

Don't overlook the importance of KPIs in AI/ML projects

By Maria Jesus Saenz



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The role of KPIs

In AI, an algorithm or robot performs cognitive functions that are typically associated with the human mind, such as learning or interacting with the environment. These algorithms or robots require anchor points when analyzing a situation or process.

KPIs provide the anchor points in AI/ML projects by helping to define what outcomes we should expect when using the models to, say, improve a supply chain process. In that regard, the aggregated layers of KPIs provide a structure for decision-making and become critical to the success of the project.

Performance indicators also anchor the complex data sets that AI/ML models analyze and interpret. This is particularly important when the objective is the digital transformation of the supply chain, projects that typically draw data from many disparate sources.

These layers of data represent different units and entities and must be connected end-to-end if the project is to achieve its goals. An example of such a unit is an SKU, which may be represented in terms of how it is manufactured, which logistics services provider delivers it over the last mile or even the contracts that frame these services. Because performance is measured in these different contexts, a KPI, or anchor point, ties the multiple data layers together.

Artificial Intelligence (AI) and Machine Learning (ML) are affecting many areas of supply chain management, including the use of key performance indicators (KPIs).

As critical measures of operational performance, KPIs are fundamental to the efficiency of supply chains. Artificial Intelligence (AI) and Machine Learning (ML) can reshape the way KPIs are chosen and applied and facilitate the development of new ones. KPIs also play an important role in guiding AI/ML projects to successful outcomes.

Think of streams of data as strands that run through the end-to-end supply chain to form a multi-layered fabric. The KPIs are like buttons or fasteners that link the different layers together.

Linking AI/ML with KPIs

AI/ML coupled with performance indicators can be a powerful combination when the goal is to improve a supply chain process or achieve across-the-board efficiencies.

An increasingly common application is improving the accuracy of demand forecasts. Often, such an AI/ML project introduces new sources of market-related data such as promotions from competitors, weather forecasts or changes in government policy to refine demand forecasts. Combining AI/ML technology with relevant KPIs enables the project team to measure the increase in forecast accuracy achieved when the new data sources are introduced and to guide the algorithm to rely on the most impactful data.

Sometimes, the addition of a new KPI is necessary for an efficiency-building strategy identified by the AI/ML analysis to work.

One example is a project to create a digital platform that enables different types of retailers to collaborate in last mile delivery. Let's assume that the platform comprises grocery outlets, restaurant online delivery services and dry-cleaning services. On a day-to-day basis, these entities

use different supply chain KPIs owing to the different nature of their respective business models. However, over the last mile the retailers have one goal in common: to improve on-time delivery. The AI/ML analysis shows that this common objective provides an opportunity to raise the efficiency bar by sharing logistics resources.

To capture the opportunity, a new KPI is introduced that helps the parties achieve the level of network density required to pool logistics services. The new KPI could measure each retailer's contribution to density to identify those that are contributing the most, and incentivize the parties that need to step up their efforts. Perhaps the analysis indicates that certain parties need to build more flexibility into their delivery processes.

If the hypothetical platform described above supports hundreds of retailers, an AI/ML/KPI combination can be used to identify clusters of retailers that excel in certain areas of performance. Delivery performance can be integrated with current ratings from customers in that area. The model investigates why these groups excel in this way, and whether the lessons learned can be applied more widely.

It follows that the development of new KPIs is a way to distill new sources of "value" from the data analytics and to quantify them and include them in a model's set of optimizing functions. Moreover, once the right KPIs have quantified these sources of value, we can translate them into monetary terms and learn how to monetize them.

Developing KPIs to achieve performance goals also extends to suppliers. For example, we worked with a leading company in the soft drinks market that decided it needed to develop a synchronized distribution network as part of a broader strategic plan to increase efficiency. It used AI/ML to identify the KPIs required to measure the degree of synchronization to aim for in its diverse, segmented supply chain. The company also used the approach to identify which KPIs suppliers such as logistics service providers would need. In addition to measuring ongoing performance, the KPIs measured performance gaps in terms of individual suppliers, clusters of suppliers or the geographic areas covered.

AI/ML can help companies connect the KPIs that were key to the business in the past, with those that will be needed in the future. A comprehensive panel of KPIs can be used to build forward-looking scenarios. The project team can then integrate backward-looking, traditional KPIs driven by historical data, with the forward-looking KPIs, to shape their business projections over the next three years to five years based on new trends, market disruptions or demographic changes.

Develop a new mindset

We believe that the importance of KPIs in AI/ML projects will increase over the next few years as companies collect more data and refine their analytical methods.

To take full advantage of these opportunities, companies need to think of KPIs in an AI/ML context. For example, in our work we measure the degree of improvement attained with specific KPIs and pinpoint the factors that are driving the gains. We call these improvements "key learning indicators" or KLIs. The KLIs help us to track how the AI/ML analysis is evolving, and to scale the benefits. Importantly, identifying the improvements in this way also helps to engage and motivate the people involved.

These concepts are especially important when the overall goal is the digital transformation of the supply chain. Achieving such an ambitious goal requires flexible, innovative approaches to managing agile projects.

Digital supply transformation also requires dynamic feedback loops that project teams use to measure progress by selecting the right KPIs and KLIs. A company we worked with in the consumer electronics business based the digitization of its supply chain on a customer-centric vision. At the vision's core was making the right commitment to customers by delivering positive, end-to-end experiences. For this company, on-time-in-full delivery was a critical KPI in its digital transformation journey.

As these examples illustrate, a critical component of emerging road maps to digitizing supply chains is how companies deploy AI/ML/KPI combinations.

The innovative application of KLIs will refine AI/ML modeling and what these models can deliver. For example, we can select KLIs to monitor how different AI agents—an algorithm, robot or human expert, for instance—contribute to the model's collective intelligence and ultimately its decision-making capabilities. What does the algorithm learn from, say, a human expert on demand forecasting that improves forecast accuracy and vice versa?

We are learning that sometimes simple KPIs like "thumbs-up" or "thumbs-down" performance indicators are needed to guide the AI system as it adapts to informational changes and the evolution of goals/requirements. Perhaps the system needs to readjust after receiving NPS (net promoter score) data collected from the user of a supply chain process owner about the usability of the AI-driven predictions.

Companies should also keep in mind that AI/ML models are dynamic; the improvement strategies identified today may have to be modified as the model learns from experience. Hence, it may be necessary to revisit the KPIs used. Changes such as the introduction of a new product or market can also change the context of the model. ∞