspect of pharma and would be ill-suited to the siloed culture prevalent in traditional pharmaceuticals companies.

On the flipside, licensing deals offer pharmaceuticals companies the opportunities to "get to grips" with the sector with minimal risk to

them. "Such deals enable them to test products in certain countries, pursue outcomes-based contracts, get a feel for the value of the data generated and the potential for greater loyalty." ²⁸

As has been previously touched upon, the potential for unlocking value in digital therapeutics is huge. The data generated is a source of value which could enable the identification of new products and services, and therefore market voids. It will also be a major driving factor for future development and innovation.

Given to clinicians it will allow for better-informed, more integrated and personalised care, and allow both clinicians and patients to interact and enter into a decision-making process in which both are better informed than ever.

"There's not a lot of small, fast-growing companies around. And I think that's partly because of these huge regulatory and clinical-trial overheads."

– Jonathan O'Keeffe

²⁷ Ibid. Page 20

²⁸ Ibid Page 18 Quote attributed to Konstantin Mehl, Founder and CEO of Kaia Health

Licensing deals entered into with digital therapeutics also provide pharma companies with access to “precious digital real estate” from which to build “deeper trust and more abiding direct patient relationships” – especially with respect to chronic conditions. This digital real estate which digital therapeutics (and pharma companies) would occupy on patients’ smartphones and clinicians’ portals would then allow “the nimbler pharma players” and digital therapeutics players to “own or at least co-own, their relationships with patients.”²⁹

Jonathan O’Keeffe notes that: “there’s not a lot of small, fast-growing companies around. And I think that’s partly because of these huge regulatory and clinical-trial overheads; that it’s very hard for a small company to undertake, and they have no economies of scale whereas big players have whole departments to do this, they have a conveyor belt for this stuff’, before adding that where machine medicine is concerned, avoiding acquisition is the focus for now. What we’re doing is working towards proving the value of this product so that we can get acquired or at least license into these bigger companies that already have pathways in to healthcare providers or insurance providers established.”

²⁹ *Ibid* Page 20

DLA Piper Insights

In this section, we considered the differences between digital therapeutics routes to market that involve a stand-alone digital therapeutics product, and those that involve bundling digital therapeutics products alongside a more traditional medical device or pharmaceutical therapy.

For stand-alone digital therapeutics products, licensing issues are more likely to be in the context of end-user licences to the patients, and then licences to particular healthcare providers in order for healthcare professionals to manage their patients / view data via those digital therapeutics platforms if relevant. In the former case, the arrangements are more akin to a B2C end user licence (albeit with some interesting liability and data protection overlays, after all any liability is likely to involve a personal-injury based negligence claim which would likely fall outside any enforceable limitation of liability clause, and any personal data collected will have a medical angle, and therefore needs extra protection as ‘special category personal data’ under the General Data Protection Regulation etc.). Licensing arrangements with healthcare providers might have a more B2B flavor but depending on the nature of the conditions targeted by the digital therapeutics, availability and similar service level commitments will be an issue. It is also likely that the digital therapeutics provider will want to strictly exclude liability for itself arising from any diagnostic or other clinical decision made by the clinician in their interactions with the patient, regardless of any argument that such decisions

are made in reliance upon data collected and provided via the digital therapeutics tools.

For bundled digital therapeutics products, the issues with licensing become even more complex. Licenses may require white labelling of the digital therapeutics to match the branding of the bundled therapy and require long term commitments and broad license rights granted by the digital therapeutics’ provider to the bundled therapy provider. Depending on the nature of the license grant, this can become a form of exclusivity by the back door. The nature of competition between providers in some areas of the life sciences space can mean that any particularly close arrangement with provider A means that providers B, C and D will almost certain not be willing to contemplate dealings. White labelling and a joint go-to-market strategy are likely to be the sorts of arrangements that could trigger these suspicions.

As noted above, licenses in a bundled context also need to be considered in terms of potential impacts upon exit strategies and valuations for digital therapeutics start-ups. If the most likely exit strategy is a sale of the company to one of a small number of major players whose products could benefit from bundling, then a very close association with one closes off the likelihood of bids from the others. This, in turn, means that the bundled product provider is the only realistic purchase, and they can then expect to make that deal at a lower overall value than if there were genuine competing bidders.

