Big Data Analytics: Scaling Up and Out in the Event-Enabled Enterprise

By Michael O'Connell, PhD

An effective systems platform for the 21st century enterprise has five key elements (Ranadive, 2011). First, it must detect relevant patterns and correlations amidst the torrent of big data and events that surround any business today, so that an enterprise can interpret what is happening at a point of sale, an instance of risk, or what is generically called the "moment of truth". Second, such a platform must provide powerful analytic capabilities so that anyone can interpret what is happening at that moment of truth and immediately understand the implications. Third, the platform should have the muscle or automation to initiate corrective action based on recognized patterns, as well as the flexibility to compose and assemble new lightweight applications on the fly, as needed. Fourth, the platform should scale elastically across both on-premise and cloud environments. Finally, the platform should provide a natural environment for collaboration – one that marries systems and people into a single unified desktop.

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"Big Data" refers to datasets whose size is beyond the ability of typical database software to capture, store, manage, and analyze (McKinsey Global Institute, May 2011). Big data sometimes arise from machine systems, e.g., log files that are constantly appending transactions. These data are growing rapidly; for example, the number of connected devices exceeded the world population before the end of 2011, and will reach 15 billion in 2015. In practical terms, "big data" is used to refer to high volume, high velocity, high variety and high complexity. Gartner refers to this combination of data volume, velocity, variety and complexity as "Extreme Information."

A recent TDWI Best Practices Report on **Big Data Analytics** (Russom) reinforces this perspective, discussing the three V's of big data – volume, velocity and variety. Russom presents results from a Fortune 500 survey of predominantly IT professionals, showing three areas of growth and commitment in big data analytics, namely **Advanced Analytics, Advanced Data Visualization** and **Real Time Analytics**. The report goes on to summarize the major business benefits of big data analytics as:

Customer Insights

- Acquisition, Growth, Retention, Advocacy
- Segmentation
- Clickstreams Analysis

Business Insights

- Products and Markets Analysis
- Cost Reduction / Efficiency
- Forecasting

Real Time and Specific Applications

- Fraud Detection / Intervention
- Cross-Sell / Up-Sell
- Risk Management & Compliance
- Metrics and KPIs

The intelligent, event-enabled, financial services enterprise is embracing all of these areas. Big data snapshots are used to build predictive models to understand patterns in events with context provided through data at rest, as represented in the "UNDERSTAND" component in Figure 1. Such models can then be actioned through complex event processing systems, scoring real-time

data to anticipate what is happening at the moment of truth, as represented in the "ANTICIPATE" component. This enables actions ("ACT" component) that grow top-line revenues, improve productivity and reduce risk. Examples include cross-selling of products and services, such as wealth management and credit cards; management of exposures and collateral allocations across markets; enterprise risk aggregation and big data trading analytics, including algorithmic trading testing and analytics.
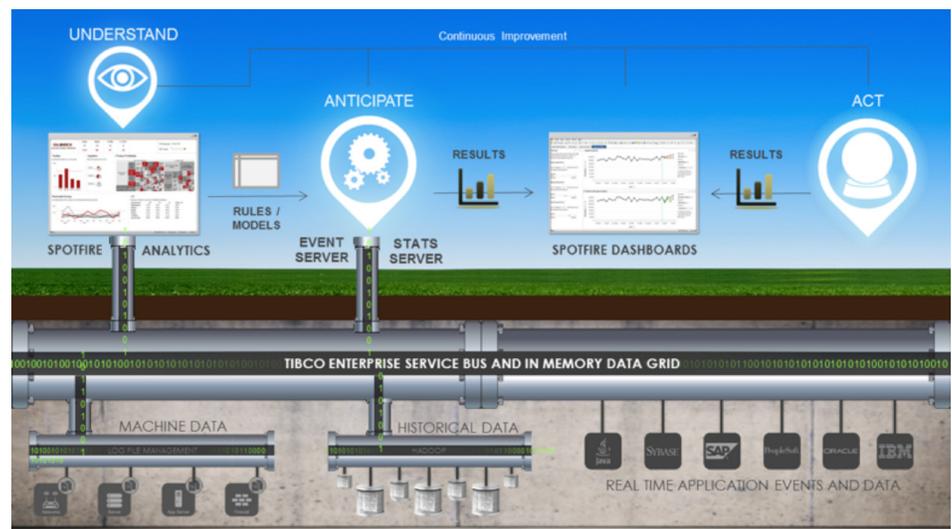

Figure 1. The understand-anticipate-act sequence-loop underlying the event-enabled enterprise (E3).

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Russom, P. (Q4 2011). Big Data Analytics. TDWI Best Practices Report.

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