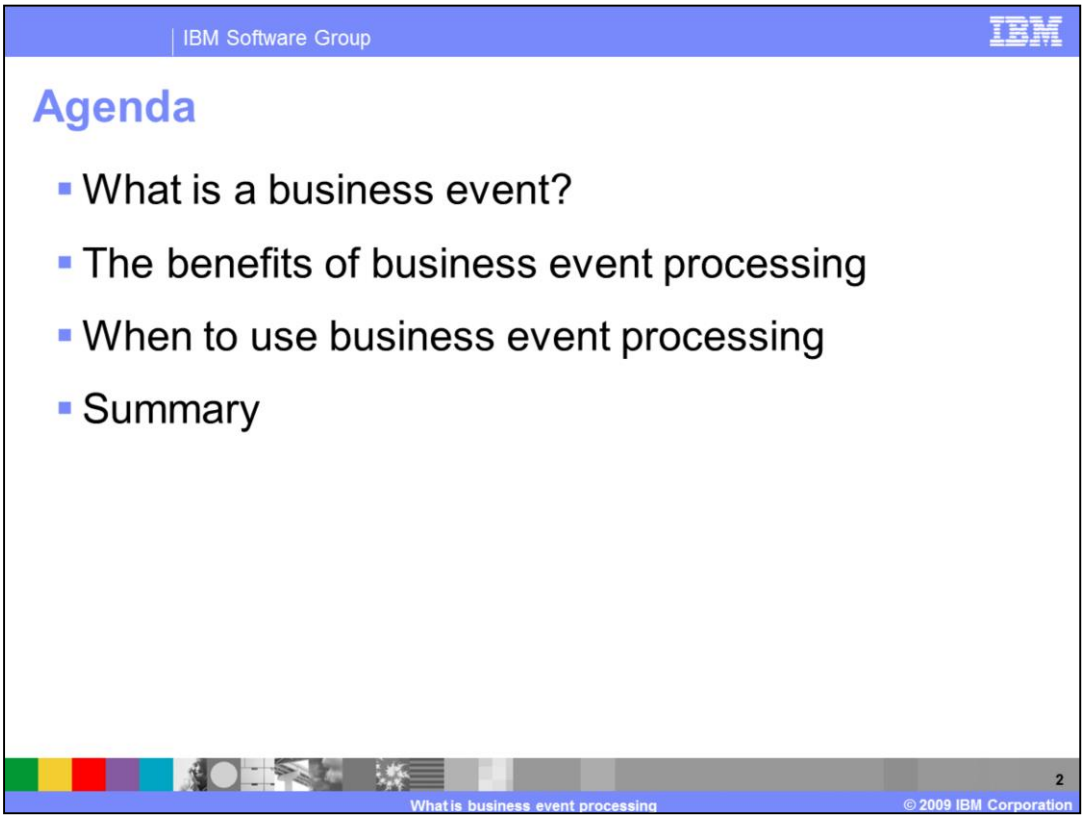
This presentation describes the concepts behind business event processing. This will articulate the value of business event processing without mention of any implementation or product. This will set the stage for subsequent presentations which describe IBM's implementation of an business event processing system through the WebSphere® Business Events product.



During this presentation you shall be introduced to Business Events, including what they are, why to use them, and when to use them.

The presentation starts with a description of what business events are, and then elaborate through examples. The benefits are discussed relative to existing processing of both manual and automated tasks. The presentation will also discuss how business event processing manages high volumes and absent events.

The presentation is closed with a summary of the role of Business Event Processing, together with pointers to additional related resources.

A Business Event is something that happens at a given point in time which is relevant to the business.

An example from the slide is an ATM withdrawal. The withdrawal of money is an event and you can imagine that withdrawal happening at some point in time. Other potential events are also shown on the slide. When you purchase shares in IBM, that is an event. When a package is dropped at your door, that too is an event. An event typically falls within a sequence of related events.

Events are all around us. You don't necessarily tend to think of them in the context or language of events, but they are still events. A business event is an event that is relevant to the business. This will depend on the business. A flight departure might be an event to some businesses but not all, where as nearly all businesses are affected by price changes and new employees being hired.

The occurrence of an event might be interesting but unless the business responds to it it is not that useful by itself. Some events can require urgent response, thus the speed of becoming aware and taking action is important. You want to respond to these events. This response, or action, is issued upon detecting a particular event or pattern across events.

