

Robotics Business Review Article: The Rise of Analytics in Manufacturing Organizations

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Introduction

Fascination with data continues unabated across industries in America and across the world. And manufacturing and operations departments are some of the more prodigious creators -- and users -- of data today. Data in all forms is a top-of-mind topic across organizations.

Data users run the gamut from planners and schedulers to production personnel, to operations leaders, to research and IT staff, to the C-suite. It's becoming increasingly common for the language of analytics to be understood throughout various levels within today's manufacturing organizations.

The Challenge -- Manufacturers are Awash in Data

With manufacturers trying to understand the underlying demand for their products, many are increasingly turning to data management and analytics to better understand customer ordering data and trends. The main problem is the high volume of data that is generated today.

As part of this data discovery process, manufacturing and operations firms must navigate through large amounts of data, both structured and unstructured, to even begin to come to any meaningful conclusions. At the same time, mining enormous amounts of residing in various databases and data warehouses is no easy task.

There are often silos of data located throughout organizations that originate from various legacy systems that have accumulated over time, including various databases and data repositories. This often creates significant challenges, as having these disparate systems inherently limit the amount of sharing possible. To mitigate these challenges, progressive industrial organizations are increasingly developing IT infrastructure that includes consolidation and integration via integration hubs and open APIs (Application Programming Interfaces), to more efficiently allow integration between systems, as well as allowing the use of enterprise databases and data warehouses.

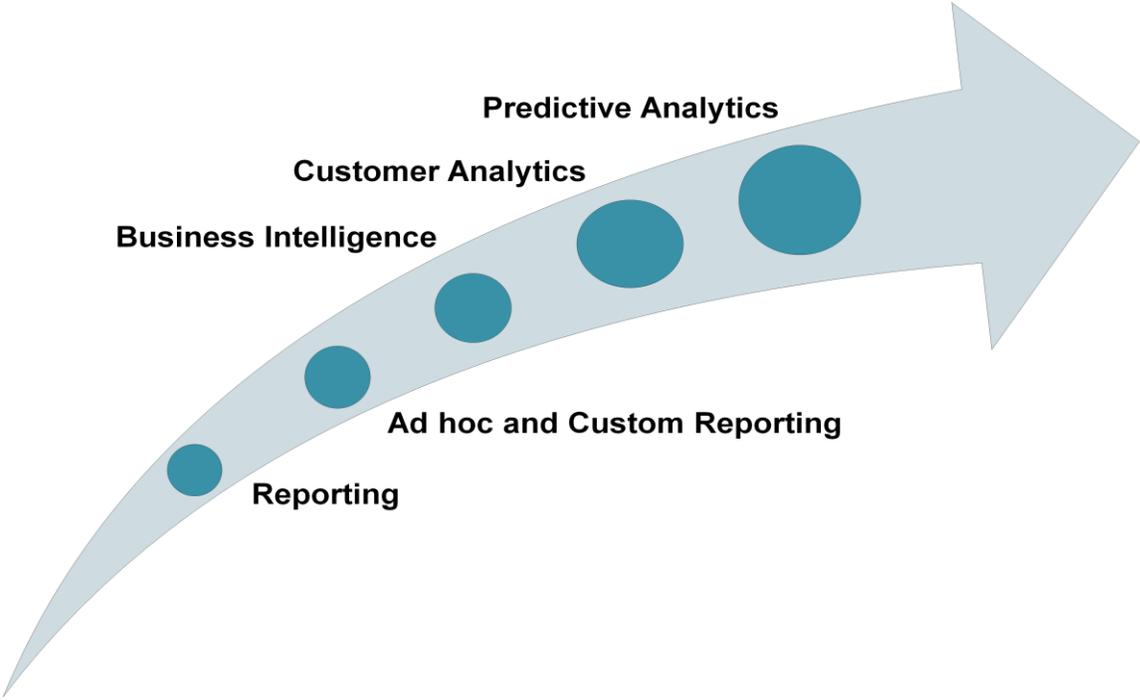
Making Sense of All That Data

One of the main challenges for manufacturers today is making sense of data – data from all sources – both from within and outside organizations. The result is often an explosion in the amount and variety of data -- both structured and unstructured data. The former can be found in databases and data warehouses, while the latter is often found in such text-based places as CRM fields and social media comments.

In many cases, analytics is a term that can mean different things to different people. It is a broad term that can have multiple meanings, depending on the user's organization. There is often a continuum of data analysis ranging from reporting to business intelligence to analytics.

Processing all this data has long been a challenge for manufacturers, but even more so in the past few years, with so much unstructured data being created and exchanged in organizations. Also, processing this data has meant advances in data evaluation processes and techniques, going from pre-packaged, static reports based on historic data, to ad hoc and custom reporting, to business intelligence systems that include dashboards and data visualization, to customer and predictive analytics that include extrapolation of trend data and future projections (Figure 1).

Figure 1: The Journey from Data to Information



Source: Robotics Business Review

Many manufacturing organizations today are trying to leverage the power of analytics throughout their organizations to better understand and serve their customers. And these are exciting times, as new solutions are being introduced into the market that can be used by business users. In the past, companies were often reluctant to use analytics solutions outside of their research and IT departments, because of the difficulty to mine such data without a background in statistics or data science.

Until recently, many software programs available required specialized expertise. Even with sufficient investments in hardware and software tools, the skill sets needed to use these solutions had traditionally been solely in the domain of trained data scientists and statisticians assigned to organizations' quant staffs.

Recent Innovations Open Opportunities for Business Users

New innovations have made business intelligence and analytics solutions easier than ever to use, and recent releases have been introduced that are designed to be used by business users as well as quant staff personnel. A revolution of sorts in data management and analysis is occurring. New, intuitive, and powerful solutions are being introduced by progressive business intelligence and analytics providers, which is creating much enthusiasm in manufacturing organizations.

These vendors are now offering tools that can be used across organizations. For example, the use of intuitive user interfaces and data visualization techniques allow users to construct models via visual representations of the data, yet they are based on traditional, text-based UIs like SQL. These solutions are both powerful and intuitive, and can allow business users the ability to create queries and some models without the need to write and sequence complex SQL queries.

In conclusion, these are exciting times for business users interested in using analytics to better understand their business. And, with the many options available with the latest analytics and data visualization solutions, opportunities for business users to participate in the analytics revolution are now available.

This allows users to better track, evaluate, and project customers' purchasing habits, anticipated needs, and likely futures behaviors. All of this information can help manufacturer better understand the many facets of their organizations, to better manage their operations and better serve their customers.

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