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RESEARCH REPORT

FINDINGS FROM THE 2018 STRATEGIC MEASUREMENT GLOBAL EXECUTIVE STUDY AND RESEARCH PROJECT

Improving Strategic Execution with Machine Learning

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Improving Strategic Execution with Machine Learning

Machine learning (ML) is changing how leaders use metrics to drive business performance, customer experience, and growth. A small but growing group of companies is investing in ML to augment strategic decision-making with key performance indicators (KPIs). Our research,[1] based on a global survey and more than a dozen interviews with executives and academics, suggests that ML is literally, and figuratively, redefining how businesses create and measure value.

KPIs traditionally have had a retrospective, reporting bias, but by surfacing hidden variables that anticipate "key performance," machine learning is making KPIs more predictive and prescriptive. With more forward-looking KPIs, progressive leaders can treat strategic measures as high-octane data fuel for training machine-learning algorithms to optimize business processes. Our survey and interviews suggest that this flip — transforming KPIs from analytic outputs to data inputs — is at an early, albeit promising, stage.

Those companies that are already taking action on machine learning — investing in ML and actively using it to engage customers — differ radically from companies that are not yet investing in ML. They are far more likely to:

- Develop a single, integrated view of their target customer.
- Have the ability to drill down to see underlying KPI data.
- Check their KPI reports frequently.

These differences all depend on treating data as a valuable corporate asset. We see a strong correlation between companies that embrace ML and data-driven decision-making.

Augmenting Execution With Machine Learning

Nearly three quarters of survey respondents believe their organization's current functional KPIs would be better achieved with greater investment in automation and machine-learning technologies. Our interviews with senior executives identified a variety of innovative ML practices. Without exception, the companies with the most intriguing and ambitious ML initiatives were the ones

ABOUT THE RESEARCH

This report explores some of the key findings from the authors' 2018 research study of KPIs and machine learning in today's corporate landscape. The research, which involved a survey of 4,700 executives and managers and interviews with more than a dozen corporate leaders and academics, has far-reaching implications for modern businesses. We focused our analysis on 3,225 executive-level respondents; more than half were marketing executives.

The study strongly suggests that data-driven organizations that align incentives, KPIs, and ML capabilities have distinct advantages over those that move too slowly to develop their data capabilities. For business leaders serious about succeeding in digital market environments, these shifts offer a clear and urgent call to action.

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with the most serious commitment — cultural and organizational — to managing data as a valuable corporate asset.

The marketing function is often an early adopter of machine learning in the enterprise. Applications in advertising, customer segmentation, and customer intelligence have become common.[2] Even among marketers, however, slightly less than half of surveyed companies have incentives or internal functional KPIs to use more automation and ML technologies. (See Figure 1, page 4.) It is highly unlikely this finding reflects ML saturation in the enterprise. Most of the executives we interviewed for our study are focused more on ML's potential than its actual development or deployment.

Kelly Watkins, vice president of global marketing at Slack, is exploring machine-learning solutions. For Slack, an essential KPI is determining which businesses using the company's free workplace collaboration app are good candidates for converting to paid subscriptions for premium features. "This is an effort that the marketing organization, product organization, and the sales organization are working on together," Watkins says. "Can we train lead-scoring algorithms to really get a sense of, based on a variety of criteria, what's the best place for sales reps to start among the options that they have for outreach?"

Watkins also envisions implementing machine learning to handle routine tasks currently performed by Slack employees. She says her intention is to "enable folks in my organization to use their minds to solve strategic problems and to be more consistently looking for insights in the data that can shift the strategy and shift execution, up-leveling their daily mode of operating." In short, Watkins sees an ML future transforming both efficiency and strategy.

Having incentives to use machine learning and automate processes is a strong signal that a company is either readying itself or already prepared to compete in digital-first environments.

The ML leaders in the marketing function distinguish themselves from the laggards in the following three ways:

- They use their KPIs to develop a single, integrated view of their customers.
- They can digitally drill down to see their KPI components.
- They check their KPI reports with greater frequency.

Developing a Single, Integrated View of Customers

At a time when business leaders generally want a more data-driven, holistic view of their customers, more than 80 percent of respondents with incentives to use machine learning report that their functional KPIs help them develop such a view. Among organizations without ML incentives, that number drops below 50 percent. (See Figure 2.) This focus greatly enhances an organization's ability to segment and engage its customer/client base. In digital marketplaces, enhanced awareness and anticipation of customer needs can ultimately help turn customers into champions for the brand. Several executives told us they see ML as essential to that end.

