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The State of **Data Analytics** in **Supply Chain Forecasting**

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Forecasting and planning has been the most data-driven process in the supply chain, with a wide range of inputs coming from ERPs and SCM planning tools. And although this complexity of data inputs has been steadily growing, the quantity of data does not translate into the quality of forecasting.

First, combining all the inputs into an aggregate dataset is a challenge because of the different formats, resources, and information that have been captured.

Second, supply chains across the globe have been progressively snowballing into breakdowns since 2020 due to socioeconomic and geopolitical conditions, making the collected data obsolete. And according to most experts, the situation is not going to get better any time soon. The effects of the supply chain disruptions are impacting raw materials and product availability, which ultimately results in poor customer experience and lost revenue.

To combat the global supply chain crisis and improve the quality of forecasting and planning, many enterprises invest in modernizing their tech stack and enhancing the use of data, such as using AI and machine learning models. Yet, not all companies are prepared to combat the disruptions. Even more surprisingly, many still don't have a roadmap toward supply chain digitalization.

Ikigai Labs (a data analytics company) with BizIntel (an independent market research firm) surveyed supply chain operations and technology leaders in retail and manufacturing about their utilization of supply chain technology. We invite you to read this report to benchmark the level of digitalization of your organization's supply chain and consider some course-corrective suggestions.
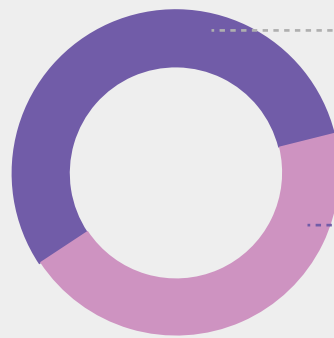
1.

The current state of forecasting

Making data-driven decisions is not always possible, and throwing more bodies at the problem is not going to solve it

The current state of forecasting

57%
5+ supply chain analysts or employees

43%
Up to 5 supply chain analysts or employees

Since supply chain demand forecasting and planning requires input from various parts of an organization for retailers and manufacturers, it can be tedious and labor-intensive. Depending on the company's size, this job might be performed by a dedicated analyst team or the supply chain managers themselves.

Additionally, some organizations have extremely predictable supply chains and require minimal forecasting efforts, with most of the time being spent on inventory replenishment. Still, most respondents stated that they have at least five or more people that work on demand forecasting and planning.

Question: **When it comes to forecasting and demand planning, your organization always makes data-driven decisions.**

29.55%
17.05%
17.61%
19.89%
15.91%
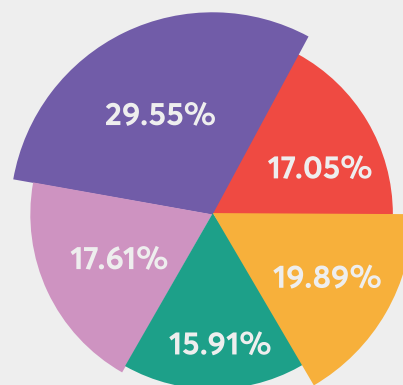
◆ Strongly agree

◆ Neither agree nor disagree

◆ Strongly disagree

◆ Somewhat agree

◆ Somewhat disagree

Typically, the success of supply chain operations is strongly correlated with execution and planning. So we asked supply chain leaders to rate themselves and their organizations on the use of data: Do they always make data-driven decisions for planning and forecasting? It turns out that only 18% of supply chain leaders strongly agree that their decisions are data-driven.

As expected, the percentage of those who identify their organization as data-driven increases with the organization's size. Of all organizations with over 5,000 employees, 53% either somewhat agree or strongly agree that their decisions are data-driven, while only 23% disagree.

However, this trend might not be related to the size of the organization itself but rather to the sophistication of the company.

This assumption is confirmed in another interesting observation. The survey results show that 36% of respondents from larger demand forecasting and planning teams did not feel their predictions were data-driven, while the same was true for only 29% of small team representatives. This leads to the conclusion that having a larger demand planning and forecasting team does not translate into being more data-driven.

Question:

Compared to your industry peers and direct competitors, how efficient and effective is your forecasting and demand planning process?

We are ahead of most competitors

33.52%

We meet industry standards

34.66%

We lag behind industry standards

31.82%

When companies were asked to evaluate the efficiency of their forecasting and demand planning process, the results were evenly distributed. Roughly a third of respondents felt they were ahead of the competition, another third said they were on par with industry standards, and the remaining third felt they were lagging behind.

While these results are not based on any objective assessment, this even distribution demonstrates that the intuitive sentiment could be a good indicator of the company's benchmarking position.

