

A Break-Through Approach to Real-Time Decisioning in Business Management

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Abstract: - The paper discusses the need for a new kind of analytics, one that does not operate outside of the operational business processes, but instead inside the processes, collaborating with them in real-time fashion. Main topics discussed are: the characteristics of real-time decisioning, the necessary components that make real-time decisioning work, and how real-time decisioning compares to alternative solutions. The application of real-time decisioning in the context of few common processes is used to illustrate how it can significantly improve the business.

Key-Words: - Real-time systems, decisioning, business processes, process improvement, business analytics, business intelligence, rule-based systems

1 Introduction

Seeing, understanding and acting in real time is what defines the 'Agile Enterprise'. Enterprise agility – the ability to change business and adapt quickly to changing conditions – often may be the difference between organizational success and failure [1].

The changing conditions might be from customers, competitors, partners, market forces, regulatory forces, or world events. Whatever the cause, not being able to adapt quickly has caught many a company flat-footed and unable to respond to an innovation by a more agile competitor.

In the past, enterprise agility has been exceedingly difficult to achieve because viewing all the critical data streaming through the systems, applications, and processes that make up an enterprise's transaction and information data flow, could not be done in cost effective manner [2].

But, things are changing dramatically. Now business information that can be understood in its business context is flowing between applications – and even between our organizations and those of our business partners, customers, and suppliers. We can now observe in real time any critical piece of business data within these flowing business messages and we can probe for deeper understanding by asking "what if" kinds of questions.

This means that for the first time, IT and Line of Business Managers will have deep visibility to business data in real-time. This will have a dramatic impact on an enterprise's ability to be agile. This promises to make

organizations more competitive, more responsive, more secure, more compliant, and more profitable [3].

In these circumstances, decisioning is playing a critical role and must also be made in real time.

2 Characteristics of Real-Time Decisioning when Applied to Business Management

Real-time decisioning is an analytic process that allows organizations to automate the 'next best actions' based upon their goals and objectives. It embeds real-time analytic capabilities into business processes. It analyzes events as they happen, and recommends actions that will most likely influence those events to achieve a set of defined performance goals.

Real-time decisioning captures the result of every event and recommendation, and learns from experience. This allows the solution to self-correct and significantly affects the operation of processes in real-time which can lead to more informed business decision making and more agile business management.

This kind of decisioning is an active participant in business processes. Because it can be embedded in virtually any process, it is uniquely positioned to observe all process parameters. Those can include contextual information, such as time of day and purpose for a customer's phone call, and profile data about the actors, such as the customer making the call and the agent answering the call.

3 The Three-Step Process: Event-Insight-Action Cycle

To better understand the main features of real-time decisioning, let us think for a moment about how, for example, customer experiences are analyzed and operated by one person. The owner has a very good view of all company activities; therefore he or she can take good care of his/her customers. If there is a problem with one of his/her products, he or she will personally and quickly discover the issue and react to it. He or she can optimize his/her inventory against what he or she knows about the buying habits of his/her customers and also shortcut unnecessary processes and react quickly whenever he or she learns something interesting and new.

In large companies, processes are distributed across many participants, including systems and people; there is no one person capable of learning from the many interactions and activities that pertain to each customer [4]. When problem or opportunities arise, they may be noted and analyzed later – sometimes weeks or even months after-the-fact. Rarely is a person or system able to react to the problems or opportunities as they occur.

In general, there is a three-step process that typically takes place before directed, insightful action can be taken in response to a problem or opportunity, as illustrated on Fig. 1.

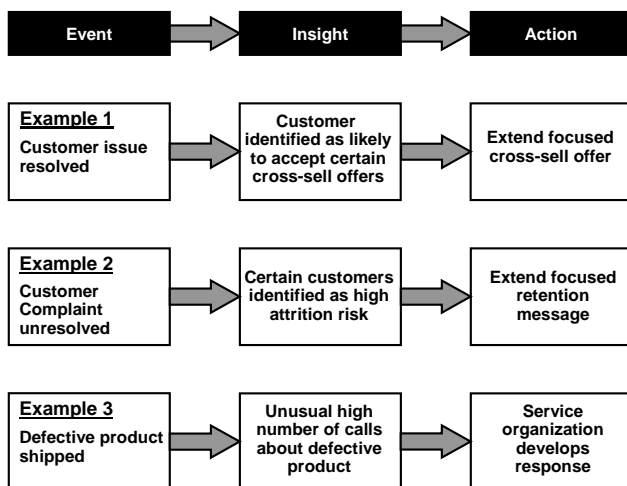


Fig. 1 – Event – insight – action cycle

The lag time between the event (e.g., defective product being sold to customers) and insight can be weeks. During this time, the organization assumes a substantial liability in terms of additional service costs, replacement product, and customer dissatisfaction. But, the liability does not end there.

