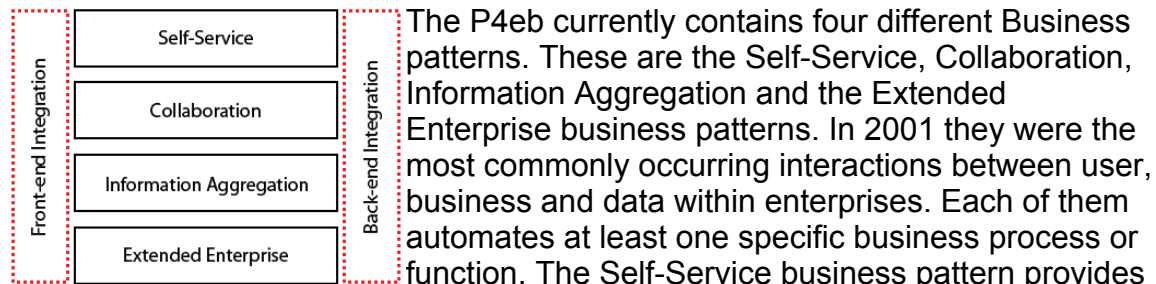


## ***The revised P4eb Business patterns and the scenario decomposition framework***

### ***Overview***

This article introduces the reader to the revised Business patterns of the Patterns for e-business (P4eb), including the rationale and the relevance to the Smarter Planet initiative of IBM.

### ***Until now***



The Self-Service business pattern provides users with access to enterprise transactions, applications and data. The users are individuals with interest in the business, like customers, employees or business partners. To support teams in communication, collaboration and the exchange of knowledge (for example in distributed project teams) the Collaboration business pattern is applied. The Information Aggregation business pattern enables users to access and update data from multiple different sources and use tools to filter and extract relevant information. In solutions which utilise the Extended Enterprise business pattern inter-enterprise applications are connected via a programmatic interface. This supports the interaction and collaboration between discrete enterprises.

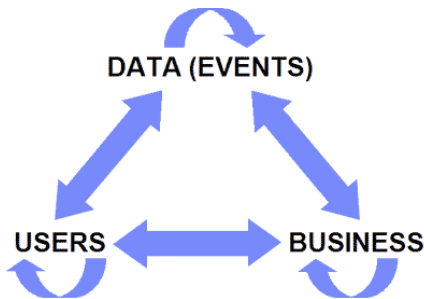
Most solutions are more complex and implement more than just one of the Business patterns above. To create one seamless solution, Integration patterns can be used to combine various different Business patterns. P4eb identified two different Integration patterns. The Front-end Integration pattern unifies access to one or more Business patterns. Additionally if required, this pattern enables access from multiple devices and provides a consistent user interface. The second pattern that integrates various Business patterns or applications with their data within one seamless solution is the Back-end Integration pattern. An example of the Back-end Integration pattern is an eCommerce application which needs to integrate with a Supply Chain application to replenish stock. The integration between the applications is transparent to the user.

### ***New Requirements***

We are surrounded by events which have a significant impact on day-to-day business. These events could be a stock level falling below a threshold, a changing state of a business process or merely a user request from an application. The relevance of events is continually growing and the last decade

saw the introduction of complex event processing. Additionally the Smarter Planet initiative requires the increasing integration of digital and physical infrastructures and the ability to handle the related challenges. To accommodate these requirements the P4eb Business patterns needed to be revised.

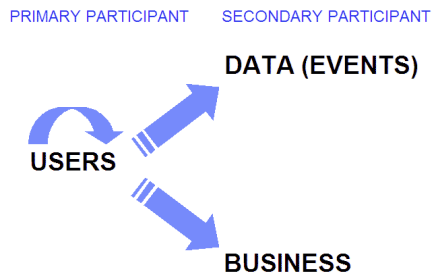
## ***Fundamental Analysis***



First let us review the common business interactions and their key participants. A business interaction has three key participants: the user, the data (or event) and the business (application). Each of them is able to initiate or control a business interaction with another participant and of course with itself. The outcome of this is nine possible combinations - these are the modern common business interactions. On the basis of

this analysis we can classify business applications and services using the main participant who initiated or controlled the interaction into: User-Centric, Event-Centric and Process-Centric applications and services. A User-Centric application gathers and presents information in response to an individual user request. An Event-Centric application may cause an application to be executed, alert users or update data stores when an event arises. Lastly, Process-Centric applications and services, are driven by an overall business process and invoke other services, sub-processes, data or users.

## ***User-Centric***



Reviewing the current P4eb Business patterns, we can observe that the User-Centric interactions are already covered. The Self-Service business pattern matches the User-Business interaction which for example could be a user maintaining his/her bank account. The User-User interaction is covered by the Collaboration business pattern, and includes

patterns for instant messaging, emailing, team activities and etc. And lastly the User-Data interaction is already identified as the Information Aggregation business pattern which for example includes solutions involving database analysis. The remaining P4eb Business pattern is the Extended Enterprise business pattern which is being supplemented. This relates to Process-Centric interactions, but it is too limited as it is only relevant to Business-Business interactions with other enterprises.

