Modern Marketing: Pharma's Data-Powered AI Revolution

Successful pharma brands in 2023 will employ AI in all aspects of their marketing. Will you be one of them?

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WELCOME

Introduction

All about this ebook and the partnership behind the project.

Originally developed as an online ebook, you can experience interacti ve content, register for updates, or share with others at **modernpharmamarketing.com.**

Answering the AI Call

As industry ambassadors, we see it as our responsibility to help colleagues and clients understand promising trends and new technologies – to help break it down, discern inflated hype from real hope, and advance the industry to improve patient outcomes.

So when we kept receiving questions about artificial intelligence (AI) from friends and colleagues at pharmaceutical companies, we knew it was both an opportunity and a responsibility to answer that call. What is the future of marketing? What is AI and its role in marketing? How will it change marketing roles in the years to come? These are the questions we seek to answer in this informative, interactive ebook.

In *"Modern Marketing: Pharma's Data-Powered AI Revolution,"* we aim to explain how the proliferation of data is causing radical shifts in marketing; to help you understand what AI is, how it works, and why it matters; and to outline what the future of modern marketing looks like. We also polled the industry on these key issues, and marketers gave us their opinions on these and other pressing questions.

We always welcome your feedback and comments. Was the information in this ebook helpful to you? Is there other content you'd like to see in the future? Did we leave questions unanswered? Please contact us with your input any time, and we thank you for your partnership.

A Partnership Between the Digital Health Coalition and Intouch Solutions

The Digital Health Coalition and Intouch Solutions have collaborated since 2014 on projects designed to educate and inform the life sciences industry.

We believe that by working together to promote the adoption of innovation, and to brainstorm new ways to progress, we can advance the industry's ability to help patients, healthcare professionals, caregivers, and all others affected by our products and services. We look forward to continuing these collaborations and improving lives.

Digital Health Coalition

About the DHC

The Digital Health Coalition is a 501(c)(3) nonprofit created to serve as the collective voice for the discussion of current and future issues relevant to digital marketing of healthcare products and services. We engage diverse stakeholders through research, events and advocacy projects, and then recommend specific actions that will drive innovation.

INTOUCH SOLUTIONS®

About Intouch Solutions

Intouch Solutions is an independent, full-service marketing and advertising agency serving the life sciences industry. The 800-person firm operates from four offices in the U.S. and Europe, where its client-centric focus translates to an average client tenure of 11 years. With roots in digital marketing, Intouch offers full-service, forward-thinking solutions for companies that want to understand and connect with patients, caregivers, HCPs and payers.

CHAPTER 1

Data, AI and the Age of Modern Marketing

The exponential proliferation of data is changing the world, and pharma marketing specifically.

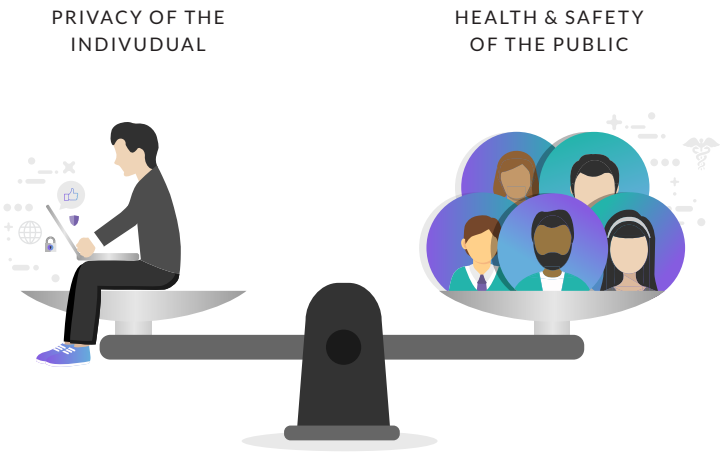
Data Proliferation

People, machines, sensors, and devices are generating unimaginable amounts of data, every minute of every day. Cloud computing, social media platforms, and smartphones are everywhere. Everyone is connected — 3 billion people online, 5 billion mobile phones, and 6 billion connected devices.

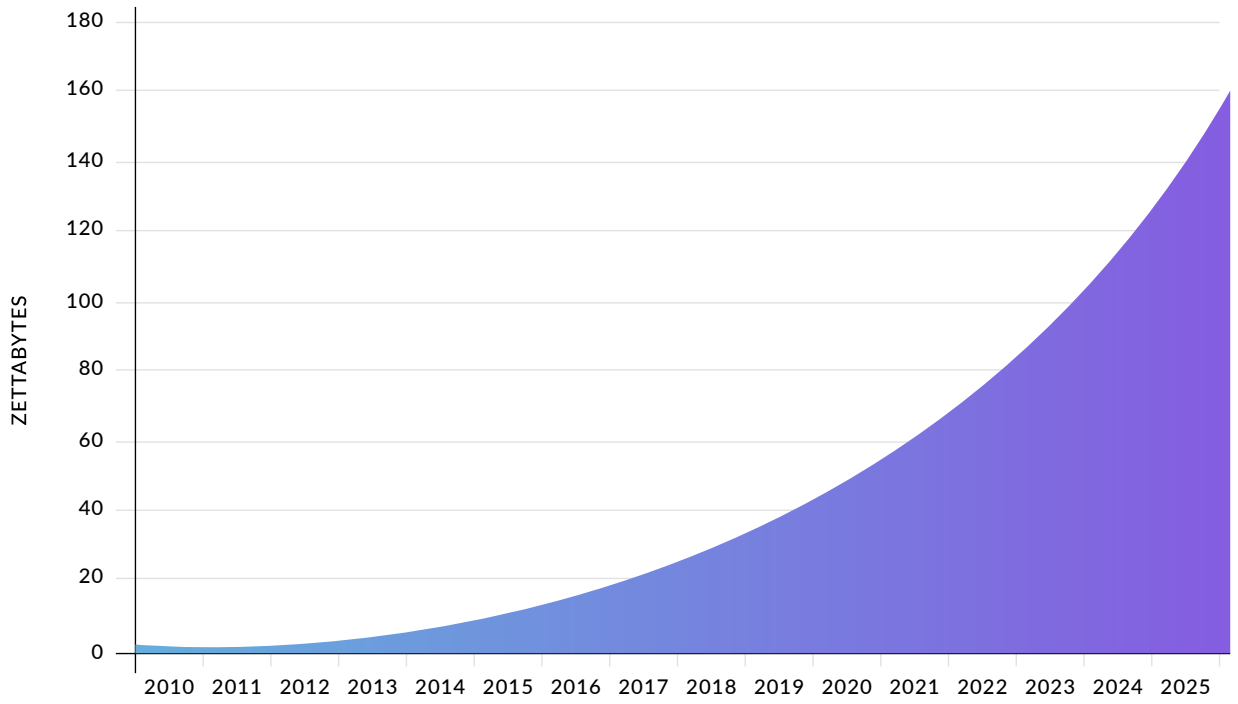
The data we generate is estimated to grow tenfold from 2016 to 2015 to 163 zettabytes. We hear the term "big-data" in everyday conversation and in every channel. Most of us tend to agree that the big data trend is generally a good thing, but it is fundamentally changing how we communicate, how we interact with machines, how we socialize, how we work, and ultimately empowering us to choose how much information we all share about ourselves with the public.

There are advantages and disadvantages to the widespread emergence of big data. That is not to say the disadvantages can't be addressed, managed, and resolved through improved technology, as well as debate, regulation, and policy changes. As we become increasingly aware of the scope and volume of data being collected, analyzed, and used by organizations, we must collectively determine what is appropriate and ethical, and in some cases, weigh the disadvantages (such as less privacy) in the interest of the greater good (such as public health and safety).

The rapid increase in the creation, availability, and processing speed of digital data has resulted in an exponential proliferation of data stored and analyzed.



ANNUAL SIZE OF THE GLOBAL DATASPHERE



DATA CREATED

By 2025, we are expected to produce 163 zettabytes per year, or 163,000,000,000,000,000,000,000 bytes. In the future, data volume will be measured in yottabytes – a number with 24 zeros.

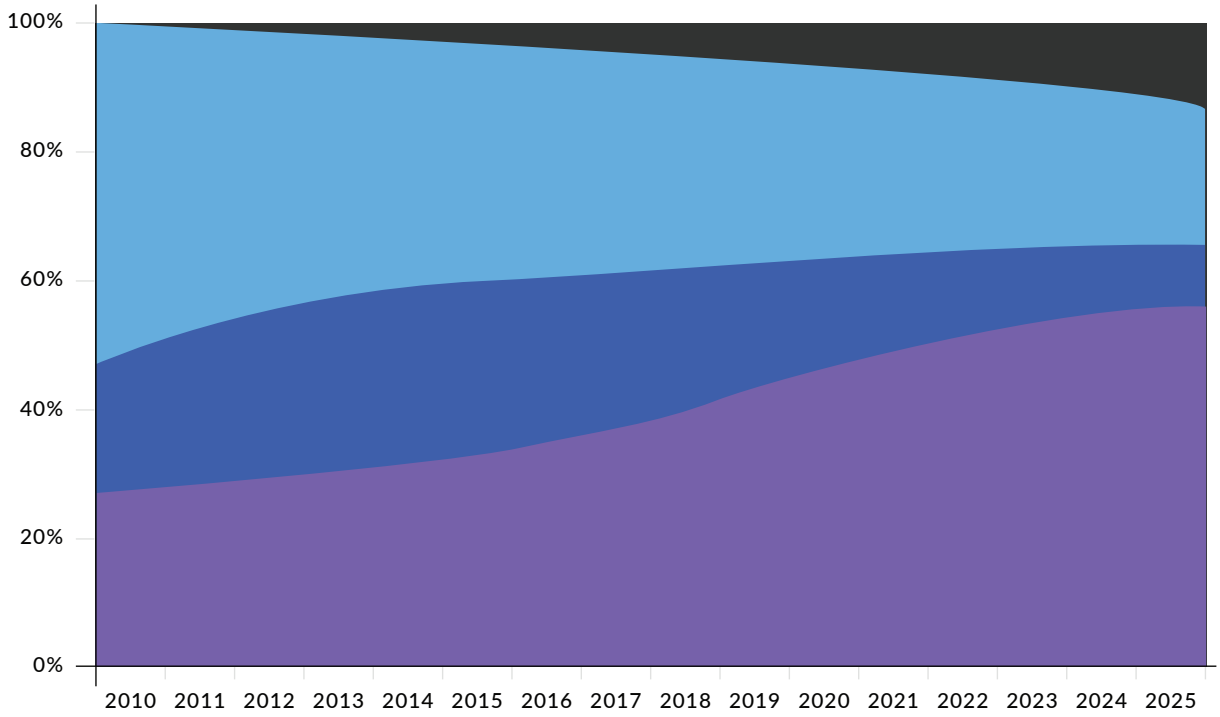
Source: IDC study, "Data Age 2025," sponsored by Seagate, April 2017

The growth in volume is also being fueled by the increasing diversity of the data. In the early days (2000-2010), it was primarily numbers and documents. Today, we have data that is generated from the Internet, photos, videos, phones, bots, social media, sensors, and the exponentially growing field of IOT (Internet of Things) — connected devices generating and storing data 24 hours a day, 365 days a year. Within the next decade, the allocation of data being captured and stored within organizations (enterprise) is expected to grow by orders of magnitude — overall and relative to other personal devices. In other words, if you think there is a lot of data today, that number is set to grow significantly with each passing year.

The emergence of connected devices, and the number of interactions per connected person per day, is also set to explode in the next decade. Granted, a lot of these interactions will be through phone, entertainment devices, and our automobiles.

However, relatively new to the data scene, the emergence of connected devices in the healthcare industry will certainly drive a large share of the increase in data capture — and the march to 5,000 interactions per day. Given the exponential growth in the amount of data and the increasing diversity of data, it will become critical for big data to move into the "smart data" age. In other words, as we get better at collecting and storing massive amounts of data, we must also get better at using the right tools to derive insights.

WHERE DATA IS STORED

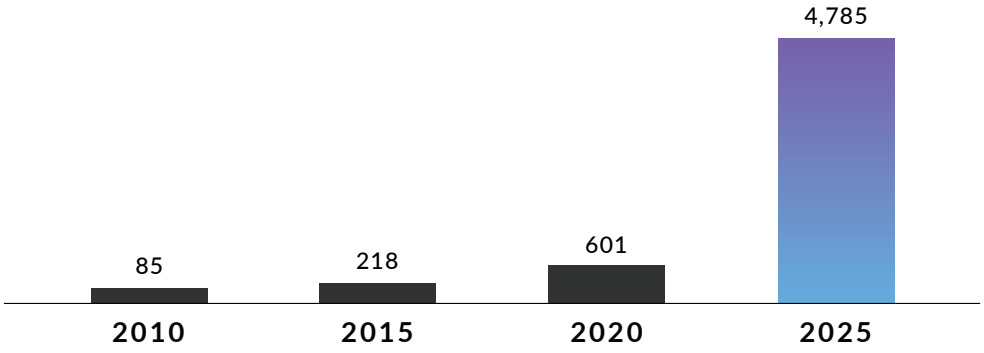


The amount of data being captured and stored at the enterprise/organizational level is expected to grow dramatically in comparison to personal devices.

Source: IDC study, "Data Age 2025," sponsored by Seagate, April 2017

MOBILE
PCs
ENTERTAINMENT
ENTERPRISE

INTERACTIONS PER CONNECTED PERSON PER DAY



The typical connected person is estimated to have had 85 interactions per day in 2010. By 2025 that number will be close to 5,000 interactions per day.

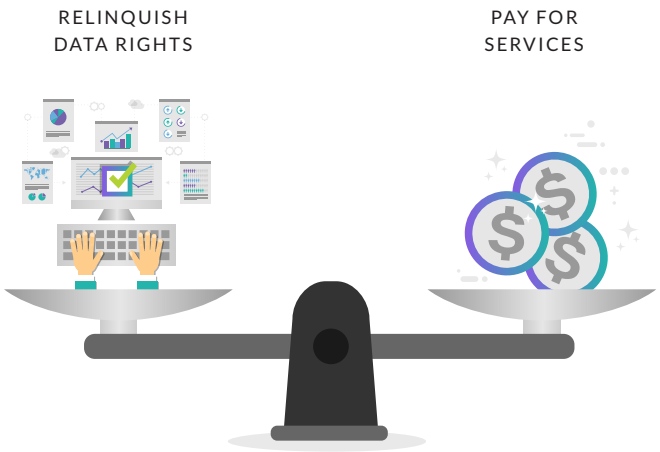
Source: IDC study, "Data Age 2025," sponsored by Seagate, April 2017

Privacy and Trust

In March 2018, ***The New York Times* broke a story** that consulting firm Cambridge Analytica used deeply personal data on more than 50 million Facebook users for political targeting. It was later revealed by Facebook that the impacted population was closer to 90 million. Although the debate started with a discussion about the use of personal data for political advertising and targeting, the conversation quickly evolved into a larger discussion about the proper use of data by social media, advertisers, and online firms in general.

This incident was somewhat unique in that it was made possible by using a third-party app to collect survey questions, profile data, and the data of users' Facebook friends. The data was then used to create psychographic profiles for subsequent targeting. We all know that online data was used — very successfully — in the the 2012 election. However, during the 2016 presidential election, the debate centered around the fact that the data was very detailed, used in a way that was relatively new, used against policy, and generated questions about the "ethical" use of data for marketing purposes.

The rapid increase in the availability of data to help marketers provide targeted messaging in the health and pharmaceutical space has been generally viewed as a good thing. Customers get relevant advertising, brands get efficiency, and the publishers and platforms sit in the middle — charging a premium for highly targeted audiences. However, the use of Facebook data by third parties — and the debate over how Facebook let it happen — has resulted in a growing number of consumers asking how they can control their self-generated social media data. Given most social media and publishing platforms rely on personal and tracking data



to support ad sales, this debate will not end anytime soon. During a recent interview, Sheryl Sandberg at Facebook indicated that consumers wishing to opt out of any type of data tracking may be considered as an audience for a "paid product" from Facebook. In other words, if you are not willing to relinquish your data rights — and disclose your activity online — platforms may argue you need to pay to use their technology. Those willing to share their data — driving targeting and advertising — are welcome to continue to use it as a "free" service.

In response to the **Facebook/Cambridge Analytica scandal**, some customers have joined the #deletefacebook movement and are going as far as deleting their history and activity archive from the platform. Ironically, the #deletefacebook hashtag was originally posted by Brian Acton, the founder of WhatsApp — a company acquired by Facebook for billions of dollars. Of course, Brian has been very vocal over the years about maintaining user privacy as a primary focus within

> Is the backlash against Facebook an isolated reaction, or will it represent a segment of consumers placing the importance of data privacy over targeting?

Time will tell. Some experts believe that only about 2-3% of all Facebook users are willing to take the step of deleting their account and activity. The stock market certainly did its best to judge the impact of the scandal; Facebook's stock initially lost about $50 billion in market value after *The New York Times* article dropped

Of course, the Facebook story is only one part of the discussion about the future of privacy — and regulation — as we enter the age of stricter regulations in 2018.

The Impact of GDPR

The General Data Protection Regulation (GDPR) is Europe's new framework for data protection laws, effective as of May 2018. Any company that stores or processes personal information about EU citizens must comply with the GDPR. Companies that fail to comply could face steep fines.

GDPR requires companies to review their approach to:

- Data flows
- Data handling
- Cross-border data transfer
- Data privacy
- Security monitoring
- Policy for handling the data of international individuals

The good news is that while GDPR is a cross-industry regulation, the health and pharmaceutical industry historically had some of the highest data privacy and security standards, often driven by ultra-conservative legal teams. In other words, given that most pharmaceutical companies were already hyper-sensitive about data privacy, GDPR will be a chance to review those policies and procedures. The critical part will be to ensure all data, marketing, and service partners are aware of GDPR — and compliant.

The GDPR regulations are designed to standardize data privacy and protection laws across Europe, but the impact will be felt globally as most organizations will act to maintain compliance. The regulations apply to any organization that handles EU data, without consideration for where the organization is based. In other words, unless you have a plan to guarantee you will never have data from any EU citizen in your data set, you will have to become compliant. The regulations change how data can be used, managed, stored, deleted, and released.

> Additional information about the GDPR regulations can be found at **www.eugdpr.org**

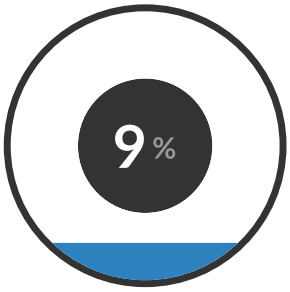
Consumer Concerns About Privacy

As with most things in life, the online debate over access to technology and the desire for privacy is very nuanced — and at times confusing. A 2014 study by the Pew Research Center found only 9% of consumers believe they have "a lot of control" over the information and data collected from them. However, in the same study, 74% of consumers say it is "very important" to be in control of the information collected about them. In other words, we think data privacy is very important, but many of us also realize we really don't have much control over what happens. The same study also found that 64% of consumers support more regulation of advertisers online.

