HEALTHCARE AND LIFE SCIENCES: USING AI TO REDUCE COMPLEXITY

By: Derek Perry and Jeff Lundberg



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EXECUTIVE SUMMARY

With accelerating advancements in artificial intelligence (AI), digital sensors, big data analytics and cloud computing, businesses have begun an epic shift: using digital technology to advise employees on making decisions, and in some cases making decisions for them. Our study of 310 U.S. companies in financial services, transportation and healthcare found many are using AI to guide sales, service, marketing, and other employees on how to deal with customers. Some even give AI-generated advice directly to customers themselves. And more than a few companies have developed systems that act on behalf of employees or customers who don't act quickly enough. These AI-infused systems, as we refer to them, take control.

After surveying these companies in January and February of this year, these were among our biggest learnings:

- Al-infused systems represent seven out of 10 applications implemented in the last three years. For the average company, 71% of all applications software they implemented from 2020 to 2023 used Al to provide advice, issue alerts or take control of user decisions. That is up sharply from 55% prior to 2020. What's more, companies expect that percentage to grow to 76% of all applications implemented in 2024- 2025.
- **They're spending, but cautiously.** The average spending per company in 2023 on Al-infused systems was \$14.1 million, or 0.1% of average revenue (which was \$12.3 billion). Healthcare services and health insurance companies led the way, spending an average \$23.4 million. Across the three sectors, companies expect their investments in these applications to rise to \$20.9 million per company in 2024-25. The average company implemented five Al-infused applications in 2023, and they plan to implement another seven over this year and next.
- The majority (55%) said their most successful Al-infused application generated strong or extremely strong benefits. On average, those whose most successful application was in the sales function reported a 32% increase in revenue; those who said it was in finance and accounting reported an average 32% cost reduction; and those in customer service said service quality improved an average 27%. Companies whose most successful Al system was in strategic planning reported an average 34% reduction in the time it took to develop and implement a new plan.

 The most successful companies in developing Al-infused systems are more likely to design them to take control - if necessary - of user decisions.
On average, 29% of the Al systems they're building in 2024-25 will act on behalf of users. In contrast, of the companies whose most successful Al-infused application generated only moderate, minor or no benefits, on average only 24% of their Al-infused systems will be able to take control of user decisions. Our <u>full report</u> compares the most successful companies in leveraging Al-infused systems to those companies that have struggled. "Leaders" are companies that said their most successful Al-infused application generated extremely strong benefits. Overall, they were 21% of the companies that had developed Al-infused systems since 2020. Less successful companies, or "Laggards," are companies whose most successful AI-infused system produced zero, minor or only moderate benefits. They comprised 45% of the sample.

In looking at how Leaders, Laggards and the rest of our survey respondents answered our guestions, the following became clear to us: Moving to more advanced Al-infused systems that can take control isn't easy. It requires pristine data and enormous computational power to train AI models to deliver insights on demand. Moreover, companies must master algorithmic thinking. That starts with deeply understanding the business rules of a business process - rules necessary to provide meaningful, timely advice that users will embrace. It also requires making a rapid but informed decision of determining when the machine must act on behalf of the user.

Given the sizable complexities to overcome – especially employee resistance to having Al make decisions for them - the challenges are daunting. So what must healthcare and life sciences companies do to propel their businesses with artificial intelligence? We surveyed 120 firms in these industry sectors. This report dives deeply into what they've accomplished this decade with Al, and where they are headed over the next few years.



SHIFT RIGHT

As Al-infused systems become more capable (from left to right), they require vast amounts of clean and accessible data

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Compared with financial services and insurance companies, a lower percentage of healthcare services and life sciences companies installed Al-infused applications between 2020 and 2023. For healthcare companies (including health insurers), 61% had done so; 46% of life sciences companies did the same. (They include pharmaceutical, biotech, medical device and medical product firms.)

Nonetheless, both sectors are ramping up their Al system development activities this year. Some 74% of U.S. healthcare services and 78% of life sciences companies are now building Al-infused apps that advise, alert and act on behalf of users when necessary. And nearly three-quarters of healthcare firms and 56% of life sciences companies say they'll deploy some of those applications this year.