Gareth Stokes, Partner, DLA Piper

DLA Piper Insights

We have considered explicit monetisation strategies above, and carved them up into two broad categories: stand-alone monetisation (which includes direct-to-patient sales, and sale via healthcare commissioning bodies or reimbursement via insurers as a therapy in its own right); and bundling (which includes any traditional therapy augmented by or provided with a digital therapeutics add-on).

Implicit monetisation of digital therapeutics products is a potentially interesting, and there are many examples of particularly technology sector start-ups with models based on rapidly growing market- and attention-share and using the access to users that they therefore enjoy as a way of monetising by secondary means. The obvious challenges with these approaches in the digital therapeutics space arise from the sensitivity of the data (medical data that constitutes 'special category personal data' from a General Data Protection Regulation perspective) and the willingness or otherwise of people to share medical matters with a 'free' service. However, there are many interesting approaches to implicit monetisation strategies in the digital therapeutics space, from creating highly valuable communities of patients with a particular condition (who might then be of interest to providers of other therapeutics targeting the condition, or researchers investigating the condition) to online marketplaces for patients to monetise their own

pseudonymised health data by selling it for use in research etc. The popularity and value generated of special-interest communities in other spheres (everything from forums aimed at Mums to film fanatics and beyond) suggests that the right digital therapeutics offering will be able to successfully tap into implicit monetisation if it can create an active and supportive user community.

In order to obtain reimbursement from payors – whether public or private – the digital therapeutics company is going to need strong evidence to show that the digital therapeutic is equivalent to, or better than, the traditional medicine (or fills a current gap that traditional medicines have been unable to fill).

If the digital therapeutic is viewed as merely adjunctive to an existing medicine or therapy, it likely will not secure separate reimbursement and instead, digital therapeutics companies would be trying to make their value case to health systems and providers, who would need to purchase the digital therapeutic product without an increase in reimbursement. The shift to value-based care and rise in risk contracting in the U.S. is poised to support these arrangements between digital therapeutics companies and healthcare providers, however, establishing the value of the digital therapeutics will still be a challenge.

Gareth Stokes, Partner, DLA Piper

Monetisation: implicit or explicit?

Monetisation is a key requirement for making digital therapeutics part of the mainstream healthcare industries.

An article by Simon Kucher & Partners suggests that there are two core types of monetisation that any product can leverage – implicit and explicit.³⁰

Explicit monetisation of a product is characterised by the direct increase in revenue from the product itself, whereas implicit monetisation of a product is often characterised by non-revenue benefits, including higher adoption rates, greater customer engagement or more robust data capture.

Amongst survey responses the most commonly cited way of monetising digital therapeutics was reimbursement by public and private payers (i.e. public health insurance systems), followed by payment by employers and by patients.

³⁰ David Lee, Ian MacPherson, Dr Steven C. Chase (Simon Kucher & Partners); *Monetizing Digital therapeutics* (July 2018)

³¹ Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; *Digital therapeutics: Pharma's threat or opportunity*, (S3 Connected Health and eyeForPharma) 2019; (Page 16 Para 1)

³² *Ibid* Page 13 Para 8

³³ Gali Weinreb (Globes, Israel's Business Arena) *Digital therapeutics co Happify teams with Sanofi*; (21 May 2019)

³⁴ Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; *Digital therapeutics: Pharma's threat or opportunity*, (S3 Connected Health and eyeForPharma), (2019) (Page 13 Para 2)

³⁵ *Ibid* Page 13 Para 2

Explicit monetisation

Explicit monetisation of a product is characterised by the direct increase in revenue from the product itself, whereas implicit monetisation of a product is often characterised by non-revenue benefits, including higher adoption rates, greater customer engagement or more robust data capture.

Amongst the explicit monetisation “opportunities” expanded on by Simon Kucher & Partners, are the traditional reimbursement model, offering multiple versions of a product to different market segments and licensing deals.

Reimbursement

Reimbursement is key for Dr Isabel Van de Keere, in order to widen the reach of a digital therapeutic:

“I think that’s really important to have in mind, getting a product into a reimbursement plan allows you to reach more people.” This is echoed by Dr Jossy Onwude of Bold Health, who stated that “our goal is to partner with insurance companies to reach more people who really need it.”

The reimbursement route appears to apply especially to prescription-only digital therapeutics (both drug-replacement solutions and adjunctive therapies) – such as Pear Therapeutics’ reSET and WellDoc’s BlueStar (real-time coaching to individuals living with type 2 diabetes); both of which have struck deals with insurance providers to that effect.