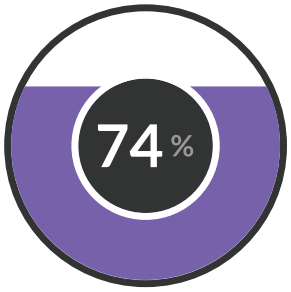
Another study by the Pew Research Center in 2016 looked at the amount of confidence consumers have in various companies and organizations to keep their data private and protected. Perhaps a preview of things to come, only 9% of U.S. adults were "very confident" that social media sites would protect their data. Another 38% were "somewhat confident" in social media platforms. U.S. adults seem to place the most trust in their cell phone manufacturers — followed next by their credit card companies, then cell phone service providers. For those familiar with data practices, credit card and cell phone companies are very proficient aggregators and users of data, which is often used for subsequent targeting. That said, the implementation of GDPR in 2018 and the inevitable government hearings at the country and regional levels will provide ongoing fodder and fuel for consumers to determine their level of comfort with online platforms and how much they are willing to give up in return for access to social media, customized content, and highly targeted and relevant advertising.

> Is the current debate over privacy a temporary discussion — or part of a larger trend in which consumers demand more control over their data (and subsequent use)? Only time will tell.

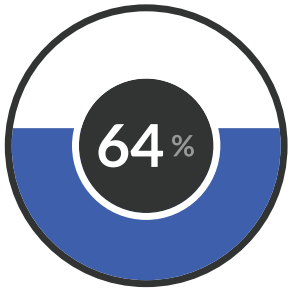
CONSUMERS | BELIEFS ABOUT PRIVACY



Believe they have **"a lot of control"** over data collected about them



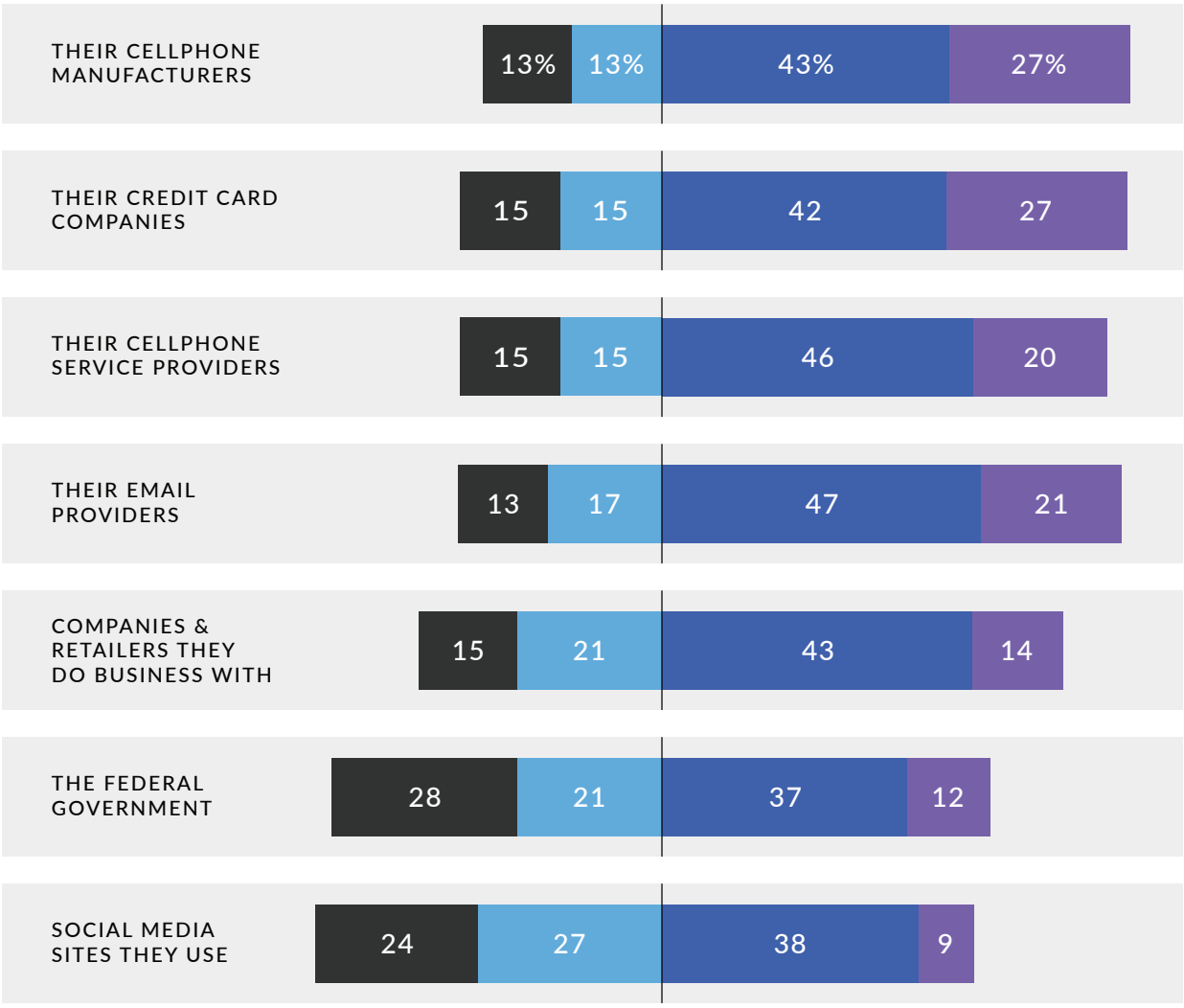
Believe it is **"very important"** to be in control of information collected about them



Support more regulation of advertisers online

Source: Pew Research Center survey, "Americans' Attitudes About Privacy, Security and Surveillance," May 2015

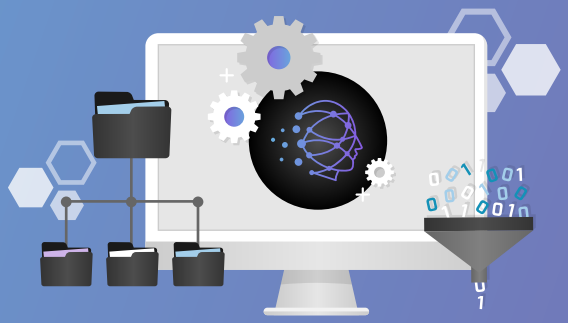
PROTECTION OF DATA



Roughly half of Americans do not trust the federal government or social media sites to protect their data.

Source: Pew Research Center survey, "Americans and Cybersecurity," May 2016

NOT AT ALL CONFIDENT
NOT TOO CONFIDENT
SOMEWHAT CONFIDENT
VERY CONFIDENT



The Radical Shift in Content

Can artificial intelligence be creative? Can an algorithm create advertising from scratch on par with a marketer with decades of experience? Not yet. That said, we are at the point where AI and machine learning algorithms can choose and serve up pre-existing content based on audience data in a way that allows the creative to focus on the pure strategy and copy — and the AI to vastly improve efficiency and effectiveness when it comes to getting the right content, ad, and experience to the right segment. A projection from analyst firm Gartner already estimates that 20% of commercial content today is being created (broadly defined) by machine learning.

While AI is not yet winning awards for the "best" ad, there are some examples that demonstrate it is successfully being used to create content overall: by curating news, creating click-worthy headlines, and producing video that would rival an expert with years of video- production experience.

Marketers across industries are using data analytics and AI to not only learn consumer preferences, but to predict — perhaps even before they realize — what a consumer will be most interested in. In other words, best practices in many fields can be learned and then replicated. The key is to provide the raw education to the AI platform, let it continue to learn, and then let it refine the approach over time.

Another trend that is being driven by AI, targeting, and hyper-personalization is "snackable" content. The term has been used to describe the phenomenon of short-form content (text and video) to engage a customer audience facing an increasing number of distractions in a constantly connected world. For the health and pharmaceutical marketer, this translates into creating content that can be consumed in chunks — over time or across platforms. It's the debate of going from a 30-second (traditional television commercial) mentality … to a 15-second mentality … to a five-second mentality. It's telling stories over time, over sites, but providing a coherent brand message to the customer at the same time. Clearly, pharmaceutical brands have unique regulatory challenges like fair balance that make the idea of truly dynamic content and five-second videos a real challenge.

It can be argued that while pharma may never reach the level of truly dynamic content that exists in some sectors such as entertainment — where brands may let consumers actually "create" ad content based on their browsing history, search, or purchasing activity — pharma does have an opportunity to invest in creating content that can be consumed in chunks, and then use AI and intelligent targeting to serve up that content in a personalized and compliant manner. AI has the potential to change how customers interact with information, technology, and services. It also has the potential to help marketers achieve the Holy Grail of relevance to the individual customer — at scale. AI will enable marketers to tailor approved campaigns to the customer in the moment based on intent.

NVIDIA EXAMPLE OF USING AI TO CREATE CONTENT

NVIDIA trained a computer to compose music "like" *Star Wars* composer John Williams and then had an orchestra play the result. The company showed the final piece at CES 2018, a large technology conference in Las Vegas. The company worked closely with Disney to teach the neural network how to compose. As NVIDIA put it, "Our ultimate purpose is to build computing platforms that allow you to do groundbreaking work."

Does that mean, over time, we don't need a musical genius like John Williams? No, we still need experts to teach the machines and neural networks. However, over time, the benefit gained is from using the platforms to create "new" pieces with much greater efficiency. The same example can apply to marketing and advertising copy — eventually. Great creative minds will teach, sometimes unknowingly, neural networks what makes a great campaign or copy, letting the machine focus on creating — without the need for a nap or any rest at all.

WATCH THE VIDEO

CHAPTER 2

Deep Dive: What Is AI and Why Does It Matter?

To understand what AI is capable of, let's talk about what it is.

What Is AI?

Artificial intelligence is the ability of machines and computers to think and learn — to gain knowledge not simply by repeating given facts, but by recognizing similarities and making inferences and educated guesses.

To some, artificial intelligence seems like a futuristic topic – something from sci-fi movies, not a part of everyday life. But this impression needs to evolve, because AI is already woven into most facets of our days.

Have you ever owned a Furby, a Roomba, or an Xbox Kinect? How often have you asked Google, Siri, or Alexa a question, or gotten a recommendation from Amazon or Yelp? From traffic lights to airline flights, AI has become part of everyday life over the past two decades. To see how pharma marketers can best use AI today, let's explore a little to see what AI is, how it works, and why it's become ubiquitous.

In a traditional computer program, each line of code gives a specific rule: If A happens, do B. If C happens, do D. In rules-based programming, programmers must think of every possible contingency and write a rule for each one. Obviously, this can only work up to a certain scale.

> "I propose to consider the question, 'Can machines think?'
>
> — Alan Turing

Learning, whether done by human or machine algorithm, is more than just rule-following. It's taking information and extrapolating that to make inferences about wholly new situations.

Perhaps the best example of AI at work is in search engine optimization. Going through millions of searches to determine the best keyword strategy would be impossible for a human, which is why search has been fueled by AI for years.

ARTIFICIAL INTELLIGENCE IS MORE THAN JUST PROGRAMMING

You've probably already used AI technology today

amazon

Bank of America

NETFLIX

nest

pandora®

Southwest®

UBER

yelp

AI is already woven into most facets of our days.

FANTASY FOOTBALL IS ONE OF THE BEST EXAMPLES OF EVERYDAY AI

WATCH THE VIDEO

AI IN YAHOO'S FANTASY FOOTBALL

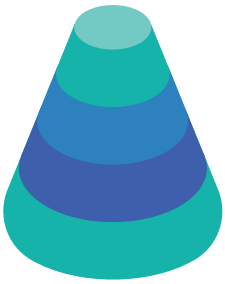
Why AI Matters

Artificial intelligence matters because it's already changing the world. AI matters to pharma marketers because it's currently changing their jobs. Marketers are increasingly becoming data orchestrators, and a baseline understanding of the technology is necessary to succeed in their evolving roles. Simply planning for future change is no longer enough.

In *Human + Machine : Reimagining Work in the Age of AI*, Accenture researchers refer to the "third wave of business transformation." Where the assembly line *standardized* processes, and the *advent* of computers *automated* processes, AI can adapt processes. It can learn.

The time is now: data collection, data storage, and computing power are ever more affordable and accessible. These are the raw materials that power AI, that make it possible to unlock insights using unprecedented automation and analysis. Simultaneously, funding for AI projects is growing exponentially, both overall, and in healthcare specifically.

TRAITS OF AI THAT MAKE IT ESPECIALLY VALUABLE FOR HEALTHCARE



Efficiency at scale

Humans can't work efficiently with data sets that are too large.

Accuracy

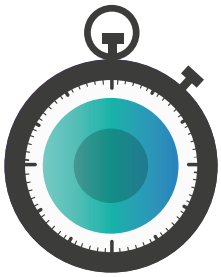
AI removes the opportunity for human error caused by factors like bias, prejudice, emotion or exhaustion.

Speed

Thanks to ever-increasing storage and processing capabilities, AI can provide analysis, answers, and even predictions that can affect decisions in real time.

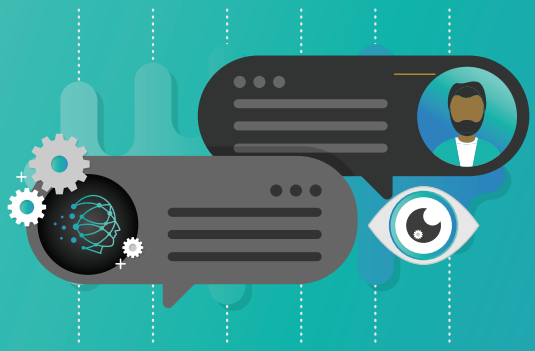
Enhanced utility

Bringing sci-fi into reality, AI enables complex digital functions that were impossible both humans and rules-based machines.



Flexibility

Conventional computing requires very precise inputs, but AI programs can be fed structured or unstructured data.



Types of AI

Experts have created any number of graphics to attempt to describe AI systems. They can be organized according to what they comprise, how they function internally, the way they interact with the world, the purposes they serve – and in many other different ways.

The graphic below depicts one of the most popular methods of classification, with emphasis on the most relevant types of AI systems.

MACHINE LEARNING

The ability of a system to adjust and improve by using data without the need for explicit rules.

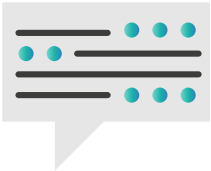
- **Deep Learning** – Large networks loosely mimic the connections of neurons in the brain. The connections are made based on examples. These systems can learn from mistakes, and eventually build better networks. Deep learning is used in applications that include image recognition, self-driving vehicles, and real-time language translation.

- **Supervised Learning –** Systems are trained by labeling attributes of data and connecting those attributes to an output. (Those are ears; that is a tail; that is a trunk; elephants have ears, tails, and a trunk.) When the system encounters similar information, it can give a prediction or recommendation to an appropriate level of certainty. Supervised learning can work with data that is easy to organize and label, such as in spam email recognition, sentiment analysis, or product recommendation engines.

- **Unsupervised Learning –** Algorithms explore data without a human having labeled it as training data. Unsupervised

learning is particularly useful in situations such as identifying customer segments or detecting anomalies.

- **Reinforced Learning –** A mechanism reinforces an action by rewarding desired outcomes. An example of reinforcement learning might be in a stock tool: If a system reviews variables, chooses a stock, and profits from the investment, the action is reinforced.



NATURAL LANGUAGE PROCESSING

The ability of a system to accept input in normal human sentence structure, not only specific command words.

- Content Extraction
- Classification
- Machine Translation
- Question Answering
- Text Generation

VISION LEARNING

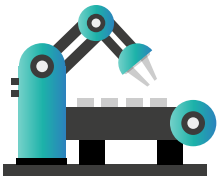
The ability of a system to understand a picture without words.

- Image Recognition
- Machine Vision

SPEECH RECOGNITION

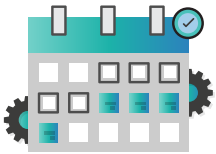
The ability of a system to accept input from the human voice.

- Speech to Text
- Text to Speech



ROBOTICS

The ability of a system to act and interact with the physical world.



PLANNING

EXPERT SYSTEMS

Source: Neota Logic

AI in Modern Pharma Marketing

From a quick Google search to the most complex digital experience, pharma marketers run across AI everywhere. It's already being used to automate existing processes and help reduce or eliminate the human component when it comes to digesting large amounts of text or image data. The AI layer can help filter and present the most relevant and pertinent data and insights for further analysis and action. AI is also being used at scale in the field of drug discovery and screening.

However, the applications on the commercial side of the business, and within brand teams, are just ramping up as brands are still working through the key questions to determine how, when, and why to apply AI to critical marketing processes and to the various structured and unstructured data sets they have at their disposal (or can acquire).

A FEW EXAMPLES OF HOW AI IS BEING USED TODAY ARE LISTED BELOW:

1. Admin: handling the paperwork.

ExpTools like Zocdoc use AI to provide patient-assistance services that handle the complicated processes inherent to healthcare: verifying insurance, finding doctors, booking appointments, filling out forms, and the like.

2. Chatbots: automating and assisting customer service.

AI isn't just about chatbots, but since Merck Italia launched the first pharma chatbot using Facebook Messenger in 2017, they're one of the most popular and effective uses for the technology today. Machine learning and natural language processing help chatbots interact with patients, caregivers, HCPs, or payers — or assist customer service agents in the process. When it's vital to communicate using approved language, this technology is a logical way to improve customer service.

3. Modeling: Combining data to track user behavior.

Adobe and Salesforce offer platforms that allow marketing teams to build profiles based on many data inputs, including CRM databases, social media activity, or other offline avenues. Pharma marketers who are diligent about adding relevant information over time can use their databases to build models that enable data-based marketing-strategy decisions.

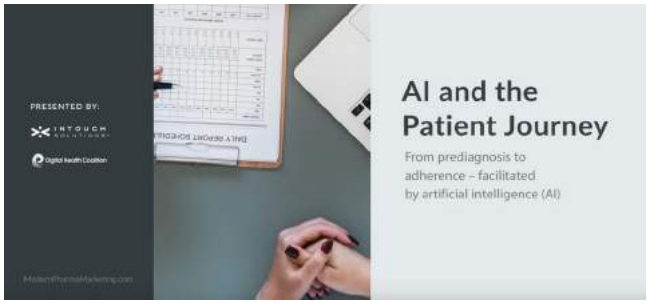
4. Personalization: predictions at scale.

Companies like Netflix and eBay employ AI to understand their customers and provide personalized recommendations. Healthcare brands can use tools like Crossix to do the same, using AI to scale personalization, targeting across media with relevant messages. This precision can help interested patients and HCPs to learn about a treatment or help existing customers remain on treatment if appropriate.

AI & THE PATIENT JOURNEY

Every pharma marketer is familiar with the patient journey, but where does artificial intelligence fit in?

WATCH THE VIDEO



AI is whatever hasn't been done yet.

— Douglas Hofstadter paraphrasing Tesler's Theorem on intelligence.

AI & the Patient Journey

AI has enormous potential for pharma marketers. This graph illustrates how AI manifests across the health ecosystem to benefit patients.