The company must still make a decision on how it should respond to the event, and take action. In the

example of an organization shipping defective product, it may be several more days or weeks to execute the appropriate response (e.g., proactively contact customers with recall notice). Again, the organization assumes a significant liability in terms of service costs and customer dissatisfaction during this lag time [5].

The lag problem illustrated above can cause a direct and substantial impact to both sides of the business' profit and loss.

4 Limitations of Traditional Decisioning Approaches

4.1 Offline Analytics

Some organizations attempt to identify and react to key events by using offline analytics such as traditional business intelligence (BI) tools. Once insights are gained, a reactive plan is set into motion to address the problem or opportunity [6]. But, this approach has some severe limitations.

In terms of the simple three-step process described above, the singular purpose of offline analytics is to identify important insights. The automations of actions must be pushed to another system that is discontinuous with the overall decisioning process. This creates a capability gap between insights and recommended actions.

As a result, organizations must make up for this capability gap by spending more time and money on manual steps such as integration between the offline analytics and processes. Additionally, offline analytics are not capable of 'learning' whether their prescribed recommendation was successful or not because there is no feedback from processes to analytics. Organizations relying on offline analytics for decisioning have to query manually the system to determine recommendation effectiveness.

While offline analytics play an important role within every organization, it has inherent limitations that restrict its ability to make decisions and influence events as they take place. These limitations include:

- An inability to define key performance goals that the analytics are designed to support.
- An inability to monitor processes and results in real-time.
- Time lag issues from the time an event takes place until the problem/opportunity insight is queried.
- High costs issues associated with the highly skilled, manual analyses (and people) that is needed to extract new knowledge.

- A narrow focus on a small number of important analyses due to their manual nature.
- A complicated infrastructure that makes analyses fragile and prone to a high degree of administration.
- An inability to recommend and/or automate appropriate actions in real-time based on key insights.

Today, companies waste a lot of money by taking the wrong actions with their customers [7]. Traditional offline analytic tools are not designed to identify key events in real-time and take appropriate action automatically.

4.2 Rule-Based Systems

Some organizations try to use rule-based systems to predict scenarios that trigger specific actions to take place [8]. While this approach seems to provide a high degree of control, organizations cannot predict every unique scenario that must be defined in a rule-based system. In reality, rule-based systems actually provide a limited amount of control to help organizations achieve their performance goals.

In terms of the simple three-step process described earlier, the purpose of rule based systems is to execute specific actions when certain conditions exist.

While rule-based systems play an important role within some organizations, these systems have inherent limitations that restrict its ability to make the right decisions to achieve performance goals and objectives. These limitations include:

- Scalability issues that result from the number of rules that must be manually written to predict every unique situation that should receive a pre-defined response. Even simple rule-based system implementations can have multiple-thousands of rules.
- Complexity issues that result from the nested functions that must be written to address the granular details of segmentation schemes and unique scenarios.
- Administration issues that arise from the complexity and scalability issues.
- One or more administrator must make changes throughout thousands of rules contained in the system.
- Flexibility issues that result from the inability to quickly adapt the system to changing customer or market conditions.
- A lack of closed-loop insight that would be able to show the effectiveness of the rules-driven recommendations.

While rule-based systems are able to take action automatically, the recommended action is not always the best action to achieve performance goals. Additionally, rule-based systems provide a limited amount of control that quickly gets over-complex as the number of rules increases.

Limitations of business intelligence tools and rule-based systems as compared to real-time analytics are shown in Fig. 2.

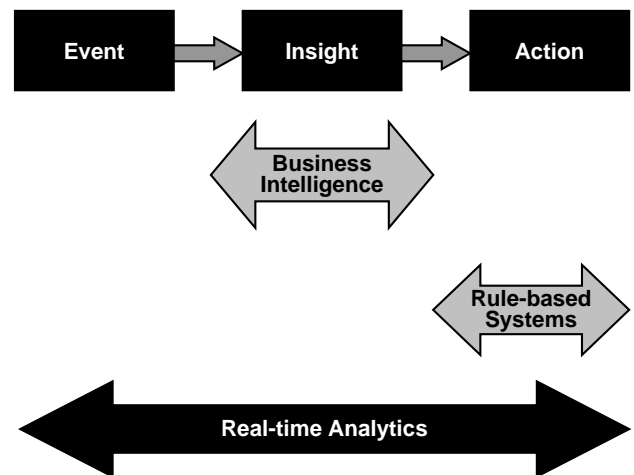


Fig. 2 – Real-time functional limitations of business intelligence tools and rule-based systems

5 A Break-Through Approach to Real-Time Decisioning

A real-time decisioning can help organizations to proactively and consistently take the best actions with their customers, and in turn achieve their desired performance goals [9].

