



How to transition your organization into using real-time KPIs

By John J. Oskin

Data-driven decision-making has become overwhelming for many industries. Pressures and responses to such concerns as globalization, performance margins, integrating supply chains and balancing costs with customer service have produced voluminous amounts of data at previously unthinkable levels.

Data has increased in resolution as many plant and supply chain operating metrics are now measured in minutes vs. hours or hours vs. days. Further, measurement types have increased as hundreds of data points within a supply chain have

given way to thousands. As a result, some believe the issue is quantity of information when the real focus should be faster insight.

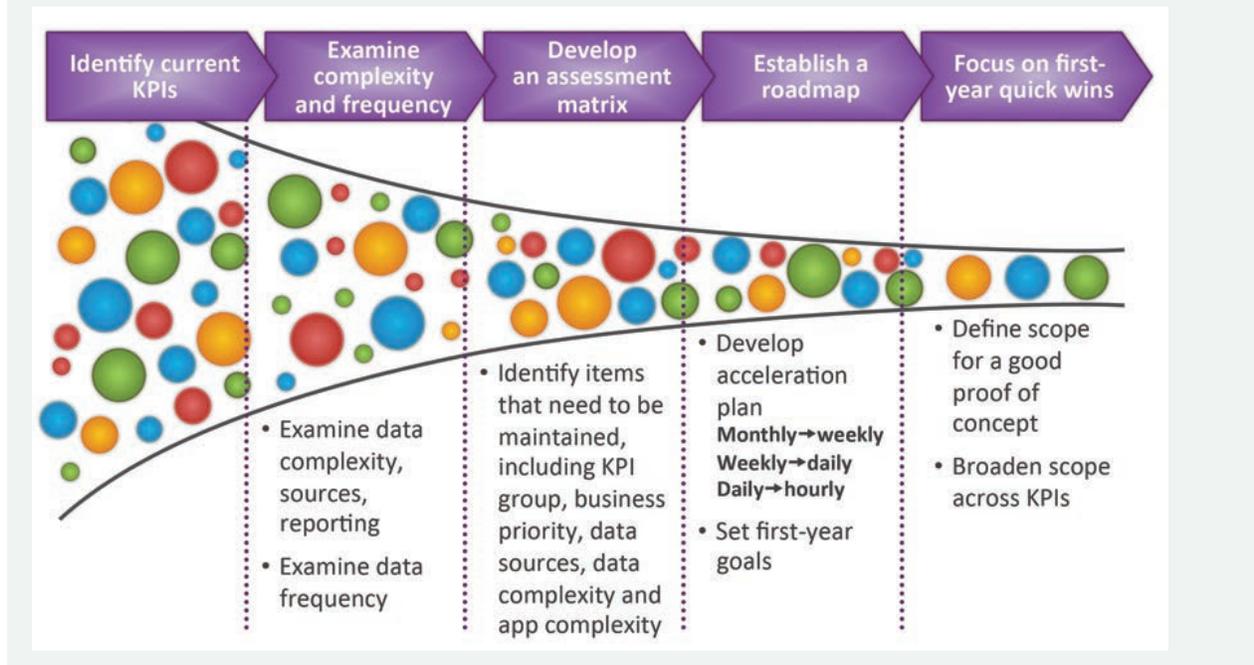
On its website, IBM reports that the world generates 2.5 quintillion bytes of data a day. In addition, the company notes that 90 percent of the data in the world has been created in the last two years. With this enormous and ever-growing volume, deriving insights used for decision-making has become almost impossible without a systemic methodology that can analyze data without drowning in it.

Whose job is this? The entire organization's – from execu-

FIGURE 1

Quicker KPIs

Organizations can follow this five-step methodology to help them migrate to real-time KPIs.



tives to middle management to supervisors to hourly employees. Using a team approach, companies can focus on how to use data to create a culture of continuous improvement.

Data is most valuable when used to improve a competitive position. This occurs when companies focus on such business-critical concerns as identifying the most profitable customers, determining the most difficult products to manufacture and deliver to customers, and quality issues that can cause customer payment delays that negatively affect working capital.

Real-time KPIs

Real-time key performance indicators (KPIs) are business metrics that provide relatively quicker insight than standard KPIs that review business performance on a monthly or quarterly basis.