% OF HEALTHCARE AND LIFE SCIENCES COMPANIES THAT HAVE DEPLOYED AND WILL DEPLOY AI-INFUSED APPLICATIONS

SECTOR	% That Implemented Al-Infused Apps from 2020-2023	% Developing Such Apps in 2024	% That Expect to Deploy the Apps in 2024	% That Expect to Deploy the Apps in 2025	% That Expect to Deploy the Apps in 2026 or After
HEALTHCARE	61%	74%	73%	38%	15%
LIFE SCIENCES	46%	78%	56%	46%	13%

EXTERNAL FOCUS: MAJORITY OF USERS ARE CUSTOMERS, SUPPLIERS AND OTHER OUTSIDERS

Who are these companies building these systems for? Who do they want to actually use the systems? For the Al-infused apps deployed between 2020 and 2023, a slight majority of healthcare firms said their users were external: customers and suppliers, business partners and other external parties.

On average, an even higher percentage of life sciences companies – 62% – targeted outsiders to use the systems they developed over the last three years. Of that 62%, 33% were for customers and 29% were for suppliers, partners and other external parties.

Still, building Al-infused systems for employees and other company workers was important. The average healthcare services firm developed 42% of those systems for employees or contract workers. That was higher than in the average life sciences firm, where less than a third (31%) were built for employees and contractors.

SECTOR	External Users		Internal Users		
	Customers	Suppliers, Partners and Others	(Employees and Contract Workers)	Other Users	
HEALTHCARE	27%	24%	42%	7%	
LIFE SCIENCES	33%	29%	31%	7%	

TARGET USERS: FOR WHOM ARE HEALTHCARE AND LIFE SCIENCES COMPANIES BUILDING THEIR AI-INFUSED APPLICATIONS?

HOW MANY APPS DID THEY BUILD? AND FOR HOW MUCH?

We asked how many Al-infused apps they implemented in 2023 that at least advised users to make certain decisions. The average healthcare company rolled out seven such apps; the average life sciences firm implemented four.

How much did they spend on the apps that they implemented last year? The average healthcare company spent \$23.4 million, which was 65% higher than the average of all industries we surveyed. In contrast, the life sciences companies spent the least: \$7.5 million on average per firm.

What about the future? We asked how many Al-infused apps they plan to install this year and next. Both sectors said more than in 2023. The average healthcare firm surveyed plans to deploy eight more such systems in 2024-25, while the average life sciences firm says it's aiming at five.

Both sectors plan to raise their investments in such systems. The average healthcare firm estimates it will spend \$37.8 million in 2024-25 on them. If that pans out, that would be 62% more than in 2023 – and more than twice the \$17.7 million average of the next leading sector (airlines, within the transportation and logistics sector).

The average life sciences firm is projecting investments of \$11.5 million on Al-infused apps in 2025-26. That is 44% less than the average across all sectors surveyed (\$20.6 million)

SECTOR	No. of Apps Deployed in 2023	Spending on Apps in 2023	No. of Apps to be Deployed in 2024-25	Projected Spending on Apps in 2024-25	
HEALTHCARE	7	\$23.4 million	8	\$37.8 million	
LIFE SCIENCES	4	\$7.5 million	5	\$11.5 million	

HEALTHCARE AND LIFE SCIENCES: AVERAGE PER COMPANY NUMBER AND SPENDING ON AI-INFUSED APPS IN 2023

ABOUT A THIRD OF AI-INFUSED APPS WILL TAKE CONTROL

Around 40% of healthcare and life sciences companies are building AI applications that will advise users on what they should do. Another 28% will build additional functionality in their AI systems: alerting users to act if they haven't – i.e., if the system believes they should.

Overall, another 32% of the AI applications will advise or alert users to act, and more: take control of making and acting on the decision if a user hasn't acted quickly enough.

	Capabilities of Al-Infused Apps to be Implemented in 2024 and 2025			
SECTOR	% That Will Advise Users	% That Will Advise and Alert Users	% That Will Advise, Alert, and Take Control for Users	
HEALTHCARE	39%	29%	32%	
LIFE SCIENCES	41%	28%	32%	

HEALTHCARE AND LIFE SCIENCES COMPANIES: CAPABILITIES OF AI-INFUSED APPS IMPLEMENTED IN 2024-25

A good example is an AI staff scheduling assistant developed for the Cleveland Clinic, called Virtual Command Center. The health system's main hospital in Cleveland takes and discharges thousands of patients daily, which can create logistical headaches. Does it have enough personnel on hand? Which operating rooms have capacity, and which beds are open? One aspect the AI system continuously evaluates is the facility's operating rooms. It recommends how to maximize resources: which OR to use for which surgery, with what surgeon, other medical professionals, and equipment in the room.