There are few characteristics of real-time decisioning platforms that make it uniquely suitable for operation within processes:

- First, it can look at a broad array of data; unlike humans, an automated system can look at hundreds or even thousands of pieces of data, checking all of them for correlations, in parallel and within the time period that that data is still relevant to customer interaction.
- Second, the analysis is done as a part of the process, so there is no delay of discovery. As soon as data reflects the problem, it is discovered.
- Third, the analysis is automatic, so that there is no need for a person to be alert and perform the necessary queries to detect the anomaly, it is detected automatically.

Such a break-through approach can overcome the limitations of traditional decisioning approaches including business intelligence and rule-based systems, due to its capability of real-time decisioning.

6 How Real-Time Decisioning Works

Here, we present six steps which have to be accomplished to make real-time decisioning possible. These steps include:

1. define performance goals
2. connect existing ERP and CRM systems and customer processes
3. monitor processes in real-time
4. learn about customers and processes automatically
5. evaluate the impact of potential actions on all performance goals
6. drive the best actions and refine processes

In following subsections we discuss these six steps.

6.1 Define Performance Goals

Compliant to business strategy of the enterprise, specific performance goals are defined, such as [10]:

- customer retention rates,
- self-service success and failure rates,
- cross-sell revenue rates, and
- sales cycle success rates

These goals are defined with the real-time decisioning platform as goals that are to be tracked, understood, and managed.

6.2 Connect to Existing ERP and CRM Systems and Customer Processes

The real-time decisioning platform is to be connected to enterprise resource planning applications, customer relationship management applications, self-service channels, databases, data warehouses and data marts, and other applications and systems.

Connecting the real-time decisioning platform to these types of legacy applications and data sources can be done rather quickly, particularly if Web services technology is implemented, since Web services technology enables connection and integration of applications and systems of virtually any kind without much intervention needed.

6.3 Monitor Processes in Real-Time

The system continually monitors the real-time stream of events that are generated by the flow of customer and process interactions within the enterprise. As a means of

processes monitoring a kind of modified rule-based system can be used.

6.4 Learn about Customers and Processes Automatically

The real-time decisioning platform automatically builds and maintains real-time predictive models that track and explain the specific factors that drive organization's key performance goals. A form of predictive and proactive business intelligence solution may be used to make insight into customer and process behavior.

On a real-time basis, the shifting patterns of customer and process behavior are continually discovered and prioritized to enable proper reaction to changing conditions and learn about customers and processes automatically.

6.5 Evaluate the Impact of Potential Actions on All Performance Goals

In real-time, the system evaluates the impact of all relevant decisions and recommendations on customer profitability and organization's performance goals. This is unique because it realizes that performance goals are multifaceted and interdependent.

For example, cross-sell offers may have a bigger impact on defection rates of unsatisfied customers vs. satisfied customers. In this case, the system must automatically calculate and evaluate the relationship between customer satisfaction, retention, and cross-sell acceptance likelihood to decide the best action to recommend.

6.6 Drive the Best Actions and Refine Business Processes

Businesses make real-time adjustments to their business processes to improve their performance relative to their goals. Some of these adjustments will happen through offline changes to people, process, or technology.

7 Improving Processes with Real-Time Decisioning

By trying real-time decisioning to the improvement of specific performance goals, an organization can add intelligence and significantly influence every enterprise business process.

Real-time decisioning can advise operational systems to optimize recommendations that are made in process, and it can also make decisions where none were made before.

Using real-time decisioning makes it possible to make informed decisions regarding how to treat every participant in a given process based on the characteristics of the actor, as well as the context.

8 Example of Real-Time Decisioning Implementation in a Contact Center

A call center has the objective of reducing costs by keeping every customer in the interactive voice response (IVR) for self-service. The concept is to reduce the number of service requests that utilize live agents.

Typically, a global decision like this is not optimal. Organizations realize that different customers provide differing amounts of value to the organization, and therefore some customers require different treatment such as better service. The most valuable customers generally deserve the premium service and this can be usually assured in human-to-human interaction mode.

For example, when high-value customers call into the contact center, it may be a better long-term strategy to direct them to specialist agents as soon as customers are identified. This serves to shorten overall time to resolution (i.e., service costs), and enables the organization to provide outstanding customer service to a selected group of high value customers.

But how does an organization dynamically decide which customers should be treated as privileged and therefore sent directly to human agents instead of keeping them in the IVR?

With real-time decisioning, it could be solved like this:

- The real-time decisioning platform predicts the effect that routing the customer directly to a human agent will have on the likelihood of:
 - the call being resolved with a live agent anyway;
 - succeeding in a cross-selling effort for this customer at this time;
 - affecting the retention factors for this customer;
 - reducing the overall time to issue resolution.
- The real-time decisioning platform determines, based on the prediction (cited above) and additional business rules, when it is better aligned with the company's goals to route the customer directly to the live agent.

