TRANSPORTATION AND LOGISTICS: USING AI TO KEEP THINGS MOVING

By: John Kosar and Chris McRae

SPARQ

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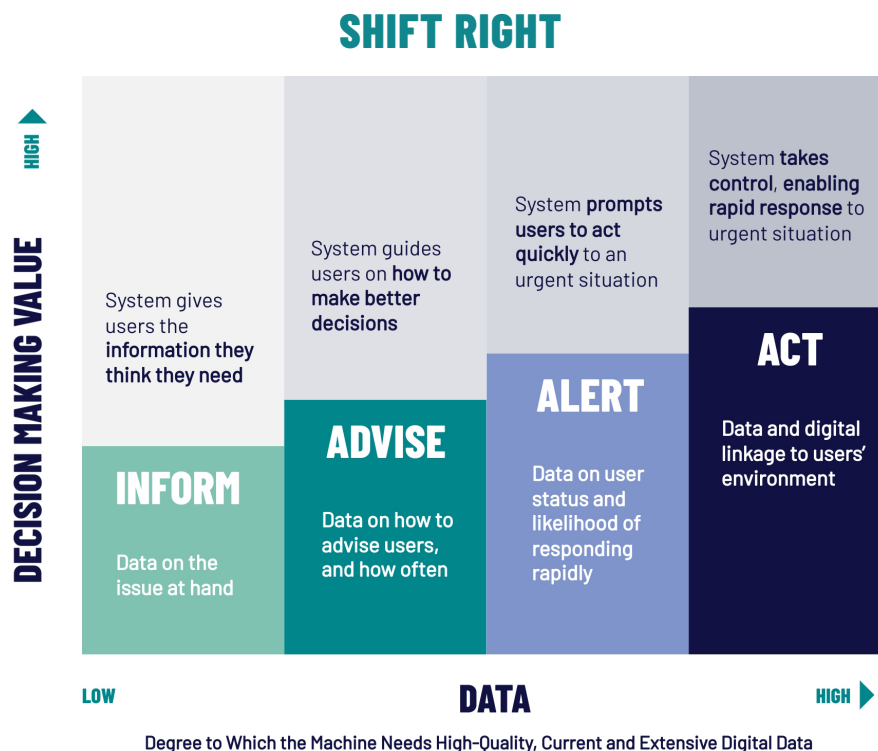
After surveying these companies in January and February of this year, these were among our biggest learnings:

- **AI-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 AI 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 AI-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 AI-infused applications in 2023, and they plan to implement another seven over this year and next.

- **The majority (55%) said their most successful AI-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 AI 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 AI-infused systems are more likely to design them to take control – if necessary – of user decisions.** On average, 29% of the AI systems they're building in 2024-25 will act on behalf of users. In contrast, of the companies whose most successful AI-infused application generated only moderate, minor or no benefits, on average only 24% of their AI-infused systems will be able to take control of user decisions.

Our full report compares the most successful companies in leveraging AI-infused systems to those companies that have struggled. "Leaders" are companies that said their most successful AI-infused application generated extremely strong benefits. Overall, they were 21% of the companies that had developed AI-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 questions, the following became clear to us: Moving to more advanced AI-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 AI make decisions for them – the challenges are daunting. So what must transportation and logistic companies do to propel their businesses with artificial intelligence? We surveyed 72 firms in these industry sectors. This report dives deeply into what they've accomplished this decade with AI, and where they are headed over the next few years.

SHIFT RIGHT

DECISION MAKING VALUE (HIGH ▲)

System gives users the **information they think they need**

System guides users on **how to make better decisions**

System **prompts users to act quickly** to an urgent situation

System **takes control, enabling rapid response** to urgent situation

INFORM
Data on the issue at hand

ADVISE
Data on how to advise users, and how often

ALERT
Data on user status and likelihood of responding rapidly

ACT
Data and digital linkage to users' environment

DATA
LOW — HIGH ▶
Degree to Which the Machine Needs High-Quality, Current and Extensive Digital Data

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

TRANSPORTATION AND LOGISTICS:
USING AI TO KEEP THINGS MOVING

The airlines sector stands out in AI-infused products and services among the 72 distribution, logistics, railroad and airline companies we surveyed – at least in using these apps during the last three years. Some 61% of airlines surveyed told us they implemented AI-infused applications that (at a minimum) gave users advice.