With a quarterly review, for example, the wrong activity or behavior could be occurring for the entire three-month period before action can be taken. This could lead to a number of problems. For example, the business could be making a poor quality product for one full quarter. Or a manufacturing plant could be falling behind schedule. And while this is happening, customers could be reallocating their business to competitors due to lagging customer service issues.

At the heart of these issues is the accuracy of KPIs and the need for them to be real time. As recently as five years ago, management based its KPIs on the “50-slide business process deck.” While a useful method at the time, this approach is no longer best practice. In the past, KPIs might have been discussed at meetings, but it wasn’t until weeks later that actions

were taken. With advances in technology, including mobile devices, organizations now can leverage real-time KPIs prior to such meetings. As a result, meetings can be more action-oriented.

To ensure KPIs can benefit the entire organization and improve decision-making, the management team must rethink KPIs. One way to accomplish that is to reduce the number. A second way is to eliminate working with metrics across all time horizons (annually, quarterly, monthly, daily, hourly) and rely on today’s mobile and network infrastructure to use a subset of KPIs in real time.

The shift lends itself to a “shallow-dive approach” instead of a deep dive into the ocean of data. The shallow-dive approach provides an instantaneous look and insight into the areas where deep diving may be warranted.

Shallow diving is a five-step process

The concept of “relatively quicker” refers to reducing the time a KPI is updated and propagated to stakeholders in the organization who need access to the KPI. A real-time KPI can be updated on a daily basis, or even sooner if needed.

The five-step process shown in Figure 1 could be used to transform an organization from static KPIs to real-time dynamic KPIs. The five steps are: Identify current KPIs; examine the complexity and frequency of the KPIs; develop a KPI matrix; establish a roadmap; and focus on initial wins.

Step one is to take and catalog a true inventory of KPIs in use across the business. Typically when organizations take such an inventory, primary KPIs are identified. A primary KPI, as

FIGURE 2

A three-level hierarchy

Step one is to identify your organization's current KPIs and group them into themes such as quality, safety, manufacturing performance, etc. Every KPI grouping typically has a primary KPI and then supporting KPIs. For safety, you may have an overall safety index with supporting KPIs like lost-time incidents, OSHA recordables, near misses and days without accidents.

KPI group	Primary KPI	Supporting KPIs	
Manufacturing performance	OEE	<ul style="list-style-type: none"> Minor/major stops Capacity utilization 	<ul style="list-style-type: none"> Total effective equipment performance Gallons produced
Quality	Percent out of spec	<ul style="list-style-type: none"> CP CPK PPM 	<ul style="list-style-type: none"> Sigma level Quality incidents
Safety	Safety index	<ul style="list-style-type: none"> Lost time incidents Days without accidents 	<ul style="list-style-type: none"> OSHA recordables Near misses
Cost variance	Annual operating plan variance	<ul style="list-style-type: none"> Percent cost per unit variance Standard cost 	<ul style="list-style-type: none"> Actual cost Overhead variance
Work order compliance	Percent on-time completion	<ul style="list-style-type: none"> Planned work orders Unplanned work orders 	<ul style="list-style-type: none"> Planned work order on time Planned/unplanned ratio

FIGURE 3

Frequency and complexity

Step two is to examine the complexity of your key performance indicators, along with their frequency of use. Examine data readiness, analytics readiness and baseline the frequency.

KPI group	Business priority	Data sources	Data readiness	Analytics readiness	Update frequency	Review frequency
Manufacturing performance	HIGH	EMI and MES systems	YES	HIGH	Daily	Weekly
Quality	HIGH	Quality systems	NO	LOW	Monthly	Monthly
Safety	VERY HIGH	Access database	YES	HIGH	Daily	Weekly
Cost variance	MEDIUM	ERP	YES	HIGH	Daily	Weekly
Work order compliance	HIGH	ERP	NO	LOW	Weekly	Monthly

shown in Figure 2, is considered the second level of a three-level hierarchical taxonomy that descends from KPI group to primary KPI to supporting KPIs. For example, a manufacturing performance KPI group would have OEE as its primary KPI. Supporting KPIs could be minor and major line stops, capacity utilization, total effective equipment performance and gallons produced.

