Reply

glue

A new approach

condition

event

action

Event Driven Business Architecture Whitepaper

Abstract

So, if we accept that events happen; events drive business; and decisions drive value, how can we ensure that we respond to events in the most effective way to derive maximum value for the business? The way companies respond to events is crucial – and it has a price tag.

Event Driven: how can we deliver full business value?

'Event driven' as a notion is not new. Business processes reengineering and applications were introduced many decades ago as a strategy to help companies to react quickly and more effectively to changes, while at the same time delivering improved service to their customers and helping to cut costs. Major improvements in business processes and applications have been delivered as a result. At a detailed level, 'events' have been widely understood and used by system developers for longer still as a basis for software development. And 'event driven' is a concept that is instantly recognisable by business leaders: an event is something which happens externally or internally and which has a direct impact on the business and ultimately on the bottom line: a fraudulent bank transfer, an inventory stock-out or a product recall are examples of adverse events which occur. Often the event is something over which the company has little or no control. In other words, 'event driven' reflects reality.

So, if we accept that events happen; events drive business; and decisions drive value, how can we ensure that we respond to events in the most effective way to derive maximum value for the business? The way companies respond to events is crucial – and it has a price tag.

It is not enough to treat the symptoms, for example, by implementing a process to respond to a given event. The truly event driven business needs to look at where and what is driving costs in relation to key events; in other words, to consider the context of these events, and focus on those events which really matter. Processes have a role to play, but as they don't 'do' context, their usefulness is limited.

This paper proposes that companies look behind the business events which occur to focus on the underlying conditions; it is by introducing changes to these that the greatest value increase or cost decrease could be achieved.

The issue

Business leaders have traditionally looked to their IT departments to help them to resolve the challenges posed by growth and competitors; to help them to reduce costs or to improve quality. The typical IT response to delivering value in these areas has tended to be process-driven rather than operating at the business level.

Many concepts have emerged, some more mature or mystical than others, and most resulting in a series of acronyms: enterprise application integration (EAI); message oriented middleware (MOM); service-oriented architecture (SOA); event driven architecture (EDA); model driven architecture (MDA). Each of these professes to drive more business value than the last.

IT departments are adopting the latest technology approach to driving more value from their systems, yet they are often failing to target the areas of the business that actually drive value up or cost down. Their approach to problem resolution is often constrained by starting with the process and creating new boxes and structures around it. This is the wrong place to start.

It is a fact that events happen; events drive business; and decisions drive value. Yet, most improvement projects and programmes focus on business process improvement and IT systems reengineering. The result is that the business process models do not reflect reality and the IT systems have evolved over time in a different direction from the process model. In addition, concepts such as security, change and cost of service have tended to be an afterthought.

As a consequence, the company usually derives a sub-optimal return on its investment or has to pay greater than expected costs of change and ownership.

There are two principal reasons for this:
- Projects and programmes fail to target areas where the greatest return could be achieved for a given investment;
- The process approach fails to recognise that no single entity owns or controls the entire business process.

In short, a sub-optimal approach tends to be applied to the wrong areas.

A new approach

What, if anything, can be done differently? I am suggesting a new approach, which incorporates three basic elements:
- Embrace the idea that events drive business;
- Accept the fact that business processes, business rules and business procedures must be treated separately. IT's goal tends to be to create a single 'über process', which will handle everything. The resulting process may well be the same for different scenarios, but the procedures required will differ depending on the specific conditions. Take for example the typical inventory process: source, store, move, consume. In the case of the MoD, for example, this process will be followed, but the procedures will be very different, depending on whether the items being distributed are toilet rolls or weapons!
- Apply effort to those areas where the greatest return for a 1% improvement in performance can be achieved. By way of example, a utility company was able to eliminate the number of dry holes it drilled in the process of identifying leaks by improving the technology used to locate those leaks. This resulted in a saving of £100,000 per dry hole.

One technique which can be used to achieve this is Event Driven Business Architecture. But don't start with IT! In the first instance, Event Driven Business Architecture should not consider IT implementation, but rather should help the business to identify those areas where the greatest value increase or cost decrease could occur; what 'business events' affect these areas; and what action should be taken as a result of this information.

Some definitions

We need to be clear what we are talking about, so here are some simple definitions:

Event: This is typically a change in state, which on the basis of experience, can be matched to a known event type.

Condition: This is a logical test, performed as a result of the event. There must be a positive result to cause an action.

Action: This is the action that is executed as a result of meeting the event and condition criteria.

Business Process: A sequence of high-level activities that deliver business outcome.

Business Rule: A Business rule is a statement that defines or constrains some aspect of business activity. Essentially business rules assert control or influence the behaviour of the business processes. A business rule outcome is the trigger event for another business rule outcome that are then chained together.

Business Procedure: A sequence of discrete, low level, atomic actions that are executed to produce a prescribed result.