Even though prescribing and obtaining reimbursement for digital therapeutics is not without difficulty – “relatively new, haphazard and until recently there was little supporting infrastructure either to properly account for them in existing reimbursement codes”³¹. “On the other hand, the regulatory environment has turned reimbursement friendly for Digital therapeutics companies in Germany since the new German Digital Healthcare Act (“DVG”) entered into force on December 19, 2019, emphasises Dr. med. Kokularajah Paheenthararajah, a lawyer and a medical doctor from DLA Piper Germany. This new legislation has introduced a new and stand-alone reimbursement system for digital therapeutics in Germany enabling physicians and psychotherapists to easier prescribe digital therapeutics to the approximately 90% of the 83 million German population who are covered by the country’s Statutory Health Insurance (“GKV”) and giving digital therapeutics companies easier and faster access to the German healthcare system. They now have more clarity what requirements need to be met to place their products successfully on the market. This route is now thought to be increasingly sought after by digital therapeutics companies; as the recent deals struck by Pear Therapeutics and Akili (thought to have secured reimbursement along the lines of conventional medicines) suggest.³²

This view is echoed by Bozidar Jovicevic of Sanofi – which recently entered into a partnership agreement with Israeli-founded digital therapeutics company Happify Health to combine with existing drug treatments for multiple sclerosis (as clinical research has demonstrated that patients suffering from MS and depression respond less favorably to treatments)³³.

Jovicevic maintains that: “there are now enough deals to demonstrate that the prescription model offers scale.”³⁴ Such affirmations suggest that although some expressed doubts regarding the financial value of digital therapeutics in the industry’s early days, “payer’s attitudes to reimbursement are becoming clearer.”³⁵

Ben Sadowjy noted a lack of guidance where establishing value is concerned: “there isn’t much guidance for DTx companies to understand what sort of value messages are important to payers, what type of data do they need, and does this differ from for instance, medicines reimbursement, and what do we need to have to demonstrate that there is a real value added for our products.” He adds that: “there needs to be a focus on quality in data, to make sure that the outcomes we do get are evidence-based– cancer research is in a more privileged position where they can set up a more unique funding structure

Type	Regulatory Path	Clinical Pathways	Pricing/Reimbursement
Standalone	Clinical Trials to demonstrate efficacy. Regulatory approval for specific indication	Prescribed by Physician / HCP	Reimbursement achieved by pricing in line with conventional treatments with similar outcomes. Provided directly to payers
Augment	Requires regulatory approval for use in conjunction with approved medicine	Prescribed by HCP for use in conjunction with specified treatment	Priced as part of a Drug+ offering. Provided by pharma
Complement	Either seek regulatory approval, or use as complimentary tool to support patient selfmanagement. Greater datasets are obtained and subsequently used to demonstrate effectiveness	Direct to patient, but recommended by physician. Provided as part of patient support services to prescribed treatment	Lower cost pricing. Provided direct to patients, HCP, payers & employers. Offered by pharma as part of support services with prescribed treatment

using a range of funds including donated funds to get over the first hurdle, whereas in the private sector that might be more challenging to get that cash injection to get past that initial lag time in order to gather the data needed to prove value.”

Jonathan O’Keeffe also emphasised the benefits of innovation schemes, such as Innovate UK: “I think one really good thing about the UK is one of two initiatives such as Innovate UK – we received a grant from Innovate UK which has made the difference between life and death for us – which was enough to get investors over the line and de-risk it.”

Digital therapeutics “Lite”

Another pathway to direct revenue generation open to digital therapeutics companies might be to offer multiple versions of a product or a customised offering. This complements the “primary” goal of obtaining reimbursement quite neatly.

Simon Kucher & Partners propose that “digital therapeutics bring the unique opportunity to develop and bring to market varying tiers” of their product.³⁶ Doing so, companies that develop prescription-only digital therapeutics could create ‘lite’ versions of their product available for direct payment by the end user (patients) – thereby capturing those who may not have insurance or who’s insurance doesn’t cover digital therapeutics.

Although this option does present with some risk; for instance eroding the value of the prescription-version, it does present the chance to capture and capitalise on different market segments, therefore maximising revenue – which, in turn, should

drive innovation and attract further investment; augmenting credibility (by granting access to a wider patient base – all of whom will be inputting data into our river Oceanus); which will encourage adoption and widen market access, creating a (hopefully) virtuous cycle.