Step two involves examining KPI frequency and complexity and is highlighted in Figure 3. This is the “thinking” step where collaboration with members within the organization takes place. The items for each KPI to be examined include:

- Business priority: KPIs that offer a material impact to the business and shareholder value
- Data sources: IT systems where data is generated and/or stored – ERP, enterprise manufacturing intelligence, manufacturing execution system, quality, etc. This is an important step where some organizations realize that the same KPI is generated and/or stored in multiple systems. This is where a decision may be made to standardize where the KPI is generated.
- Data readiness: Can the data easily integrate and be provided to other systems and/or team members?

- Analytics readiness: Do these KPIs feed into the KPIs, or are they derived from other KPIs?
- Update frequency: The frequency that data for KPIs is updated
- Review frequency: How often the KPIs are reviewed

The last two items provide a true assessment of whether the KPI in question can be real time. If a KPI is updated monthly, then real-time possibility may not be immediate. Weekly and daily KPIs are the most real-time ready. Look for a downward trend in KPI review frequency, moving from quarterly to monthly, monthly to weekly and then weekly to daily.

It is important to note that even if a KPI is updated and reviewed quarterly, the process and organizational discipline to continue the downward trend is crucial. While a quarterly to monthly trend does not provide an immediate opportunity for real-time capabilities, the downward trend may continue and a real-time opportunity may arise over time. Alternatively, there may be value migrating from quarterly to weekly when a weekly update or review cycle for the specific KPI may offer the maximum value for the business.

A word of caution: In this step, companies might report, “We sometimes review on-time in full (OTIF) daily, sometimes weekly, sometimes monthly.” Every time this comment is repeated, it is a red flag. Applying discipline and consistency to the review process is a necessary and vital outcome. If KPIs are not reviewed regularly, it is an indication that their value to the business is not recognized and supported. Optimizing review frequency provides another step in the process for transforming to real-time KPIs.

Step three develops a KPI complexity matrix to establish priorities. A matrix can be developed by leveraging knowledge gained from the prior step. This matrix can be used to communicate specific business knowledge about KPIs, knowledge that will be applied during the next phase when a roadmap is developed. The items that need to be maintained in this matrix include KPI group, business priority, data sources, data complexity and app complexity.

Step four defines a long-term roadmap. Migrating to real-time KPIs can be a large undertaking for any organization. To ease the transition, consider a rollout plan that considers a technology roadmap of other business systems that could affect the reporting nature of information.

In this process, a key factor to consider is data sources. Real-time KPIs for labor or quality may require either a new workforce management system or a new quality management system. If both are scheduled to go live in two years, real-time KPIs that utilize these data sources should be part of the technology roadmap. An organization that has just implemented an updated ERP or a modern inventory management system may have easy access to inventory, therefore, inventory-based KPIs could be rolled out sooner.

Mining for safer measures

In the case of dangerous mine work, tracking the right KPIs could make the difference between life and death.

The Australian Department of Mines and Petroleum recommended that companies change their key performance indicators to reduce the number of deaths, *The West Australian* reported. Attacking the causes of serious injuries has a better chance of reducing fatalities than overall safety performance measures that most companies use.

“A KPI based on the incidence rate for amputations, fractures and crush injuries (AFC) has potential as a lead indicator to measure the effectiveness of fatality-prevention strategies,” the report said.

Most companies calculate bonuses for staff and management via frequency rates for lost-time injuries or restricted work injuries. But the Department of Mines and Petroleum report, which analyzed 658 serious injuries in the last six months of 2013, suggested those measures don't help companies reduce the number of fatalities, according to the newspaper.

Work site mining deaths have averaged two to three a year for more than a decade, showing no decline even as overall injury rates continue to drop.

