

## I. The sibling rivalry between ESB and BPE

Sooner or later will most SOA adaption programs spent a lot of time and resources in having a more or less religious discussion arguing pro's and con's of different SOA implementation styles utilizing an enterprise service bus (ESB) versus a business process engine (BPE).

The ESB community will persist on their standpoint: "We don't need a business process engine. We'll use ESB functionality to aggregate, compose and orchestrate services and business integration processes."

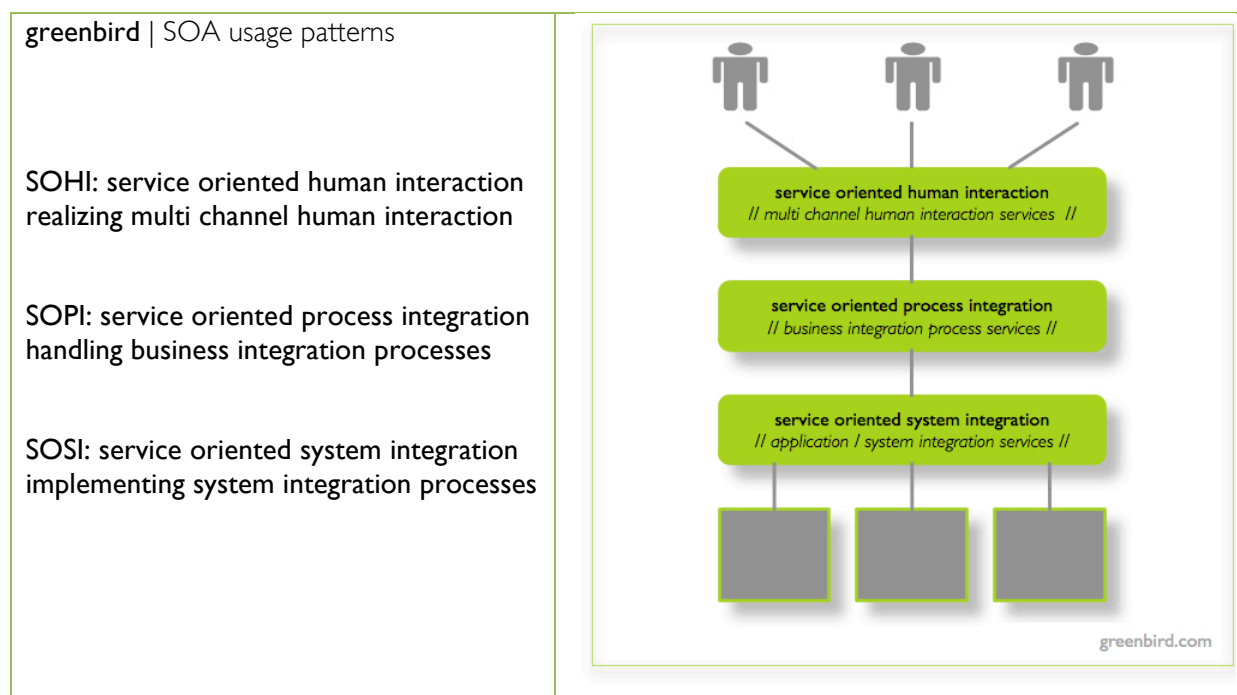
On the other side - the BPE supporter side - will point our: "We don't need a en ESB. Our BPE supports data transformations and mappings, service callouts, messaging and various endpoint bindings."

This sibling rivalry<sup>1</sup> between ESB and BPE can either result in

- A deadlock, where ongoing discussions and architectural fights block any progress and potential value generation or
- A symbiotic liaison, where the competition between ESB and BPE lead to a continuous improved architecture blueprint that utilizes the strengths and potentials of both approaches.

### I.1. greenbird | SOA usage patterns

To drive the ESB and BPE competition and discussion further on, greenbird has established a holistic SOA architecture reference model, which proposes 3 major SOA usage patterns:



The SOHI usage pattern (service oriented human interaction) is typically applied in a multi channel scenario where various users with different roles shall be granted access to various business processes, services or information using different devices and channel in an unique and holistic

<sup>1</sup> Sibling rivalry from wikipedia.org: Sibling rivalry is a type of competition or animosity among brothers and sisters, blood-related or not.

approach. Multi channel human interaction services are responsible to handle user interaction on different devices and channels such as web, fat / thin client UI applications, smartphones or mobile solutions.

The SOPI usage pattern (service oriented process integration) is typically applied in scenarios where business processes spawn across different companies, business units, different products or services in order to realize horizontal business integration processes such as

- Sales process enforcing up- and cross selling between different product areas
- Order-to-cash process
- Customer service process across different business units or product services
- Meter-to-cash process within energy or smart metering applications
- Smart meter rollout process within energy

Horizontal business integration processes are mostly asynchronous and “long-running” and should therefore typically be implemented on a business process engine (BPE<sup>2</sup>). Often those horizontal business processes will require manual intervention from different users, groups or roles. Therefore the BPE must provide capabilities for human interactions such as defined with the BPEL4People specification.

The SOSI usage pattern (service oriented application / system integration) is typically applied for cases where main focus is on enterprise application integration scenarios such as

- Data or message exchange between different systems
- Data or information aggregation
- Transaction handling
- (Master) data synchronization

System integration processes are mostly transactional and “short-running”. They must be able orchestrate integration services which have to handle with various different endpoint bindings, technologies, protocols and data models in depending on the enterprise applications and system to integrate with.

Integration services should typically be realized on an ESB<sup>3</sup> implementing VETRO<sup>4</sup> functionality.

