

DIGITIZING HEALTHCARE

Embracing change. Creating opportunity.

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THE FUTURE OF HEALTHCARE IS DIGITAL

For many industries, embracing digitization has become a matter of survival. Healthcare has always had a reputation of being resistant to change, but consumer demand and a rapidly evolving technology-driven world have led the digitization of healthcare to move at a frantic pace.

THE GROWTH OF DIGITAL HEALTH

In comparison with other industries, healthcare has been slow to take advantage of the digital revolution. Traditionally healthcare has always been a difficult industry in which to innovate; it is highly regulated, expensive, complex and risk averse. However, rising drug development costs, increased patient expectations, and a growing dependence on health resources, place the industry under increasing pressure to move with the times. Many organizations with an interest in health, including the pharmaceutical industry, medical technology companies, health insurers, and payers are focusing on the digital world. However, the strongest digital health innovators are now coming in from outside the industry.

How tech companies are driving digital transformation

Healthcare represents an incredibly lucrative opportunity for traditional technology companies. The tech giants - Alphabet (the parent company of Google), Amazon, Apple, Microsoft and IBM - are taking the lead and heavily investing their time, resource and talent into healthcare.¹

PLAYING TO THEIR STRENGTHS

Each of the major tech companies are using their core business strengths to create digital health initiatives across a variety of platforms. These are being implemented at every touchpoint of the patient/health professional journey ranging from data storage, artificial intelligence (AI), e-commerce, voice-enabled solutions, consumer apps and wearables. By developing tools that patients and health professionals embrace, and through collaborations with healthcare providers, the Big 5 are poised to reinvent the healthcare industry.

SOURCING HEALTHCARE TALENT

The tech industry is also actively seeking out talent to support their aspirations, with a growing number of tech companies investing in healthcare expertise. The most notable examples were Microsoft hiring Emma Walmsley, CEO of GSK, to be on their board⁴ and David Feinberg, CEO of Geisinger, being hired by Google to lead its healthcare strategy.⁵ Amazon have also recently hired Taha Kass-Hout, FDA Chief Health Informatics Officer⁶, and Alphabet have recruited Robert Califf, FDA Commissioner, to join their team.⁷