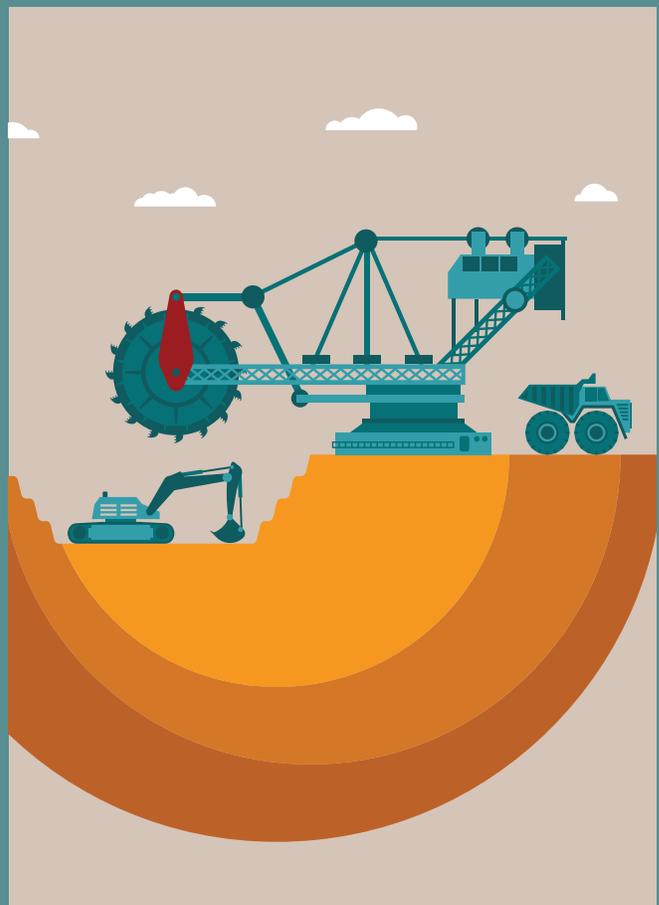


FIGURE 4

On to victory

As a group, decide what the quick wins are. In this example, cost variance emerged as a key KPI group that was a good candidate for migrating to real time.

KPI group	Data complexity	Business priority	Data readiness	Analytics readiness	Update frequency	Review frequency
Manufacturing performance	MEDIUM	HIGH	YES	HIGH	Daily	Weekly
Quality	HIGH	HIGH	NO	LOW	Monthly	Monthly
Safety	HIGH	VERY HIGH	YES	HIGH	Daily	Weekly
Cost variance	LOW	MEDIUM	YES	HIGH	Daily	Weekly
Work order compliance	LOW	HIGH	NO	LOW	Weekly	Monthly

Items in a long-term roadmap could include migrating the inventory KPI from monthly to weekly this year. Next year, the map could include the goal of migrating the order fulfillment KPI from weekly to daily.

For step five, identify first-year quick wins. By reviewing business impact and availability of data and refresh rate, the organization can determine which KPIs can translate the fastest to business or financial improvement. Among the questions to ask are:

- Will the business function that the KPIs support improve in performance?
- How will real-time behavior affect this improvement?

In the KPI matrix in Figure 4, the KPI cost variance has been identified as a strong initial candidate for a real-time transformation because it is important to the business. The data is available, not very complex and updated daily.

Note that the KPI work order compliance has a high business priority; however, the data readiness attribute of this KPI shows “no,” and the analytics readiness attribute is “low.” In this case, the organization will have a challenge accessing the data. Therefore, while this KPI is important, the ability to leverage it in a real-time manner may not be immediate.

To move forward on the work order compliance KPI, the organization will have to improve its data and analytical readiness. This scenario represents a good opportunity to review and improve the system where this KPI is generated and stored.

Diving, deep vs. shallow

Many business intelligence systems provide KPIs. That’s not the challenge. Of greater relevance and importance are quick access and information that is not so detailed that it can drown most executives.

Using a swimming metaphor, it is nearly impossible to

drown in data when the pool of information is shallow. This metaphor can be applied to analytics. When reviewing the KPI matrix, supply chain executives and knowledge workers need to focus on the key set of metrics that provide high-level insight and directions on the areas that may require a deeper dive.

It is a waste of resources to take a deep dive without first skimming the surface of the data to determine where you need to focus your resources.

Shallow-dive analytics are quite specific, but they are user-friendly and offer quick access to KPIs. The primary audience for them is executives rather than analysts.

A key consideration when examining shallow-dive analytics is the attention span of society in general and executives in particular. According to an April 2015 study by the Statistic Brain Research Institute, the average human attention span has dropped from 12 seconds in 2000 to 8.25 seconds in 2015. That is not a long time for people to concentrate before they are distracted. Here’s another interesting fact from Statistic Brain: People read only 28 percent of the words on an average Web page.

These findings need to be understood in the context that digging deep and providing more information can be counterproductive. Apply these statistics to executives who receive far more external stimulation than the average worker. They verify the need for executives to have the option of KPI shallow dives. Without the latter, important metrics will go unnoticed and business improvement opportunities are likely to be lost. ❖

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