The concept is seen in Physics and is analogous to 'Brownian Motion'. This articulates that the path of a particle is almost impossible to predict in advance but is easy to trace in train post event.
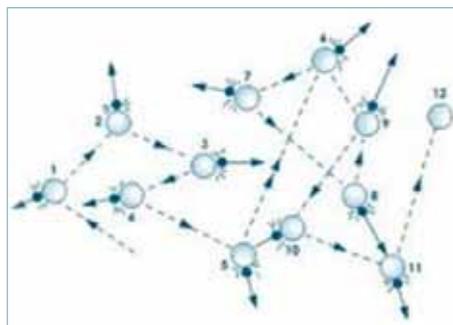
In the analogy, the path of the object is the 'Process'; the potential collisions are the events or rules. Businesses operate in response to event and processes adapt to accordingly.

Should 'event driven' replace 'process' driven?

Event driven is not a replacement for process; we must recognise, however, that there is no 'predictable happy path' for process – even with something as simple as placing an order. System designers cannot predict every eventuality.

The problem is that business processes and IT systems will never always drive the expected outcomes or results. As with the theory of Brownian motion, applied to the random movement of particles, different events provoke so many potential permutations that it is impossible to predict them beforehand and hence impossible to build into the system a response for each. Yet the exceptions and the unexpected must be accommodated. This should be done by building flexibility and adaptability into the process model.

Consider the simple example of an on-line sales order:
Order Placed; Payment Request, Payment Authorisation, Order Acknowledgement, Order Pick, Order Pack, Order Despatch, Despatch Confirmation, Delivery Confirmation.

At each stage the state of the order is updated as events occur. Consider the 'out of stock' event, for example. IT will focus on actions to redress the situation and to release part shipments, for example. Yet the logic in optimising the process to improve value to the business is flawed. Rather than treating the symptoms, the focus should be on the underlying condition.

We need to consider the event in the context of the value drivers of the business. In the 'stock out' example, consideration should be given to the potential revenue increase if the occurrence of 'stock-outs' could be reduced by 1%. To take another example, if product design faults could be reduced by 1% then warranty claims could be reduced by many thousands of pounds: just think of the potential cost savings for the car manufacturer which has suffered from a series of product recalls over the last two years.

The figure below displays some examples of the value which could result from a 1% improvement in a particular business driver. By applying this focus, then determining what events relate to these drivers with the appropriate response, rules and procedures can be adjusted to increase business performance.
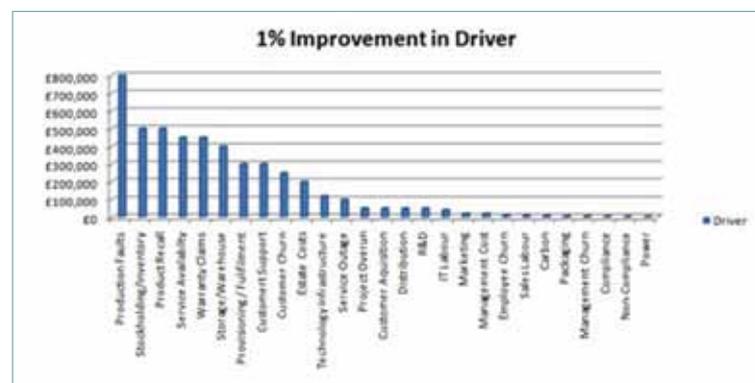
Consider a real-life example:
A major consumer packaged goods (CPG) company wanted to remove costs from its distribution operation. It looked at a number of 'events' to identify where improvements could be made and focussed on reducing the occurrence of 'empty truck events'. The reduction of 'empty truck events' by just 1% (by using them for returns or diverting them to a different depot, for example) would mean savings of thousands of pounds.

Event : Condition : Action

It is not enough to simply consider the events or potential sequence of events. Consideration must also be made to the condition resulting from the event and the action or actions required in response to the event.

An analogy from everyday life can help to clarify this. There is a fire [the event]; where and what kind of fire is it? [the condition]. Is it (a) a domestic electrical fire in a house; (b) a blaze at a petro-chemical plant; or (c) a shed on fire in disused allotment. The response and priorities of the emergency teams will differ depending on the context: If the fire service responded to all situations in the same way as to scenario (b) the cost to the tax payer would be unbearable.

Yet this is what business processes make businesses do.

Simple versus complex events

In architectural terms, we need to make the distinction between simple and complex event processing.

Simple event processing is directly related to specific (one to one event to action), measurable changes of condition: an event happens which initiates downstream action. This is often used to drive work flow.

Complex event processing (CEP) involves multiple conditions (one too many conditions and actions). An event may occur and multiple conditions will be tested before a single action is executed; alternatively, multiple conditions will be tested, resulting in multiple actions being executed.

