Summary:

Organizations that are looking to extend the success they have enjoyed with business intelligence are often the best candidates to go to the next level, and embed more intelligence into high-volume operational decisions. This discipline, Enterprise Decision Management, differs from traditional BI in that it is focused on execution of decisions and actions rather than reporting. EDM uses business rules management systems and predictive analytics to automate, improve and connect decisions for greater precision, consistency and agility. Adding EDM to BI extends the value of analytics-driven insights, allowing businesses to make smarter strategic, tactical and operational decisions.
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The search for “operational BI”

One of the hottest topics in the field of business intelligence (BI) today is what many call “operationalizing” BI. At issue is how to bridge the gap between the insights BI brings to knowledge workers and decision makers in the back office and the tactical, everyday decisions and actions that determine an organization’s success. An enterprise drawing strategic intelligence from its data via a BI competency center needs a way to push the same degree of intelligence out into its operations and front-line systems—and even the most advanced BI systems are simply not designed to do this.

Phrases such as “operational BI” and “decision-centric BI” may reinforce the feeling that what’s needed to bridge the gap is a logical extension of business intelligence technology. In fact, as some observers have noted, the kind of technology needed to bring insight-driven execution to tactical decisions already exists, and has had successful adoption in some areas of financial services, insurance and other industries. It just isn’t called BI. It is called “Enterprise Decision Management,” or EDM. EDM represents a logical extension of the gains companies have made with BI, giving them the power to embed greater intelligence in front-office applications and processing systems. EDM is what Operational BI advocates are looking for.

From insight to automated action

The evolution from insight to automated action is the focus of Enterprise Decision Management. Making a case for this approach first involves understanding how it is like—and not like—business intelligence.

EDM is an approach that automates, improves and connects high-volume, operational decisions to enhance business results. It applies predictive analytics, business rules and other proven technologies to give businesses a much greater degree of control over decisions. Typically these are customer decisions that have revenue and cost impacts, but EDM technology also elevates processing and other non-customer decisions that require a systematic, complex application of rules, policies, data and procedures.

The crucial distinction between BI and EDM is that the former helps you understand your business; the latter helps you execute your business. If BI is the bridge between your data and your strategies, EDM is the bridge between your strategies and your customers or transactions.

At the risk of simplifying two sophisticated disciplines, here are some other differences in approach between BI and EDM:

■ Where BI solutions provide information access and insight on customers, EDM uses customer-level insight to identify the ideal action to take on a particular customer decision or transaction.

■ Where BI is a back-room, offline operation controlled by knowledge workers, EDM is embedded in operational systems and processes. Some processes will call out to an EDM system for decisions during “live” transactions; other processes, such as selecting candidates and assigning offers for a marketing campaign, operate offline. In both circumstances, the decisioning must be tightly coupled with the operational system.

■ Where BI analytics traditionally synthesize past performance, the analytics used in EDM frequently predict future behavior. Predictive analytics play a role in BI as well, but are more dominant in EDM systems, because the empirical linkage they provide between historical data and future results can be critical to assigning the right action.

Think of it this way: If BI is on the sidelines, EDM is on the field calling the play. That’s not a judgment on their relative merits—just as in sports or warfare, both strategic (offline) decisions and tactical (online) decisions are necessary for victory.
How does EDM extend BI?

EDM systems give businesses increased control and visibility over the factors used in decisions, by treating the decisioning step as a separate process. This provides greater consistency and precision than processes that queue decisions for work lists, and which rely on the potentially inconsistent manual review of every decision.

EDM also represents an advance over the practice of coding decision logic into operational systems themselves, where the rules, steps and models are difficult to change without extensive programming. With EDM, a business rule or predictive model can be defined, reviewed, modified, and reused as a corporate asset. Managing these control points independent of the programming code that runs operational applications gives business users the ability to implement changes as quickly and as often as necessary.

These kinds of systems enhance and extend BI capabilities in several ways.

**EDM leverages BI insight to tackle “what next?”**

Traditional BI solutions raise awareness, assess trends, identify potential problems and even share insight with the latest in collaborative BI. But the outcome is usually in the form of dashboards or reports. The solution to a problem—or the “what next” step—must be developed outside the BI infrastructure.

EDM solutions help product line managers, customer service managers and others take that “what next” step by giving them the tools to develop and deploy intelligent decision strategies that guide operational decisions. While BI brings data to the people responsible for developing strategy, EDM gives them the
tools to refine their strategy and implement it within the operational systems and processes, for greater precision, consistency and agility.