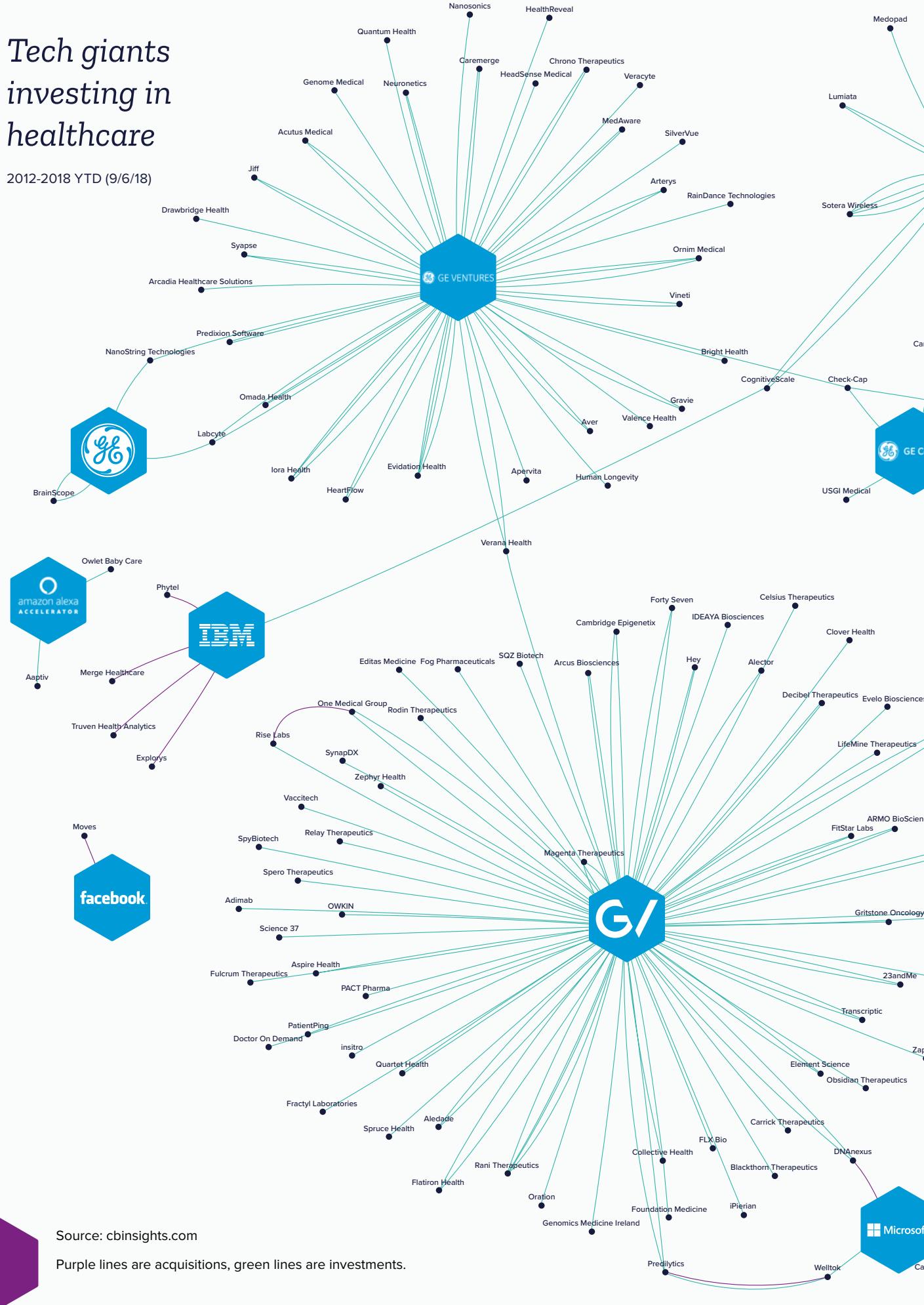


Between 2013 and 2017 Alphabet filed 186 health-related patents - more than Microsoft and Apple combined²



