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ANALYTICS & MANAGEMENT
Dashboards for Business Success

With the increased use of computers and automation in construction, data is captured across many business processes and can cover such areas as project opportunities, job estimates, actual job labor, equipment and material usage, on-hand inventory, accidents, and various job communications.

However, the overwhelming amount of available data makes it difficult to manage and extract tangible value.

One potential solution is a management dashboard tool that translates data and information into knowledge to improve the decision-making process. Through the use of data visualizations, dashboards provide at-a-glance awareness of current business performance, allowing contractors to better focus on critical activities rather than day-to-day operational issues.

This article will explore options for effective management dashboard setup and deployment as well as how to maximize the benefits of this tool.

PRIMARY DRIVERS FOR MANAGEMENT DASHBOARDS

Dashboards keep all department managers on the same page and display where critical facts can have the greatest impact. While they have many benefits, here are three of the most common business drivers.

Maximized Returns from Data Assets

Data has become one of the most valuable assets of a modern contractor. Putting this data to work, however, can often prove difficult. A dashboard system can provide better information across the organization and on-demand access to core business metrics, which enables contractors to make better use of the information at hand.

Improved Information Integration & Consolidation

Since dashboards can aggregate both internal and external data, the number

of reports managers use can be significantly reduced. As a result, more time can be spent addressing critical issues. Streamlined integration can also occur at the management level: Since all managers are viewing business-critical data in a more unified fashion, this enables them to turn the company's strategic objectives into tactical efforts.

Improved Communication

Management dashboards improve communication not only among the management team, but also with internal and external stakeholders. Dashboards could be used to communicate the company's overall health to help keep employees engaged and focused on achieving common goals. Performance dashboards could also be shared with outside partners (e.g., clients and subcontractors) to update them on various activities. For example, project management and performance dashboards could be used to better communicate the status of key project metrics to external stakeholders.

METRICS, SOLUTIONS & DEPLOYMENT

Most management dashboards have three common functions: displays, filters, and the ability to analyze data.

Displays

Management dashboards use innovative data visualization tools to simplify communication of complex business process metrics and trends. The use of graphs, tables, charts, and gauges in a standardized manner across various dashboards can increase overall effectiveness.

Filters

Managers should be able to view and narrow down performance data based on filters, search capabilities, and drop-down lists. These filters should enable managers to navigate up and down in organizational data hierarchy on the same screen.
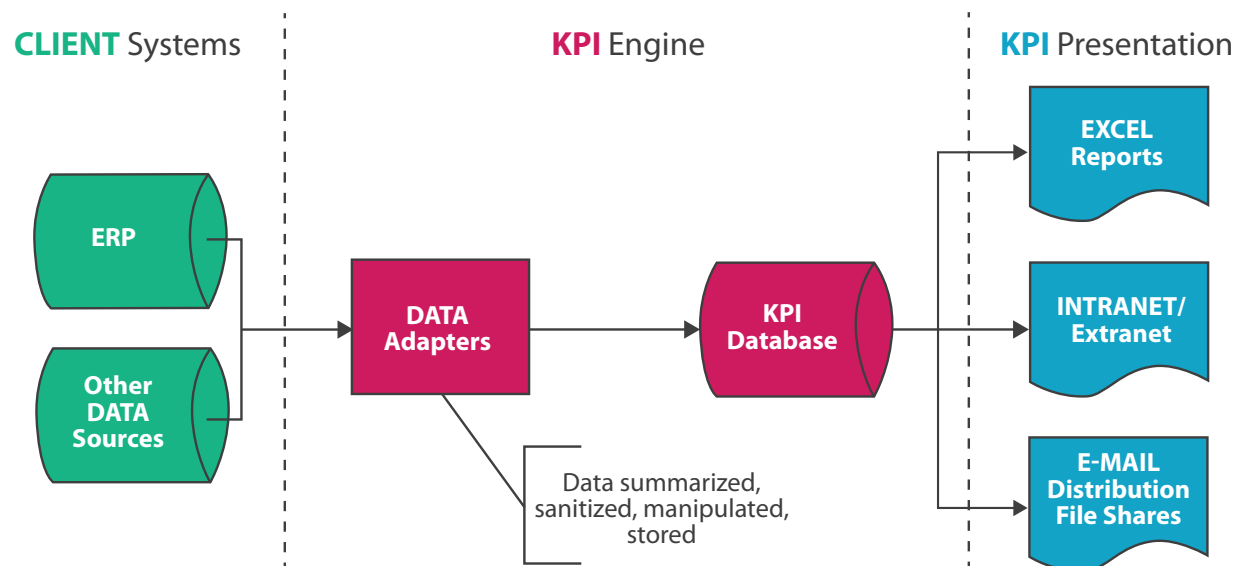
Guided Analytics