Take for example a fire alarm going off. When you hear a fire alarm you have been taught to leave the building. In this case, the event is the sounding of the alarm and the action you perform is that of leaving the building. This is a simple event with a simple resulting action.

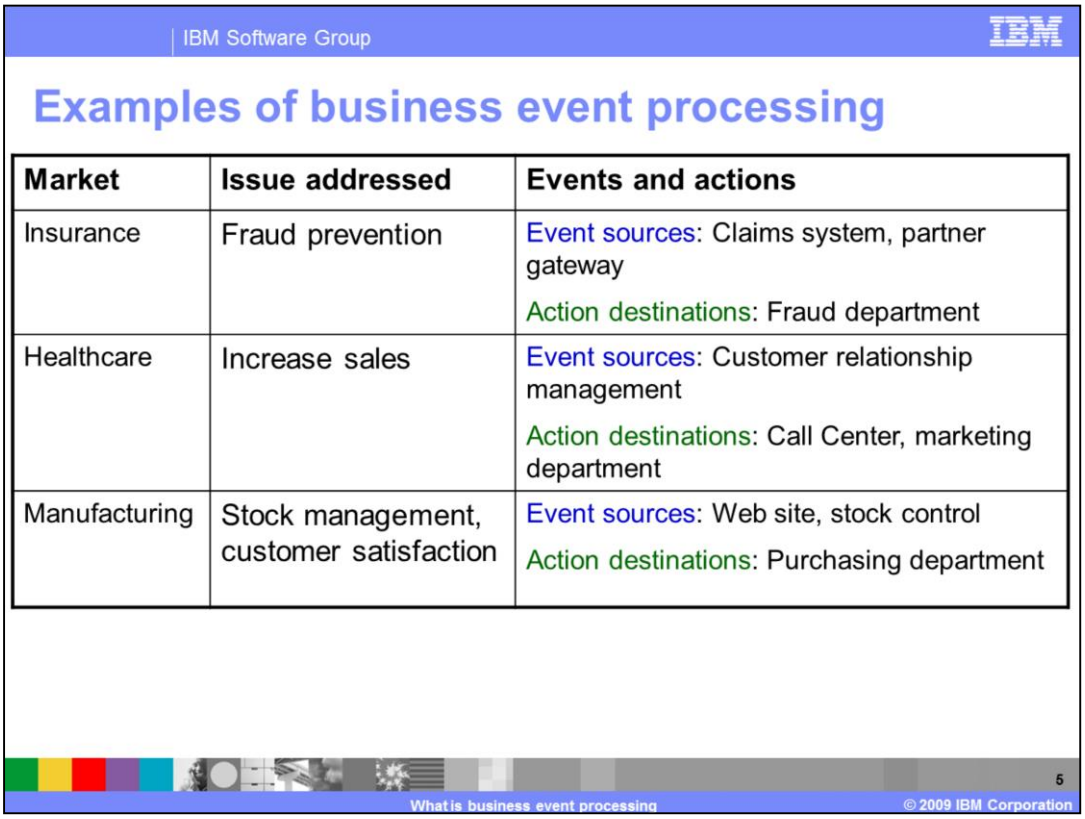
Another example is that of hiring a new employee. When the person starts their job the organization has to perform many tasks such as assigning them a desk and telling the tax office the new employee's details. This shows how multiple actions might result from a single event.

Not all responses are based on a single event, some actions are the result of a combination of events. For example, an ATM withdrawal is an event which on it's own is not unusual. Somebody using their debit card to pay for a car park is also an event, but again it's not of particular significance when taken in isolation. Suppose the ATM withdrawal is made in South Africa on the same day the person's card is used to pay for a car park in London. This can result in a telephone call to the customer to investigate the possibility that one of these transactions is fraudulent. This example shows how a pattern of events can be detected and responded to based on the context in which they occurred.

The key concept here is that you detect some events and respond to those events through the execution of some actions. This sequence of events occurring followed by pattern detection resulting in one or more actions being instigated is the core of Business Event Processing.

Organizations might have limited event processing implementations today, but these are typically silo'd implementations found in specific applications and processes. Business event processing gathers events from right across the enterprise, correlates these events,

determines whether a response is necessary and then instigates the appropriate actions.