WHERE ARE THE SYSTEMS GOING? IT, FINANCE & ACCOUNTING, Among them

We asked them which functions used the systems they implemented in 2023. Healthcare firms used the average 7 applications across multiple functions (with some applications used by several of them). However, three were the biggest beneficiaries: IT, finance and accounting, and product development.

Life sciences companies' AI systems had many beneficiaries across their organizations, but three were most frequent: IT, product development and manufacturing.

WHERE THE AVERAGE HEALTHCARE AND LIFE SCIENCES COMPANY USED THEIR AI-INFUSED APPS IN 2023

HEALTHCARE		LIFE SCIENCES		
Function	Locus of Activity	Function	Locus of Activity	
IT	3	IT	2	
Finance and Accounting	2	Product Development	2	
Product Development	2	Manufacturing	2	
Marketing	1	Finance and Accounting	1	
Customer service	1	Customer Service	1	
Strategy	1	Marketing	1	
Human Resources	1	Strategy	1	
Distribution/Supply Chain	1	Sales	1	
Sales	1	Distribution/Supply Chain	1	
		Purchasing	1	
		Human resources	1	

WHERE HEALTHCARE AND LIFE SCIENCES AI SYSTEMS ARE HAVING THE BIGGEST IMPACT

Healthcare firms said the most frequent beneficiary of AI is the IT function itself. That's what 28% of these firms indicated. In second place: customer service (named by 14%).

Life sciences firms' No. 1 beneficiary was manufacturing (cited by 26%). Three other functions tied for second: marketing, customer service, and product development (each collecting 13% of the picks).

Here's what the companies said:

SECTORS & FUNCTIONS		REDUC	CTIONS INCREASES		EASES
		COSTS	CYCLE TIME	REVENUE	QUALITY
HEALTHCARE	IT	-28%	-28%	+17%	+23%
	Customer Service	-32%	-15%	+39%	+30%
LIFE SCIENCES	Manufacturing	-28%	-21%	+17%	+23%

SURVEY DEMOGRAPHICS

Our 120 U.S. survey participants included healthcare companies (70), counting health insurance, and life sciences companies (50), including pharma, biotech, medical devices and medical products firms. They share the following demographics:



JOB ROLES





ABOUT THE AUTHORS

DEREK PERRY

Chief Technology Officer

In his role as Chief Technology Officer, Derek Perry oversees strategic service offering development and implementation for Sparq's clients.

Prior to his role with Sparq, Derek was the Director of the Quality Systems Business Solution and Manager at Clarkston Consulting. During his tenure at Clarkston Consulting, he was responsible for delivery consistency, methodology development, and service offering development.

Previously, Derek worked in the pharmaceutical, biotechnology, and consumer products industries. Within these verticals, he has deep knowledge of laboratory operations and automation, informatics, quality management and manufacturing operations. Derek is a graduate of Georgia Tech, where he earned a B.S. in Computer Science.



JEFF LUNDBERG

Chief Revenue Officer

In his Chief Revenue Officer role, Jeff is entrusted with a range of responsibilities aimed at driving the company's growth and success. Central to this is the development and execution of Sparq's vertical go-to-market (GTM) strategy, carefully crafted to navigate market dynamics and foster sustainable growth. He also works closely with Sparq's dedicated strategic verticals sales team to ensure they delight clients and continue to drive growth for the company.

Before joining Sparq, Jeff held a number of sales leadership roles, each contributing to his expertise in vertical GTM strategies. For eight years, he led sales within the Manufacturing, Logistics, Energy and Utilities organization at Cognizant, a global IT services firm. He then joined Fujitsu North America as Head of Sales, further deepening his understanding of vertical markets and refining his ability to lead high-performing sales teams toward success. Most recently, Jeff was the Chief Revenue Officer at 3Pillar, where he drove sustainable revenue streams and fostered continued growth.

Jeff has a Bachelor of Commerce Degree in Accounting from the University of Alberta and a Master of Business Administration in Marketing and Management from Robert Morris University.

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