**EDM automates core day-to-day decisions—often in real time.**

With ad-hoc query tools, knowledge workers can drill down into data any number of ways to look at customers by region, product line, purchase or channel preferences, etc. This analysis usually happens in an offline environment, and the analyses generally interact with stored, historical data.

EDM solutions, on the other hand, can automate 75% or more of the day-to-day business decisions that are otherwise handled manually: Which product best matches this customer’s needs? What are the best actions to take on this claim or application? How likely is this transaction to be fraudulent? Decisions are often made in real time because EDM solutions are tightly coupled with operational systems, such as CRM systems, collections systems and authorization systems. For processes that demand real-time processing, incoming data from a transaction in-process causes rules to fire and triggers models to deliver a transaction-specific decision (as opposed to one simply “stored” in a database and retrieved).

Decision automation leads to consistency in decision making, faster turnaround and higher throughput with less drain on resources. EDM solutions also flag exception cases and pass them to experts for further review. While the initial focus of EDM in an enterprise is typically to automate clear-cut steps and rules, as businesses become more confident in their processes and more sophisticated in their use of rules and analytics, a higher percentage of decisions that once required expert review can be automated.

**EDM provides better answers to “what-if” questions.**

Advanced BI and EDM installations both give businesses simulation capabilities, but with EDM these capabilities are part of a controlled approach to operationalizing strategy. Before rolling out, say, a new promotional offer, a new collections strategy or a new underwriting model, managers can simulate the effects on volume, response, risk, etc.

Advanced EDM simulation and optimization capabilities rely on complex decision models that map relationships between decision inputs, the decision itself, the response to that decision and the business objective. With this simulation, businesses get much more precise and reliable answers to complex questions involving customer dynamics: for example, “What would happen if I change my pricing for this segment by 5%? By 10%?”

In addition to simulation, EDM systems offer a closed-loop testing environment. Business users can apply “challenger” strategies on small, randomly selected population segments and test their performance against their current or “champion” strategy. While impractical for some applications, this kind of champion/challenger testing is essential to the very precise decision strategies evolved by leading lenders.
TABLE 1: BUSINESS INTELLIGENCE VS. ENTERPRISE DECISION MANAGEMENT

<table>
<thead>
<tr>
<th></th>
<th>BI</th>
<th>EDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>Improve strategy development through insight into trends and</td>
<td>Improve strategy execution through automating decisions</td>
</tr>
<tr>
<td></td>
<td>performance</td>
<td></td>
</tr>
<tr>
<td>Called by</td>
<td>Business manager or knowledge worker</td>
<td>Production application, customer-facing staff</td>
</tr>
<tr>
<td>Activity</td>
<td>After transaction</td>
<td>During transaction</td>
</tr>
<tr>
<td>Key methodologies</td>
<td>Data analysis, OLAP, reporting and query tools data warehousing</td>
<td>Business rules engines, predictive models, optimization algorithms</td>
</tr>
<tr>
<td>Workflow</td>
<td>Offline, disconnected from business processes</td>
<td>Embedded in operational processes and systems</td>
</tr>
<tr>
<td>Analytics</td>
<td>Summarize past performance, group behavior, trends</td>
<td>Identify individual potential, risk, preferences</td>
</tr>
</tbody>
</table>

Another way of differentiating between BI and EDM is to look at the kinds of decisions they support. BI and EDM generally operate on different ends of the “decision spectrum,” with some overlap in the middle.

- Strategic decisions have broad business scope but occur less frequently. These can range from M&A decisions or the decision to enter a new geographic region to product direction and store location decisions. These decisions can be supported by data and analytics, but are seldom automated.

- Tactical decisions determine the way in which the enterprise will manage processes, customers and procedures. For example, decisions about which segments of a customer base will receive which precise offer, or what level of risk an enterprise will allow in accepting credit applicants, would be tactical in nature. While analytics can play a more prominent role in developing data-driven strategies, the entire process is seldom automated.

- Operational decisions have the highest volume and deal with individual transactions. These include approve/decline, next-offer, authorization, fraud detection, processing and other decisions that often take place in real time. These decisions must frequently be automated to be made at the requisite throughput and within the necessary timeframe.

Traditional BI tools are generally used to support executives making strategic and tactical decisions. EDM solutions are most frequently applied to operational decisions.
Some of the more advanced decision analytics used in EDM are starting to make inroads into the realm of strategy, where they complement and may overlap with BI approaches. While the division between strategic and operational decisions may help differentiate BI and EDM now, both disciplines are expanding their “analytic footprint,” and the overlap will grow.