Once data is cross-referenced with other factors—such as industry or respondent's background—this even distribution starts to shift. For example, the self-assessment result is correlated with the organization's industry. Retailers are more likely to rate themselves as being ahead of the competition (39% vs. the average 35%), while manufacturers feel they are lagging (36% vs. the average 31%).

At the same time, respondents within supply chain operations functions were more likely to say their organization lags behind the competition compared to responders with a technical background (40% vs. the average 31% for operations and technology functions combined).
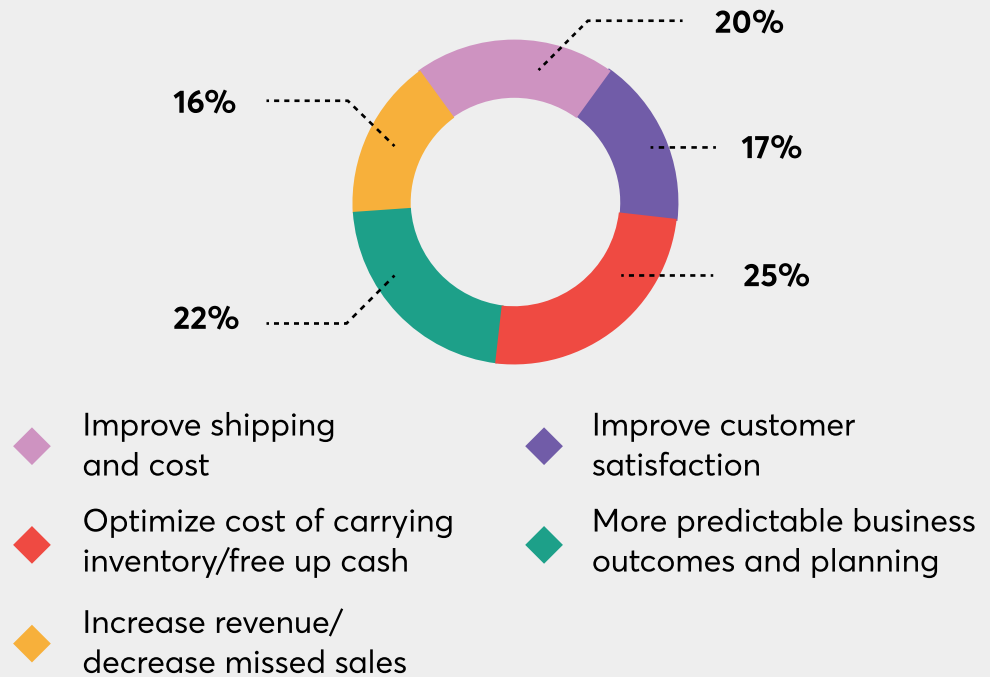
2.

The need for improved forecasting

Inventory cost and more predictability are the goals of better forecasting but pose a significant challenge at a SKU level

Question: **What would be the greatest value for supply chain operations if you could improve forecasting and demand planning?**

20%

17%

25%

22%

16%

◆ Improve shipping and cost

◆ Optimize cost of carrying inventory/free up cash

◆ Increase revenue/ decrease missed sales

◆ Improve customer satisfaction

◆ More predictable business outcomes and planning

Cost-cutting and more predictable planning emerged as the most important reasons to improve supply chain forecasting. Even so, these numbers differ for retailers and manufacturers. Respondents within the manufacturing industry were more likely to state optimization of inventory cost as the primary driver for better forecasting (28% of manufacturing industry respondents vs. 25% across various industries).

Additionally, manufacturers were more motivated to improve shipping and its associated costs (20% for manufacturing vs. 16% for retail). And while retailers named the cost of inventory as the most significant factor, they were more likely to care about customer satisfaction (21% for retail vs. 15% for manufacturing).
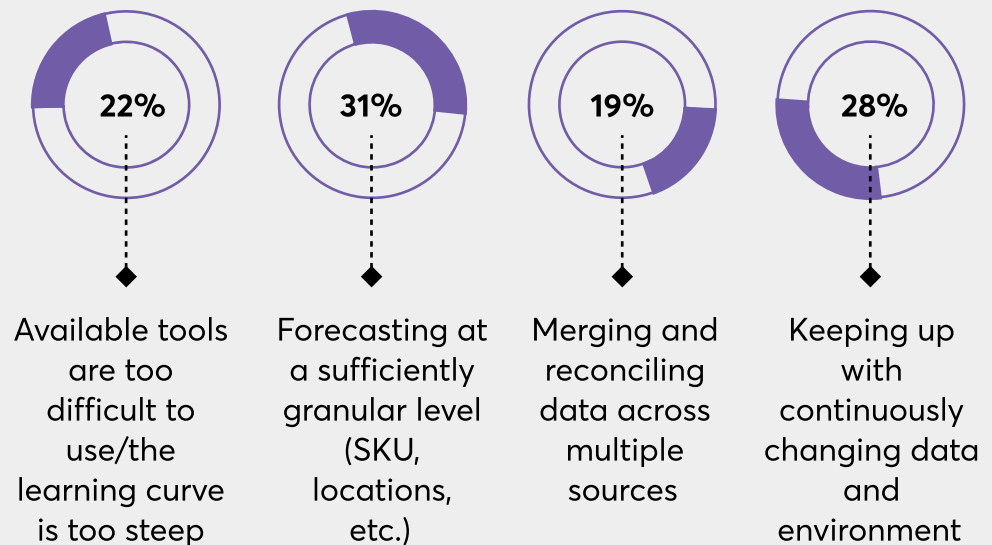
This trend is to be expected. While both manufacturers and retailers care about their customers, the nature of their customer relationships is quite different. Manufacturers sell to other businesses. They might have stronger bonds with their clients because of potential contractual agreements, a long history of collaboration, or unique products they supply downstream.