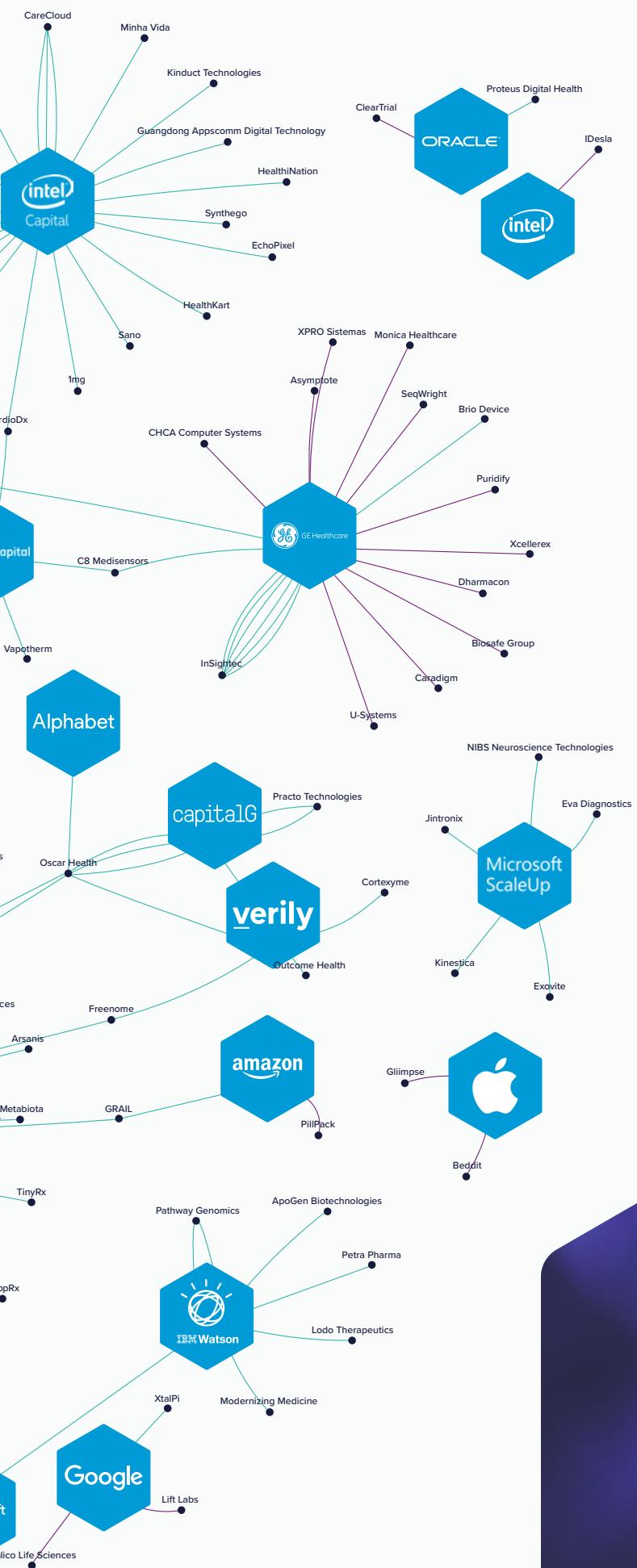
Tech giants investing in healthcare

2012-2018 YTD (9/6/18)



Source: cbinsights.com

Purple lines are acquisitions, green lines are investments.



Stepping up investment

With a third of the world's data being generated from the healthcare industry,¹ tech companies are turning towards health as the next big thing.

The scale and rate of healthcare-related activities for major tech companies is growing at an exponential rate. So far Google has been the most active tech player, acquiring and investing in multiple AI healthcare applications. In 2017 one report stated GV (formerly known as Google Venture) had invested about one-third of its Alphabet funds into healthcare and life science start-ups.¹



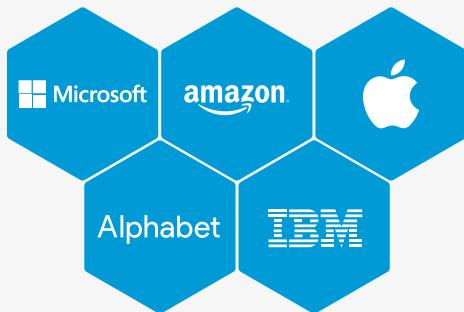
Creating a new healthcare vision

Every health-related acquisition or new development provides tech companies with access to crucial health data. There are already numerous examples of how tech companies have disrupted traditional diagnostic procedures and processes.

Alphabet have now developed an algorithm that can diagnose diabetic retinopathy.⁸ Verily (Alphabet's research organization dedicated to life sciences) is developing tools to collect and organise health data with the aim of creating data-driven solutions with the potential to increase patient engagement, speed up intervention, and lower costs of care.⁹ After years unsuccessfully trying to break into the wearables market, Alphabet have now recently acquired Fitbit, reinforcing the focus on the healthcare market and gives them access to vital health-related data.¹⁰

Amazon is currently developing solutions across the healthcare value chain. In 2018 Amazon collaborated with Berkshire Hathaway and JP Morgan Chase to create a joint health-initiative called Haven Healthcare; a company focused on providing better healthcare outcomes, satisfaction, and lower costs for their U.S. employees and families.¹¹ It is also expanding into medical distribution with the acquisition of PillPack in 2018 enabling them to sell over-the-counter drugs.¹²

The Big 5 Entering Healthcare



Apple dominate the wearable device market.¹³ The Apple series 4 watch is now approved as a FDA Class 2 medical device to detect and analyze irregular heart rhythms and has an ECG app that can enable consumers to take an electrocardiogram right from their wrist.¹⁴ Apple devices were integral to the Apple Heart Study, an innovative research study with over 400,000 participants, in collaboration with Stanford Medicine. Completed in February 2019 the study aimed to improve the technology used to identify irregular heart rhythms with the view to helping prevent serious heart complications including stroke.¹⁵