The previous slides provided a high level description of event processing.

This table shows a range of real examples that use business event processing. These are listed to help re-enforce the notion of events and actions, your response to events. These are all example problems that can be addressed by event processing.

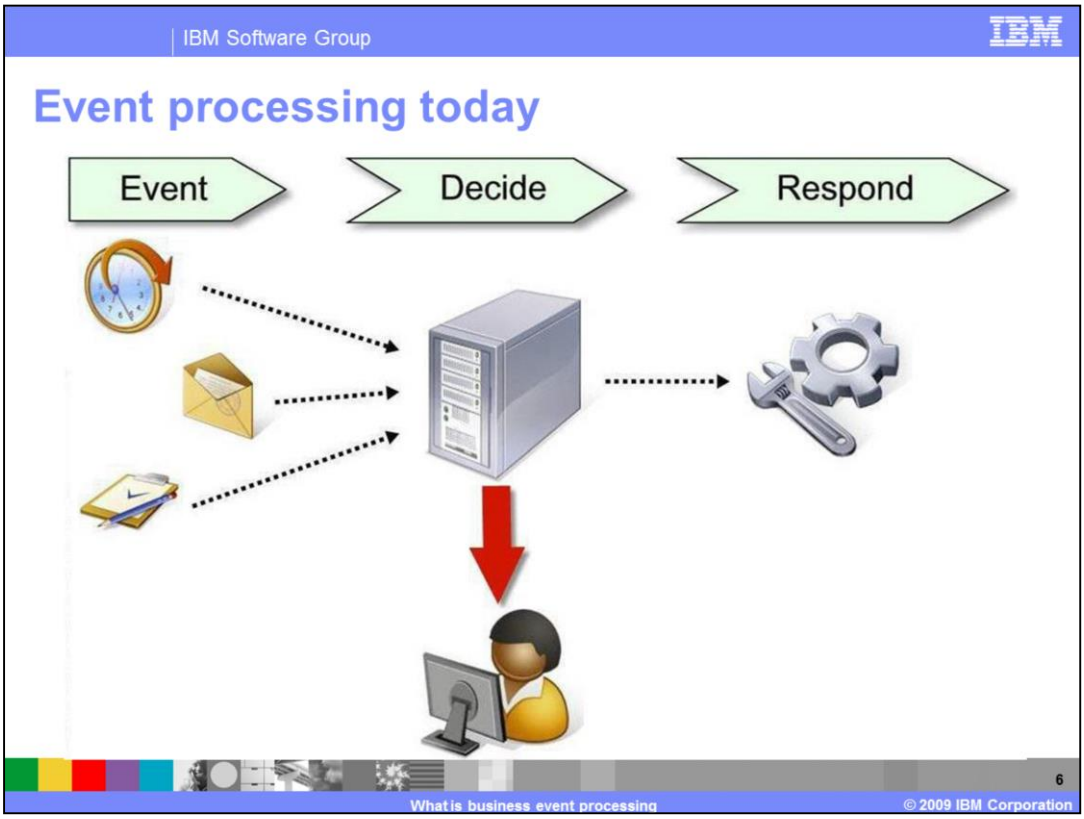
In the first example an insurance company can use business events processing for fraud prevention. Consider the scenario where a customer makes a claim for an item against two different policies which have been setup with two different insurance companies. This is likely to be an indication of a potential fraud occurring. There are multiple sources of events in this example; the internal claims system where the customer has attempted to exercise the policy and the partner gateway through which external insurance companies notify each other of policy claims. The target of the action response might be to a fraud prevention system which can prompt someone to start investigating the customer's exact circumstances.. Therefore, the event is a customer claiming on multiple policies for the same item, the Action is a prompt to investigate the claim in more detail.

The second example looks at how an healthcare company can take advantage of a cross-sell opportunity. When a customer notifies the company of a change in their circumstances such as getting married, this might be an opportunity to help the customer by offering additional services, such as a change in their policy terms. The source of the event might be the customer relationship management system which saw that a change of circumstance has been received. The target of the action might be a customer sales or marketing representative who is prompted to make a call to that customer to offer them a joint healthcare policy and to inform them of the family policies available. In this case, the Event is the customer making a change to their details, and the Action is for a sales or marketing representative to call the customer.