Furthermore, some digital therapeutics companies have utilised ‘Freemium’ models where consumers would either (1) be charged a monthly fee for using an App, or (2) in exchange for agreeing to receive in-App advertising, use the app without charge. Under option two (the Freemium option) the digital therapeutics company would sell consumer data to advertisers and allow advertisers to push direct to consumer advertisements back to the consumers through the app (these advertisements would be personalised). In the US, such models may implicate HIPAA and FTC regulations, and, or state privacy and consumer protection laws. However, it should be noted that these practices may not be permitted in other countries under their life sciences and medical devices regulatory laws. For example, in Germany regulations mean that one cannot place advertisements on medical devices.

Licensing and Selling Data to fellow manufacturers

As previously discussed, licensing is another pathway towards direct revenue generation. In this case, licensing a digital platform and licensing data generated by the digital therapeutic take center-stage. Both provide ways of generating additional revenue off the back of the digital therapeutic itself.

Of course, data privacy and individual consent laws would need to be evaluated before embarking on certain data licensing and, as mentioned above, jurisdictional differences in these areas vary widely. Therefore, consideration would need to be given to where and how the company intends to use the digital platform, what data it will collect, and how those licensing deals would need to be structured.

Licensing the digital platform to other manufacturers

Digital therapeutics manufacturers with a “proven platform” are thought to be “years ahead” of competitors who may not have started developing their own platforms according to Simon Kucher & Partners.³⁷ They posit that additional revenue might be generated by strategically licensing the digital platform to other manufacturers – enabling “monetisation in a new market.” Examples include: AppScript, Solera Health, RxHealth and Xhealth – all of which offer digital medicine platforms designed to help healthcare professionals deliver digital therapeutics at scale. These platforms integrate with EHRs, clinical health data and CRMs to automatically pair the best therapies to the appropriate patient population.³⁸

Licensing data to other manufacturers

Data generated by digital therapeutics proffers many benefits, some of which are monetizable. Simon Kucher & Partners suggest that “there may be an opportunity to sell access to anonymised and aggregated results”³⁹ to fellow manufacturers working in the same therapy area or sector.

³⁶ David Lee, Ian MacPherson, Dr Steven C. Chase (Simon Kucher & Partners); *Monetizing digital therapeutics* (July 2018)

³⁷ *Ibid.*

³⁸ Andrew Stone, Writer, Jim O’Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O’Donoghue, President, S3 Connected Health, Bozidar Jovicic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital Therapeutics Alliance; *Digital therapeutics: Pharma’s threat or opportunity*, (S3 Connected Health and eyeforpharma); 2019, (Page 16)

³⁹ *Ibid.*

Implicit monetisation

“Implicit monetisation of a product is often characterised by non-revenue benefits including higher adoption rates, greater customer engagement, or more robust data capture.”

Amongst the possible options, Simon Kucher & Partners highlight the opportunities that implicit monetisation holds for digital therapeutics. Many of them are linked to the data generated through the digital therapeutic and associated platforms.

Data

The integration of AI into digital therapeutics proffers “a strategic competitive advantage” to digital therapeutics companies that use it to develop and collect proprietary data, in order to then “use it as training, input, and feedback to data to deploy AI effectively.”

Digital therapeutics offer a perfect opportunity for this, as their data is self-updating – the more patients use a digital therapeutic, the more data is collected – this can be used to drive further research, provide information on patient engagement, and identify patterns or links that may not have been evident previously, etc. In the case of Drug+ packages or adjunctive therapies, the data could be used to train an AI

and then help improve dosages for personalised medical treatments.

Another window into implicit monetisation linked to the data generated by digital therapeutics might be to license patient engagement or adherence data to third parties such as healthcare providers and insurance providers in order to trial outcome-based contracting.

This would enable payers to trial digital therapeutics offerings across selected patient populations; and depending on the outcomes (measurable through the data collected by the digital therapeutic solution) could drive further adoption and clinician uptake, as well as giving the digital therapeutic company access to a wider patient base – all of which could generate revenue both directly and indirectly.

Increased product engagement – patient involvement may help drive engagement

Part of digital therapeutics’ appeal is their comparatively much shorter product development cycles. Unlike traditional pharmaceuticals which can take up to a decade to make product changes, digital therapeutics run on a sprint cycle – aided by the self-actualising feedback loop

which the data provides – allowing digital therapeutics’ manufacturers to rapidly update their products, meaning iterative innovation is possible.

Rapid updates could be used to drive engagement, and their commercial value is clear. Updated products with improved security or functionality may make them more appealing to payers and healthcare providers.