Ideally, technology should enable improvements at all three levels of decision making. Complementary BI and EDM solutions help organizations achieve this goal.
The technologies behind Enterprise Decision Management

Basically, Enterprise Decision Management introduces two new kinds of technology into the enterprise:

**Business rules management systems** enable the design, deployment and maintenance of business rules and policies. These systems—also known as business rule engines and decision engines—put control into the hands of business users, allowing them to build and revise rules without IT support.

Typically, a business rules management system is invoked as part of the total processing involved in an interaction with a customer. The system accesses and processes relevant transactional and historical data, uses predictive models and other analytics to segment customer populations for targeted action, executes business rules appropriate for the specifics of the customer and transaction at hand, and returns decisions to the production system or business staff.

Using these systems gives business managers increased control and visibility over the factors used in each business decision. A business rule is defined, reviewed, modified, and reused as a corporate asset. The ability to manage these control points independent of the computer programming code that runs the automated applications allows for faster and more accurate review of business operations and implementation of changes as quickly and as often as necessary. Business rules management systems enable businesses to make highly consistent, strategy-driven decisions, and to change them with greater agility.

**Predictive analytics** make decisions more precise by segmenting customers or transactions for treatment using very complex statistical formulae (developed, needless to say, offline). Predictive analytics analyze historical and transactional data to isolate patterns: what a fraudulent transaction looks like, what a risky customer looks like, what characterizes a customer likely to switch providers. These analyses weigh the relationship between hundreds of data elements to isolate each customer’s risk, potential and preferences. The term “predictive analytics” here encompasses what are known as predictive models (e.g., credit risk models) as well as other kinds of analytics that identify subtle data patterns (e.g., fraud detection models).

A more recent strain of analytics is making contributions to Enterprise Decision Management. So-called “decision analytics” are used to model decisions in much the same way predictive analytics model behavior. Used in optimization, decision analytics map the relationship between the inputs to a decision (such as customer data or scores from predictive models), the decision itself, the reaction to the decision and the end result. They statistically produce strategies or decision logic that optimize a desired performance result, within defined constraints. These strategies take predictive analytics beyond the “insight” stage by empirically assigning actions to every customer or transaction. As noted earlier, these analytics are used in the strategy design phase, and so form a bridge between the back-office analytics used in BI and the front-office, executable analytics used in decision automation.

Both decision analytics and traditional BI tools tend to provide value for strategic decision making, falling outside the operational realm. In this way, they are naturally complementary. An organization hoping to refine its pricing strategy could leverage BI analysis of past pricing trends in order to simulate potential pricing outcomes and optimize a new strategy.
Migrating from BI to EDM—when should you start?

Closing the “decision gap”—between the insights you get from BI and the actions you automate to improve results—sounds logical. But from a technology standpoint, moving from dashboards and ETL tools to rules engines and predictive models may sound like a big jump.

The good news is that companies that have invested in BI centers and data warehouses have already established an information-centric culture, along with the data infrastructure needed to support decision automation. Because BI and EDM are complementary, automating decisions builds on your investment and realizes more of its latent value.

Given that BI and EDM are both data-intensive, analytics-powered disciplines, how do you start to build a business case for extending your investment? Simply put, how do you know when it’s time to start migrating? If you’re relying on ad-hoc queries, dashboards and other BI tools, you may already be seeing the signs that you need EDM. Just look for these common signs:

1. **Your can segment your customers 30 ways—but you deal with them 3 ways**

One of the ironies of BI’s adoption is that companies can now view their customers from myriad angles, drill into preferences and purchase trends, but they often still treat their customers as a largely undifferentiated mass. If your ability to differentiate customer treatment is not even close to your ability to differentiate customer performance, you’re simply wasting much of the insight you’ve gained through BI.

EDM systems enable you to build complex decision trees that segment populations or groups of transactions for targeted treatment. These systems “call up” the same performance, customer and transactional data accessed by your BI dashboards and analysis tools; they can also tap outside data sources, for example to get additional performance or verification data. This means you can bring all the insights you’ve gained through BI right to each new decision.

Say your data tells you purchases of MP3 players have dropped 25% quarter over quarter in the “young urban” segment of your customer base. You could choose an aggressive pricing strategy, but in order to mitigate the cost and increase the effectiveness, you would want to target it not to this entire segment of your portfolio, but to those candidates who would be least likely to purchase an MP3 player without the incentive, and who would likely respond to the incentive.

This requires more than data mining or categorization based on past performance—it requires multi-variate analysis of those characteristics that best predict future buying behavior, and an analysis of likely customer response to a given offer. The kinds of predictive analytics associated with EDM give you this forward-looking view of your customers, and the ability to use this kind “action-based” segmentation in automated decisions.