Apple's healthcare aspirations continue to grow and, with the addition of the right hardware, an Apple watch can now even measure and monitor your blood pressure.¹⁶ Other examples of Apple using its products to track disease include using the iPhone X for vision tests, a hearing test feature in its AirPods, as well as a speech recognition tool to detect speech impediments associated with stroke.¹

Microsoft is also hoping AI will drive the future of healthcare and are significantly investing in their initiative, Healthcare NExT, which brings together their research, AI and cloud teams to focus on healthcare.¹⁷



THE GROWING INFLUENCE OF THE BIG 5 ON HEALTHCARE

	Alphabet	amazon	Microsoft	IBM	
STRENGTHS	Data and artificial intelligence	Patient facing products	Delivery and distribution	Software and IT applications	Cloud and data analytics
ASPIRATION	The healthcare innovation leader	The consumer face of healthcare	The valued healthcare distributor	The trusted leader in healthcare IT	The healthcare AI specialist
ACTIVITY	Data Storage	✓	✓	✓	✓
	Interoperability	✓	✓	✓	✓
	Advanced Analytics	✓	✓	✓	✓
	Distribution	✓	✗	✓	✗
	Voice-enabled Solutions	✓	✓	✓	✓
	Consumer Apps and wearables	✓	✓	✗	✓
	THINKING	<p>"We think that AI is poised to transform medicine, delivering new, assistive technologies that will empower doctors to better serve their patients."</p> <p>Google AI⁸</p>	<p>"If you zoom out into the future, and you look back, and you ask the question, 'What was Apple's greatest contribution to mankind?' It will be about health."</p> <p>Tim Cook, CEO, Apple¹⁸</p>	<p>"We want to change the way people experience health care so that it is simpler, better, and lower cost"</p> <p>Atul Gwande, CEO, Haven Healthcare¹¹</p>	<p>"We have an incredible opportunity to apply AI to accelerate drug development and reduce patient's costs."</p> <p>Satya Nadella, Microsoft CEO¹⁹</p>

With a third of the world's data being generated from the healthcare industry, tech companies are turning towards health as the next big thing.



Healthcare's reaction to digital disruption

Biopharma companies and the pharmaceutical industry are playing catch up to tech's forays into healthcare.

Unlike the big tech players, the pharmaceutical industry does not have the necessary infrastructure and digital expertise in place yet. However, those with the foresight not to be left behind are now reaching out to form strategic partnerships, acquire digital functionality, and recruit top tech talent.

BUILDING STRATEGIC PARTNERSHIPS

A growing number of forward-thinking pharma companies are now working with tech companies to support digital transformation from within their organizations. Sanofi and Google recently announced a joint initiative to develop a new virtual healthcare Innovation Lab. By leveraging Google's AI, machine learning technology, and cloud infrastructure, Sanofi will be able to benefit from the experience of a technology agnostic partner. This partnership will ultimately create scientific and commercial solutions for both companies.²¹

Another example of a pharma/tech strategic partnership is Novartis and Microsoft. They recently announced a collaboration to transform medicine with artificial intelligence.²² Their aim is to significantly bolster Novartis's AI capabilities from research through commercialization and thus help to accelerate drug discovery and development.

Verily have also entered into multiple wearable device strategic partnerships with Novartis, Otsuka, Pfizer and Sanofi to bring digital data collection to clinical research projects.²³

Strategic partnerships between tech and pharma



Filling the tech knowledge gap

Pharma companies are partnering with tech companies to fill existing knowledge or technology gaps.