1 AWARENESS & RECOGNITION	2 PRESENTATION & DIAGNOSIS	3 TREATMENT SELECTION	4 BRAND SELECTION & ACCESS	5 SWITCHING & ADHERENCE
Search Marketing: Highly personalized ad targeting via programmatic media bidding Search Optimization: Automatically tailored messaging based on patient's historical / predicted behavior Search Experience: Voice search + chat interface				
Sales force CRM systems, pre-call planning, guided selling, e-detailing	Cross-referencing against de-identified patient record data to better diagnose and recommend treatment plans based on patient commonalities or patterns in the data		Cross-referencing against de-identified patient record data to better diagnose and recommend treatment plans based on patient commonalities or patterns in the data	
Google Duplex-enabled appointment scheduling to seamlessly align critical health visits with a busy schedule	Better testing protocols and analysis (MRI, CT scan, melanomas, etc.)	Connecting caregivers like PCPs to specialists via AI-powered chat interfaces	Insurance plan/ pricing analysis yield treatment recommendations for patients and HCPs	Forum bots connect patients with relevant treatment threads

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Digital Health Coalition

digitalhealthcoalition.org

Funding Signals the Importance of AI

Looking at the funding of AI startups — particularly AI health startups — can illuminate our understanding of AI's importance in modern pharma marketing. According to CB Insights, investments in AI firms went from $1.7B in 2013 to $15.2B in 2017, and there's a similar sharp trajectory for health AI: from $30M in 2013 to $693M in 2017.

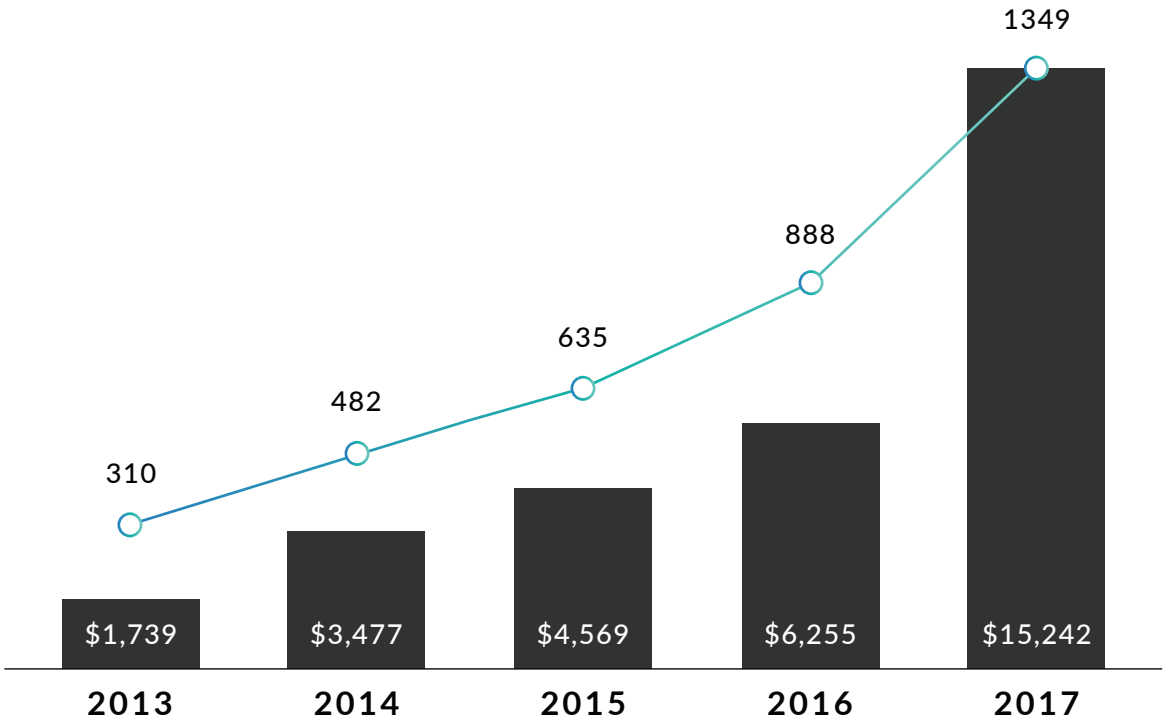
Although many startups will ultimately fail or be acquired, some of the recipients of this capital will create AI solutions that will affect data for every brand. And as the year-over-year growth demonstrates, the interest — and, therefore, that likelihood — is growing fast.

One intriguing example is the story of the NYC startup Flatiron Health. Flatiron analyzes real-time oncology data to better understand treatment patterns, outcomes, and efficiencies, using a proprietary electronic medical records system. Data from more than 2,500 oncologists is used to create virtual clinical trials — models that may be able to predict real-world results.

Flatiron was purchased by Roche in February 2018 for $1.9 billion. Roche told investors at the time, "We believe that … real-world evidence is a key ingredient to accelerate the development of, and access to, new cancer treatments."

While many initially expected **Roche** to keep Flatiron as a very closely held asset, it appears they are much more interested in letting the technology grow. In May, Flatiron **signed** a three-year agreement with BMS to use Flatiron's insight and expertise to help them develop oncology drugs. The use of data, analytics, and AI is not only an advantage for Roche, but has the potential to fuel industry-wide clinical trial innovation.

INVESTORS FLOCK TO AI

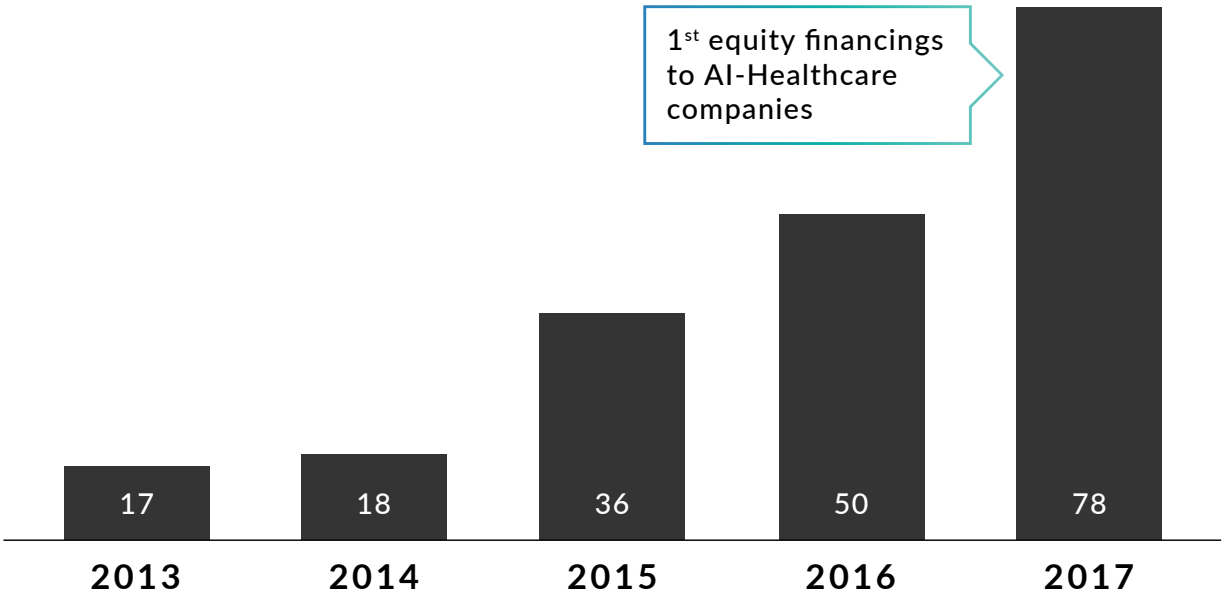


DISCLOSED FUNDING ($M)

DISCLOSED DEALS

Source: CB Insights

AI HEALTHCARE STARTUPS ON THE RISE



Source: CB Insights

Conclusion

AI technology allows for stronger, more adaptive, directed marketing, while doing so more efficiently, more cost-effectively, and with more assurance of compliance with regulatory parameters and guidelines. **A McKinsey Global Institute report** concluded that, when it comes to companies who are adopting artificial intelligence early and aggressively, those companies report higher earnings and may be forming "an insurmountable advantage" over their competition. The implementation of AI can be daunting due to the need to gather and standardize data, build systems, and gain the necessary approvals, but the competitive advantage and end result can make this investment pay dividends.

Not using AI to extract value and insights from data will soon mean not only missing growth opportunities, but failing to connect. Brands need the right information at the right time to make the best decisions. Customers do, too. Pharma brands that use AI will be able to anticipate needs and address them in the best possible ways. In Chapter 3, we outline some of the most popular current platforms and tools with which modern pharma marketers should be familiar.

"

AI is one of the most important things humanity is working on. It is more profound than … electricity or fire.

— Sundar Pichai, CEO, Google

CHAPTER 3

The Healthcare AI Landscape: Top Players and What It Takes to Get in the Game

Which companies do you need to know, and what are they doing?

Staying Informed During Turbulent Times

Discerning the main creators and users of AI can be daunting. This is a rapidly changing field. Players enter or exit, and their products succeed or fail all the time. There is no shortage of lists of top healthcare AI companies, but there is almost no consensus across them, and no ranking has any recognized industry authority.

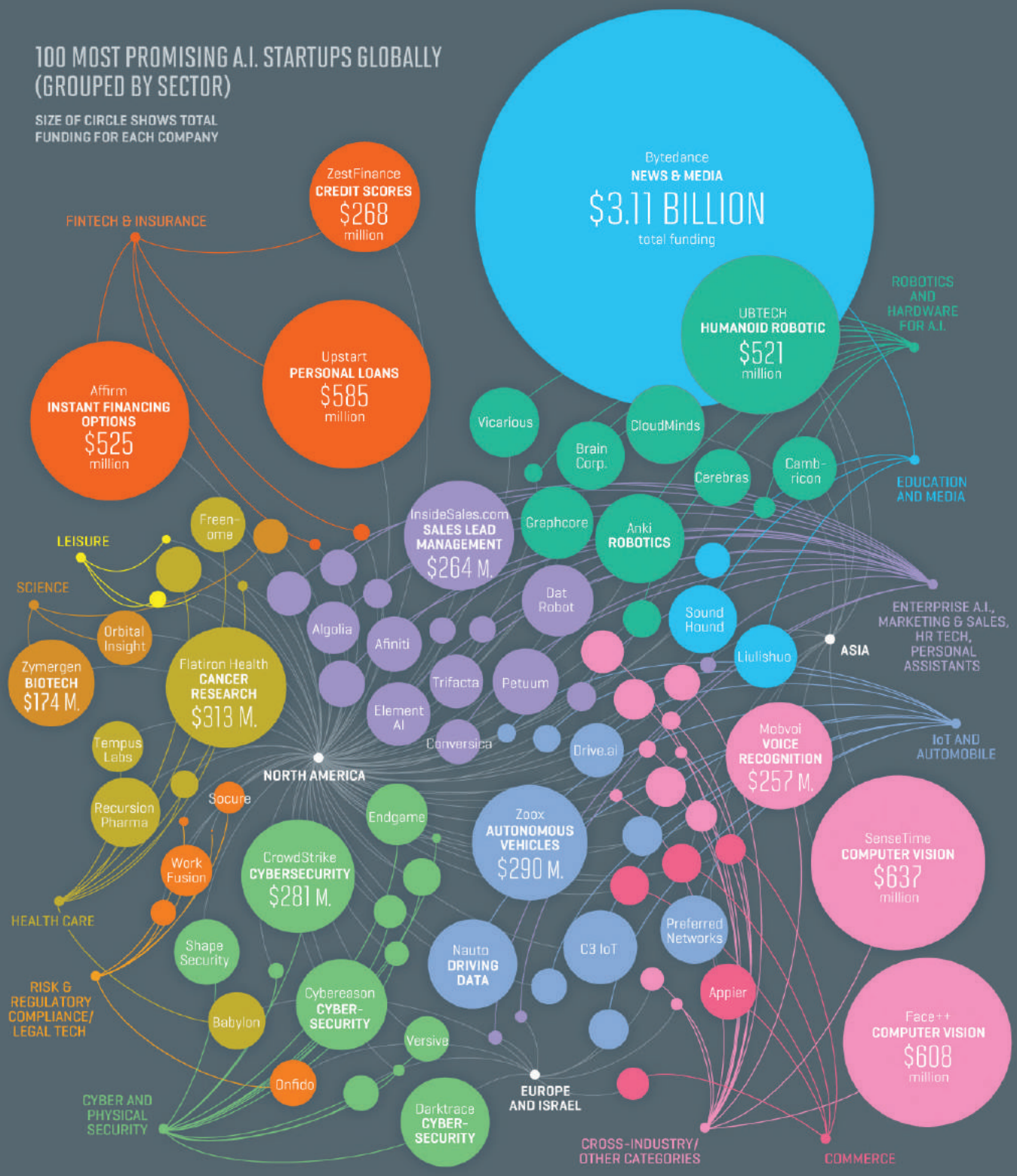
Rather than provide yet another list of questionable longevity, we've investigated methods of classifying the landscape — from company size, to funding type, to technology methodology. The most useful approach we've found is to organize the landscape by products' desired end users.

It's still an imperfect system — some startups straddle boundaries, and some products may have overlapping purposes — but it's a productive method of categorization. It helps us to see the activity across healthcare.

> "
>
> ... the 10 largest technology companies have acquired more than 50 AI startups [since 2012.]
>
> — VentureBeat

100 MOST PROMISING A.I. STARTUPS GLOBALLY (GROUPED BY SECTOR)

SIZE OF CIRCLE SHOWS TOTAL FUNDING FOR EACH COMPANY



FORTUNE MAGAZINE

SOURCE: CB INSIGHTS; FOR THE COMPLETE LIST, GO TO CBINSIGHTS.COM/RESEARCH-AI-100.

CONSUMER-FACING

These products are intended to be used by patients and caregivers, often designed to submit data gathered by sensors, images, photos, or data entry. Whether users track information actively or passively, algorithms analyze it in order to respond with actionable information.

For example: Woebot is a chatbot created by psychologists and AI researchers from Stanford that uses natural language processing, through a proprietary app or Facebook Messenger, to help users regulate their moods with cognitive behavioral therapy exercises. Other examples are shown below.

Woebot	physiQ	VIOME	FIRST DERM
Mental Health	**Wearables**	**Personalized Genetics**	**Skin**

CONSUMER-TO-HCP

These products are also used by consumers, but they function as conduits between patients and providers, connecting consumers with HCPs. Often called telehealth, these products help to triage needs and, in some cases, address lower-level concerns digitally.

For example: Diabnext uses an AI-powered interface (amusingly named J.A.R.V.I.S., as in Marvel Comics) to connect patients with diabetes to their doctors for conversations that are informed by their records of insulin dosage. Other examples are shown below.

DIABNEXT	AiCure	babylon
Disease Management	**Lifestyle Management**	**Telemedicine**

HCP-FACING

These AI applications for physicians, nurses, hospital staff, and other HCPs often manage health records, analyze medical images, or help in other ways to make a practice or hospital run more efficiently.

For example: Qventus helps hospitals reduce bottlenecks in their logistics and improve the efficiency with which different departments interact. Other examples are shown below.

Hospital

Medical Records

Medical Imaging

RESEARCH-FACING

Pharmaceutical companies, academia, or other research institutions use these AI tools to improve their ability to discover and test investigational compounds. Clinical trials require enormous quantities of data, which make them a perfect application for AI.

For example: Antidote, **as wired puts it**, "does for clinical trials what Priceline did for travel," helping researchers to recruit patients for clinical trials with an interface that uses machine-readable data, making it easier to search and find patients and trials. Other examples are shown below.

Clinical Trials

Drug Discovery

Genetic Research

RESEARCH-FACING

As we said, it's hard to perfectly classify everything. Some companies cover various audiences, some change their approach, and others do a combination of these. What one AI startup is known for now may change as they find a more effective use for their data and algorithms. AI is also being developed in places that might seem unexpected: public-private partnerships like the Accelerating Therapeutics for Opportunities in Medicine (**ATOM**) consortium, or consultancies like **Deloitte**, which announced AI-building plans with a $20MM fund for that purpose.

> Often, though, these efforts are focused on population health — using massive data sets to understand and predict outcomes in ways that would have been impossible before the advent of AI.

Prognos is one **example** of a population health AI startup. They were originally called Medivo, and were focused on helping patients understand lab results. But in January 2018, they changed their name and their focus, and now work with payers and pharma companies to predict disease. Other examples are shown on the right.

prognos

Predicting Disease

flatiron

Oncology Research

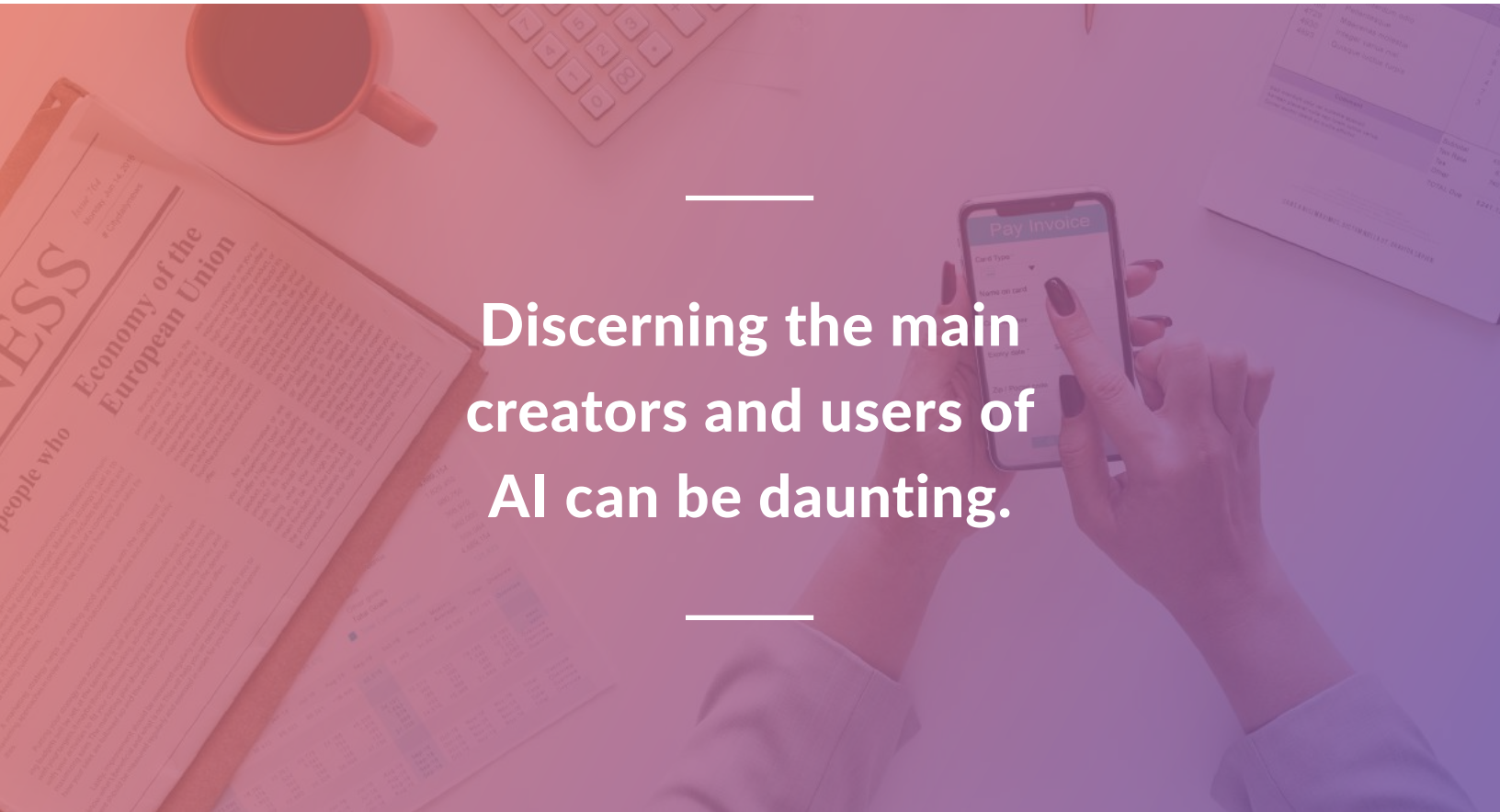
Health Catalyst
ignite outcomes improvement

Health Systems

THE MOST-FUNDED APPLICATIONS OF HEALTH AI

R&D	Population Health	Clinical Workflow
$650.1 million	$523.8 million	$514.8 million

Source: Rock Health



Discerning the main creators and users of AI can be daunting.