Amit Shah, CMO of 1-800-Flowers.com, captures the enhanced value of aligning smart algorithms with greater corporate goals: "All of our AI efforts are highlighting for us the central learning we have had, that all of this is helping us learn about our customers, learn about ourselves, and ultimately learn about how we leverage technology. It has less to do with, 'What are the workplace savings because we have bots?'"

For some leading companies, machine learning effectively expands the role of KPIs. Where KPIs were once analytic outputs to inform human decision-making, they are fast becoming data inputs to train machines to deliver better business outcomes. The technical and business importance of this inversion could be profound.

FIGURE 1: INCENTIVES TO USE MACHINE LEARNING

Slightly less than half of surveyed companies have incentives or internal functional KPIs to use more automation and machine-learning technologies to support marketing initiatives.

Do you have incentives or internal functional KPIs to use more automation and machine-learning technologies to drive marketing activities?
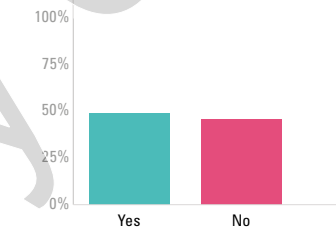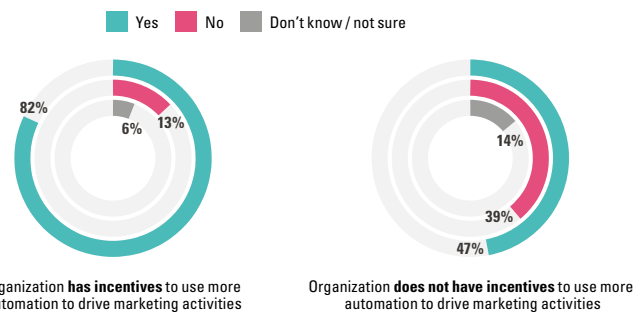

Percentages do not total 100 due to "Don't know" responses.

FIGURE 2: DEVELOPING A SINGLE, INTEGRATED VIEW OF CUSTOMERS

More than 80 percent of respondents with incentives to use machine learning report that their functional KPIs help them develop an integrated view of target customers.

Do your functional KPIs help your function develop a single, integrated view of your target customers?

Organization **has incentives** to use more automation to drive marketing activities

Organization **does not have incentives** to use more automation to drive marketing activities

Percentages do not total 100 due to rounding.

Drilling Down to See Underlying KPI Data

Those with machine-learning incentives are more than twice as likely as counterparts that lack such incentives to agree or strongly agree that they can easily drill down to see the underlying data or analytic components aggregated into their KPIs. (See Figure 3.) The ability to see and interpret factors driving KPI outcomes creates greater transparency around operational effectiveness. This fosters greater shared understandings of corporate data, which, in turn, supports a data-driven, decision-making culture. Not surprisingly, companies with ML incentives agree at an above-average rate with the statement that they are better than their rivals at making data-driven decisions.

What's more, companies can use high-frequency data and analytics to empower software and systems to anticipate customer and business needs and move smarter decision-making upstream. Andrew Low Ah Kee, chief revenue officer at GoDaddy, says his organization is "extremely bullish" on the possibility of its systems' learning from its huge stores of data. "We are very excited about using outcome measures to help personalize and improve an individual's online experience to help them find the right products for whatever they want to do," he says. For early adopters, machine learning enables a shift in focus to metrics that are forward-looking and predictive rather than retrospective and reactive.

Checking KPI Reports Frequently

Survey respondents whose organizations have incentives to use machine-learning technologies to drive marketing activities are roughly twice as likely to check their KPI reports hourly or daily than those whose organizations aren't investing in ML. (See Figure 4, page 6.) The frequent monitoring is an indication that those companies' KPIs are not merely "key" in name only; they reflect the enterprise's strategic priorities and enable daily or more frequent assessments of organizational effectiveness.

The ability to assess organizational performance on a daily basis can be extremely useful for organizations seeking to increase their responsiveness to sudden market shifts. These may include abrupt changes in customer behavior, disruptive arrivals of unexpected competition, or even macroeconomic factors — from inflation to political crises to climate events. In fast-moving markets, KPIs that anticipate timely business risks can provide critical information for strategic decision-making in between planning review meetings. "I'm looking at marketing automation almost daily to understand what kinds of things are resonating," notes Hannah Grove, CMO of financial services company State Street.

FIGURE 3: ABILITY TO DRILL DOWN TO UNDERLYING KPI DATA

Respondents with incentives to use machine learning for marketing purposes are more than twice as likely as those lacking incentives to agree that they can easily drill down to see the underlying data or analytic components aggregated into their KPIs.

I can easily drill down to see the underlying data or analytic components that are aggregated into my KPIs.