In the last example a manufacturing company can use business event processing to improve their stock management and ensure customer satisfaction. Consider the scenario where one customer makes an order for 300 items of a type A and another customer

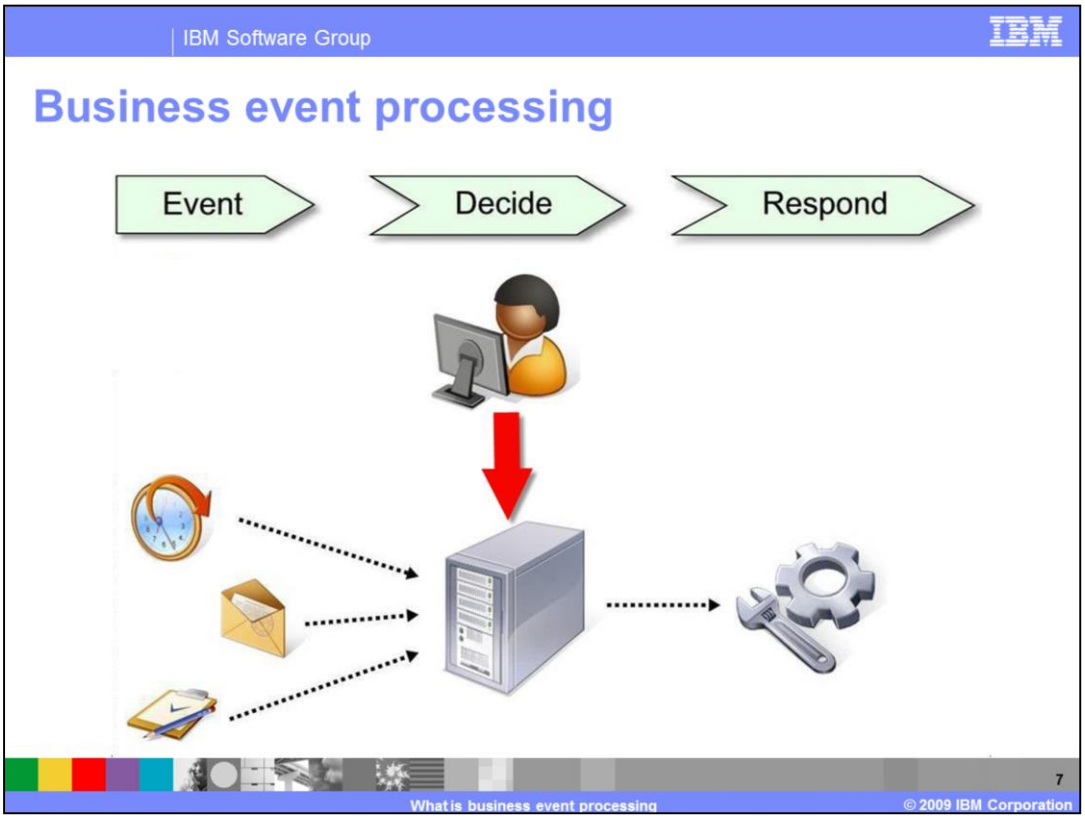
makes an order for 200 items of type B. The two product types share a common component of which there are only 350 in stock. A simple process which detected each individual order and validated the stock levels for all parts on the bill of materials for the products in the order cannot not detect the potential problem. Business event processing allows the combination of these orders to be detected, the potential impact to be identified and corrective action to be taken. In this scenario the event is several customers placing orders while the action which is triggered by the business event processing is to notify the purchasing department to place an order for the required components. The result of taking these actions is not only to ensure sufficient stock levels are in place but also to maintain customer satisfaction by fulfilling the customer orders.

You have now seen how business event processing can be applied to various industry sector scenarios. The next slides will explain what benefits are offered by event processing.