Retailers, on the other hand, sell to consumers who—while having a certain level of loyalty to a brand—are more likely to switch to a different brand if the product they are looking for is unavailable. Finally, more predictable business outcomes were the second most important value of an optimized demand forecast for both industries, though this result varies significantly depending on job roles.

While managers focus on tangible business goals (reducing costs and increasing revenue), their planning teams have more tactical, harder-to-quantify objectives for a more predictable planning process. As such, having more predictable business outcomes was the least popular goal among supply chain operations leaders but the most popular one among their direct reports.

Question: What data-specific issue is most frustrating for your analysts while doing forecasting?

22%	31%	19%	28%
Available tools are too difficult to use/the learning curve is too steep	Forecasting at a sufficiently granular level (SKU, locations, etc.)	Merging and reconciling data across multiple sources	Keeping up with continuously changing data and environment

The most popular issue with supply chain predictions is forecasting at a sufficiently granular level. This issue is especially painful across organizations that use basic Excel functions—41% mentioned it as their primary source of frustration. In comparison, 30% that use advanced Excel functions identified frequent industry changes as their source of frustration.

On the other hand, unlike users of more advanced tools, Excel users did not think it was hard to use or had a steep learning curve. A separate question is whether supply chain professionals find Excel easy to use because it is indeed easy to use or because this is the tool they have been utilizing for many years, despite its clear limitations.

The need for improved forecasting

Why is your organization considering improving supply chain data forecasting?

30.11%

27.27%

19.32%

23.30%
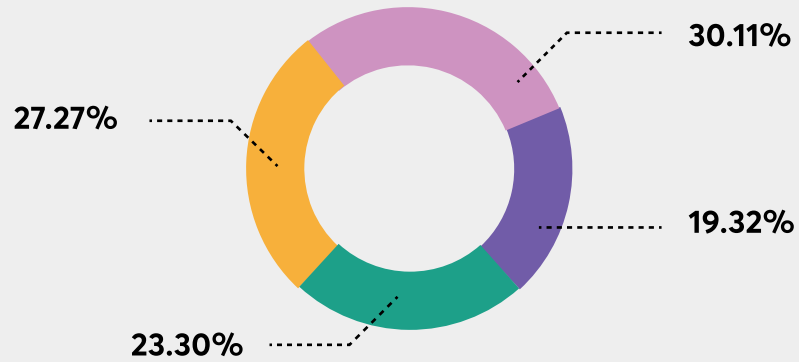
◆ We need a solution for integrating and analyzing data in disparate systems

◆ We are unable to manage our data-intensive workflows manually

◆ We can't forecast accurately

◆ We are unable to take advantage of AI and machine learning capabilities

For almost a third of all respondents, having a solution that would integrate data from disparate systems is the number one reason organizations consider improving their supply chain data forecasting. However, nearly an equal number of respondents said their inability to take advantage of AI and machine learning capabilities is the main reason for improving supply chain forecasting.

Remarkably, being unable to manage data-intensive workflows emerged as the most popular issue among retailers (36%) and the second most popular answer among supply chain leaders (26%).
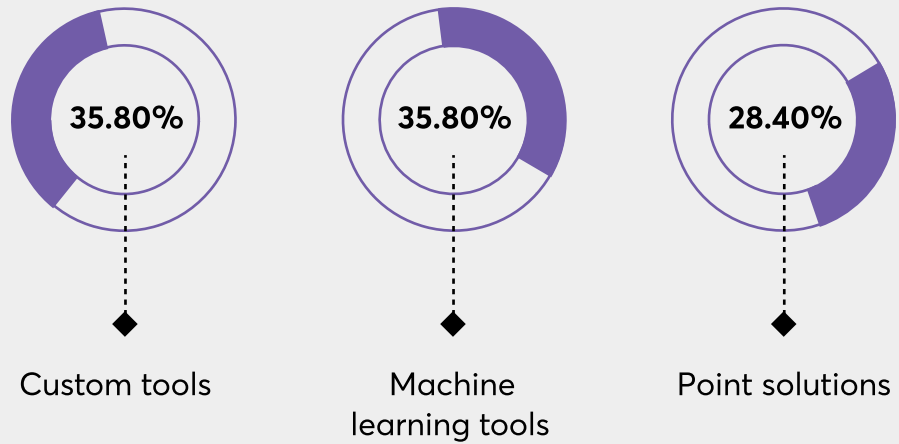
3.