Q&A WITH SUNDEEP BHAN

Sundeep Bhan
CEO & Co-founder
Prognos

Mark Bard
CEO & Co-founder
Digital Health Coalition

DHC: WHAT PROBLEMS IS PROGNOS SOLVING FOR CLIENTS TODAY?

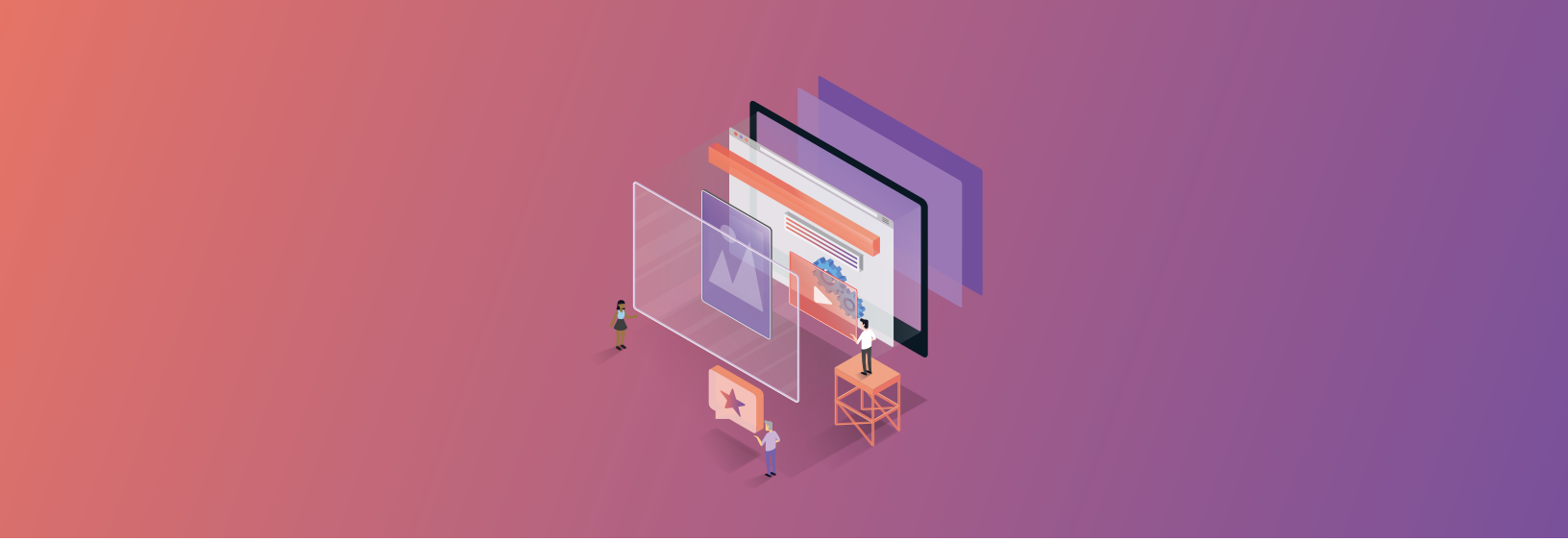
Sundeep Bhan: We've built one of the largest registries of clinical diagnostic information, with 16 billion records tracking 180 million patients across 50 disease areas, and we use that to improve patient outcomes by predicting disease earlier than anyone else.

> The amount of health data doubles every two to three years, and to function at this scale, it's beyond manual work or human intelligence. We have to go beyond.

One of the biggest problems for brands — increasingly so, as we move towards precision medicine — is identifying patients that are right for a therapy or a trial as early as possible.

The second is measuring and predicting outcomes through real-world evidence, to support market access, or to support virtual or real-world trials.

Note: Paraphrased for brevity.



How Tech Giants Are Shaping the Future of AI

FAMGA. No, it's not the latest Pokémon character. It's an acronym for Facebook, Apple, Microsoft, Google, and Amazon: the five tech giants making a significant impact on the future of artificial intelligence and machine learning across all industries.

We know many of these companies because we interact with them every day as consumers using hardware, software, and sites powered by their underlying technology (and AI). They're investing billions in the future of AI and machine learning, which will benefit patients, physicians, pharma, and of course the shareholders of these companies.

Think of FAMGA as infrastructure, building out the structures and technology that make individual AI and ML applications possible at scale. In many ways, investments by Google have already inspired and enabled countless startups relying on their tools (and Google Cloud resources) for distributed applications.

A Few Examples of How Each Company Is Fueling the AI Revolution

Facebook — The social network now has facial recognition in video and images at scales that were — even recently — previously unimaginable. AI powers their advertising solutions and targeting.

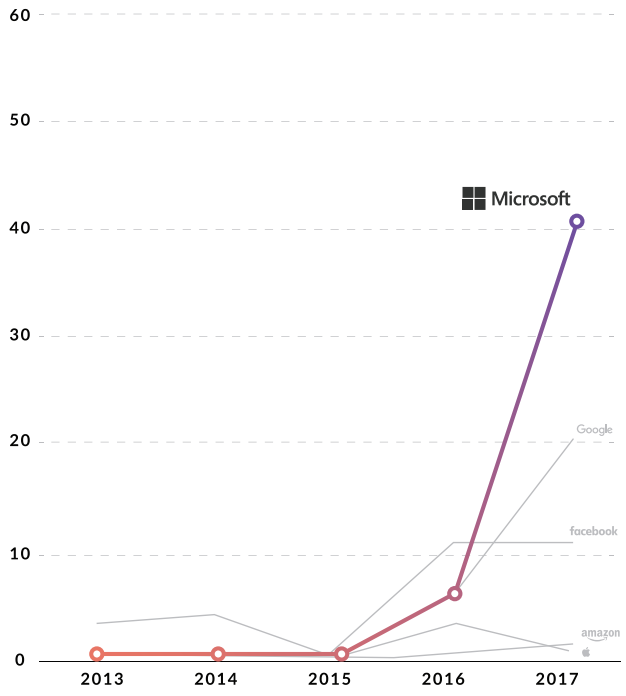
Apple — Virtual assistant Siri learns what you need over time, and tailors responses accordingly. AI powers their video and photo curation at scale, and specific to healthcare, AI is being used to analyze health data to predict potential cardiology events.

Microsoft — While Microsoft's AI innovation has not been as visible to the average consumer as some of the others, their investments and research, through tools such as Cortana, continue to fuel startups and investments. Microsoft has also entered the cloud space with their Azure offering.

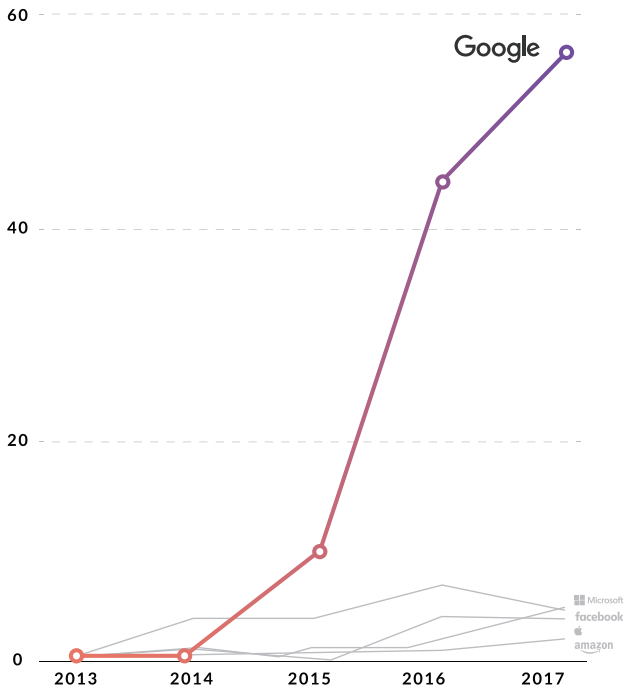
Google — Google has proudly declared that AI and ML are fully embedded and driving everything they do. Applications and tools include the Google Home voice assistant, and AI for image and video processing, as well as cheap and powerful Google Cloud storage and processing that make large-scale AI and ML analysis accessible to even the smallest startup.

Amazon — The company that pioneered data-driven predictive recommendations continues to invest in a range of AI-powered tools and platforms. Their voice-controlled home devices, with Alexa at the core, are making their way into a growing number of homes today. Like Google, Amazon brought cloud services (storage and processing power) to the masses at prices unimaginable even five years ago.

MENTIONS OF AI/ML BY FAMGA IN EARNINGS CALLS

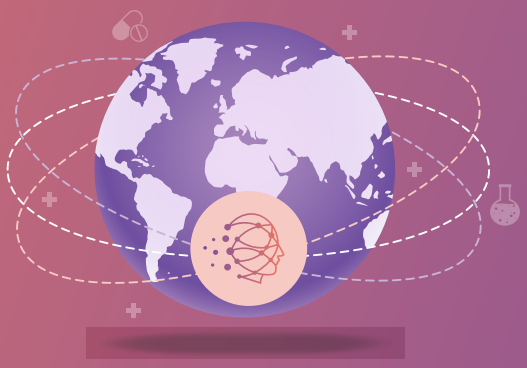


Microsoft focuses on AI, with skyrocketing mentions of "artificial intelligence" in 2017



Google has instead focused on "machine learning" when talking to *The Street*, with mentions of the term jumping in 2016

Source: CB Insights



AI Is Global

All over the world, virtual assistants are becoming the norm for patients. Healthcare is considered a "**top two" industry** ready to benefit from AI virtual assistants, and several leading pharmaceutical companies already collect and use data to engage with patients through virtual assistants and drive adherence. It's estimated that AI-based assistants can help businesses save **$8 billion per year by 2022** through support that is four minutes faster and costs an average of $0.70 less per interaction.

A Few Examples

Affectiva, an Egyptian company, has "emotion recognition products" that now power healthcare applications for stroke rehabilitation and autism, in addition to more than 1,400 brands and one-third of the Fortune Global 100.

Bioserenity, a French **company** "headquartered in the Brain and Spine Institute of the largest teaching hospital in France," has **raised** $22 million in its quest to create wearables to monitor patients with epilepsy (and monitor clinical trials).

Florence reminds German users to take their medications, motivates them to adhere to their regimens, and can provide medicine-specific information. It can also track health, help achieve health goals, provide additional information about a disease or condition, or locate a doctor or pharmacy.

Ubenwa (which means "baby's cry") is a Nigerian **startup** in the second round for the IBM Watson AI XPRIZE. The company's smartphone app analyzes infant cries to detect and prevent birth asphyxia, the third highest cause of death for children under five.

What AI Moves Can Pharma Brands Make Today?

We've illustrated the landscape of current companies, current fields of inquiry, and current technologies so far in our explanation of AI. But even if a specific brand does not appear to have a present need, we still recommend that brands and organizations take the time now to get to know some of these companies more closely. Not necessarily from the point of view of immediate investment (although that's certainly a possibility), but instead, for the purpose of understanding who and how the path forward is being blazed.

If brands can better understand how data is being used, it can help them see the potential of how those data sets and algorithms can be used, and how they should be gathering, organizing, and looking at their own data.

Take time to invite conversation with a few chosen organizations. Learn what drives them, what they're doing, what problems they're solving, how they currently are — or how they envision— working with pharma, and how they think innovative companies can work wth AI. These discussions are vital to positioning a brand for success in the next five years.

(And, of course, your contacts at Intouch Solutions and the Digital Health Coalition are an excellent resource to make these introductions.)

Three Things You Can Do Now to Get Smarter About AI

1. Get smart with partners. Reach out, make connections, schedule meetings and presentations with industry partners — including your agency — to learn more.

2. Take an online intro course. Google offers a wide range of free courses. Start with the **Machine Learning Crash**

Course, then venture over to **ai.google/education** for a broad range of resources, including many tutorials on the free Google AI tools.

3. Follow the news to decipher the buzzwords, catch trends, and find out about related conferences. If you had to choose just one newsletter, sign up for ***The Algorithm*** from the MIT Technology Review. ***AI Weekly*** and ***Data Elixir*** are also great options.

Conclusion

AI is no longer a theoretical future technology. It can be found changing healthcare on every continent, coming everywhere from tiny startups to the biggest corporations.

The companies mentioned above are worth watching, but even more important to watch is the trajectory of AI. As systems increase in sophistication, they will become increasingly capable. But they're already capable of a great deal today that can help the data-sodden healthcare marketer. They can connect patients' online habits with prescribers' behavior, make initial diagnostic analyses for a variety of conditions; and make it possible to discover and test new drugs better, faster, and with fewer resources.

Stay tuned for Chapter 4, in which you'll hear from pharma marketers about these and many other ways in which AI is being piloted and put to real use.

WHAT ABOUT WATSON?

When the term "artificial intelligence" is mentioned, IBM's Watson often comes to mind. What happened to the company that introduced us to the promise of AI with Watson's *Jeopardy*-winning ability? In short: a lot has happened since the early days of AI and the launch of Watson.

While some in the AI and ML industry were quick to attack Watson as not "true" AI, IBM has certainly had success developing customized industry solutions. Unlike companies like Google and Amazon, which offer platforms to be tailored and used by users, IBM Watson chose to personalize its offerings in an industry-specific manner — including Watson Health for healthcare.

To IBM's credit, Watson was labeled "cognitive computing" (not AI) when the platform was described to clients and prospects. In their own words, "It's about augmenting what you and I do so we can do what we're supposed to, our best."

While IBM Watson has done a great job of branding the concept of AI, many industry watchers are waiting to see how the investments (such as their purchase of The Weather Company) will affect the core business of IBM and provide solutions that deliver on the long-term promise of AI — going beyond assistive technology to augment and speed up human decision making.

Q&A WITH SUNDEEP BHAN

Sundeep Bhan
CEO & Co-Founder
Prognos

Mark Bard
CEO & Co-Founder
Digital Health Coalition

DHC: A COMMON QUESTION POSED BY PHARMA EXECUTIVES IS: WHAT CAN I DO WITH AI TODAY?

Sundeep Bhan, CEO and co-Founder of Prognos: Today, we're working with about 20 pharma companies, and I can give you a couple of examples where brands are benefitting from leveraging AI capabilities.

One is targeting and understanding where patients are earlier. Most of what's done today is based on claims or pharmacy data. That's after the fact. The transaction has already happened. But you can get signals earlier: when sales reps interact with doctors, or with digital marketing campaigns.

We did this in asthma and were able to predict with >95% certainty which patients would switch to a biologic in the next 90 days. AI was able to give the brand the ability to get there before a treatment decision was made. We can do the same in rare disease and oncology.

The second example of the utility of AI is connecting real-world data with outcomes. In oncology, we've seen certain patients respond to certain treatment cocktails without understanding exactly why. Connecting data sets — diagnostics, genomics, biomarkers, EHR data, Rx data, claims data — can help us understand why certain outcomes happen, and get to the causation.

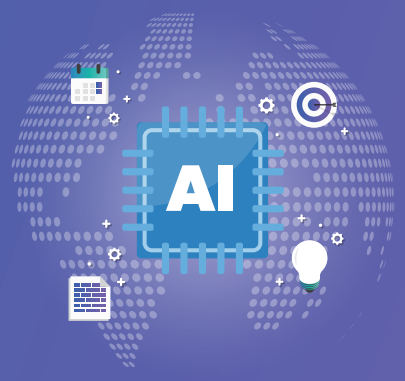
Those are a couple of practical examples of uses that brand teams can benefit from today.

Note: Paraphrased for brevity.

CHAPTER 4

Ask the Experts: The Pharma POV

Marketers give us their opinions on the state of AI across the industry.



How Pharma Ranks AI Among Other Tech Trends

The Digital Health Coalition (DHC) surveyed a group of 24 pharmaceutical executives across marketing roles in May 2018 and asked them about 13 different technology trends impacting their businesses (and brands). The survey revealed that pharma executives were most concerned with tech areas of focus that have been around for the past decade.

Respondents ranked the top digital and technology trends affecting them in 2018 as:

- Privacy and security
- Mobile
- Beyond-the-pill services
- Social media
- EMRs

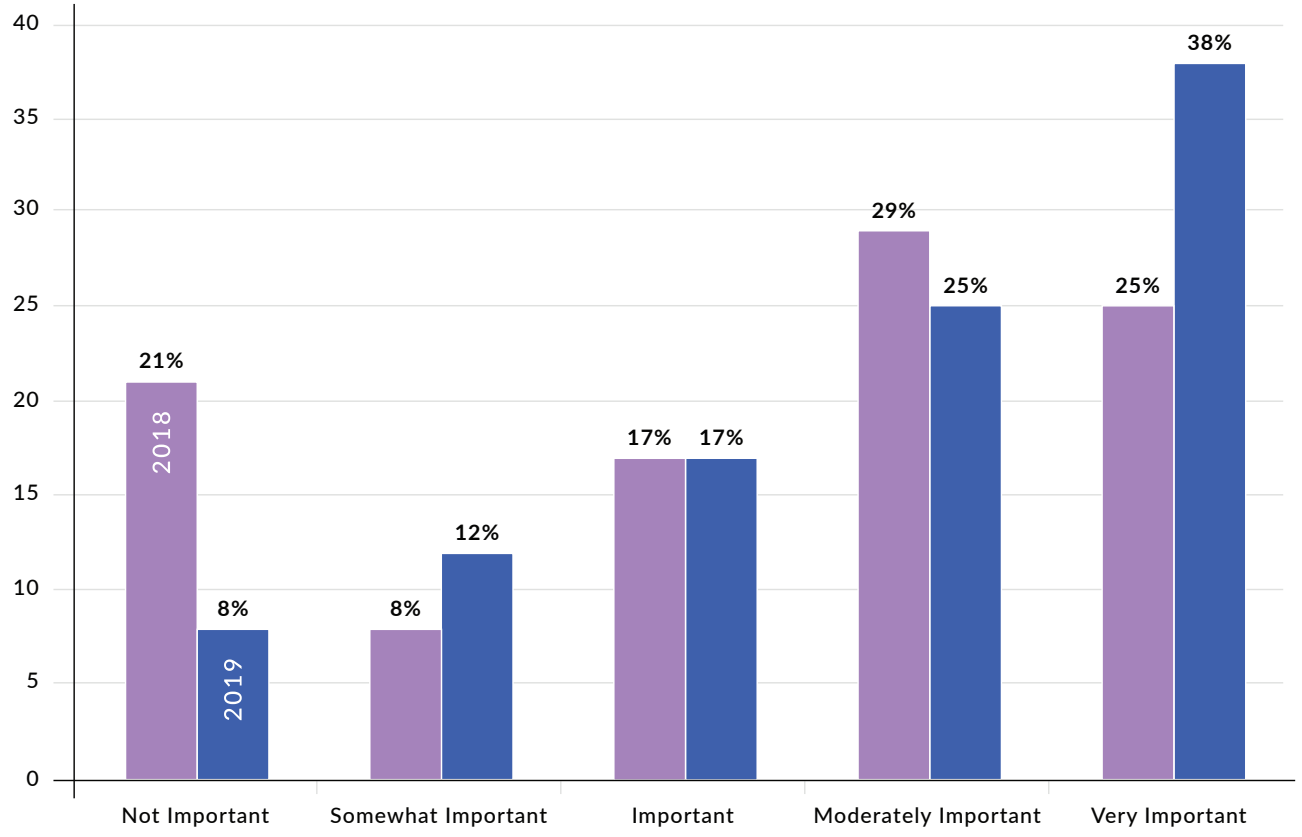
Where does AI fit? Figure 1 illustrates how pharma executives rank AI in 2018 and 2019 on a five-point scale (from low to high importance).