Management dashboards assist users in identifying trends and issues as well as accessing related and pertinent information.

Using technologies such as predictive analytics, the dashboard acts as a decision support system rather a simple information display. In construction, the following metrics are frequently used:

- *Change Orders:* Managing change orders; number of such orders; and change orders by PMs, project type, and customers.

- *Accidents and Safety:* Number of accidents by employee groups, project types, equipment, and time spans.

- *Profitability:* Profitability levels and margins by job, department, service category, and client.

EXHIBIT 1:
Dashboard Architecture

CLIENT Systems | **KPI** Engine | **KPI** Presentation

ERP
Other DATA Sources
DATA Adapters
KPI Database
EXCEL Reports
INTRANET/ Extranet
E-MAIL Distribution File Shares

Data summarized, sanitized, manipulated, stored

- *Productivity:* Employee productivity, labor utilization, labor availability, and labor and equipment downtimes.
- *Client Satisfaction:* On-time job completion, complaints reported, project cost overruns, and repeat business.
- *Business Health:* Outstanding bids, bid/win ratios, project backlog, revenue recognition, employee revenue/profit contribution, employee turnover, cash on hand, and A/R and A/P cash positions.

Dashboard Solution Options

Management dashboard software is typically housed in one of two types of solutions: as part of an existing Enterprise Resource Planning (ERP) or as standalone software.

Analytics Modules Within Existing ERP Systems

Many construction ERP systems either have built-in dashboard modules or offer add-on applications for building management dashboards. These applications often integrate with existing data in the ERP system, making it easier to access.

However, a major challenge with this approach is that many companies utilize ERP applications from several different vendors – e.g., a job costing and financial application from one, bidding and estimating from another, and sales and marketing from yet a third; data is being stored in multiple systems and must be transferred from one system to another. As a result, the dashboard module would have difficulty accessing and aggregating information in other systems to produce unified results throughout the organization.

Standalone Dashboard Software

There are a variety of business analytics and dashboard systems that range from dashboard-only software applications to comprehensive dashboard modules that address budgeting and analysis. These solutions are ERP agnostic – they can work with any back-end application and integrate with several data sources simultaneously from multiple applications.

In situations where data resides in multiple back office systems, data is typically consolidated into a single repository to allow the dashboard software to easily access and manipulate it. This "data warehouse" approach allows contractors to create a separate database system that is refreshed in predetermined intervals (e.g., hourly, daily) with minimal interruption to users.

Although a data warehouse could improve management decision-making, it requires ongoing maintenance and management. Warehouse changes, such as version upgrades or adding modules or fields, may also need to be addressed

(i.e., mapped) within its integration framework. If not consistently updated, then the data warehouse will lose accuracy and value.

Dashboard Deployment Models

Management dashboard systems can be deployed in a variety of ways. Typically, a dashboard is installed and managed on company-owned servers. If a company has the IT resources and a strong track record in successfully managing and maintaining such systems, then dashboard software could simply be another addition to its existing portfolio.

Another emerging approach is to forgo in-house installation and instead leverage the cloud to use a Software-as-a-Service (SaaS) platform that would provide the necessary services for a monthly fee. Given the pace of technological innovation, many analytics software vendors are investing in the cloud-based approach.