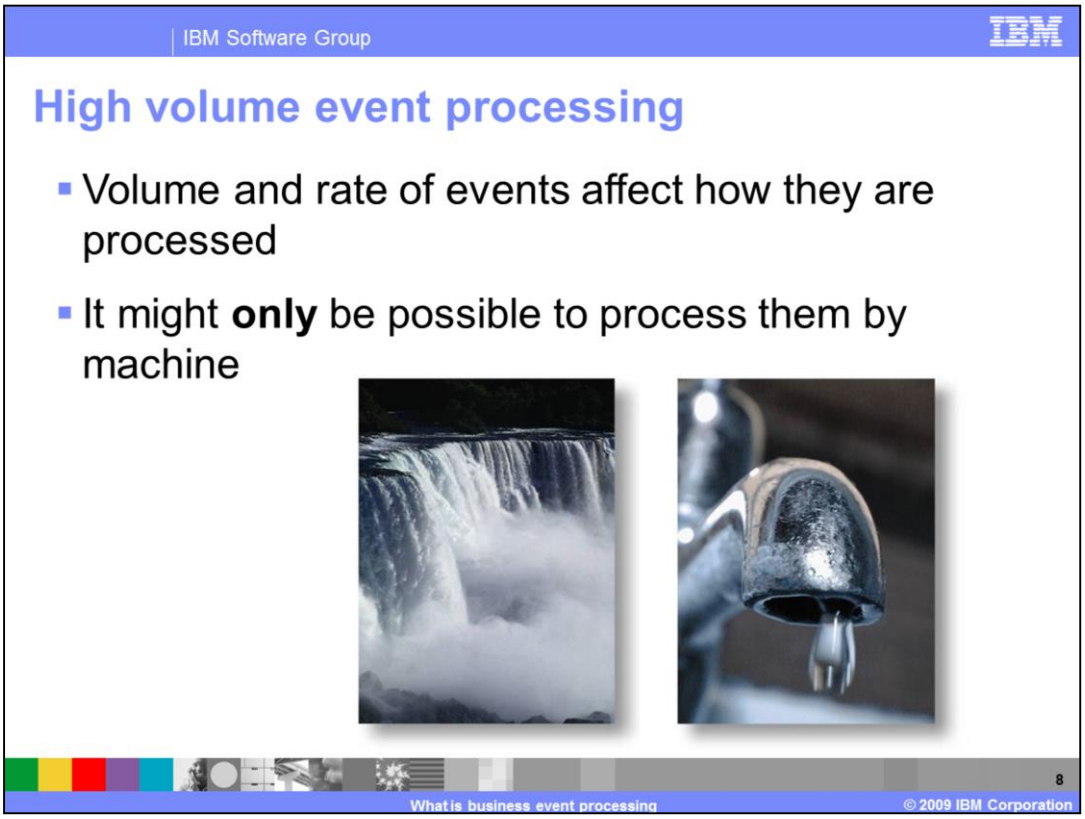
Commonly, existing event processing solutions are implemented in a distributed and uncoordinated fashion. Information technology solutions deliver unfiltered, unstructured events and it is often people who are presented with information in a variety of forms in order to instigate the appropriate actions. It is these peoples skill and experience which guides the decision making process rather than any concrete process definition.

With these solutions, consistency can be difficult to achieve; employee experience can be lost through retirement or unavailability due to illness, decision processes might be poorly documented and incorrect decisions can occur.



Business event processing provides a solution to these problems by allowing business users to describe the decision making processes which they already understand. Allowing them to focus on refining other processing within their organization while business event processing engines run the processes. These business users are empowered with tools that allows them to not only describe these decision processes but also refine them in an agile way that allows flexibility to change within an organization.

In many cases the handling of events can be automated by a machine that examines and processes the events as they arrive. By applying rules and pattern matching against the events, the machine can determine which actions should be issued and when. However, business events processing also allows people to be more productive by automating the processes that are well understood and filtering the large number of business events. This allows employees to be presented only with events which are pertinent to the decisions that need to be made.