Agree   Disagree

3%
65%
Organization **has incentives** to use more automation to drive marketing activities

15%
28%
Organization **does not have incentives** to use more automation to drive marketing activities

Percentages do not total 100 due to "Don't know" responses and rounding.

What's Next

A small proportion of companies are currently investing in machine learning to improve strategic execution across their business. While a significant number of marketing executives say their function is using machine learning for marketing activities, even within the marketing function, more executives *believe* ML can help their function achieve its KPI outcomes. Fewer say that their function is investing in ML in this way.
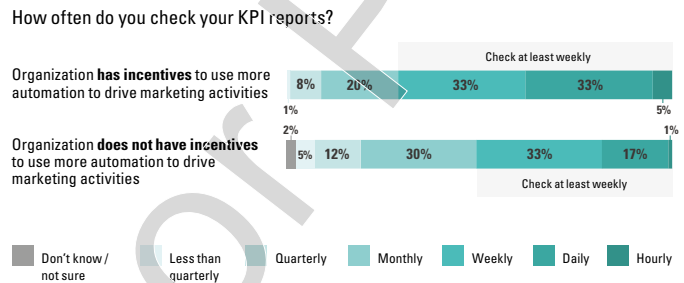
Machine-learning capabilities are fast becoming a baseline measure of a company's ability to compete. To improve these capabilities, executives should consider three questions:

1. **Are you making the right levels of investment in data and its governance and trustworthiness?** Data-driven decision-making and machine learning all start with data. Questionable data quality will undermine or corrupt machine-learning initiatives. Are you treating data as a valuable corporate asset?

2. **Does your organization have incentives to use machine learning to address pressing business problems?** Internal pilot programs are a good place to start. But, scaling these initiatives is key. If the pilots are successful, what incentives will enable broader adoption in the enterprise? If the pilots fail, does your culture penalize or support reasonable failure?

3. **Are your KPIs more forward-looking or backward-looking?** What would your strategy meetings look or sound like if your KPIs were more forward-looking? How can you use machine learning to create more adaptive KPIs that enhance your ability to predict and prescribe your future performance?

The 2017 *MIT Sloan Management Review*/Boston Consulting Group report "Reshaping Business With Artificial Intelligence" concludes with a warning: "Just about any company today needs a plan with respect to AI. Most do not have one, and those that have been slower to move have some catching up to do. Those that continue to fall behind may find the playing field tilted evermore steeply against them."[3]

We see parallels with regard to machine learning in the current business landscape. Given the imbalance between ambition and action, there is a clear need to improve access to ML. One option is to bake it into interfaces and dashboards already in use.

FIGURE 4: FREQUENCY OF CHECKING KPI REPORTS

Respondents with incentives to use machine learning for marketing activities are twice as likely to check their KPI reports hourly or daily.

How often do you check your KPI reports?

	Don't know / not sure	Less than quarterly	Quarterly	Monthly	Weekly	Daily	Hourly
Organization **has incentives** to use more automation to drive marketing activities	1%	8%	20%	33%	33%		5%
Organization **does not have incentives** to use more automation to drive marketing activities	2% 5%	12%	30%	33%	17%		1%

Check at least weekly

"It's going to be very difficult to overcome one-on-one learning that is potentiated by machine learning outcomes and algorithms."

– Amit Shah, CMO, 1-800-Flowers.com

We have observed that as more companies move to adapt to changes demanded by digital disruption, others have followed in response. The early adopters of machine learning may well inspire their competitors in a similar way. As Shah of 1-800-Flowers.com warns, "I think what we will find, five years down the road, is that the people who took the early bets in artificial intelligence actually achieve the learning that cannot be copied. I don't think you can short-circuit your way the way you can do with other channels. It's going to be very difficult to overcome one-on-one learning that is potentiated by machine-learning outcomes and algorithms."

There are methods to using KPIs, individually and collectively, to teach machine-learning systems to improve and optimize their performance. Our analysis, both here and in our June 2018 report, strongly suggests that early adopters explicitly use KPIs to reinforce analytics best practices. Opportunities to link these technologies to today's robust data capabilities are plentiful. To take advantage, many organizations will need to transform their cultures and operations to some degree. But companies that do not invest in machine learning now, and don't implement the array of changes that investment entails, risk being left behind.

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REFERENCES

1. M. Schrage and D. Kiron, "Leading With Next-Generation Key Performance Indicators," *MIT Sloan Management Review*, June 2018.

2. M. Yao, "14 Ways Machine Learning Can Boost Your Marketing," *Forbes*, April 10, 2018.

3. S. Ransbotham, D. Kiron, P. Gerbert, and M. Reeves, "Reshaping Business With Artificial Intelligence," *MIT Sloan Management Review* and The Boston Consulting Group, September 2017.

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