CEP identifies and analyses cause-and-effect relationships among events in real time, allowing effective actions to be taken in response to specific scenarios.
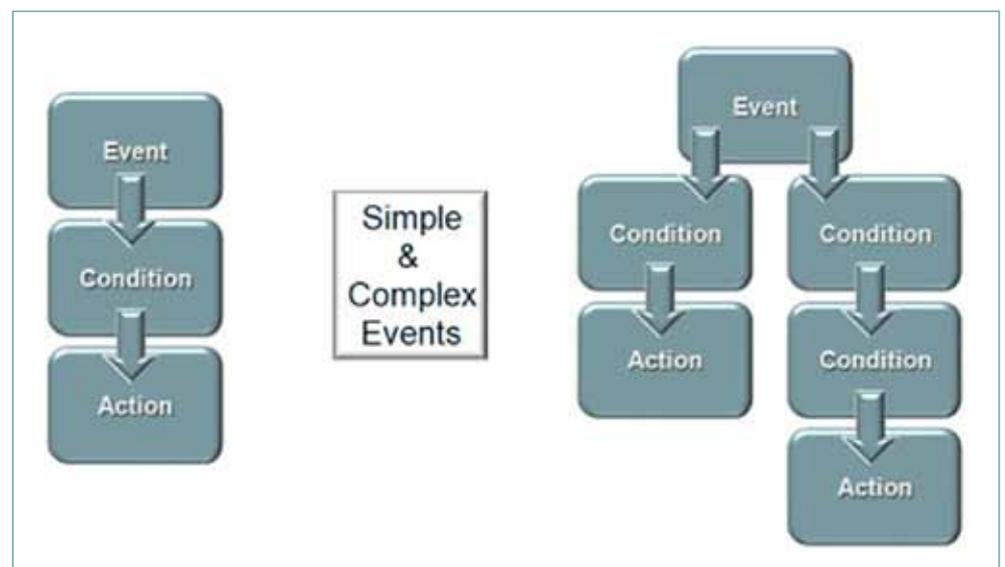
The limitations of Business Process Re-Engineering

Business process re-engineering and system integration projects tend to focus on creating a single business process model to capture all scenarios for a given set of activities. Even as services, driven out of approaches such as SOA, the result tends to be bloated operations and poor performance or cycle time: ultimately this drives higher through life costs as perceived agility is delivered at the expense of lean thinking.

Instead, business processes, business rules and business procedures should be separated and recompiled to define how to respond to any particular event and condition.

What does this mean?
Consider the Inventory Management Process: Source, Store, Move, Consume.
This process is true for virtually all material types in all geographic locations. The state of inventory is changed at each stage (as with an online sales order, for example) and multiple physical states may be held for the materials. Unfortunately, this model whilst conceptually correct is too abstract to be meaningful when implemented. By contrast, to model the activities at a lower level does not provide sufficient coverage for all possible scenarios.

We must ask what events have taken place? What conditions exists? And, what action is required?
In the inventory example; low volume, high value goods may require different procedures from high volume, low cost goods. The process is essentially the same (Source, Store, Move, Consume) but the procedures may be different in each scenario (for example, physical counts, quality check, secure distribution, packaging and so on). Think back to our MoD example cited above.

The goal is therefore to create a sufficiently high-level process that can handle things at the 'über' level, supported by multiple procedures driven by business rules, which are based on specific events and conditions.

Where to target Event Driven Business Architecture? Focus on what matters

There is much hype currently about dealing with large numbers of events and data. I would suggest that the opposite is true: only deal with what matters and avoid the temptation to create big problems that need big solutions!

The figure above shows that there is an inverse relationship between the complexity (and number) of procedures and the complexity of the business process driven by the business rules. By taking the event: condition: action approach greater flexibility and coverage can be achieved in a much shorter timeframe. In addition, the phasing and cost of implementation and the cost of change can also be reduced. For example, in military logistics the same inventory business process is used for Boots & Bombs! (Source, Store, Move, Consume) however, if the same procedures were used for boots as bombs the cost of execution would be enormous. Instead the procedure for handling bombs is more complex than boots and the events such a mismatched inventory counts are treated more seriously in the bomb scenario.

Conclusion:

Business processes have been developed as a response to business events. Seeking to improve business process performance or IT applications in isolation of the events that drive the business is flawed. Unless there is a change is approach IT project will continue to underperform, overrun and come in over budget.

The focus must be on business drivers to identify the areas of business where a single percentage improvement will drive most business value. By targeting the events that occur in these areas the events, conditions and actions can be manipulated in a flexible and dynamic way to drive the desired businesses outcome. This is done by separating the activities in a business process from the low level procedures, using business rules to determine conditions. Leaner and more flexible solutions can be designed that will improve business performance in a visible and measureable way.

About the author

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Jason is a Partner within the Reply S.p.A Group responsible for architecture, technology and consulting. With 18 years' experience in enterprise architecture and solution delivery, Jason has held senior positions within both software development companies and large system integration companies.

He began his career in IT at the 'back-end' of the IT value chain working in manufacturing and industrial environments. Often literally on the 'shop floor' and at the end of the production line! Having picked up the pieces from several front-end architecture and design flaws, he is now committed to helping organisations drive genuine business value from IT investments and avoiding costly front end mistakes.

Glue Reply

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Its consultants work with heads of architecture, programme security, CIOs and CTOs across many sectors from retail, telecoms, financial services, utilities and defence to media and entertainment. Set up in 1999, its clients include: Marks & Spencer, AXA UK, Boots, Cable & Wireless, Sainsbury's, Ministry of Defence and National Grid.

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