The innovation ahead

Machine learning in demand forecasting and planning is yet to be adopted industry-wide—but the trend continues to grow, especially among industry leaders

The innovation ahead

Question: **What techniques/tools have you considered to improve forecasting accuracy and efficiency?**

35.80%

Custom tools

35.80%

Machine learning tools

28.40%

Point solutions

When it comes to demand forecasting, companies prefer AI-powered tools or custom solutions that are potentially built in-house—point solutions are the least popular option. Interestingly, the tool considered for improving forecasting accuracy is strongly correlated with the self-assessment findings.

If an organization is using machine learning to achieve greater accuracy in forecasting, they are also more likely to rate themselves as being ahead of their peers. At the same time, those with custom tools frequently identify themselves as laggers.

Question: **How have you tried to apply machine learning as part of your supply chain forecasting?**

23.86%

14.77%

18.75%

16.48%

26.14%
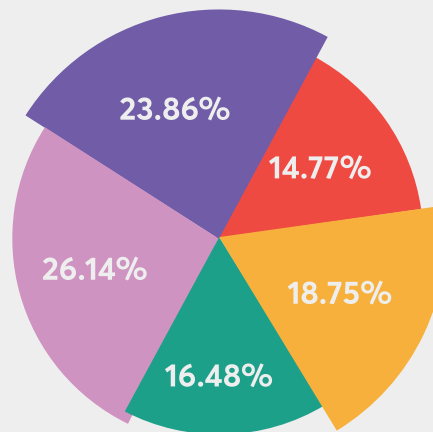
◆ We have plans to investigate and assess machine learning as part of our supply chain forecasting

◆ We have no plans to apply machine learning to supply chain forecasting but would like to learn more

◆ We have no plans to apply machine learning to supply chain forecasting

◆ We have fully implemented machine learning as part of our supply chain forecasting

◆ We have experimented with applying machine learning to supply chain forecasting

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Most companies still use Excel as their primary tool for demand forecasting, with 60% of organizations using a combination of basic and advanced Excel functions.

Even though many companies consider themselves data-driven, most companies have not fully embraced machine learning for supply chain forecasting. Thus far, only 14.7% of all respondents reported fully embracing machine learning.

Another quarter reported experimenting with these more modern trends. Of all organizations across industries and sizes, 40% started taking advantage of machine learning for supply chain forecasting. This means that about 60% of organizations still use old demand prediction and planning methods, even with known issues and disruptions.

For organizations that don't use machine learning, 36% of larger companies (5,000 employees and above) are more likely to have plans to adopt it in the near term compared to 21% of smaller companies (less than 5,000 employees). These results might be explained by better access to resources—such as talent, time, or budget—to implement the new tools.

Overall, the adoption of machine learning continues to grow stronger. With an additional 26% having plans to use AI/machine learning in the future, supply chain leaders see the value in adopting AI-based technologies for demand forecasting and planning.

Conclusion

There's still room for improvement when it comes to using data for demand forecasting in supply chain-heavy industries. A third of the organizations lag behind, and less than half make data-driven decisions. The reasons for this vary: from merging and managing data from multiple systems that don't talk to each other to being unable to forecast at a SKU level. And while the existing tools (like Excel) served their purpose and are easy to use (everyone knows how to use them), they don't necessarily help resolve these issues.

Additionally, most organizations can't use machine learning as a part of their current setup. Only 14% reached maturity in machine learning, but the trend is clear—more have been experimenting with machine learning, and more are looking to try it soon.

About Ikigai

Ikigai's operational BI platform transforms the way businesses make tactical decisions. Business-user-friendly UI/UX enables anyone to infuse and prepare data and run robust AI-powered analyses to achieve their business goals.

DeepMatch stitches together even the most disparate datasets in minutes without any data pre-processing. This patented technology improves over time and learns from humans.

The proprietary DeepCast technology generates forecasts on as little as a few weeks of data, also with higher accuracy than any other method.

Instead of comparing a handful of what-if scenarios, Ikigai's proprietary how-to analysis evaluates up to 10^19 options and identifies the most optimal ones for any given parameters.

Learn more at ikigailabs.io