Examples include Amgen, who have moved the bulk of their cloud infrastructure onto Amazon Web Services.²⁴ Another example is BenevolentAI and Novartis, who have signed an AI R&D deal to increase activity in advanced analytics.²⁵ Merck and Co. have collaborated with Alexa to develop voice-enabled diabetes tools²⁶ while Johnson & Johnson are working with Apple to assess the impact of wearable technology on earlier detection of atrial fibrillation to improve diagnosis and patient outcomes.²⁷

HIRING TECH TALENT

In the same manner that tech companies are hiring health talent, we are also seeing the reverse. Over recent years there have been a significant number of appointments of Chief Digital Officers within the pharma and biotech industries as they try to grow their research teams with tech-savvy employees.

In 2017 Karenann Terrell was appointed as GSK's first ever chief digital and technology officer with a company-wide remit to transform how new technologies are used to improve performance across the group. Her previous role was Chief Information Officer for Walmart, where she led the transformation of the use of data, analytics and digital engagement with its customers. In late 2018 Nike's Global Chief Information officer joined Merck and Co. as Chief Information and Digital Officer to lead the development and innovation of digital strategy.

NOVARTIS: PIONEERING DIGITAL INNOVATION

Novartis has a clear digital strategy and vision. They are actively developing internal artificial intelligence with multiple initiatives to support digital transformation based on patient outcomes. In April 2018 Novartis launched its digitally enabled Nerve Centre platform. This is an industry-first and enables the company to monitor its worldwide clinical trials in real time with algorithms which predict time delays, thus helping to accelerate research and development.²⁸

"When Google was buying DeepMind we asked ourselves what we were doing in this field?"

Dr. Luca Finelli, Predictive Analytics & Design, Novartis²⁸

"The Nerve Centre changes the way we conduct our business and how our teams interact because suddenly access to information is instant."

Badhri Srinivasan, Head of Global Development Operations, Novartis²⁸

"At Novartis we want to be the number one digital organization in the industry by 2022."

Vasant Narasimhan, CEO, Novartis²⁹



Conclusion

Digital innovation has forever changed the way people interact and communicate. It has revolutionized nearly every industry, streamlining systems and improving efficiency.

But for healthcare, embracing technology has the potential to help people live longer and lead healthier lives. Traditional technology companies are taking the lead, leveraging their core business strengths. However, tech disruption means greater complexity and more unknowns for the healthcare industry. If health and pharma players hope to own the integration of tech, instead of getting swept away by it, they need to think strategically and assess themselves thoroughly. And if they haven't started addressing this digital transformation head on yet, they need to start now.

HOW STRATEGIC INTELLIGENCE CAN HELP

Strategic intelligence can help explore key questions that the healthcare industry is facing in relation to digital innovation. These may include:

- What is the most effective digital strategy for our organization?
- How can technology be used to:
 - Overcome data silos?
 - Optimize drug discovery?
 - Accelerate product development?
- How can technology help improve patient experience and deliver better outcomes?
- Where can technology add value to my organization?
- Where can digital capabilities be utilized to integrate operations across clinical and administrative departments?
- Which types of tech collaborations will my organization benefit from?
- Where are the technology 'gaps' within my organization?
- Can technology help my organisation manage cybersecurity threats?

The future of digital health will be based on collaboration and building mutually beneficial partnerships. Those with the foresight to bring the best tech and healthcare expertise together, will not only reap commercial benefits, but also offer the greatest improvements to patient health and outcomes.

About the Author

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Emily is a Senior Associate based in the London office. Since joining Deallus, Emily has lead research for top tier pharmaceutical clients supporting their global strategy to implement personalised healthcare initiatives across the value chain. She has also facilitated competitive simulation workshops looking at the impact of Tech disruption in healthcare. Emily has significant experience across a variety of therapeutic areas and industries including neuroscience, oncology, immune-oncology, companion diagnostics, liver diseases, autoimmune diseases and personalised healthcare.

Emily holds a MPhil in Bioscience Enterprise from the University of Cambridge and a BSc Honours in Biochemistry from the University of Bristol. Throughout her career, Emily has also developed strong expertise in the medical devices space, having led business development projects for medical device companies in oncology and inflammatory diseases.