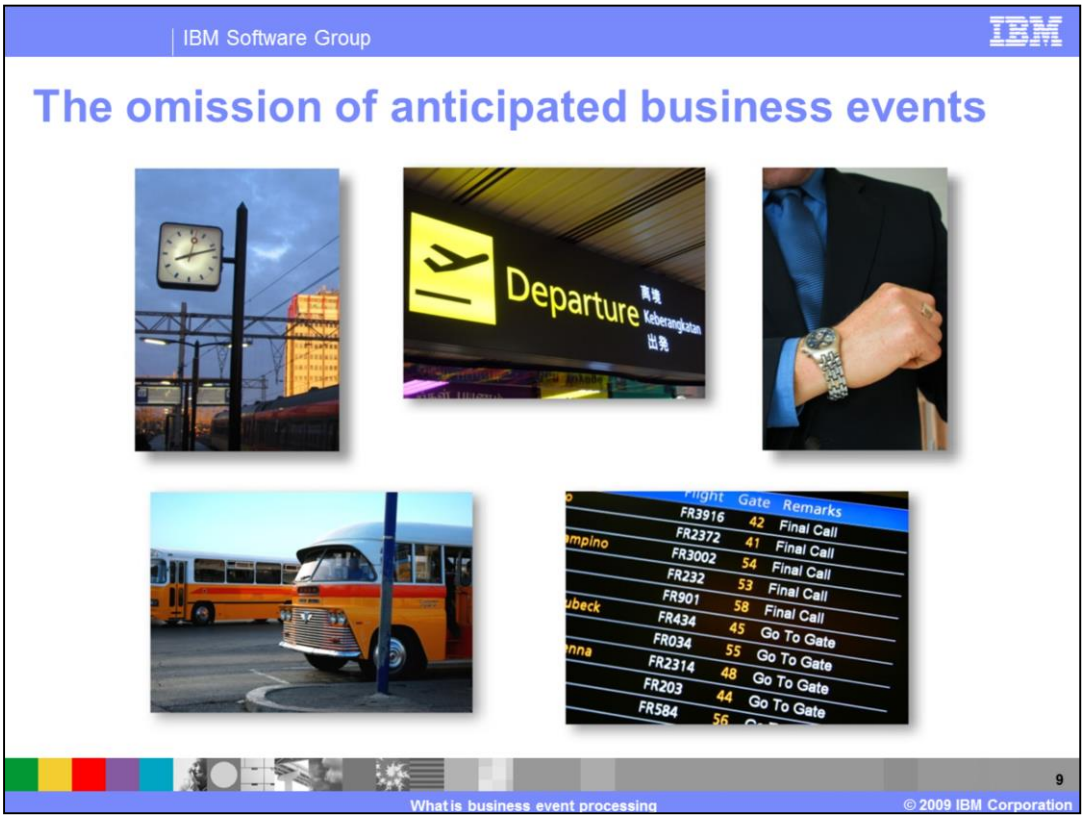


The previous slides have described how business event processing can improve process consistency and increase process flexibility. There are also scenarios where the volume of events cannot be absorbed, assimilated, correlated and processed by humans.

If you look at a range of scenarios where event processing is a good fit for a solution, you can see that there are great differences in how often and how many events are generated. An event that happens infrequently can be missed when it eventually does happen. Alternatively, other events can happen so quickly that the sheer volume of events cannot realistically be processed by people. In both of these cases, automating the task of watching for the arrival of events and deciding how to respond can best be achieved by machine. This solution can offer both consistency and scalability.

Business Event Processing turns a flood of events into a trickle of valuable actions.

Consider, for example, an invoice processing department of an organization. The organization might receive hundreds of invoice requests per day. A common scam is to send an invoice to an organization for a relatively low value item which was never ordered. Because of the item's low value the organization's policy will result in automatic payment of the invoice. If business event processing were implemented then this can be avoided by ensuring correlation of invoices against purchase orders being issued and products being received; thus ensuring that incorrect invoices were not paid.



Scenarios with a high volume of events are not the only case where human decision making is sub-optimum. The case of missing events is also difficult for humans to process. Whilst you can handle decision making based on a small number of events happening within a short period of time, it is far more difficult when there is the complexity of numerous events occurring at dispersed time intervals.

Up until now the presentation has focused on the pattern that an event arrives and, as a result, you respond to that event with the execution of some action or the sending of an alert. Although this is a common pattern of Event processing, it is by no means the only one possible. Another core capability for event processing is the notion that the absence of an event is itself an event.

Let's look at some examples. When a flight fails to depart on time there is no departure event. This might trigger some actions. The airport gate is not clear, so this might result in another gate being used for the subsequent flight. Other actions might include re-routing the passport control staff, or getting the nearby vending machine reloaded with drinks or chocolate.

In another example, if a passenger fails to board the bus when it is due to depart, the omission of the event that the passenger has boarded might allow the seat to be given to someone else.