However, all three sectors are in high gear this year in developing these kinds of systems. Roughly 70% of distribution & logistics and airline companies are building them. An even higher percentage of railroads – 81% – are also developing them.

And all three transportation sectors intend to install and use these systems between now and 2026.

% OF DISTRIBUTION, LOGISTICS, AND AIRLINE COMPANIES THAT HAVE DEPLOYED AND WILL DEPLOY AI-INFUSED APPLICATIONS

SECTOR	% That Implemented AI-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
DISTRIBUTION & LOGISTICS	48%	70%	48%	57%	22%
AIRLINES	61%	70%	50%	56%	31%
RAILROADS	44%	81%	38%	69%	15%

INTERNAL FOCUS: MAJORITY OF USERS ARE EMPLOYEES

This industry is intensely focused on moving goods and people through their networks. They must continually monitor their networks to make sure they're working, and to quickly fix the pieces that aren't. Thus, it was no surprise that their AI focus has been internal – unlike the companies we surveyed in banking, insurance, healthcare and life sciences.

In all three subsectors, when asked about the users of AI-infused software implemented between 2020 and 2023, at least half the applications were aimed at employees and contract workers in their companies.

A much smaller percentage were built for customers. Only a third of the AI applications of airlines were developed for customers. The number was 30% at the railroads, and 22% at the distribution & logistics companies surveyed.

Suppliers and other external parties came in last.

TARGET USERS: FOR WHOM ARE DISTRIBUTION, LOGISTICS, AND AIRLINE COMPANIES BUILDING THEIR AI-INFUSED APPLICATIONS?

SECTOR	External Users		Internal Users	Other Users
	Customers	Suppliers, Partners and Others	(Employees and Contract Workers)	
DISTRIBUTION & LOGISTICS	22%	19%	53%	5%
AIRLINES	33%	15%	50%	3%
RAILROADS	30%	16%	51%	4%

AVERAGE NUMBER OF AI APPS PER COMPANY: 5

Across all three transportation sectors, the average company deployed five AI-infused systems in 2023. However, distribution & logistics companies stood out, averaging six apps per company and spending $18.7 million to implement them.

Airlines were next, averaging five AI apps per company last year, and spending an average $12 million per company on them. An example of a major airline that has been experimenting with AI is Delta Air Lines. One of its earliest experiments is helping reservation agents answer difficult customer questions such as guidance on traveling with their pets. "People ... are on hold for five minutes waiting for an answer," said CEO Ed Bastian in a December 2023 investor conference. "They should only be on hold for five seconds. That's what AI can do, and that's one of the first applications that we're deploying."

Railroads were last, averaging four apps per company and spending an average $8.8 million on them.

What about this year and next? Airlines plan to outspend the two other sectors, estimating they'll devoted an average $17.7 million on seven AI apps. Distribution & logistics was close behind, at a projected spend of $16.4 million and seven apps to come. The average railroad estimated it would spend $9.1 million on six apps.

DISTRIBUTION, LOGISTICS, AND AIRLINE COMPANIES: AVERAGE PER COMPANY NUMBER AND SPENDING ON AI-INFUSED APPS IN 2023

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
DISTRIBUTION & LOGISTICS	6	$18.7 million	7	$16.4 million
AIRLINES	5	$12.0 million	7	$17.7 million
RAILROADS	4	$8.8 million	6	$9.1 million

HOW FAR WILL THESE AI APPS GO? ABOUT A THIRD WILL TAKE CONTROL

DISTRIBUTION, LOGISTICS, AND AIRLINE COMPANIES: CAPABILITIES OF AI-INFUSED APPS IMPLEMENTED IN 2024-25

SECTOR	Capabilities of AI-Infused Apps to be Implemented in 2024 and 2025		
	% That Will Advise Users	% That Will Advise and Alert Users	% That Will Advise, Alert, and Take Control for Users
DISTRIBUTION & LOGISTICS	49%	23%	28%
AIRLINES	42%	27%	32%
RAILROADS	38%	29%	34%

When they're moving goods and people, lives can be on the line if a part fails, obstacles are encountered, or weather wreaks havoc. Airlines and railroads said about a third of the AI-infused systems they are developing this year and next year will be able to take control away from a user if that person doesn't act fast enough. A lower percentage of distribution & logistics companies (28%) said the same thing.