References

- ¹ How the “Big 4” Tech Companies Are Leading Healthcare Innovation. Healthcare weekly. February 2019. Available at: <https://healthcareweekly.com/how-the-big-4-tech-companies-are-leading-healthcare-innovation/> [Accessed November 2019]
- ² Alphabet Has Filed 186 Healthcare Patents. Watch Out, World. Forbes, March 2018. Available at: <https://www.forbes.com/sites/techlatindera/2018/03/13/alphabet-has-filed-186-health-care-patents-watch-out-world/> [Accessed November 2019]
- ³ Tech Giants all have their Eyes on Healthcare. How does it affect you? Available at: <https://medium.com/leolab/tech-giants-all-have-their-eyes-on-healthcare-aac95879aff> [Accessed November 2019]
- ⁴ GSK CEO Walmsley to join Microsoft board as tech giant wades deeper into healthcare. FiercePharma. September 2019. Available at: <https://www.fiercepharma.com/pharma/gsk-s-emma-walmsley-to-join-microsoft-board-as-tech-giant-wades-deeper-into-healthcare>. [Accessed November 2019]
- ⁵ Google has hired Geisinger’s David Feinberg to lead its health strategy. CNBC. November 2018. Available at: nbc.com/2018/11/08/google-hires-geisinger-ceo-david-feinberg-to-oversee-health.html [Accessed November 2019]
- ⁶ Amazon hires FDA trailblazer Kass-Hout for healthcare project: report. Fierce Biotech. March 2019. Available at: <https://www.fiercebiontech.com/medtech/amazon-hires-openfda-trailblazer-kass-hout-for-healthcare-project-report> [Accessed November 2019]
- ⁷ Google parent Alphabet hires former FDA head Robert Califf to lead health strategy and policy. Fierce Healthcare September 2019. <https://www.fiercehealthcare.com/tech/alphabet-hires-former-fda-head-robert-califf-to-lead-health-strategy-and-policy-at-google> [Accessed November 2019]
- ⁸ Healthcare and biosciences. Google AI. Available at: <https://ai.google/healthcare/> [Accessed November 2019]
- ⁹ Verily. Available at: [Verily.com](https://www.verily.com) [Accessed November 2019]
- ¹⁰ Google buys Fitbit for \$2.1 billion. The Verge. November 2019. Available at: <https://www.theverge.com/2019/11/1/20943318/google-fitbit-acquisition-fitness-tracker-announcement> [Accessed December 2019]
- ¹¹ Amazon, Berkshire Hathaway, JPMorgan Chase Health Care Venture Launches Website and Announces Its Name: Haven. Business Wire March 2019. Available at: <https://www.businesswire.com/news/home/20190306005660/en/Amazon-Berkshire-Hathaway-JPMorgan-Chase-Health-Care> [Accessed November 2019]
- ¹² Amazon to Acquire PillPack. Business Wire June 2018. Available at: <https://www.businesswire.com/news/home/20180628005614/en/Amazon-Acquire-PillPack> [Accessed November 2019]
- ¹³ Apple Watch Series 4 outsold every other smart watch in 2018—in just one quarter. Fortune June 2019. Available at: <https://fortune.com/2019/06/25/apple-watch-smartwatch-sales-2018/> [Accessed November 2019]
- ¹⁴ ECG app and irregular heart rhythm notification available today on Apple Watch. Available at: <https://www.apple/newsroom/2018/12/ecg-app-and-irregular-heart-rhythm-notification-available-today-on-apple-watch/> [Accessed November 2019]
- ¹⁵ Apple Heart Study: Assessment of Wristwatch-Based Photoplethysmography to Identify Cardiac Arrhythmias. Clinicaltrials.gov. Available at: <https://clinicaltrials.gov/ct2/show/NCT03358000>. [Accessed November 2019]
- ¹⁶ Can an Apple Watch measure blood pressure? Business Insider October 2019. Available at: <https://www.businessinsider.com/can-apple-watch-measure-blood-pressure?r=US&IR=T> [Accessed November 2019]