Each of these are examples of an expected or required event failing to arrive. Detecting missing events can be just as important to the business as detecting the arrival of other events.

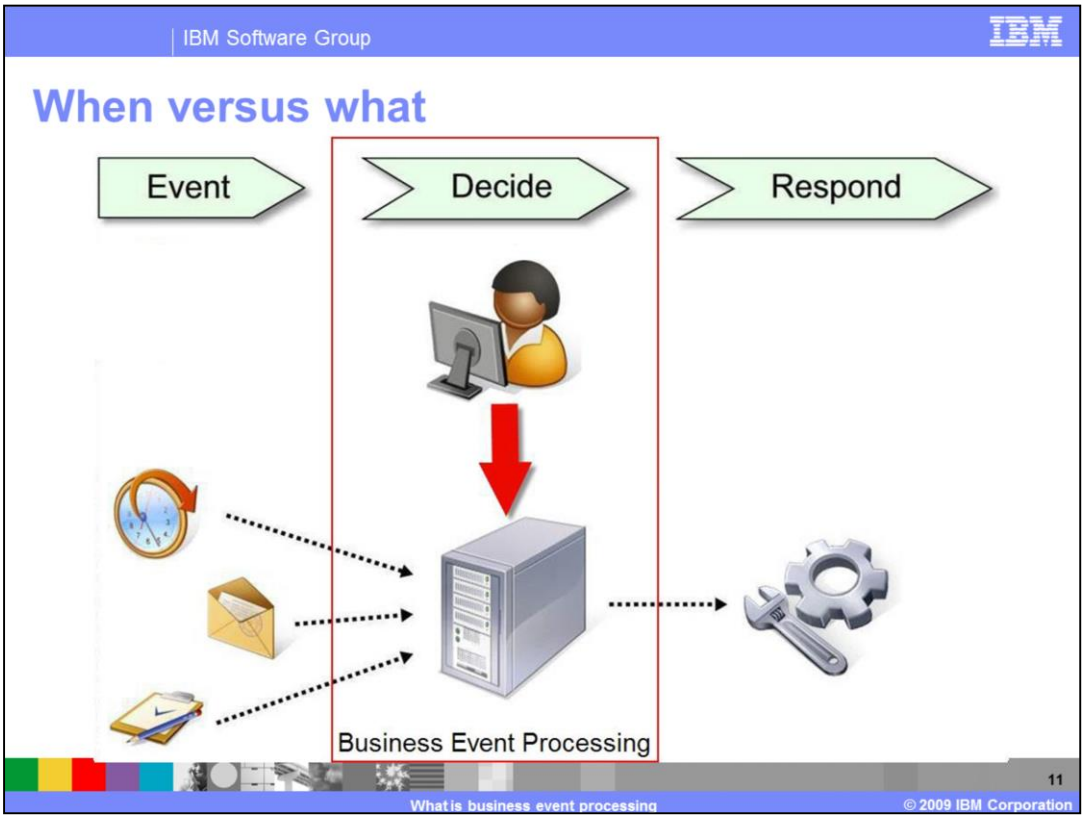
Handling multiple events

- Response to the existence of multiple events
- Observation of events within defined timeframes

Responding to a single event is an easy proposition. The more interesting needs are responding to the relationship between multiple events and the consolidation of multiple events which are observed within a given timeframe.

As an example, in the banking industry a change of a customer's personal identification code by itself is not suspicious and neither is a cash withdrawal. However a large cash withdrawal within 24 hours of the personal identification code being changed might be considered a suspicious activity. It might be thought to be suspicious because historical evidence has shown that such occurrences have resulted in frauds in the past.