## ***Event-Centric and Process-Centric***

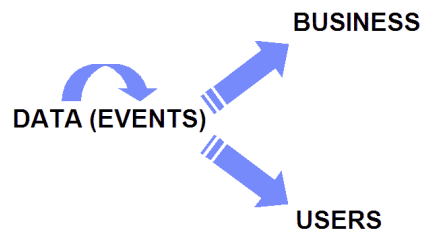
The new Event-Centric and Process-Centric business patterns were introduced to document completely the remaining six common business interactions.

Additionally they supplement the Extended Enterprise business pattern.

The Event-Centric business pattern has the following three Application patterns:

- Event-Triggered Analysis & Possible Action (aka Data Event-Business)
- Event-Triggered User/Device Manager Message (aka Data Event-User)
- Event-Triggered Data Capture/Update (aka Data Event-Data)

PRIMARY PARTICIPANT      SECONDARY PARTICIPANT



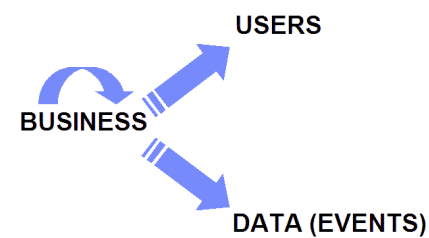
For example, an Event-Triggered Analysis & Possible Action solution could reorder stock when it is below a certain threshold. An Event-Triggered User/Device Manager Message solution could be an application that sends stock price alerts to users, and lastly an example of an Event-Triggered Data Capture/Update solution is an application that trickle

feeds master file updates to an operational data store.

The three fundamental variations of the Process-Centric business patterns are:

- Process-Managed Interaction/Flow (aka Business-Business)
- Process-Managed Workflow (aka Business-User)
- Process-Managed Data (aka Business-Data)

PRIMARY PARTICIPANT      SECONDARY PARTICIPANT



Examples for the Process-Managed Interaction/Flow are straight-through processing and systematic processing within or across enterprises. The Process-Managed Workflow could be case processing or approval processes requiring human intervention and examples of Process-Managed Data are bulk processing or batch printing.

The Process-Centric business pattern is a high-level Business pattern and can be usefully recast into the three following pragmatic Business patterns:

- Intra-enterprise (aka **Enterprise Process-Centric business pattern**)
  - Business-to-Business
  - Business-to-User
- Inter-enterprise (aka **Extended Enterprise business pattern**)
  - Business-to-Business
  - Business-to-User
- Business-to-Data (aka **Bulk Processing business pattern**)

## ***Responding to Smarter Planet***

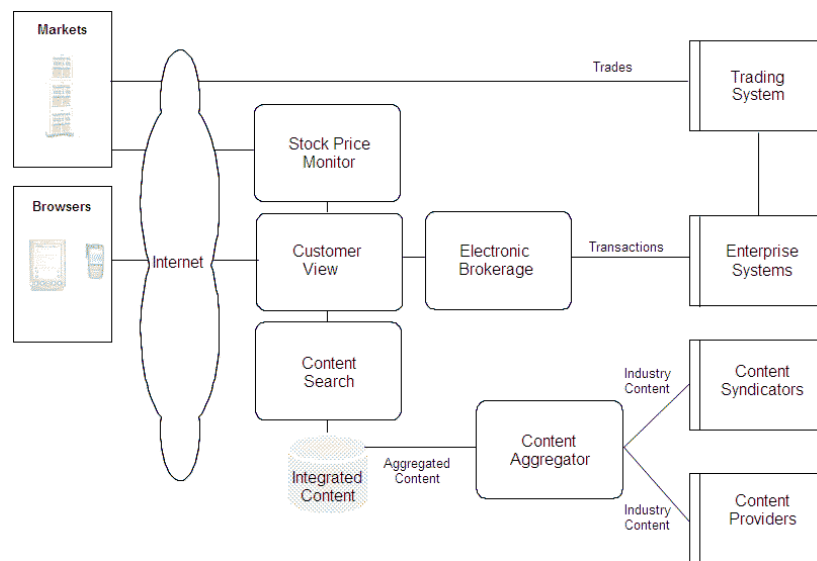
The increasing need to include our physical environment in decision processes leads to intelligent but also more and more complex solutions. Leveraging the opportunities of these new solutions, which are an essential part of the Smarter Planet vision, requires new approaches for developing information systems and handling the growing amount of data. As a consequence of this, there is a need to add event-based applications. These capture and analyse events and initiates changes in our physical and digital environment. These require the integration of data collection devices which track and monitor events

and device actuators to execute the changes. An example of such a solution could be a managed traffic flow on a motorway where the traffic density and the average speed are detected, such that when the data exceeds a time threshold the solution automatically recalculates the traffic congestion levels and if necessary changes the traffic speed indicators to optimise the traffic flow. Until now complex and intelligent solutions were difficult to implement with the existing patterns of P4eb. But the new Event- and Process-Centric business patterns are filling the gap and are an important step for enabling the P4eb patterns to support a Smarter Planet.