- ¹⁷ Microsoft and partners combine the cloud, AI, research and industry expertise to focus on transforming health care. Microsoft February 2017. Available at: <https://blogs.microsoft.com/blog/2017/02/16/microsoft-partners-combine-cloud-ai-research-industry-expertise-focus-transforming-health-care/> [Accessed November 2019]
- ¹⁸ Tim Cook: Apple’s greatest contribution will be ‘about health’. CNBC January 2019. Available at: <https://www.cnbc.com/2019/01/08/tim-cook-teases-new-apple-services-tied-to-health-care.html> [Accessed November 2019]
- ¹⁹ Bringing together deep bioscience and AI to help patients worldwide. October 2019. Available at: <https://blogs.microsoft.com/blog/2019/10/01/bringing-together-deep-bioscience-and-ai-to-help-patients-worldwide-novartis-and-microsoft-work-to-reinvent-treatment-discovery-and-development/> [Accessed December 2019]
- ²⁰ Here’s How IBM Watson Health Is Transforming the Health Care Industry. April 2016. Available at: <https://fortune.com/longform/ibm-watson-health-business-strategy/> [Accessed December 2019].
- ²¹ Sanofi Press Release. Sanofi and Google to develop new healthcare innovation lab. June 18, 2019. Available at: <https://www.sanofi.com/en/media-room/press-releases/2019/2019-06-18-07-00-00> [Accessed November 2019]
- ²² Novartis and Microsoft announce collaboration to transform medicine with artificial intelligence. October 2019. Available at: <https://news.microsoft.com/2019/10/01/novartis-and-microsoft-announce-collaboration-to-transform-medicine-with-artificial-intelligence/> [Last accessed November 2019]
- ²³ Verily Forms Strategic Alliances with Novartis, Otsuka, Pfizer and Sanofi to Transform Clinical Research. Business Wire. May 2019. Available at: <https://www.businesswire.com/news/home/20190521005485/en/Verily-Forms-Strategic-Alliances-Novartis-Otsuka-Pfizer> [Accessed November 2019]
- ²⁴ Amgen moves bulk of its cloud infrastructure onto Amazon Web Services. Healthcare IT news. November 2018. Available at: <https://www.healthcareitnews.com/news/amgen-moves-bulk-its-cloud-infrastructure-amazon-web-services> [Accessed November 2019]
- ²⁵ BenevolentAI announces agreement with leading healthcare company to leverage BenevolentAI’s technology platform. September 2019. Available at: <https://www.healthcarenews.com/news/amgen-moves-bulk-its-cloud-infrastructure-amazon-web-services> [Accessed November 2019]
- ²⁶ Merck aims to put Amazon’s Alexa to work on voice-enabled diabetes tools. March 2017. Available at: <https://www.fiercepharma.com/marketing/merck-and-amazon-alexa-partner-for-voice-enabled-innovations-diabetes-challenge-up-first> [Accessed November 2019]
- ²⁷ Johnson & Johnson Announces Research Study with Apple Watch to Help Improve Afib Outcomes Including Stroke Prevention. January 2019. Available at: <https://www.fiercepharma.com/marketing/merck-and-amazon-alexa-partner-for-voice-enabled-innovations-diabetes-challenge-up-first> [Accessed November 2019]
- ²⁸ Nerve centre gives Novartis edge in clinical trials. PMLIVE January 2019. Available at: http://www.pmlive.com/pharma_news/nerve_centre_gives_novartis_edge_in_clinical_trials_1276784 [Accessed November 2019]
- ²⁹ Novartis CEO Who Wanted To Bring Tech Into Pharma Now Explains Why It’s So Hard. Forbes January 2019. Available at: <https://www.forbes.com/sites/davidshaywitz/2019/01/16/novartis-ceo-who-wanted-to-bring-tech-into-pharma-now-explains-why-its-so-hard/#448707927fc4> [Accessed November 2019]



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