What does this data tell us about AI in the short term? Respondents ranked its (mean) level of importance as 3.29 out of 5 in 2018, and 3.71 for 2019. For context, mobile for 2018 was rated 4.5, increasing to 4.6 for 2019, and social at 4.0 for 2018 and 4.1 for 2019. On the surface, the importance of AI is trending only slightly upward, but noticeably with a larger relative increase than other leading trends.

However, the averages hide some of the trends underway. While only 25% of pharma executives ranked AI as a 5 (on a five-point scale) in 2018, fully 38% ranked AI as a 5 in 2019. In other words, at the far end of the scale – "very important" – we see a significant jump in the segment reporting the

THE IMPORTANCE OF AI IN 2018 AND 2019

Figure 1



greatest importance within the next 12 months. At the opposite end of the scale, only 8% of pharma executives rank AI as having very low importance (1 out of 5) for 2019 – down from 21% in 2018. There are significant shifts away from AI being "not an issue today" to "becoming very important" in 2019.

It is critical for brands seeking to plan ahead for market moves to understand and plan their strategy for where the market is headed, as opposed to placing all of their emphasis on established technology such as mobile and social.

AI in Pharma Today – Knowledge, Use, Structure, and Drivers

Building on the above research, the Digital Health Coalition surveyed pharma executives in July 2018 to better understand the current state of AI adoption, use, and value realized. Companies participating in the DHC research included Pfizer, AstraZeneca, Eli Lilly, Takeda, Boehringer Ingelheim, Sanofi, Genentech, Roche, Biogen, and GSK, as well as some emerging pharma and biotech firms. The study focused on gaining a better understanding of how companies are embracing AI, and where they are capturing benefits from AI projects.

"

I would encourage anybody to be open to this change and to be able to start to appreciate working with companies that are trying to integrate AI/ML, and start to really build another competency to be a part of this change, because this change isn't going anywhere; it's here to stay.

– Will Jones, Dir, Strategy, Partnering and New Capabilities Novartis Pharmaceuticals, during an interview with DHC's Mark Bard.

INTERVIEW WITH WILL JONES

William Jones III
Dir, Strategy, Partnering & New Capabilities
Novartis Pharmaceuticals

NOVARTIS ONCOLOGY

Mark Bard
CEO & Co-Founder
Digital Health Coalition

Digital Health Coalition

- **DHC:** In recent years, a lot of the conversation about artificial intelligence and machine learning has been about how it will impact the pharmaceutical medical device industry specific to research and drug discovery – using an algorithm to go through a lot of data for drug screening. A key question for the marketing teams … how does AI apply to the commercial side of the house? Does it apply to the marketing?

- **Will Jones:** The simple answer is yes … because when you think about the entire healthcare system, more than likely, most of the time, the pharma piece of the healthcare system – which is just one piece of the entire healthcare ecosystem – we're the ones that are typically lagging behind when it comes to using technology to improve the experience of whatever output we're trying to help the marketplace achieve or gain or have. Three-plus years ago when Novartis was first interested in trying to understand this better, we piloted some use cases, and the thing that we initially tried to understand is … could this new use of technology and way of looking at data, could it help us solve the business. The answer is yes. The first thing you had to get right was – can we first bring the right people in the room? We learned that when we a brought cross-function team together in one place, the automatic answer was "wow," AI/ML can be extraordinarily useful for the business because it brings people together who otherwise sometimes talk over each other or don't even talk to each other at all. Another key thing we learned out of it was the ability to answer significant key business questions that typically have gone on for several business cycles without being able to be effectively answered. We now have a practical way to answer some of those key business questions, because no matter how many smart people we have in a company or on a team, no one can understand all the data as fast as they need to understand it.

- **DHC:** What are some of the other challenges within pharma when it comes to embracing AI and machine learning? It seems like a lot of the traditional methods of targeting seem to be working, right? What is the motivation or incentive to change?

- **Will Jones:** In many ways, you are absolutely right because many of the things that pharma companies are doing today are actually good things. Pharma companies have found really extraordinary ways to use what they have fairly well. Some of the current data sources that have always been in play are still good data sources, and they probably still solve anywhere from 60 to 80 percent of the questions we have in terms of better targeting, and better segmentation, and building better responses and messaging that we can use in promotional ways. Normal data still gets us a long way. Where I think AI/ML really comes into play and where it really kind of just takes off and it leaves some of the practical datasets in its wake is the fact that AI/ML really allows you to bring a lot of data sources into one platform and start to look at data and get more insights and questions from what you thought were answers. You can bring more functions and teams together in a way that traditional data just can't do. For example, in one AI/ML use case, we brought medical, marketing, finance, operations, market access, and HEOR/Outcomes in order to solve for key business questions for multiple brands. Bringing all these functions together allowed us to speak a common language; between all these teams coming together to solve the key business questions was the fact that AI was [is] that common currency or language that we were [are] all using to kind of understand things we never could before. So when we start to think about predictive triggers, biomarkers or lab tests that were very significant, these are significant not just for understanding the marketing plan or understanding first-line or second-line positioning. They're also very important to understand if you are on the clinical/outcomes side because now some of the analysis done with AI//ML was allowing the business to find efficiencies, solve for deeper questions than before, and show us there were new ways to operationalize outputs between marketing and the field force. Some of that same data analyzed by AI/ML was also confirming known answers to some business questions and, in some cases, answers were more robust and rich for every business function that was able to touch it. Of equal importance was the ability to have rich discussions with a lot of cross-functional teams; that really wasn't happening all the time in a consistent way. That was a good byproduct of AI/ML.

- **DHC:** You mentioned earlier the explosion of data in oncology – exponential increases in data. Given we've seen the number of data sources increase – and the volume within those data sets increase rapidly – which data sources are important and why?

"

... AI/ML really allows you to bring a lot of data sources into one platform and start to look at data and get more insights and questions from what you thought were answers.

— William Jones III

- **Will Jones:** So I think how you get your head around this is that there's still some limitations on the data that's collected, just because it's pharma; and so obviously, one of the biggest challenges at times of appreciating AI/ML and the data that it brings into the business is the fact that we still have a lot of data/privacy rules and standards that we have to meet so that we're doing things correctly and safely, along with a standard of integrity and transparency the marketplace truly respects and appreciates. What AI/ML has allowed us to do beyond traditional data is to bring considerably more data together to be assessed – whether it's wearable technologies, claims data, lab data, scans, EHR data, is you can look at a lot of data together and derive understanding from every particular touch point a patient has had with a physician(s). All those different actual points within that patient journey become important because it allows us to appreciate what the patient is experiencing – pre-treatment/diagnosis to current-treatment/diagnosis to post treatment/diagnosis. How can that pharma company build the resources that support that patient journey? In pharma, we are striving to create resources, tools, and information that allow the patient to have similar experiences of the online functionality they experience in the other parts of their daily life. The patient/consumer perceives phenomenal ease of use in everything else they do, except for what it seems like in healthcare – we aim to recreate that same experience.

In pharma, we are striving to create resources, tools, and information that allow the patient to have similar experiences of the online functionality they experience in the other parts of their daily life.

— William Jones III

- **DHC:** Any advice for someone within pharma seeking to get a better understanding of how AI is changing the business and assessing the impact it will have on the industry? Any advice from your experience and what you've seen that works?

- **Will Jones:** Yes, I think this might be the most important question. It seems like the pharma business – outside of all the other major sectors – has been slower to appreciate some of the dynamic that's coming toward us that's happening right now with AI/ML. I think we have to be even more open minded to being curious about innovation, especially AI/ML. Colleagues and peers that are open minded to this [AI/ML] seem to be creating a competitive advantage for learning and applying new ways of doing the business. There is clear evidence that other sectors of business have embraced AI/ML and are starting to see changes to their business and the outcomes that AI/ML is helping to create.Our sector is just beginning this journey, and we should expect exciting achievements as we are beginning our journey leveraging AI/ML. I would encourage anybody to be open to this change and to be able to start to appreciate working with companies that are trying to integrate AI/ML, and start to really build another competency to be a part of this change, because this change isn't going anywhere;it's here to stay. I think most everyone would agree, whether it's a top-tier oncology company or a top-tier diabetes company, if something can help your

teams address the business needs today more efficiently and then scale up what you're trying to do in a competitive and economical way, and drive the business while delivering an exceptional patient experience – I think companies are open to that. That's why I think AI/ML is here to stay. You are seeing many companies with a chief digital officer as a function, or they are hiring for a chief data officer or VP/head of strategic data within organizations. How a company assesses, integrates, governs and strategically commercializes data moving forward is about building a new competitive advantage in the healthcare ecosystem. Governing, integrating, and scaling data across marketing and medical and clinical in efficient ways – this has not been done before, but this is now the future reality of pharma and the healthcare ecosystem. These are all new things that are happening within the last 12 to 24 months, and now pharma companies are trying to get them right.

I think the thing that is driving executive leadership to really embrace AI/ML are very practical things about data – data integration, storage, and governance. The fact that there's so much data coming into organizations and it's challenging to harness the potential of all of that data, except through some of these new and innovative ways that AI/ML can help harness. In the end, executives know that this is a significant undertaking. It's extremely expensive, and it's not a one-time cost. Human capital, executive vision, and leadership have to be willing to sponsor this long term.

The patient/consumer perceives phenomenal ease of use in everything else they do, except for what it seems like in healthcare – we aim to recreate that same experience.

Knowledge – Pharma Receiving a Failing Grade

As a baseline, we asked pharma executives about the level of knowledge their company has about AI, as well as their personal level of knowledge. Executives rated their personal knowledge as greater than that of their organization. For some, that may be because they deal with AI in their current roles. For others, it may be a case of illusory superiority, the cognitive bias where individuals often overestimate their abilities compared with those of others.

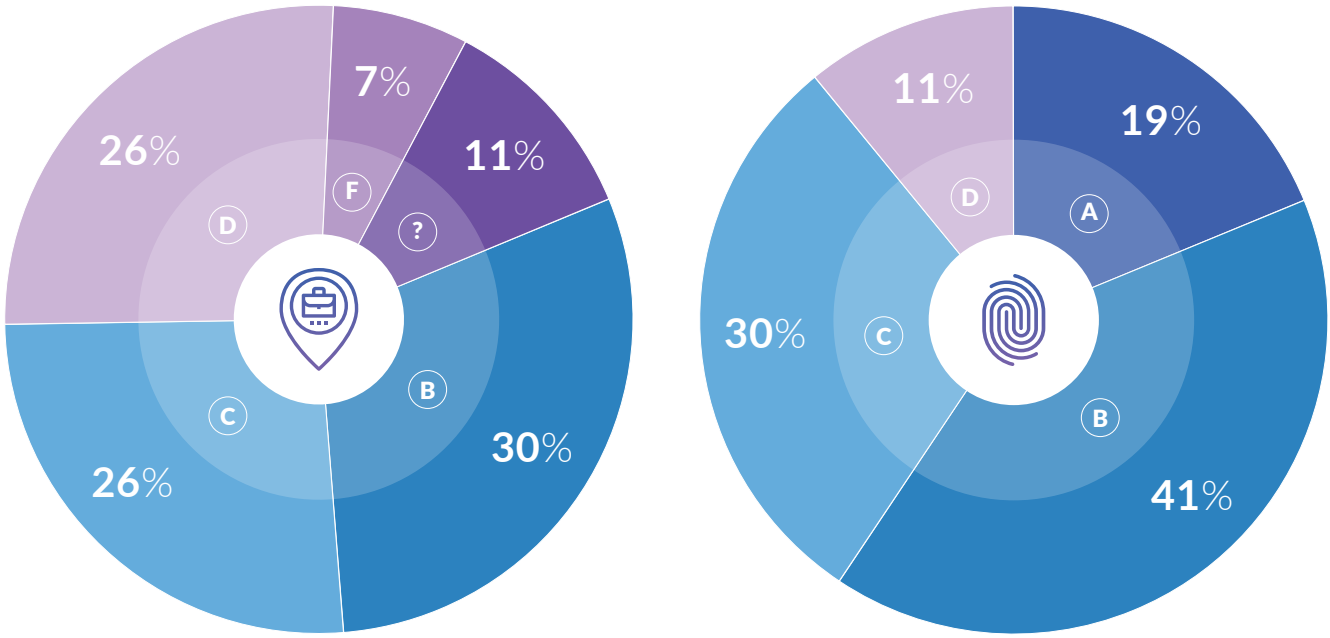
None of the respondents gave their organization an "A" grade (using a scale from "A" to "F") for corporate knowledge of AI. Some 30% graded their company as a "B," and another 26% gave their company a "C." The remaining respondents – just under half of the total at 44% – chose a "D," "F," or "Don't Know" to represent their company's knowledge of AI.

When asked to rate their personal knowledge, numbers perk up a bit (as mentioned). Just under 20% give themselves an "A"; another 41% rate themselves a "B." Only 30% report a "C," 11% a "D" – and no one was willing to rate their personal knowledge as an "F."

It's notable that only 30% of executives believe their company is a "B" or better when it comes to AI knowledge – representing an opportunity for continued education and awareness.

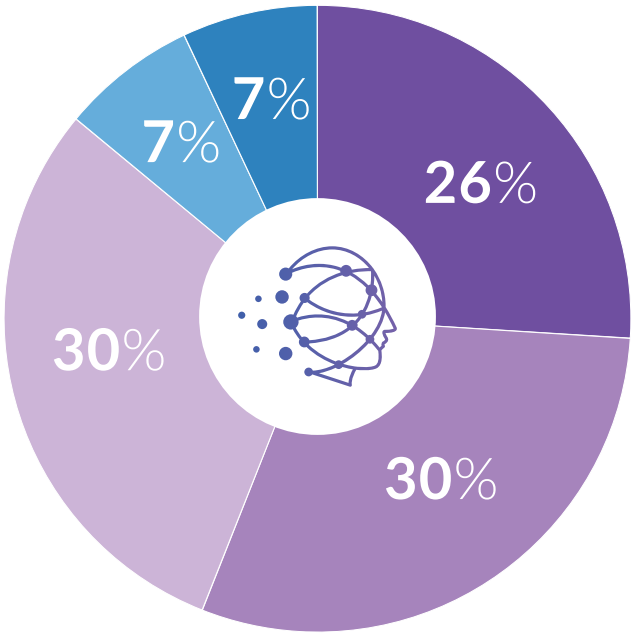
COMPANY AND PERSONAL KNOWLEDGE OF AI

Figure 2



IS YOUR COMPANY USING AI FOR MARKETING?

Figure 3



- YES, WE ARE ALREADY USING AI FOR MARKETING
- YES, WE ARE PLANNING TO USE AI BUT HAVE NOT STARTED USING YET
- NO, BUT I WOULD LIKE MY COMPANY TO START USING AI FOR MARKETING
- NO, AND I DON'T THINK MY COMPANY SHOULD BE USING AI FOR MARKETING
- DON'T KNOW

Next, we dove into the priority our respondents were giving AI for marketing and customer engagement in 2018 and 2019. While just under half reported they were currently using or plan to use AI for marketing soon, only 18% reported a high priority for AI in 2018 – with "extremely high" at 11% and "very high" at 7%. However, the story – and relative priority of AI – shifts dramatically for 2019. Fifty-one percent of respondents reported a "somewhat high," "very high" or " extremeley high" priority for AI in 2018, but that same number jumped to 67% in 2019, with the spike happening in the "very high" or "somewhat high" priority categories. At the other end of the scale, while 22% reported the priority is "not at all high" in 2018, that number was cut in half with only 11% reporting the same level for 2019.

Organizational Structure and Investments

Two key questions often debated by large companies are related to how any new technology – like AI – is operationalized:

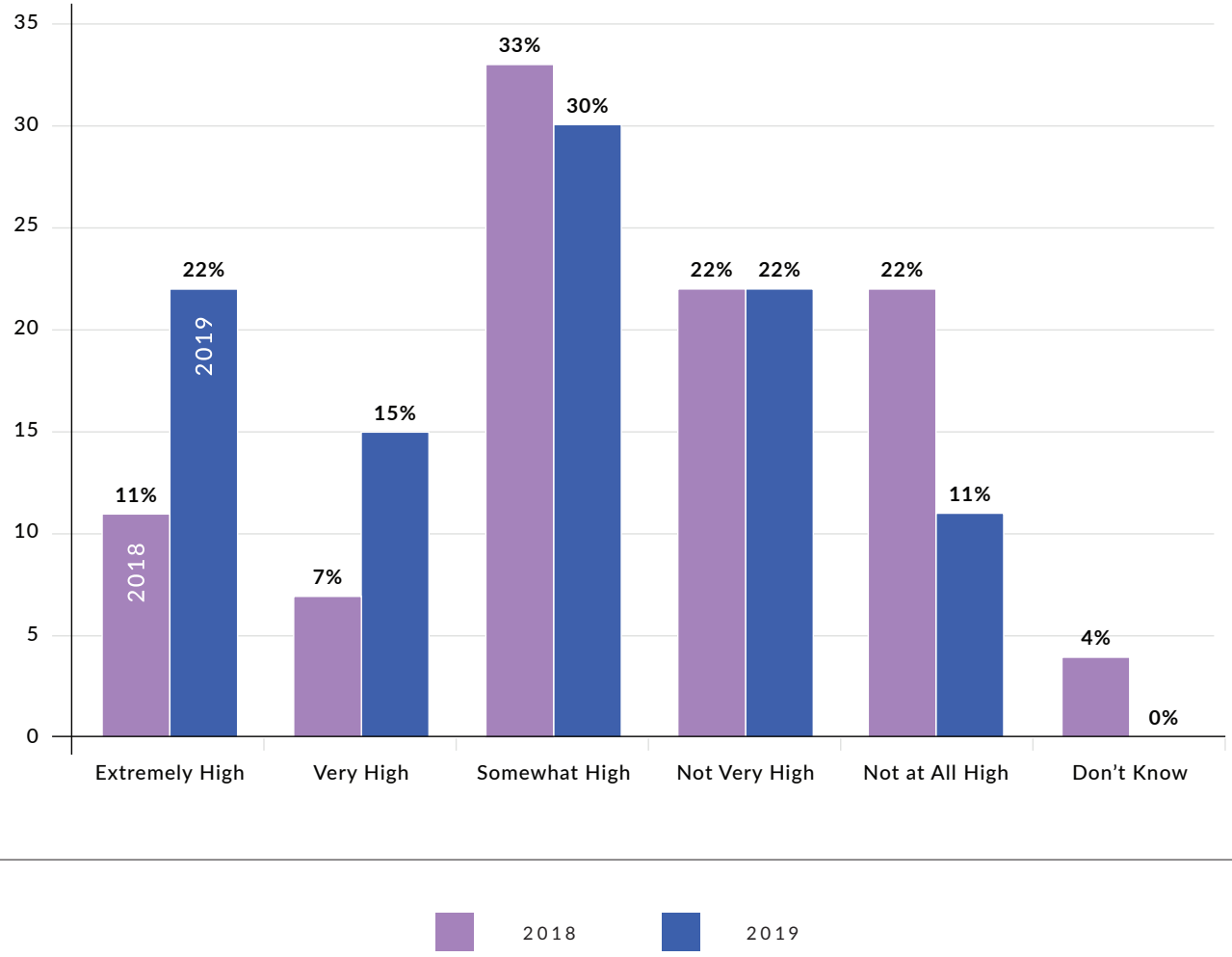
- How will teams be structured?
- Do we build or buy?