The real time decisioning platform may discover that there are situations where it is better to route customers directly to a live agent.

For example:

- The customer has a high potential value score. The long-term or life cycle value that this

customer can provide may justify better treatment today to retain the customer.

- The caller has called three or more times earlier in the same day. This may indicate possible attrition risk which is better handled in personal contact.
- The caller is not identified as high value customer but the system discovers he had made three subsequent purchases the same day. In spite of the fact that the value potential of this customer is not yet recognized as high, it may be a good decision to serve him in direct contact with a human agent who can, through a longer interaction with the caller, examine how 'serious' he is in his intention to buy something more from the company.
- This is the first call for the caller in a long time (perhaps after six or more months). This is an opportunity to nurture the relationship with the customer and may be a perfect cross-selling opportunity.
- Every time the caller calls, the IVR interaction is a direct 'zero-out' – the caller presses '0' until transferred to a live agent. This may indicate a customer that is frustrated with newer customer service technologies. It is better to route this call directly to a human agent. Another option may be to try to educate the caller in use of IVR, which can be accomplished by prompting the agent to explain how the desired operation could have been easily achieved in the IVR.

Following with the example, the real-time decisioning platform may advise the call router to route calls based on the likelihood of customer to accept a cross-sell offer – but only if the queue is below a certain size at the specific moment of the call, and only if the customer is of a certain lifetime value.

9 Conclusion

Today, enterprises are under relentless pressure to achieve higher levels of agility: the need for speed and flexibility is paramount in every industry [11]. Increasingly, the best organizations, to remain leaders, must have faster response to customers, competitors and to other external market forces. They must make decisions quickly, possibly in real time.

Automated real-time decisioning is the next automation frontier. Its influence in the business world has the potential to be as significant as other major automation efforts have been.

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time analytic capabilities into business processes. It analyzes events as they happen, and recommends actions that will most likely influence those events to achieve a set of defined performance goals.

Some organizations attempt to identify and react to key events by using offline analytics such as traditional business intelligence (BI) tools, as well as rule-based systems to predict scenarios that trigger specific actions to take place. Once insights are gained, a reactive plan is set into motion to address the problem or opportunity. But, this approach has some severe limitations.

Using real-time decisioning makes it possible to make informed decisions regarding how to treat every participant in a given process based on the characteristics of the actor, as well as the context.

In conclusion, we can make a little comparison to illustrate the real-time decisioning potential: when businesses switched to tracking documents digitally, not only efficiency was affected, but a whole new world of applications was opened; in a similar way, real-time decisioning will certainly create and define entirely new ways of doing business.

References:

[1] Miller, Steve. Exploring Agile Development. <http://www.PragmaticSW.com/Newsletters.asp>, March 2007

[2] Rogers, Sandra. Thinking Outside of the Box: Architecting for Agility. <http://www.idc.com>, May 2006

[3] Bowles, Adrian J. *IT Compliance Strategies for Improved ROI*. Robert Frances Group, Westport (CT), 2004

[4] Amor, D. *The E-business (R)Evolution*. Hewlett-Packard Professional Books/Prentice Hall PTR, Upper Saddle River, 2000

[5] Sonnen, David; Morris, Henry D. BusinessFactor: Event-Driven Business Performance Management. <http://www.idc.com>, January 2004

[6] Rouibah, Kamel; Ould-ali Samia. PUZZLE: a concept and prototype for linking business intelligence to business strategy. *Journal of Strategic Information Systems*, Elsevier, 11 (2002), pp. 133-152

[7] Swift, Ronald. *Accelerating Customer Relationships Using CRM and Relationship Technologies*. Prentice Hall PTR, Upper Saddle River (NJ), 2001

[8] Park, Chankyu; Choi, Ho-Jin; Lee, Danhyung; Kang, Sungwon; Cho, Hyun-Kyu; Sohn, Joo-Chan. Knowledge-Based AOP Framework for Business Rule Aspects in Business Process. *ETRI Journal*, Electronics and Telecommunications Research Institute (ETRI), Daejeol, S. Korea, Volume 29, Number 4, 08/2007., pp 477-488,

[9] ***. Adaptive SOA: Adaptive Discovery Enables Composite Applications with Real-time Agility. <http://www.ultimus.com>, July 2007

[10] Kim, Moon-Koo; Jee, Kyoung-yong. Factors Influencing Strategic Use of Information Technology and Its Impact on Business Performance of SMEs. *ETRI Journal*, Electronics and Telecommunications Research Institute (ETRI), Daejeol, S. Korea, Volume 29, Number 4, 08/2007., pp 497-506

[11] Light, Matt. Agile Requirements Definition and Management Will Benefit Application Development. <http://www.gartner.com>, April 18, 2005