2. **You need to comply—and demonstrate compliance—with new, and more complex, regulations**

As leading companies have already learned, adding the precision, consistency and agility of decision management technology makes your company not only more competitive but more compliant. Regulatory compliance is one of the primary motives for companies to adopt EDM systems, because of the amount of centralized control they provide. Business rules engines give management not only a way to ensure that decisions are consistently made using the same set of guidelines and policies, but their reports can also prove to regulators that the correct rules are in place and are “firing” for a given decision. Even overrides—decisions made by staff that contrast with the system’s recommendation—can be documented, along with the reasoning behind each one, to help management identify the source of potential problems.
In financial services and insurance, decision management systems help protect companies from making subjective, potentially discriminatory decisions, and also help them exercise the kind of rigor in risk management called for by international regulations such as the Basel II capital accord. And by reducing the time it takes to write and implement new rules, decision management systems reduce the anxiety of meeting mandated deadlines for compliance with new regulations.

3. **It takes much longer to respond to a competitive threat than to recognize it**

One of the frustrations for the information-fuelled business manager is that you can see trouble a long time before you can do anything about it. Your BI system gives you increasingly market-fresh data on how the competition is eating into revenues, creating churn, causing a drop-off in new service applications or even changing the profile of your customer base. But if enacting a new pricing structure, cross-sell offer or customer treatment strategy takes months, you have a serious latency gap.

EDM systems help you quickly enact new strategies to deal with the new market. With a clear, structured process giving business managers, marketers and others the ability to change rules, business rules engines enable organizations to put new rules into place 5-10 times faster than when they were hard-coded into business applications. The notion of “real-time rule changes” is still a dream—IT needs to control the test and release of new rules—but altering a cross-sell strategy or underwriting policy can be reduced from months to days or even hours.

4. **Manual reviews are dragging down the time to render time-sensitive decisions**

BI was built on the promise of information democracy and instant insight: Every decision-maker could, “from their desktop,” drill down and discover the answers to any question on performance and trends. Part of the goal was to get out of the IT queue. In the same way, high-volume operational decisions need to be removed from your staff’s queue. This improves the experience for customers who get approved faster, enables businesses to scale as volume grows, and gives staff more time to deal with exceptions that require expert review.

A good example is fraud detection: A retailer, insurer, wireless provider or credit grantor may process thousands of transactions daily, the subtleties of detecting a fraudulent pattern far exceed the ability of human reviewers, and there is a high cost both of fraud itself and of slowing down genuine customer transactions. In the area of application fraud, a fraud system typically “kicks out” only the riskiest 10% or so for manual review; for transaction authorization, the number is much lower.

Even processes that cannot be fully automated can be quickened and improved through the instant application of relevant analytics that can guide decision-makers. As noted earlier, most businesses that begin with an EDM system gradually increase the percentage of decisions they can automate, as they gain further trust in the intelligence they have injected into their rules and analytics.

5. **You experience or expect large changes in the volume, complexity or potential value of transactions in a given area**

The more frequent, complex or important a decision, the greater the reward from automation. A big change in volume, complexity or value of a given decision can justify automation.

For example, rapid business growth may spark the need for instant, web-based service approvals that still involve risk assessment, verification or fraud checks. New regulations or growing product portfolios may create the need to build more complex logic chains or decision trees. Increased competition may threaten your customer loyalty, such that even routine customer servicing decisions represent vital opportunities to identify customers at high risk of attrition and give them valued customer rewards, offer them new services or improve the terms of their existing relationships.
Towards Enterprise Decision Management

Organizations that have achieved BI excellence are the best candidates for making the move to EDM. They understand the value of sharing insight across the enterprise and have addressed many critical data management issues during BI implementation. For them, decision automation is the logical next step to extend BI value and improve business performance.
About Fair Isaac

Fair Isaac Corporation (NYSE:FIC) combines trusted advice, world-class analytics and innovative applications to help businesses make smarter decisions. Fair Isaac’s solutions and technologies for Enterprise Decision Management turn strategy into action and elevate business performance by giving organizations the power to automate more decisions, improve the quality of their decisions, and connect decisions across their business. Clients in 80 countries work with Fair Isaac to increase customer loyalty and profitability, cut fraud losses, manage credit risk, meet regulatory and competitive demands, and rapidly build market share. Fair Isaac also helps millions of individuals manage their credit health through the www.myFICO.com website. Learn more about Fair Isaac at www.fairisaac.com.