Just under half (41%) of pharma executives surveyed report that their companies do not currently have a team or group dedicated to AI strategy and implementation. However, 30% do – and another 11% report having a team focused on AI strategy (if not implementation). To put this in context with overall industry trends, a recent study by Boston Consulting

Group (BCG) with 3,000 global executives (across all industries) in 2017 found that while 60% of respondents say that a strategy for AI is urgent, only half of those 60% report their organizations have a strategy in place (a net of 30%). The study also found that the likelihood of having an AI strategy in place was highly correlated with the size of the organization: the largest global companies were the most likely to have an AI strategy.

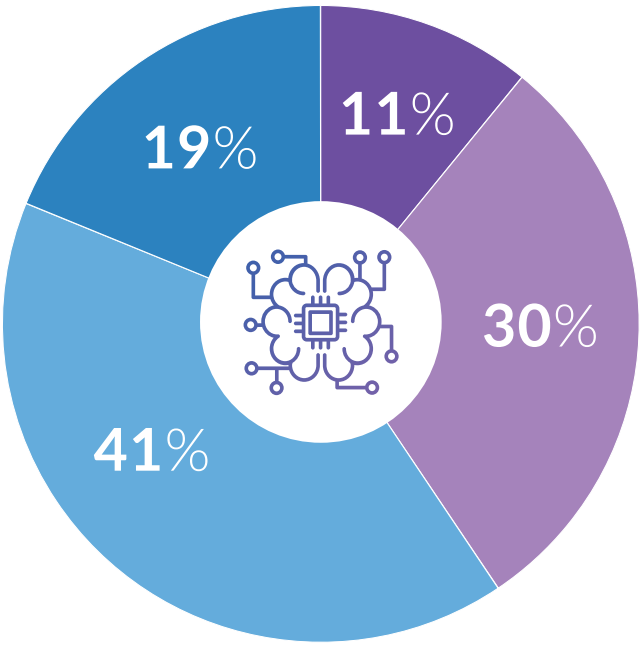
PRIORITY OF AI FOR MARKETING AND CUSTOMER ENGAGEMENT

Figure 4



INTERNAL STRUCTURE FOR AI STRATEGY

Figure 5

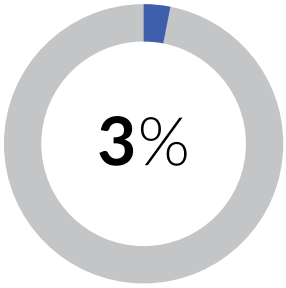


- YES, WE HAVE A TEAM DEDICATED TO AI STRATEGY
- YES, WE HAVE A TEAM DEDICATED TO AI STRATEGY AND IMPLEMENTATION
- NO, WE DON'T HAVE A TEAM DEDICATED TO AI
- DON'T KNOW

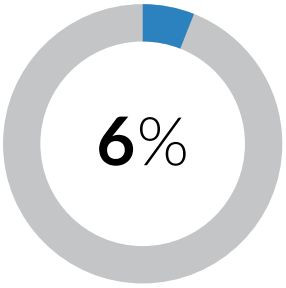
In facing the question of whether to "build or buy," pharma companies have historically embraced outsourcing capabilities, for example, "buying" as needed to bolster clinical trials, sales force, and advertising and marketing needs. Their approach to AI seems to mirror their efforts in other areas. Twenty-six percent of respondents report they have a service provider building out AI solutions and capabilities for the firm. Another 32% report they are purchasing commercially available AI solutions. Just under 20% are investing in AI startups and 13% are actually building AI capabilities in-house. Only 3% report they have acquired assets in the AI space.

MAKING INVESTMENTS IN AI

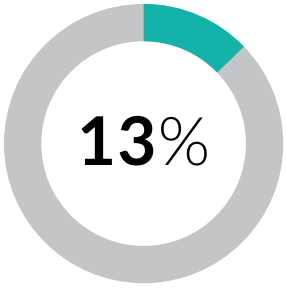
Figure 6



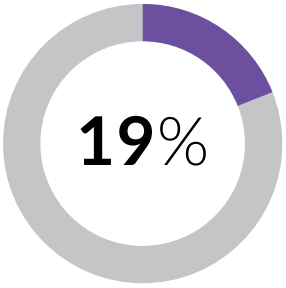
Acquiring AI/machine learning startups



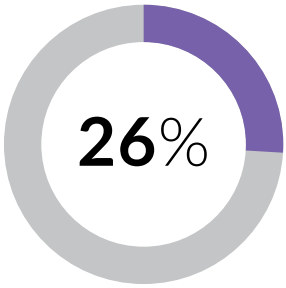
Not making AI investments at this time



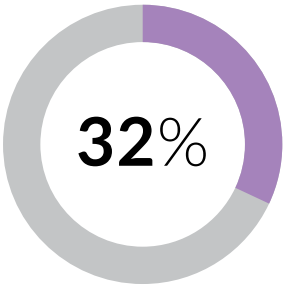
Building our own AI capabilities



Investing in AI/machine learning startups



Having a service provider build out AI solutions and capabilities



Purchasing commercial AI solutions

PHARMA DEALS, INVESTMENTS, AND PROJECTS IN THE AI SPACE

As part of the research with pharma executives, we asked them about the companies they use (or invest in) related to AI strategy and implementation. The companies below represent those mentioned by pharma executives. Of note, the "platform" companies (Google, Amazon, and IBM Watson) were mentioned the most often as the partner companies are using to better understand AI.

Platforms

DeepMind

amazon web services

IBM Watson Health

Vertical Solutions

DIABNEXT®

SYMPHONY HEALTH

Focused AI Solutions

Princeton Blue

flatiron

Apps and Therapeutics

GYANT

PEAR THERAPEUTICS

INTERVIEW WITH DAN GANDOR

Daniel J. Gandor
Dir, Digital Innovation &
Corporate Program Management
Takeda

Mark Bard
CEO & Co-Founder
Digital Health Coalition

- **DHC:** A lot of the conversation about AI and big data and machine learning has centered around drug discovery, logistics, and business processes. Does AI and machine learning apply to the commercial side of the business?

- **Dan Gandor:** It does, although I believe it depends on how exactly you're defining AI. If you're talking about it in terms of pure analytics or analytical horsepower, then there are use cases in marketing and commercial like finding better targets, finding new targets, targeting, and segmentation. There are automation aspects as well: relationship marketing automation, platforms like Veeva Suggestions, and the engines behind that. If you're defining AI as natural language processing or natural language generation like chatbots, there's activity in that area – both on the patient and prescriber side. There are also internal use cases where you have some sales forces starting to have reporting accessible via voice so they can pre-call plan on the drive in the car.

- **DHC:** What are the challenges in making AI work within a large pharmaceutical company, overall?

- **Dan Gandor:** I think, like many sexy, digital things, it's important to not just do technology X for technology X's sake, whatever that may be – AI, chatbots, voice, IoT, you name it. Rather, one should be focus on the underlying strategy: e.g., what's the business challenge; how do we solve it? Therefore, it becomes applying AI or whatever the technology (which may be simpler than true AI) to specifically solve that business challenge.

- **DHC:** What are some of these other data sources, EMR being one, that you think will become more important in the coming years?

- **Dan Gandor:** I think you're right in saying that EMR and wearable data sources are becoming more prevalent and

more useful. Those are situations where the data is too large to be analyzed by traditional techniques and approaches. Although, frankly, I'm still seeing that the industry sometimes still struggles with analyzing and integrating all the commercial data sources we know and want to use today – let alone what's one the horizon. One doesn't necessarily need AI to do that, it's just the blocking and tackling of omnichannel marketing. Step one is get the fundamentals right, then one can point an eye towards being ready to take in massive data sets like EMRs and wearables and things like that, thus opening the door towards new advanced analytic techniques.

"

I'm still seeing that the industry sometimes still struggles with analyzing and integrating all the commercial data sources we know and want to use today – let alone what's one the horizon.

— Daniel J. Gandor

- **DHC:** If we think about customer service and AI – the intersection of the two – how is AI relevant to customer service, to the customer experience? Can we predict customer needs before they even state them?

- **Dan Gandor:** Do you really need artificial intelligence to get to that answer? That's where I'd propose it's debatable. If you only have four things to tactically put in front of a customer (be it HCP or patient), do you need a whole complex engine behind the scenes to figure out what's best? Do you need true AI for this, or is it more about a smart algorithm to say, "here's who should get what, why, when, where, and how," and then to make sure you trigger that knowledge to the right internal stakeholders (e.g., sales reps)? Or maybe you just transform the website to show the right message at the right time? Again, do you need AI to do that? Probably not. This is back to one's core definition of AI. Is it true self-learning artificial intelligence? Is it a smart algorithm driven by modular personalized content? We do need to optimize our touchpoints in terms of what channels to use, the timing of the channels, the messages in those channels. I think there's an opportunity for automation, to help make that more effective and more real-time. Whether AI is actually used for that automation is debatable.

AI Drivers – Desired and Realized

Why would pharma invest in AI for marketing? All companies want to avoid chasing every "shiny penny" that emerges in the digital and technology space (for obvious reasons). The best and brightest often look for ways to use emerging technology to address specific business issues or problems, or to automate a high-volume business or marketing process. When it comes to future expectations, the greatest potential driver of future (or continued) investment in AI is … better customer insight. How can AI make that happen? In many cases, AI does the heavy lifting to help brands organize large data sets – making it possible for marketers and data scientists to focus on the data (or customer segments) where they need to focus their attention.

Right behind customer insights, pharma believes AI can help improve and optimize customer satisfaction. Although pharma companies have not historically invested in customer satisfaction (or experience) platforms compared with other industries, perhaps they are now watching how other industries are using AI (and data) to help identify key customer touch points and improve interactions with the company and the brand. Continuing down the list, they cite automating routine business processes, increasing revenue, and increasing efficiency as the next drivers for AI implementation within the firm.

DRIVERS TO USE AI AND VALUE CAPTURED

See Figure 7 on the next page

We know the key driver to future (and continued) use of AI for marketing is better customer insights. Where are they realizing measurable value and positive gains today? Where and how is AI already making an impact on the business? The top area for value realized is also the top future driver – better customer insights (17% reporting current value realized). Beyond that, the second area is automating routine business processes (14%), following by increased efficiency (8%), and improving customer satisfaction (8%).We know the key driver to future (and continued) use of AI for marketing is better customer insights. Where are they realizing measurable value and positive gains today?

Figure 7

Which of the following are reasons that your company is investing in the use of AI, or considering the use of AI, within the organization?

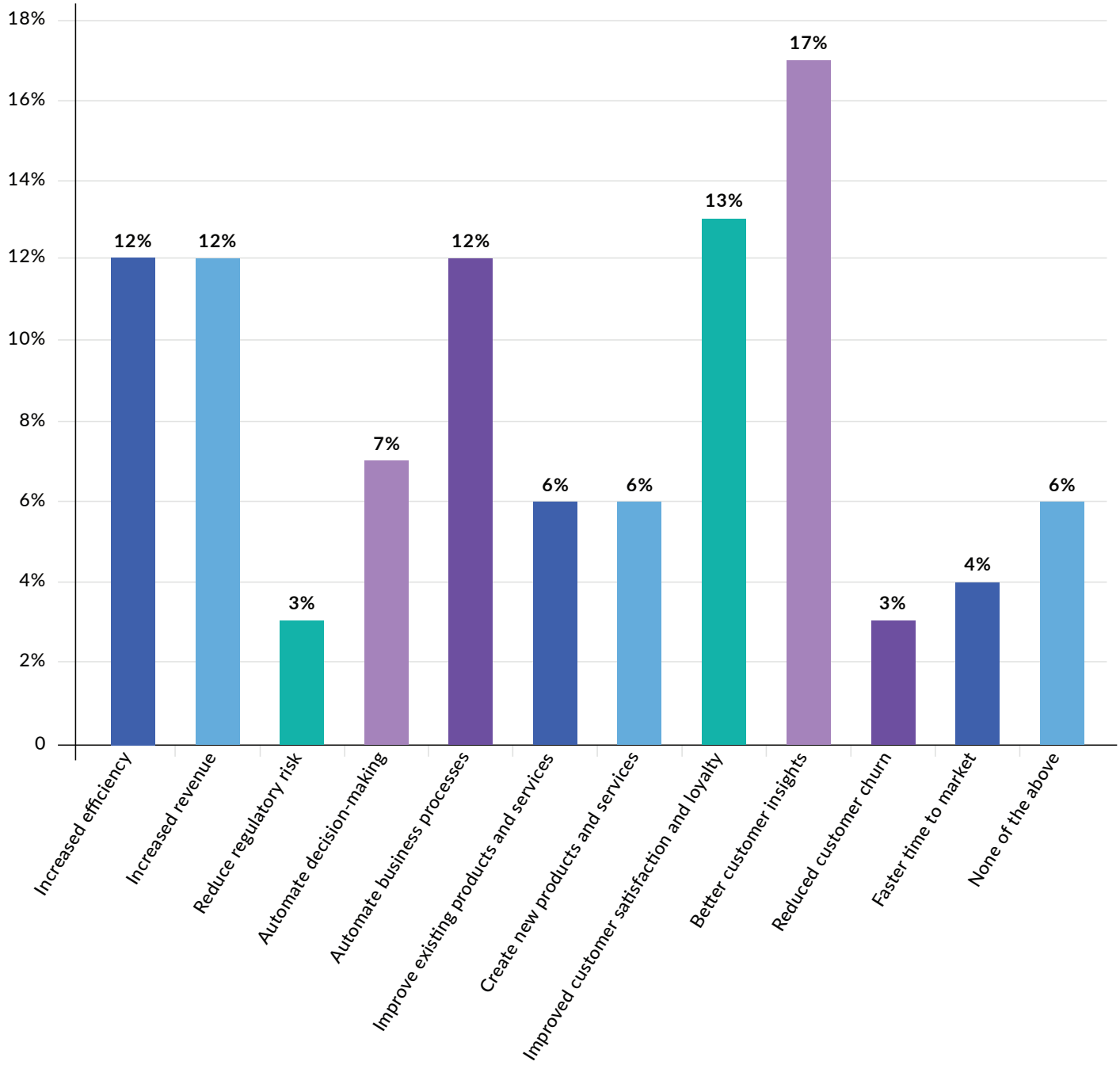
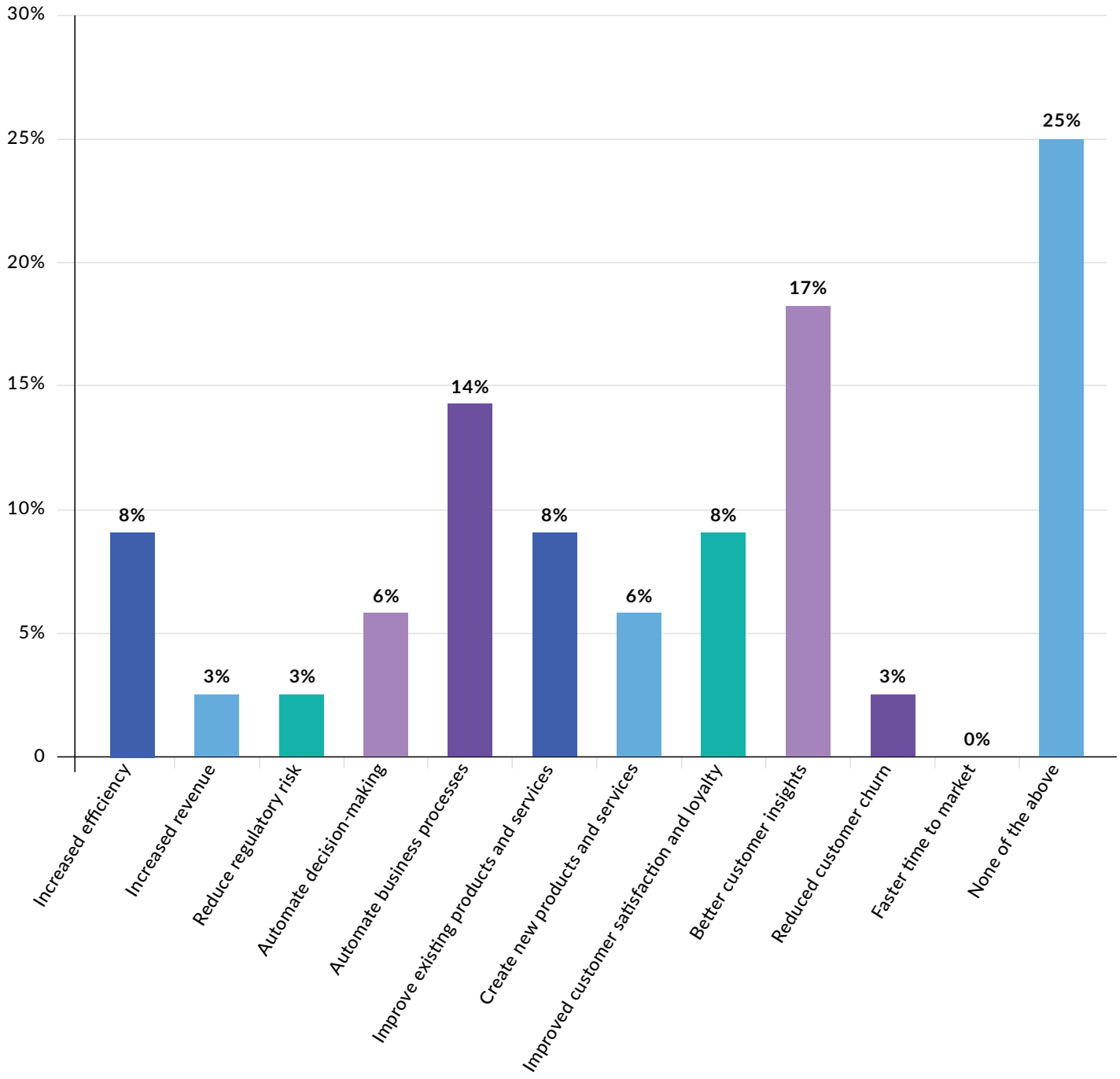
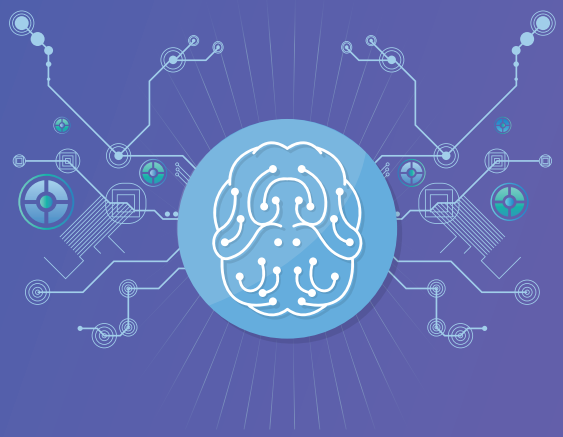


Figure 7 - Continued

In which of the following areas has investing in the use of AI within the organization already created a measurable value and positive gains?