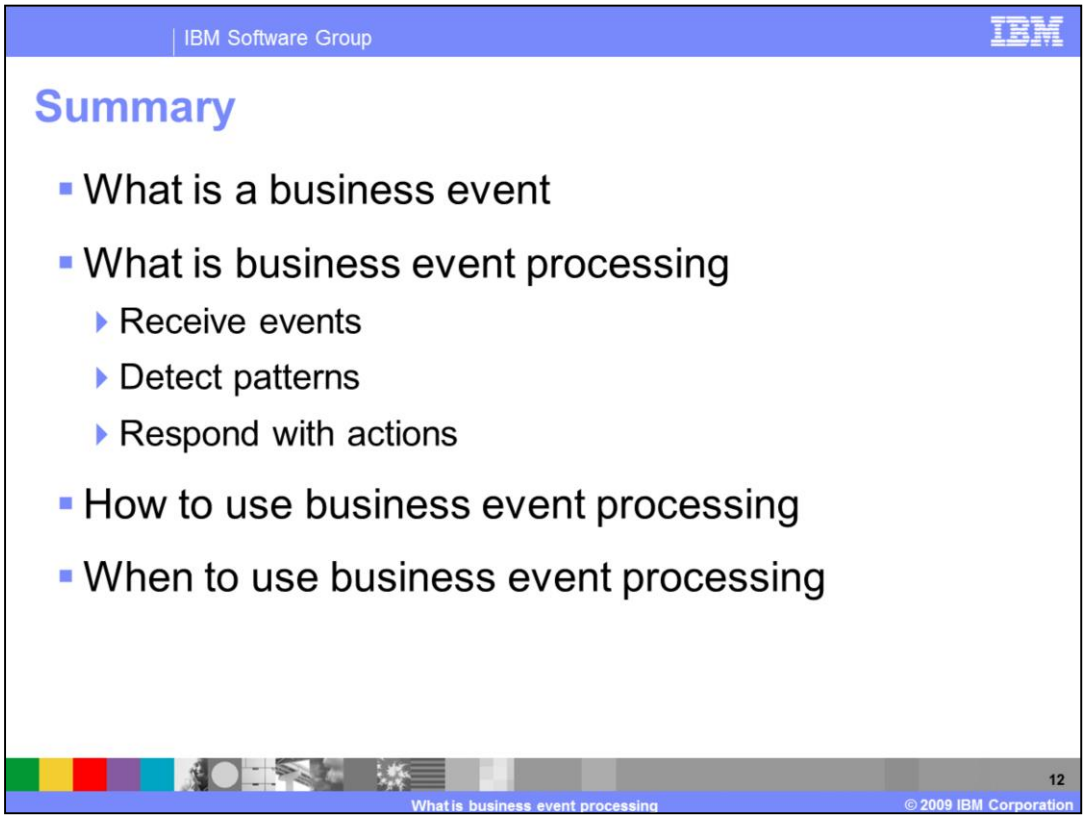
Business event processing allows business events from disparate sources (in this example from the Account Management system and from the ATM system) to be received and automatically related. The observation of these two events within the defined timeframe results in an action being instigated (in this example a fraud investigation being started).



Business event processing is about deciding **when** to act.

Business event processing examines events and applies patterns to those events. In effect, the event engine is automatically examining the stream of events that business event processing receives. From that mass of information it is able to sift through to determine when interesting things, such as threats and opportunities, are found. Once found, these then act as triggers to conventional business information systems and processes to perform the actions of what to do when such occurrences are detected.

This logical separation of the “When to Act” versus “What to Do” forms a clear division of role between Business Event Processing and the execution of the response to a specific sequence of events.



This presentation has described business event processing in terms of what it can achieve, how it can be deployed, and when to use it.

You have been introduced to several basic concepts. Events are anything that occurs that is relevant to your business. Actions are the instigation of a reaction to a single event or pattern of events being detected.

You were then introduced to the major functions of a Business Event Processing engine. Events will arrive from external systems and sources and then be analyzed by the engine. The engine will seek to match those events to patterns and determine which, if any, actions need to be performed.

A business event processing solution provides two key components: Firstly, the runtime system to absorb, assimilate and correlate events in order to instigate the execution of required actions. Secondly, the tools to enable business users to easily define event patterns and decision processes in an agile and flexible way.

Business event processing software helps businesses detect, evaluate, and react to event patterns in time to meet the business's objectives. Business event processing adds both live event pattern detection and dynamic processing so as to respond to the business events. Such systems can help increase productivity by consolidating and filtering information to highlight the business critical events, in addition to recognizing patterns of activity in order to trigger appropriate business responses.

Reference materials

- WebSphere Business Events home page
  - http://www.ibm.com/software/integration/wbe/
- IBM sponsored WebSphere Business Events public newsgroup/forum
  - http://www.ibm.com/developerworks/forums/forum.jspa?forumID=1301
- IBM Redbooks®
  - http://www.redbooks.ibm.com/

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