Increased product engagement and further value could be unlocked by involving patients directly in the design. “A risk for every player in the digital therapeutics space, but especially pharma, is a failure to recognise the importance of the end user in developing the therapy.”

Reticence is understandable, as patient participation is often “regulatory-fraught” – however it is increasingly recognised as a requirement for digital therapeutics by NICE – which identifies patient involvement as a key evidence requirement for digital therapeutics.

On a practical level, involving patients and providers makes sense, as unless the product is embraced by the end users (patients and clinicians alike) it faces a lower chance of success.

⁴⁰ David Lee, Ian MacPherson, Dr Steven C. Chase (Simon Kucher & Partners); *Monetizing digital therapeutics* (July 2018)

⁴¹ *Ibid.*

⁴² *Ibid.*

⁴³ Andrew Stone, Writer, Jim O’ Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O’ Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance; *Digital therapeutics: Pharma’s threat or opportunity?* (S3 Connected Health and eyeforpharma, 2019, (Page 19)

⁴⁴ *Ibid.*

Abbreviated bibliography

Publications

(2019) Digital therapeutics: Pharma's threat or opportunity? (S3 Connected Health and eyeforpharma) – Andrew Stone, Writer, Jim O' Donoghue, S3 Connected Health, Contributor, William Lyons, S3 Connected Health, Contributor, Paul Simms and Hugh Gosling, Editors & Jim O' Donoghue, President, S3 Connected Health, Bozidar Jovicevic, VP, Global Head of Digital Medicine, Sanofi, David Van Sickle, Co-founder and CEO, Propeller Health, John Docherty, VP, Clinical Sciences, Digital Medicine, Otsuka, Ken Cahill, CEO, Silvercloud Health, Konstantin Mehl, Founder and CEO, Kaia Health, Kyle Rose, VP, Partnerships and Strategic Projects, MySugr, Corey McCann, CEO, Pear Therapeutics, Megan Coder, Executive Director, Digital therapeutics Alliance andhealth.com.au/wp-content/uploads/2019/04/S3Connected-Health.pdf

Digital Health.London/Collaborate 2018 Summit: Digital therapeutics in the NHS (London, UK; April 24, 2018) digital.health.london/wp-content/uploads/2018/04/Event-Magazine.pdf

Digital therapeutics: Combining Technology and Evidence-based medicine to transform personalised patient care

Digital therapeutics Alliance www.dtxalliance.org/wp-content/uploads/2018/09/DTA-Report_DTx-Industry-Foundations.pdf

Articles (online resources)

The insidious threat of biometrics (The Financial Times), 21/08/2019 – Madhumita Murgia www.ft.com/content/cdf0d52a-c2de-11e9-a8e9-296ca66511c9

(Nov 2017) Product Liability Implications in the Digital Health Industry – Raymond M Williams and Jae Y. Kim (DLA Piper) healthtransformer.co/product-liability-implications-in-the-digital-health-industry-4f57751e80d8

Digital therapeutics: Improving patient outcomes through convergence – Deloitte www2.deloitte.com/content/dam/Deloitte/us/Documents/life-sciences-health-care/us-lshc-digital-therapeutics.pdf

(July 2018) Monetising digital therapeutics – David Lee, Ian MacPherson, Dr Steven C. Chase (Simon Kucher & Partners) www.simon-kucher.com/en-gb/blog/monetising-digital-therapeutics

(21 May 2019) Digital therapeutics co Happify teams with Sanofi – Gali Weinreb (Globes, Israel's Business Arena) en.globes.co.il/en/article-digital-therapeutics-co-happify-teams-with-sanofi-1001286428

Industry Guidance (links only)

www.nice.org.uk/Media/Default/About/what-we-do/our-programmes/evidence-standards-framework/digital-evidence-standards-framework.pdf

SC/SC/BUSDEV/LON/UKG/98049043.1

Germany's push towards Healthcare 4.0 – A guide to the new fast-track pathway to reimbursement for digital health apps

2bxnlg6khzwqa64e19b4hfan-wpengine.netdna-ssl.com/iptgermany/files/2020/01/DLA-Piper_Germany%E2%80%99s-push-towards-Healthcare-4.0.pdf



Key contact

Marco de Morpurgo, Partner and Global Co-Chair of Life Sciences at DLA Piper:
marco.demorpurgo@dlapiper.com

For further news and insights, please visit lifesciences.dlapiper.com



THE LAWYER
Research Service