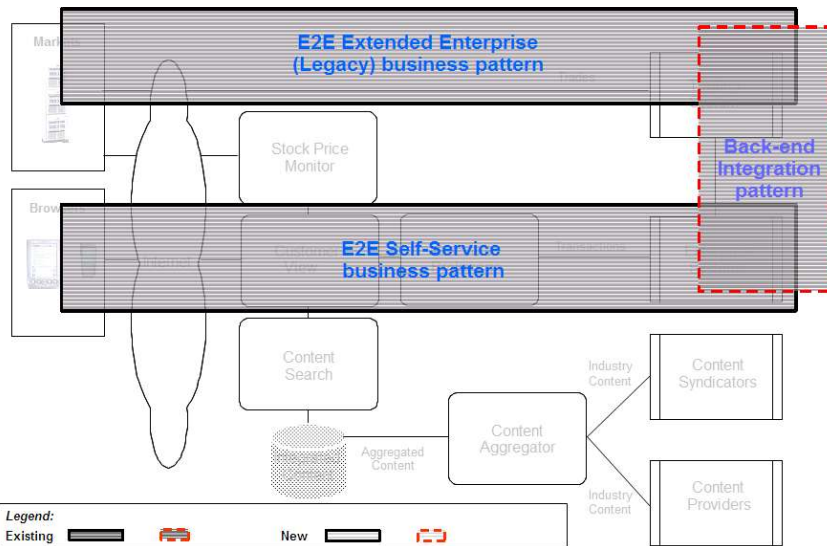
### ***In Practice***

We will now demonstrate the use of the revised Business and Integration patterns in an online brokerage example.

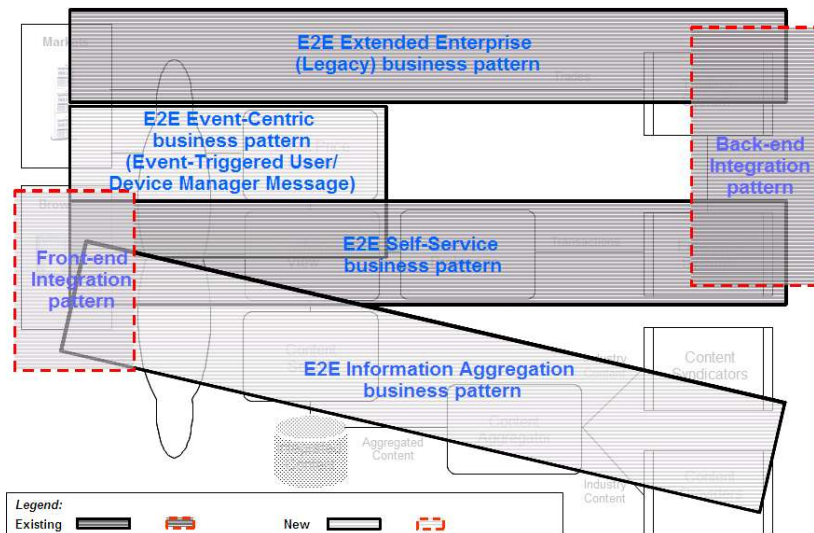
First we draw an Architecture Overview Diagram showing the key business functions and connectors within the existing and proposed scenario.



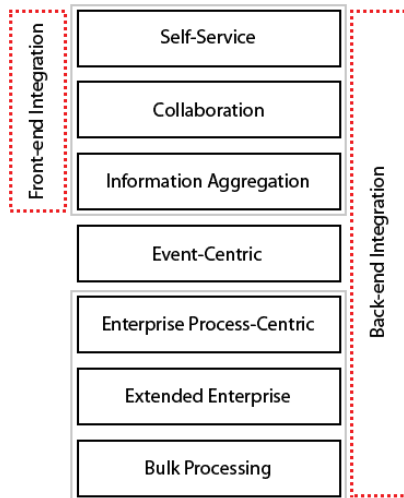
We need to document the existing solution. The user has access to the enterprise systems via the Self-Service business pattern, and an Extended Enterprise business pattern connects the internal trading system with the external stock market. The user can initiate purchases or sales of shares, because the requests are transferred via the Back-end Integration of the enterprise and the external trading system.



We wish to extend the existing solution to inform the user automatically about relevant stock price changes based on rules specified by the user. This is realised via the Event-Centric business pattern – in this case using the Event-Triggered User/Device Manager Message application pattern. Additionally the solution needs to collect data from multiple sources, to aggregate it and provide it for future analysis. The Information Aggregation business pattern is appropriate for this purpose and the collected information can be reviewed and evaluated by the user. The Front-end Integration pattern enables users to access the enterprise systems via browsers and mobile devices and provides a consistent user interface for the existing Self-Service and the newly implemented Information Aggregation business patterns.



## Conclusion



With these modifications the new Process- and Event-Centric business patterns extend the former user-focused Scenario decomposition framework. They supplement the Extended Enterprise business pattern and are a step towards fuller automation and more intelligent solutions.

A more refined version of the P4eb Scenario decomposition framework may help to remind the architect of the Event-Centric application patterns. It is possible using these revised patterns to meet the requirements of modern event-based applications and to assist the merging of digital and physical infrastructure required by many Smarter Planet solutions.