Conclusion

Our surveys of pharmaceutical executives revealed a new view of the state of AI in the industry today, answering key questions, including:

- **Where does AI rank in importance?** AI remains a "next year" trend for many brand teams and marketers given competing interests for their time and attention. They are still dealing with the ongoing challenges of privacy and security as well as the rapidly evolving worlds of mobile and social media.

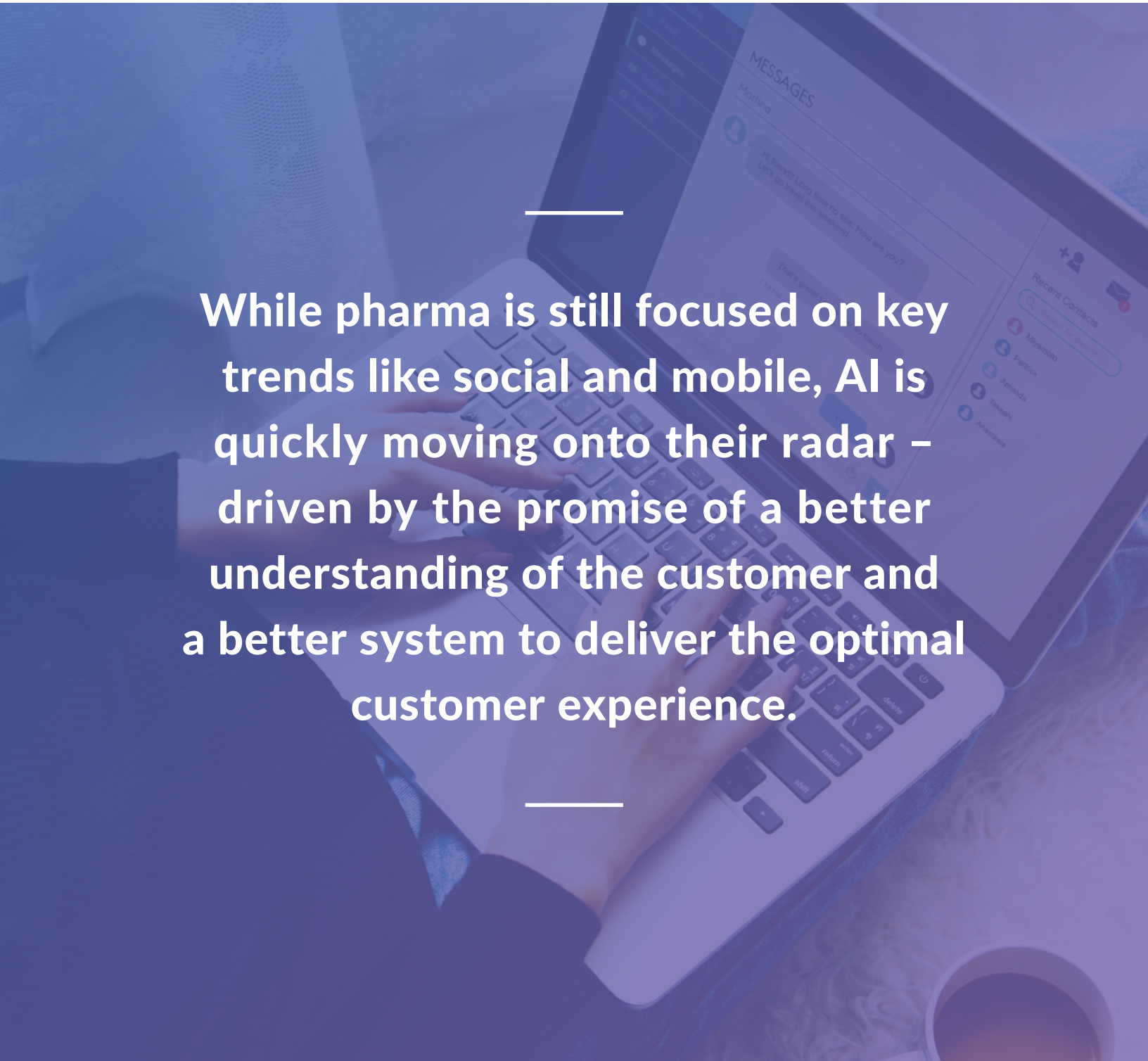
- **How confident is pharma in its knowledge of AI?** Individuals see a gap between their own understanding of AI and that of their organization. While they rate their personal knowledge as a "B" or better on a standard scale of "A" to "F," nearly half of respondents gave their organization a failing grade.

- **How is AI being used for marketing now and in the future, and how are organizations structured for this?** With regard to actions taken at the corporate level, 26% of pharma executives report AI is already being used for marketing – and 30% are planning to use it in the near future. However, less than half report their companies have a team or group dedicated to AI strategy and implementation. For comparison purposes (to other industries), a recent study by BCG found that while 60% of global executives surveyed (across all industries) report AI is important to their companies, only half of those (30% of the total) have an AI strategy in place today. In other words, pharma readiness specific to AI tends to fall in line with global industries overall today. Companies large and small around the globe are still figuring out where AI fits into the organization – and brands – of the future.

- **What's driving them to take action in the AI space today?** Better customer insights and optimizing customer satisfaction lead the list of current drivers to embrace and invest in AI. In summary, they view better connections with their customers – and better engagement and customer experience – as the value

marketing receives from AI. The ability to save money – through efficiency, automating routine processes, and better targeting – is also a key driver for brands seeking to use AI for modern marketing.

Overall, the feedback from the pharma industry is that while they are still focused on key trends like social and mobile, AI is quickly moving onto their radar – driven by the promise of a better understanding of the customer and a better system to deliver the optimal customer experience. While organizational structures and leadership mandates for next-generation moves such as AI take time to trickle down into the brands, the quick wins are becoming more and more common as teams increasingly include and operationalize AI into their 2019 brand and marketing plans.



While pharma is still focused on key trends like social and mobile, AI is quickly moving onto their radar – driven by the promise of a better understanding of the customer and a better system to deliver the optimal customer experience.

CHAPTER 5

Looking Ahead: The Next 5 Years

How will AI cause pharma marketing to evolve from now until 2023?

First, a Caveat

As we said in the Introduction, "we see it as our responsibility to help discern inflated hype from real hope." It's important when making decisions every day, but it's even more important when we're trying to look ahead into the future. It's very easy to take a small positive or negative event and over-extrapolate its importance.

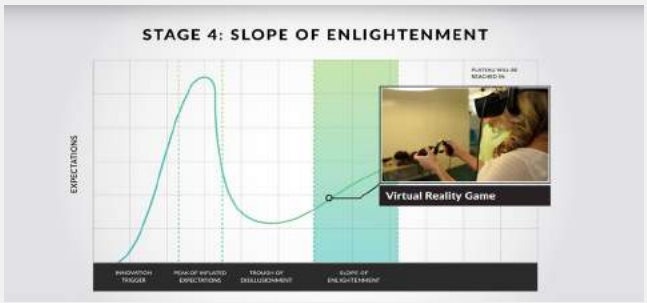
One useful tool for discerning hype from substance is the Gartner Hype Cycle, an industry standby, which helps to view innovations and the inevitable swings of overpromotion and disappointment that eventually level off to productive use. View the video on the right to learn more about the Gartner Hype Cycle and where AI currently fits into the curve.

As with every other technology, AI has limitations. It will neither create nor solve all of our problems. But there's no denying at this stage that healthcare is an area where AI shows some of the greatest promise. As McKinsey Global Institute leaders note in this recent podcast episode, McKinsey Podcast: The Real-World Potential and Limitations of Artificial Intelligence – healthcare is likely to be one of the industries where AI has the greatest financial impact, at nearly $400 billion.

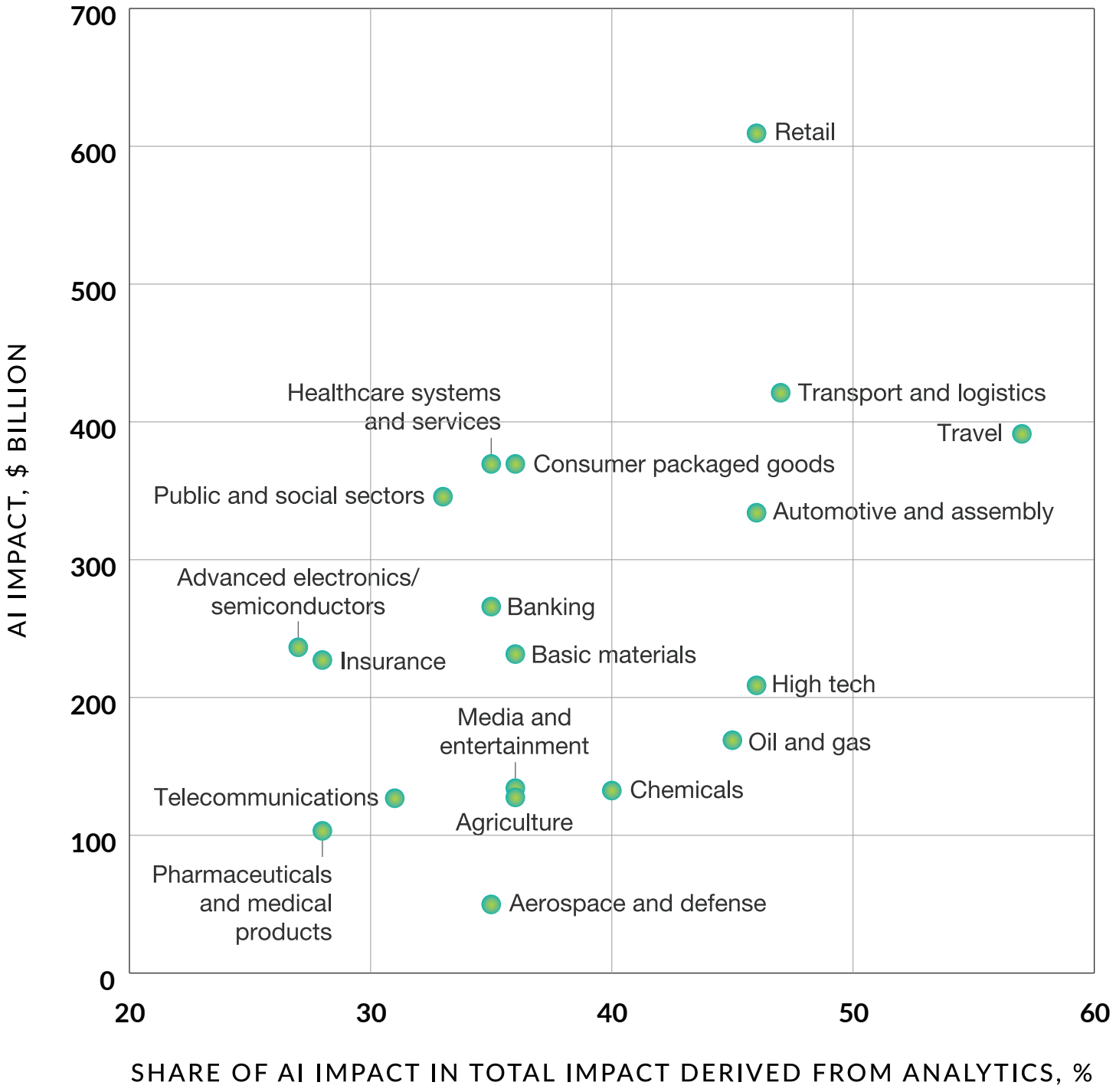
TRACING THE GROWTH OF TECHNOLOGY

The Gartner Hype Cycle

WATCH THE VIDEO



ARTIFICIAL INTELLIGENCE (AI) HAS THE POTENTIAL TO CREATE VALUE ACROSS SECTORS



Source: McKinsey Global Institute analysis

None of this is imminent. Only about a quarter of pharma marketers in our survey are currently using AI solutions in their work. However, more than 40% have a team dedicated to AI strategy and/or implementation.

We believe that AI today is analogous to the "e" revolution of the 1990s. By 2023, we won't be talking about AI-powered solutions – the same way that we eventually stopped talking about "e-business." Terms that specify a technology's inclusion stop being used when the technology becomes an assumed part of life.

So: must you run out and create an AI project today to keep up appearances? Absolutely not. But AI is going to become a fundamental part of modern pharma marketing in fairly short order. This will happen in both blatant and subtle ways – from specific AI tools, to behind-the-scenes use of AI technology. And it will happen whether you prepare now or not. We're here because we're fans of preparation.

THE GARTNER HYPE CYCLE

AI: Predictions, 2018-2023

Data Management.

We'll learn how to better deal with data – because we'll have to. How to store and manipulate enormous quantities of information. How to keep it safe and secure. Who has rights to own it, to access it, to control it, to profit from it. This will touch every industry. And the details will be battled in courts and debated regulatory and standards bodies for years.

"True" Versus "False" AI.

As AI continues to become more common, we will also see "false AI" continue to proliferate: standard computer coding that looks a lot "smarter" than it is. This isn't necessarily a bad thing (unless, of course, it's being sold as more than it is). There's going to be a place in the world for standard computer coding for a long, long time.

Everyday AI.

We will slowly notice the technology in our lives being able to assist us more: to give us better predictions, to be able to do more with less instruction. Phones will get even smarter. Language processing will become sharper. Predictions will be more accurate and helpful. The idea of a "service robot" sounds hopelessly futuristic. But what is a Roomba, or a self-parking car, but a service robot?

AI in Pharma Marketing: Predictions, 2018-2023

Efficiency, Personalization, Understanding and Engagement.

As we noted in **Chapter 2**, "What Is AI and Why Does It Matter," AI allows for stronger, more adaptive, directed marketing, more efficiently, more cost-effectively, and with more assurance of compliance. That's a combination that's hard to beat.

Industry analysts agree, pointing out how AI's ability to understand data is particularly suited to benefit marketers.

Chatbots triage customer service requests. Hyper-smart marketing automation adjusts itself for improved ROI. Predictive models help us to better understand adherence and drop-off risks. Many AI-powered applications like these already exist. They will strengthen in number and in power over the next five years, and will be joined by others that stand on their shoulders to go even further, particularly into coverage, reimbursement, and treatment decisions.

Even if you're not using AI to execute marketing at the brand level, you must understand how data is being used to make clinical decisions. How do you prepare, and respond, if and when an algorithm becomes the key influencer? How will you market for that, educate for that, influence that?

Changing the Job Description.

In **Chapter 1**, we demonstrated how NVIDIA used a neural network to mimic a world-class composer. Similarly, AI and modern marketing will enable marketing "conductors," providing them with automation and insight that not only free them up to focus on strategy, but give that strategy power and assurance.

In many ways, the role of the advertiser has already shifted. Marketing was once largely an art form in which creativity reigned, but today, data often beats creative. Amazon's marketing success, for instance, is driven not by complex creative, but by putting enormous quantities of data to

use for predictive personalization. Creativity will never be unimportant; but rather than performing solo, it is now part of a more successful ensemble.

A recent **survey** by the World Federation of Advertisers found that the greatest skills gap between current and future needs is AI predictive modeling. Simply put, the modern pharma marketers who succeed will be the ones who understand what successful people have always grasped: what tools to work with, how to use them, and how to work with the right people.

Just as the digital revolution of the 1990s required individuals across the company to build their knowledge and work together, the AI revolution will do the same. Teams across organizations will be tasked with working together to find new and better ways to identify, collect, share, analyze, interpret, and act on data.

And much, much, much more.

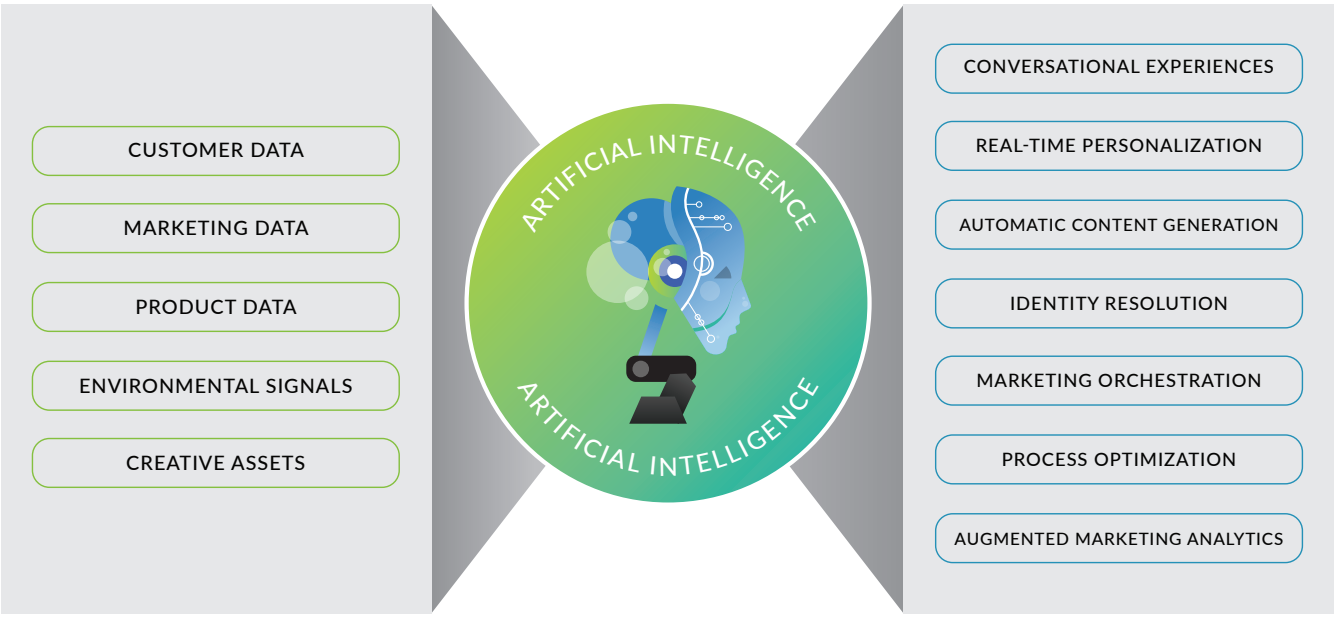
Amara's Law says that "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run." Five years, in many senses, isn't that far away. But for technology, it can be several lifetimes. In 2023, we'll see AI in healthcare in ways we're not even considering right now.