But the majority of the applications were either of the "advise" or "advise + alert" types. And even on those dimensions, a much higher percentage of these systems will merely provide advice to users vs. issuing alerts to do something differently.

WHAT THE SYSTEMS WILL IMPROVE: IT IN AIRLINES, CUSTOMER SERVICE IN LOGISTICS

Apparently, many of the AI systems these three sectors installed in 2023 were cross-functional: multiple departments enjoyed benefits from the same system. The reason we know that with an average six AI-infused systems per distribution & logistics company, they collectively touched 15 business functions (including IT). Similarly, the five-AI-systems per average airline touched 11 business functions altogether. And for railroads, which implemented an average four AI systems per company in 2023, they connected to 13 business functions.

The most commonly mentioned functions using such apps were:

- In distribution & logistics: customer service, product development, finance and (of course) distribution
- In airlines: IT
- In railroads: IT and production (the operations of which keep trains tuned and operating)

WHERE THE AVERAGE DISTRIBUTION, LOGISTICS, AND AIRLINE COMPANY USED THEIR AI-INFUSED APPS IN 2023

DISTRIBUTION & LOGISTICS		AIRLINES		RAILROADS	
Function	Locus of Activity	Function	Locus of Activity	Function	Locus of Activity
Customer Service	3	IT	2	IT	2
Production Development	2	Finance and accounting	1	Production	2
Finance and Accounting	2	Production Development	1	Product development	1
Distribution	2	Marketing	1	Manufacturing	2
Strategy	1	Customer Service	1	Finance and accounting	1
Marketing	1	Strategy	1	Customer service	1
Sales	1	Human Resources	1	Marketing	1
Production	1	Distribution	1	Strategy	1
IT	1	Sales	1	Sales	1
Human Resources	1	Purchasing		Distribution	1

BUT WHICH FUNCTION HAD THE BIGGEST PAYBACK FROM AI?