ORGANIZATIONAL IMPLICATIONS

Once deployed and adopted, management dashboards could result in significant organizational culture changes. Generating reports in a standardized format reduces silo mentality within the company and improves communication as leaders across all departments are no longer burdened by different reporting formats and assumptions.

Another key outcome is an increase in transparency and accountability within the company. Dashboards displaying KPIs within a manager's departments and other company areas can unify the management team and help leaders address issues to achieve common organizational goals.

A well designed management dashboard system could also help managers develop a holistic view of the organization and act in a more integrated and effective manner. Dashboards can also link achievements to compensation incentive systems to promote a performance-based management culture.
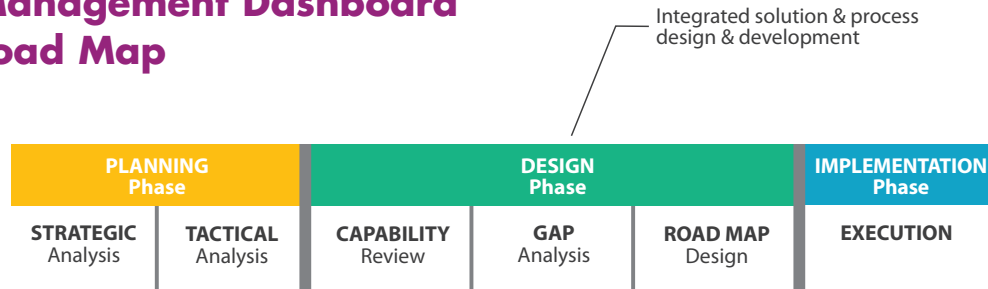
HOW TO MAXIMIZE THE MANAGEMENT DASHBOARD

While management dashboard capabilities can initially create excitement among managers, their design and execution requires thoughtful consideration. The following step-by-step approach can help ensure successful project outcomes:

Define Key Business Metrics & Performance Indicators

First, assemble a cross-departmental management team to develop a set of metrics to serve as realistic indicators that

Integrated solution & process design & development

PLANNING Phase		DESIGN Phase			IMPLEMENTATION Phase
STRATEGIC Analysis	TACTICAL Analysis	CAPABILITY Review	GAP Analysis	ROAD MAP Design	EXECUTION

need to be captured and analyzed for the company's overall health. Active participation of key stakeholders in these meetings is critical to the project's success. Documenting a summary of management's required metrics and KPIs is also vital.

Develop a Technology Solution Approach

Once metrics have been defined, a project team comprising managers and IT specialists (either internal or external, depending on available resources) must develop an effective approach to deliver those metrics timely and accurately. Such issues as choice of software, deployment models, and data warehousing implications will all need to be addressed with the goal of developing a management dashboard solution road map to outline the resources needed, steps in the process, and expected timeline. (See Exhibit 2 above.)

Solution Build & Rollout

Once the technological components have been installed and tested, spend considerable time on the actual design and delivery. Effective dashboards represent a shift in how managers look at and act on information, so even issues such as colors, formats, and navigation capabilities could have an impact on effectiveness.

As such, start by testing just one set of KPIs and metrics for one department. For example, have users try out the model, then gradually add features and capabilities based on their feedback to achieve the ideal format and presentations. Once that consensus has been reached, it will be much easier to deliver all planned metrics and performance indicators.

CONCLUSION

Management dashboards present an opportunity for contractors to leverage their IT investments and data assets as well as gain a competitive advantage. Given the advances with

available tools and solution offerings, companies capable of harvesting their data in support of their decision-making needs will be able to establish a proactive management culture, resulting in increased productivity and profitability. ∎

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Dashboard Project **Challenges**

SELECTING the wrong tool sets and approaches

DATA QUALITY and availability issues

UNDERESTIMATING resource needs

INFORMATION overload

NOT ALIGNING dashboards with effective management practices (e.g., change management)

TRYING to do too much too quickly