



Taming Big Data with Business Intelligence

A CM Perspective

e-Builder
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Taming Big Data with Business Intelligence: A CM Perspective

A CMAA Emerging Technologies Committee Article

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What is Your Business Intelligence Quotient (BIQ)?

Television programming abounds with commercials promoting the virtues of Business Intelligence (BI). You have all seen the ads telling of “a new way to work” or “how you can make smarter decisions” or “how you can do it faster and perform better.” Sounds great, but were you left wondering if Business Intelligence was really needed in the world of construction management or if the promises of mining Big Data had any useful applications in helping you run your project, your region or your business operations?

The CMAA Emerging Technologies Committee pondered these very same questions and set about to find the answers. This Whitepaper seeks to explain what Business Intelligence is, what it does and why every CM professional should be applying this technology on their projects and in their organizations.

The project team routinely create, send, share and store massive amounts of source data related to a wide array of subjects and categories including cost, schedule, material data, daily reports, RFI's, NCR's just to name a few.

As source data is generated, it is routinely stored and maintained in files and databases. Large scale data storage and access is typically managed within ever larger data-based repositories known as data warehouses. Over time, the accumulation and expansion of data volume, variety, and velocity has come to be known as Big Data. As you would expect, Big Data requires larger scale and more robust tools and systems to manage the storage, access and security of

working on the latest issue or problem. However, hidden within the mountains of accumulated “raw” source data lie patterns and trends that if properly identified

BI Functionality – How it Works

In order to understand what a BI system does, you must understand the basic system processes that all BI tools perform.

from each one and bring it into a single report, and this takes a lot of time. A commercially available \$30K software application would allow this company to do it

Benefits of Business Intelligence

Being able to quickly access critical project or enterprise data in a clear, understandable, and actionable format is something even the most technical CM can appreciate when it comes to making timely and informed decisions (refer to Figure 3: Sample Project Management Dashboard).

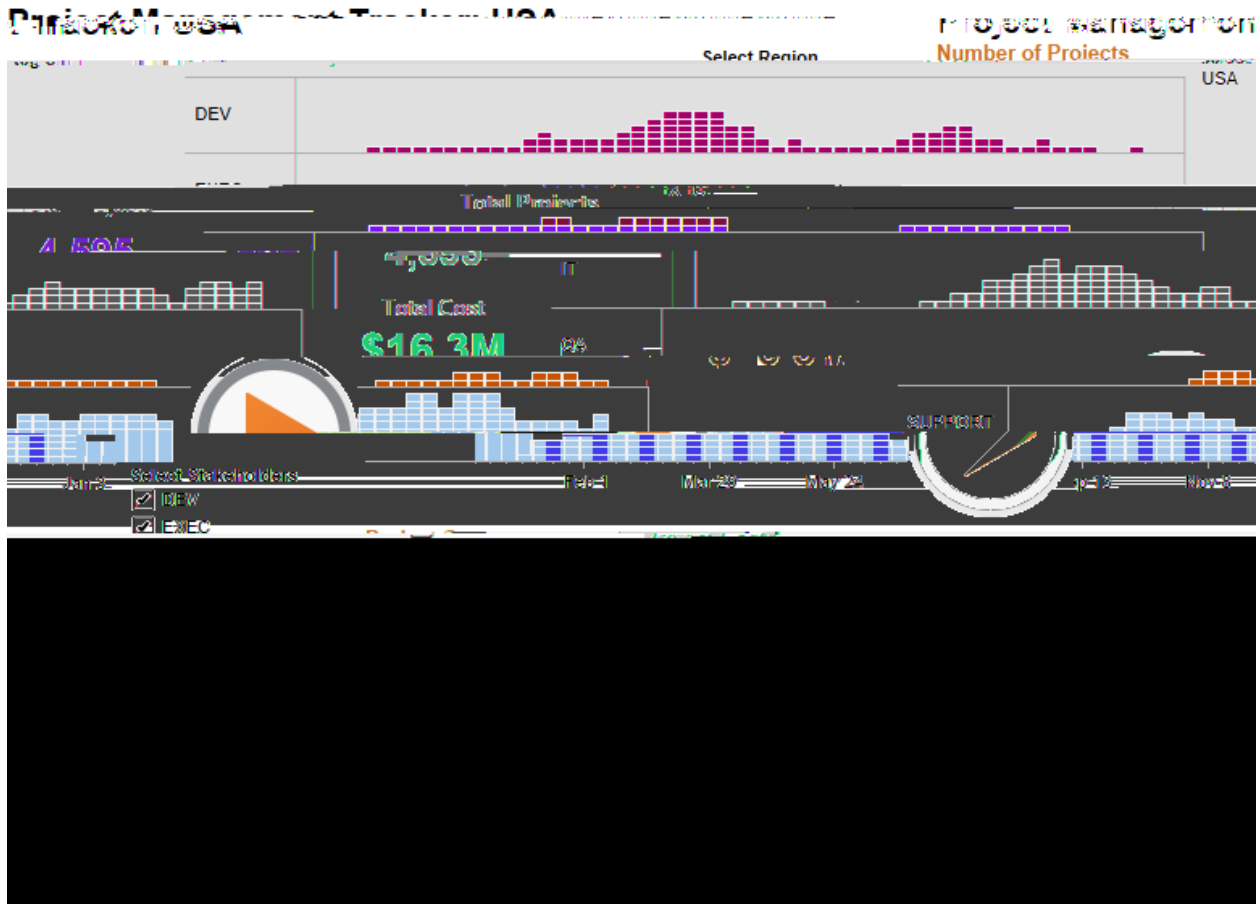


Figure3: Sample Project Management Dashboard

In a recent industry study conducted by Builder, Dodge Data Analytics, and the Lean Construction Institute shed more light on the benefits of Business Intelligence. The study sought to determine which policies, practices, tools and tactics correlate with the best project performance and best-in-class owners. The research focuses on these key metrics from 174 owners about their projects completed in the last three years:

- Cost: Final construction cost compared to the original budget at the time of capital allocation
- Schedule: Date of final completion compared to the original schedule for construction established at the time of capital allocation

- Quality: The quality of the final building compared to original expectations at the time of capital allocation, based on two components: (1) how well the building design incorporated features or functionality compared to initial goals, (2) how well the

to project performance. That's precisely where BI can make a difference. Business Intelligence tools provide fast, reliable forecasting information to predict outcomes and analyze performance to make adjustments on the fly. ⁵ A well-established BI system will provide real-time access to information, your ability to respond to issues is accomplished in a fraction of the time it would take using traditional methods.

The eBuilder and Dodge SmartBrief

Example: The following dashboard (Figure 4) was created to provide safety tracking data related to vehicle accidents involving bikes and pedestrians. This interactive dashboard was created by a first time BI user, in less than four hours. The results saved more than 80 hours of repetition and re-entry of data to an Access database and provided the client with a much more powerful and impactful representation of their safety data.

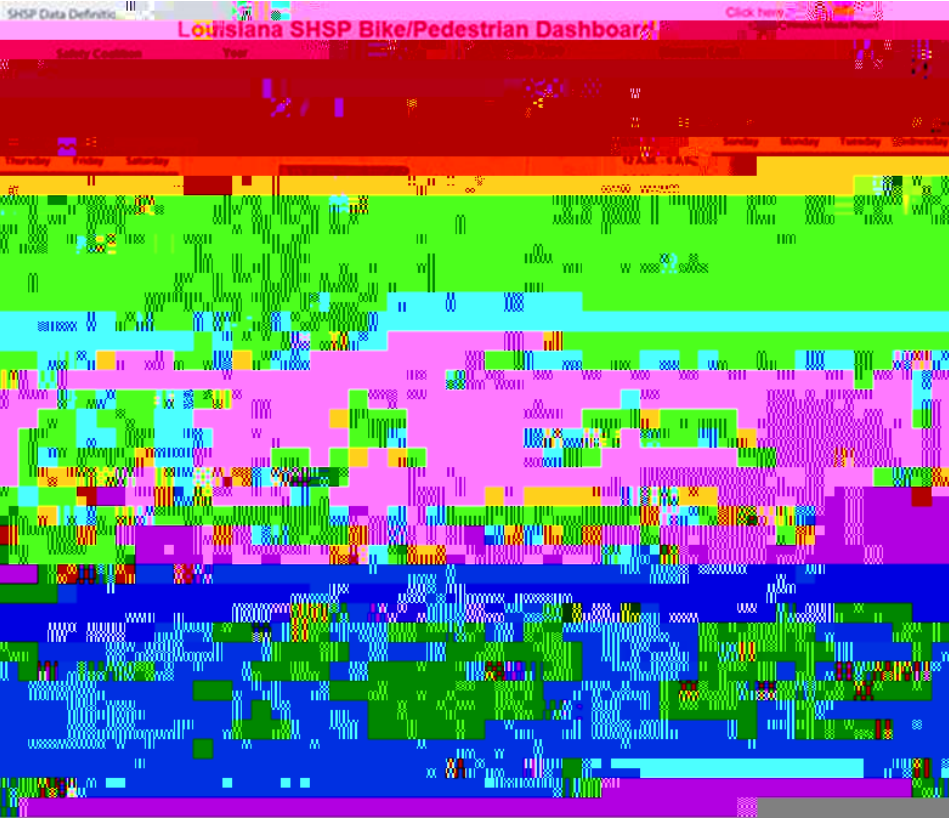


Figure4: Sample Dashboard

Challenges for Use and Implementation

While it is clear that BI solutions are becoming easier to use and can provide tremendous results, the question remains, why aren't more EPC and program management companies using them?

One major challenge is the simple lack of data standards which results in breakdown between communication protocols. Often, the cost required to establish the basics like naming conventions and data governance can be expensive to develop and maintain, despite the software itself being relatively inexpensive. Terminology and reference can vary dramatically by industry, agency, region and even district. For instance, the water utilities group may use "facility" to refer to a treatment plant. People on the sewer side may use the term manhole in the same context, but another department will use facility to name a library or police

department. To obtain consistent and homogeneous results, you must first spend the time to define standards and then implement a uniform standard for data governance. The same

And for those that think their current system of management is adequate (we're talking to you, Excel users), consider: Excel is a database and not an analytical tool. There are inherent risks with relying on a spreadsheet to manage and interpret corporate metadata. Not only is Excel prone to errors through versioning and broken cells, logic, etc. but there is also a size limitation to what can be effectively viewed and managed within a spreadsheet. While Excel does provide some functionality to sort, calculate and manage tabular data, it was not designed to provide


About the Authors

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