We asked these companies to think about all the AI applications they've implemented since 2020 and tell us which one had the biggest impacts in cost, revenue, customer retention or other relevant metrics. Here's what they said:
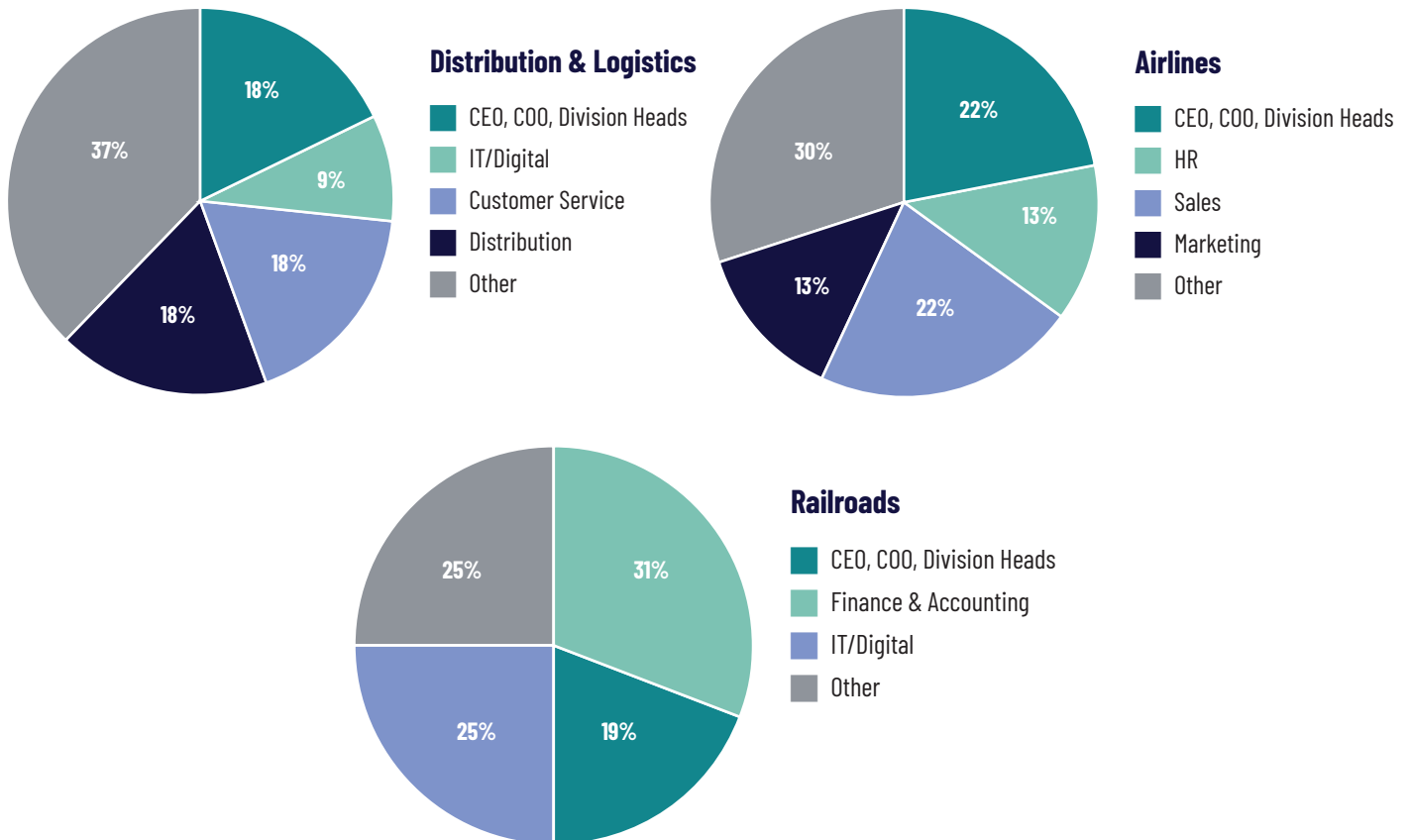
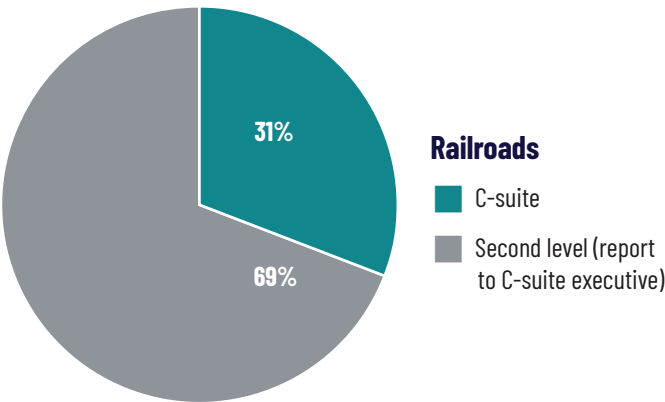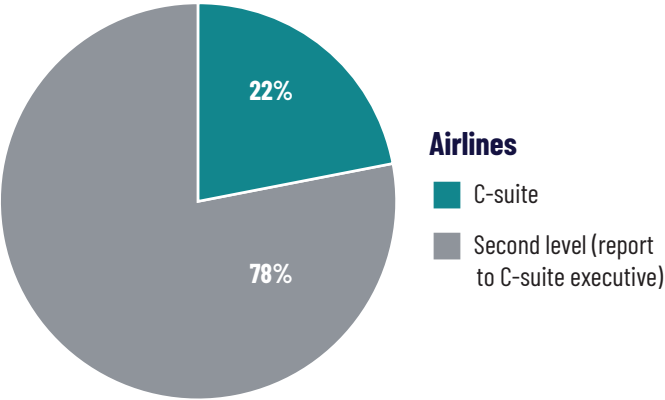| SECTORS & FUNCTIONS		REDUCTIONS		INCREASES	
		COSTS	CYCLE TIME	REVENUE	QUALITY
DISTRIBUTION & LOGISTICS	Product Development	-32%	-25%	+30%	+20%
	Sales	-30%	-38%	+32%	+10%
AIRLINES	Customer Service	-33%	-12%	+17%	+33%
	Product Development	-27%	-27%	+30%	+23%
RAILROADS	Production	-28%	-15%	+30%	+30%
	Product Development	-32%	-33%	+30%	+10%