Implementation of system integration processes - which use system integration services exposed on an ESB – could either be realized using ESB functionality (service flows, aggregations) or BPE functionality (orchestrations). greenbird recommends a BPE- based implementation whenever system integration processes

- Require a certain order or sequence of integration steps
- Must implement different execution paths for different situations
- Must have composite transactions for integrations not supporting 2-phase-transactions
- Consist of multiple integration step

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<sup>2</sup> Business Process Engines or BPM platforms such as Active Endpoints ActiveVOS, IntalioBPM or other open source and commercial platforms like IBM Websphere, Oracle SOA Suite or others

<sup>3</sup> ESB platforms such as MuleESB, jBossESB, ServiceMix, glassfish, WSO2 or commercial ESB platforms

<sup>4</sup> VETRO (Validate, Enrich, Transform, Route, Operate) describes a common message flow pattern implemented by all services exposed on an ESB

## I.2. greenbird | SOA greenprint

To describe a consistent implementation model, greenbird introduces a SOA greenprint which defines a cooperation model between ESB and BPE based on the following terms and conditions:

1. ESB shall be utilized for
  - a. Service virtualization, meaning that all services shall be exposed on the ESB
  - b. Mediation, meaning that ESB functionality shall be used for system integration, endpoint binding, protocol handling, data transformation, message validations
2. BPE shall be used for
  - a. “Long- running” or horizontal business integration processes
  - b. Asynchronous business integration processes requiring human intervention
  - c. “Short- running” or transactional system integration processes requiring integration sequences, different execution paths or composite transactions

### greenbird | SOA greenprint

interaction flows handling multi channel user interaction.

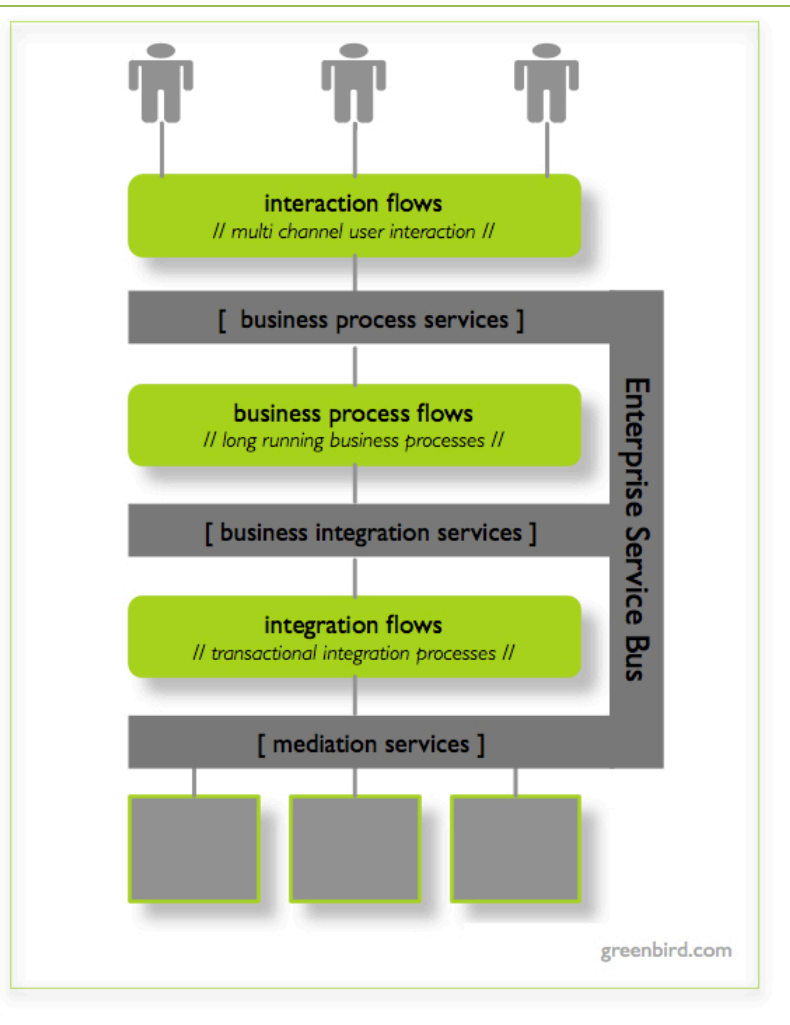
business process services exposing business process flows on ESB.

business process flows implementing long- running, horizontal business integration processes with or without human interaction on BPE.

business integration services exposing integration flows on ESB.

integration flows implementing short- running and transactional system integration processes on BPE.

mediation services implementing backend integration with endpoint binding, transaction handling, data transformation or data validation.



In the described model, the ESB's service virtualization functionality is used to glue together the different layers within the SOA reference architecture. In addition to that, the ESB's integration and transformation capabilities are used to abstract backend integration complexity and application specific data models.

The BPE's orchestration functionality is used to implement integration flows and business process flows. In addition to that BPE's human interaction functionality is used for long- running business integration processes which require human intervention / interaction.

### **I.3. Conclusion**

The described architecture greenprint turns the sibling rivalry between ESB and BPE into a strong and healthy cooperation model with clearly defined separations of concerns:

- Mediation services are responsible for abstracting backend complexity. Mediation services are responsible for transforming application specific data models into a generic service / data model (→ semantic integration).
- Integration flows are responsible for system integration processes based on the generic service / data model provided by mediation services.
- Business integration flows are responsible for business integration process implementations. System integration complexity is hidden by business integration services.
- Interaction flows are responsible for human interaction and user interface application integration.

BPE will mainly focus on business and process implementations. ESB's focus will be to hide away any kind of technical integration complexity.

## 2. greenbird Integration Technology

greenbird Integration Technology AS is a SOA and BPM specialist consultancy and software development company headquartered in Oslo / Norway. greenbird offers

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2. innovative SOA and BPM based integration middleware
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