Perhaps we'll be able to monitor the impact our every daily decision will have on the future of our health. You might be less likely to skip flossing today if you're notified that doing so will cause a 2% jump in the likelihood of a 2030 root canal.

While that's happening, perhaps the nanobots in your bloodstream will be rooting out an errant cell they're able to predict would have become cancerous.

But whatever the specific achievements of even the greatest health AI solution are, it's likely that the tectonic shifts to the industry will matter even more. Done right, healthcare in AI will help to improve what is now an immensely complex, expensive, emotionally laden field full of questions and imperfect solutions.

None of us can see the future (which is part of what makes it so exciting). But all of us can prepare for it. Both the Digital Health Coalition and Intouch Solutions are incorporating AI into our work today and our plans for the future.



Source: Gartner

Mark Bard
CEO & Co-founder
Digital Health Coalition

The Future of AI: DHC's Predictions for the Next Five Years

How does the pharmaceutical and medical device industry think about AI today? How is that changing over time?

The Digital Health Coalition recently conducted research with brand and marketing executives at approximately 25 global pharmaceutical companies and posed that very question. What we learned is that while AI is not at the top of their strategic radar today (in 2018), their likelihood to rank it as a very high priority in 2019 significantly increased. In other words, it's not impacting their business today, but they are very much aware of the fact that AI is quickly permeating all sectors of our society and healthcare is no exception.

I think a model we'll see for AI adoption and integration is one that we saw for digital and emerging technologies over the past decade. Large global companies will likely continue their pattern of creating centers of excellence for innovation tasked with researching, testing, and piloting projects related to emerging technologies in general. AI will be no exception – it will require education, investment, and the willingness to learn (and make mistakes) for companies to realize the full potential at the organization and brand level. Companies will also continue to expand the skill set of current and future hires. Just as companies across all industry sectors have expanded their head count related to data science, data analytics, and specialization in AI and machine learning, the pharmaceutical and medical device industry will do the same. Data scientists will be part of the conversation – working on cross-functional teams. Of course, these new hires, emerging technologies and investments in innovation must solve real business problems with increased efficiency and value if they are to survive internally – and not just layer new technology on an existing process

Any advice for companies seeking to better understand the impact of AI on their business, brands, and customer experience strategy?

In addition to companies experimenting with and building out AI-focused teams within a center of excellence, what we learned in the research we conducted with pharmaceutical executives was that they employ a range of build, buy, and contract. On the build front, some companies are successfully building out data science groups working across

the organization. On the buy front, some companies are actually buying AI assets and startups – one prominent example being the acquisition of Flatiron Health by Roche. Last but not least, a large number of pharma companies rely on partnering and contracting with vertical AI solutions and technology platforms, as well as consultants with industry-specific experience. A number of large pharma companies are also tapping into the expertise of the large global technology companies – and platforms – defining and pushing the entire AI space forward. Those companies include household names such as Amazon, Google, and IBM Watson. All of these are examples of how pharmaceutical companies are learning by doing. Executives can attend various conferences on the topic of AI – but actually investing and experimenting must be a part of the mix.

As the relative role, and importance, of AI grows over time, who owns the technology or strategy within a pharmaceutical or medical device company?

That's a great question. What we have learned in our research with pharma companies is that these AI teams – many of which are very early stage – tend to be cross-functional and work across various teams and parts of the organization. This is important because it shows how a technology such as AI and machine learning is not limited to one brand – or even one functional area. The core foundation of AI is often the data, so companies – and brands – must often work across the organization and with external partners to acquire, rent, or integrate key data sources used to make business decisions. Yes, traditional roles like technology, data management, and IT will continue to play a key role as companies invest and expand their commitment to AI and machine learning. However, brand, marketing, sales, and commercial leaders must have a seat at the table to ensure the tech is aligned with business goals, objectives, and key performance indicators (metrics).

Any examples of how AI is already impacting the business of pharm sales and marketing today?

"

AI is becoming part of the healthcare delivery system at every step. In a world where AI powers clinical decisions by providers and payers, the rules of engagement – and influence – evolve. Pharma and medical device companies must become conversant with the technology and algorithms to understand where they stand and how to optimize the role of products within the new world of data-driven medicine.

— Mark Bard

All too often, we want a nice clean example of how one specific brand is using AI – such as a chatbot, an AI-powered treatment algorithm, or an AI-enhanced marketing dashboard. While these are great examples for teams – and companies – to discuss the practical use of AI and associated technologies, the bigger picture is where the overall action is happening today. If we step back for a second and think

about healthcare delivery overall – AI is becoming part of the system at each step in the process. Providers are using AI platforms to incorporate patient data, therapy outcomes, and guidelines to make treatment decisions. The payer community is using AI to mine clinical and economic outcomes and determine how tech can improve and automate a process such as pre-authorization. In other words, in addition to the examples of a pharma brand using AI and machine learning to power a marketing or brand application, AI is also making a significant impact when it comes to how providers and payers are making decisions – today. In a world where AI powers clinical decisions by the provider and payer community, the rules of engagement – and influence – evolve. Pharma and medical device companies must become conversant with the technology, algorithms, and understand where they stand – and how to optimize the role of products within the new world of data-driven medicine.

What does modern pharmaceutical sales and marketing look like in 2025?

Most industry analysts can agree on one thing – the commercial model for the pharmaceutical industry will continue to undergo significant changes in the coming decade. We have already migrated from a world where the individual sales rep was the primary resource for educating physicians – and was a critical source of information to drive their individual decision making. It's not to say the rep is not relevant in 2025 – they are – it's just that the model and the pace of change accelerates even faster. Another area of rapid change is the use of data to optimize the customer and patient experience. Better use of internal data, and matching with third-party resources, will facilitate a highly customized user and customer experience. In much the same way that AI-driven data analytics will drive the R&D infrastructure and decision making of the future, AI and machine learning will drive the investments and the tactics employed for the customer experience – helping marketers focus their attention and budget where it has the greatest impact.

Longer term, when algorithms are making and driving clinical decisions – or greatly influencing those clinical decisions – the focus within the commercial model must evolve to incorporate data (and the use of that data) as a key part of the strategic sales and marketing mix. What algo is being used within a payer? What algo is being used within a specialty segment? What algo is being used by a government payer or regulatory body? In much the same way that an algo is used by Google to determine the relevance and placement of content within their search engine, the use of an algo (powered by AI) will determine access, coverage, and adoption rates for many therapeutic options in the coming decade. Does it make sense for pharma and medical device companies to better understand the data being used, to better understand what powers these algorithms? Of course. It's going to be an iterative process – and will require collaboration across the stakeholders of the health system. Just as we learned about the impact of Google (and their influence) on providing access to content – there will be winners and there will be losers. Education, investment, and willingness to learn in these early stages will separate those leading the pack in the next era of data and AI-driven medicine and those struggling to adapt to the new world of healthcare delivery and reimbursement.

Justin Chase
EVP, Intouch Solutions

INTOUCH SOLUTIONS®

How is Intouch evolving to be the "Agency of More" for modern pharma marketing? How is AI part of those plans?

Intouch is shaping the future of AI in pharma as we continue to identify how modern marketing can help our clients: where they are now, and where they need to go in the future.

Every day, we're actively investigating how AI can help solve business challenges. This begins with assessing clients' readiness, but it's already moved to developing and even deploying solutions – like AI-driven chatbots powered by Cognitive Core™ - that are effective in marketing, patient support, HCP engagement, and the creation of operational efficiencies.

What's Cognitive Core?

Cognitive Core is our proprietary AI platform. We built it specifically to work within the pharmaceutical industry and its regulations and restrictions.

Cognitive Core blends three common AI technologies – predictive analytics, robotic process automation, and natural language processing – to create user experiences that augment every aspect of a patient's or a professional's journey.

It ensures that the user experience is consistent, iterative, and personal, across multiple channels. Created with patient privacy and compliance in mind, it has adverse event and product-complaint recognition — along with notification and reporting abilities — built in. To accommodate a brand's unique MLR requirements and associated process, Cognitive Core has a customizable workflow that can be implemented for each brand.

Can you give us some examples?

Sure! One example is a "banner bot" — a media ad powered by AI. It can solve a number of challenges, such as relevance, awareness, personalization, engagement, and value for an end user. A banner bot can be the entry point for a consumer into a user-centric, intelligent, and connected ecosystem that evolves with the consumer. Every interaction with the banner bot is an opportunity for the platform to provide additional value add to the consumer.

Banner bots can strategically engage users in additional channels like SMS and email and can even add users to

a CRM stream. Cognitive Core seamlessly integrates the systems. By analyzing previous interactions in a secure and compliant manner, AI-powered banner bots can evolve the engagement experience beyond the traditional media banners.

AI power at work can also be seen in patient support, employing multichannel bot engagement with contextual conversation capabilities. What's often missing in chatbot conversations is contextual relevance. This to forgettable conversational experiences, which we've all had.) Contextual relevance is the essential bridge between technology and meaningful human interactions.

The first step in creating contextual relevance is an AI engine's ability to create a dynamic patient/user profile that becomes smarter with every interaction.

Step two is for the AI engine to be able to look back at previous conversations to add a layer of personalization.

> "
>
> Every day, we are consulting with clients on modern pharma marketing – what it means, where they are, and where they need to go.
>
> **— Justin Chase**

Once the profile is created, it can grow over time, with gaps filled in along the way, enabling conversations to become richer and more personal.

The third step is the ability of the AI engine to connect patients with the right resources at the right times through the channels they access.

The fourth and the final step is to learn and recalibrate the previous three steps. So, why isn't everyone doing this? Each step can be difficult to implement, especially in pharma. Technology isn't the only challenge: there are issues with compliance, regulatory, privacy, and GDPR requirements. Cognitive Core's conversation engine was built with contextual relevance and pharma requirements within its foundation. This makes it easier to build contextually relevant, as well as useful, conversations with consumers.

Do you have any more examples?

Yes! The next one is an example of AI improving HCP engagement, with an embedded virtual assistant that connects with Veeva and Salesforce.

Digital sales aids in pharma have become common. But even with their widespread adoption, many representatives still feel challenged by the amount of time and data it takes to research and document information on their customers.

The scope of activities required of a sales representative is vast. Most reps are required to see up to six customers every day, but the time they spend with those customers is surprisingly short. Instead, much of their time is spent planning the day, preparing for meetings, getting from place to place, documenting calls, and coordinating with partners and managers.

In the future, sales calls will be facilitated by AI, which can assist in planning, give helpful tips and do the necessary but laborious follow-up tasks.

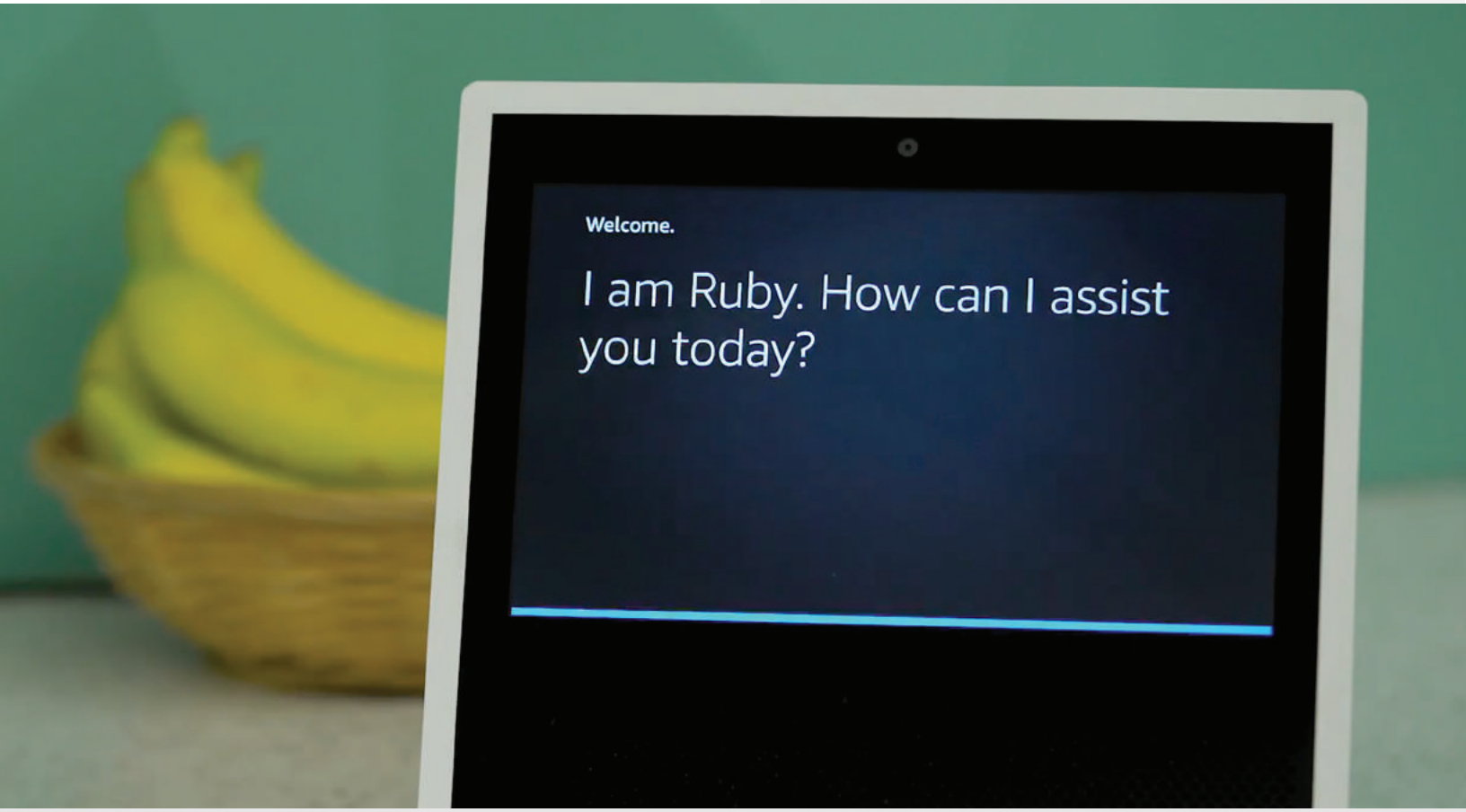
Companies need an efficient way to identify and communicate HCP needs and requests to reps in preparation for their calls, so that the most applicable and available content can be shared during sales appointments.

AI can automate tasks, give proactive reminders, and create reports and analytics automatically, among other tasks. Cognitive Core integrates with DSA platforms like Veeva, assistants like Alexa, and tools like SMS to completely re-envision for reps how a typical HCP call occurs. This includes pre-call planning research and insights, AI-based insights just before the call, and post-call activities such as logging a call.

COGNITIVE CORE™

Intouch's proprietary AI platform

WATCH THE VIDEO



Conclusion

The Digital Health Coalition and Intouch Solutions work to remain at the vanguard of technology-driven change in life-science marketing.

In "Modern Marketing: Pharma's Data-Powered AI Revolution," we've addressed how the proliferation of data is causing radical shifts in marketing; what AI is, how it works, and why it matters; and what the current and future states of modern marketing look like.

Our current time is an exciting one. The years ahead will require much work and innovation, but will deliver immense results to those willing to invest the time and effort. This is the perfect time to evaluate next-generation tools and begin to learn how they fit into the toolbox, and mindset, of modern pharma marketers.

We welcome your feedback and comments. Was this ebook helpful? Is there other content you'd like to see in the future? Did we leave questions unanswered?

Let's continue the discussion!

Follow us on social media:

INTOUCH SOLUTIONS®

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Contact Justin Chase to request an executive briefing to summarize the contents of this book.

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Originally developed as an online ebook, you can experience interactive content, register for updates, or share with others at **modernpharmamarketing.com**.

APPENDIX

Glossary and Contributors

THIS EBOOK WAS BROUGHT TO YOU BY:

INTOUCH SOLUTIONS®

agencyofmore.com

Digital Health Coalition

digitalhealthcoalition.org

Glossary

Algorithm

A computer program governed by a specific set of rules that allows it to perform complex, labor-intensive tasks like calculations, data processing and automated reasoning … so we human marketers can focus on strategy and creative

Artificial intelligence

A computer system that can gather data and make decisions and/or solve complex problems.

Big data

This is the massive amount of information we now generate about ourselves — our interests and habits — as we move through the digital universe. Some say the term "big data" should be retired, because so much data is collected these days that all data is now part of big data.

Chatbot

A type of virtual assistant that uses artificial intelligence to hold a conversation via voice or text. Chatbots can be used in facilitate transactions, answer questions, play games and more.

Cloud computing

A virtual data-storage space that provides on-demand access to software and information.

Deep learning

A more advanced branch of machine learning, where a computer teaches itself with only minimal amounts of programming. With deep learning, marketers can make predictions about consumer behavior.

General Data Protection Regulation (GDPR)

A regulation enacted by the European Union (EU) to protect its citizens' personal data privacy; goes into effect May 25, 2018. Failure to comply could mean steep fines.

Internet of things

Wearables, cars, televisions, light switches … anything with an on/off switch that can be connected to the Internet to transmit and receive data.

Machine learning

Machine learning teaches a computer to find functions — equations that work not only for the examples that it has, but for unknown ones in the future. Machine learning teaches a computer how to predict.

Natural language processing

Natural language processing is a way for computers to analyze, understand and derive meaning from human language. Where can NLP be used?

- Adverse event detection
- Chatbots
- Sentiment analysis
- Text analysis
- Text generation
- Text summarization
- Translation

Neural network

Natural language processing is a way for computers to analyze, understand and derive meaning from human language. Where can NLP be used?

Psychographic profiles

Psychological characteristics like attitudes, opinions, interests, and lifestyles that help explain why people do what they do.

Reinforced learning

A mechanism reinforces an action by rewarding desired outcomes. An example might be a stock-picking tool: if a system reviews the variables (e.g., revenue growth over time, dividend percentages), chooses a stock, and profits from the investment, the action is reinforced by the favorable outcome.

Robotics

The ability of a system to act and interact with the physical world.

Smart data

Data that's organized, provides insights and identifies patterns that businesses can act on.

Speech recognition

The ability of a system to accept input from the human voice.

Supervised learning

Systems are trained by labeling attributes of data and connecting those attributes to an output. (e.g., those are ears; that is a tail; that is a trunk; elephants have ears, tails, and a trunk.) When the system encounters similar information, it can give a prediction or recommendation to an appropriate level of certainty. Supervised learning can work with data that is easy to organize and label, such as in spam email recognition, sentiment analysis, or product recommendation engines.

Unsupervised learning

Algorithms explore data without a human having labeled it as training data. Unsupervised learning is particularly useful in situations such as identifying customer segments or detecting anomalies.

Virtual assistant

Think Apple's Siri, Amazon Alexa, Google Assistant or even a chatbot on your favorite shopping site. Virtual assistants use natural language processing to provide the correct responses to many commonly asked questions: everything from "What's the weather like today?" to "When was the last time the Yankees won the world series?" to "Who sings this song?"

Vision learning

The ability of a system to understand a picture without words.

Contributors

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Originally developed as an online ebook, you can experience interactive content, register for updates, or share with others at **modernpharmamarketing.com**.