SURVEY DEMOGRAPHICS

Our 72 U.S. survey participants in the transportation industry includes senior leaders from companies in distribution and logistics (33); airlines (22); and railroads (16). They share the following demographics:

JOB ROLES

Distribution & Logistics
- CEO, COO, Division Heads
- IT/Digital
- Customer Service
- Distribution
- Other

Values: 18%, 9%, 18%, 18%, 37%

Airlines
- CEO, COO, Division Heads
- HR
- Sales
- Marketing
- Other

Values: 22%, 13%, 22%, 13%, 30%

Railroads
- CEO, COO, Division Heads
- Finance & Accounting
- IT/Digital
- Other

Values: 31%, 19%, 25%, 25%

ORGANIZATION LEVEL

Distribution & Logistics
- ■ C-suite
- ■ Second level (report to C-suite executive)

18%
82%

Airlines
- ■ C-suite
- ■ Second level (report to C-suite executive)

22%
78%

Railroads
- ■ C-suite
- ■ Second level (report to C-suite executive)

31%
69%

COMPANY SIZE (AVERAGE ANNUAL REVENUE)

$10.8 Billion — Ditribution & Logistics
$13.2 Billion — Airlines
$6.1 Billion — Railroads
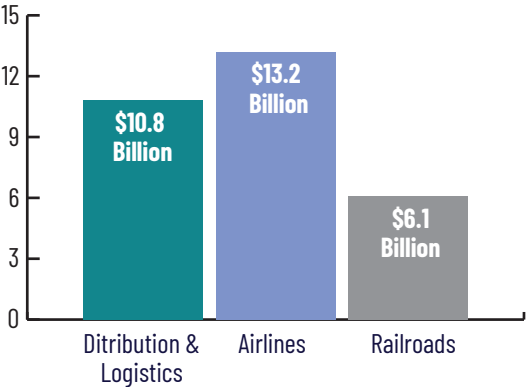
ABOUT THE AUTHORS

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John is the driving force behind Sparq's strategy in the transportation, logistics and mobility (TLM) market. In this role, he is responsible for client relations and thought leadership initiatives that reflect the company's deep TLM vertical expertise. As the leader of a dynamic client executive team, John ensures alignment with organizational objectives and revenue goals while delivering outstanding outcomes to Sparq's clients.

With over two decades of sales leadership experience, John has helped some of the largest transportation and logistics companies and fastest-growing SaaS/PE-based mobility companies with their product strategy, design, and digital engineering projects. John is a community bridge builder serving as Emeritus President and as a member of the Board of Directors on the Association of Information Technology Professionals for more than a decade, as well as serving on the Technology Association of Georgia Sales Leadership Society Board and Chairman.

John has a Bachelor of Business Administration from the Department of Economics with a minor in Entrepreneurship from the Department of Business at Washington & Jefferson College. He is also a certified Scrum Master, Product Owner and Agile Marketing Specialist.

CHRIS MCRAE
Client Partner

In this role, Chris works with Sparq's largest clients in the transportation, logistics and mobility market. He has overseen a variety of client initiatives that have yielded millions in operational efficiencies, increased supply chain visibility, heightened organizational agility and unlocked new revenue streams.

Previously, Chris worked at Docebo, where he led the build-out of the learning management system firm's global customer success organization.

Chris has a Bachelor's degree in Technical Communication from the Mercer School of Engineering. His certifications include Project Management Professional (PMP), Association for Supply Chain Professionals Supply Chain Resilience and AWS Certified Solution Architect - Associate.

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