



# Untangling Spaghetti BPM

Delivering business agility and  
project scalability to ensure  
sustainable BPMS success

## Why you should read this paper

To maximize the return on investment from a BPM Suite you need to achieve scale. Yet according to research, many organizations find that after two or three projects their progress falters. While they would have expected the cost and effort of automation to decline as their BPM Suite deployment matured, instead they find that the cost and effort increases. This paper reveals a surprising culprit for this increasing inertia – data integration weaknesses that stem from the architecture of most BPM Suites. More importantly, this paper proposes a remedy, which can streamline integration and speed up development, however widely you scale your BPM endeavor.

That remedy is the inclusion of a virtualized data model, integrated into the BPM Suite. Read this paper to learn how separate data and process layers enable you to maximize the reuse of process development, and improve collaboration between business stakeholders and IT, by simplifying process content and avoiding “Spaghetti BPM”.

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“BPM initiatives need to actively involve both business and IT stakeholders to be materially different from traditional software development methods.”

Neil Ward-Dutton. MWD Advisors.

## BPM Suite deployments are failing to scale

According to global research and advisory firm Forrester<sup>1</sup>, most organizations that invest in BPM Suites start small with a particular departmental solution, with the intention that they will then scale rapidly towards an enterprise wide program. However, although they are typically able to achieve quick wins with the first two or three departmental projects, they “hit a brick wall” before achieving anything like the scale they had intended.

Such organizations are failing to maximize the return from their investment in BPM technology, infrastructure and training. They’re probably failing to satisfy the business case on which that investment (typically over \$300,000) was justified.

Although “Enterprise Wide Deployment” is not in itself a measure of success, for any CIO that has spent over three hundred thousand dollars on a BPM Suite and associated training and consulting, failure to extend from a few

departmental projects to a more enterprise wide program, must feel like a disaster.

What’s going on? Surely, as a BPM team get more experienced and any initial teething problems get ironed out, it is reasonable to expect progress to accelerate, rather than falter? Surely, there’s no shortage of additional processes to improve? The CIO who has invested heavily in this new technology is hardly likely to starve it of resources right after the success of initial pilot projects.

The implication is that something about typical BPM Suites, leads to an increasing inertia as the deployment extends across the organization. We believe the root cause of this inertia is the approach to data integration between the BPM Suite and other systems.

Perhaps that’s a surprise to you, as every BPM vendor claims to be good at connecting to disparate data sources and web services. However, as we reveal in this paper, there’s a fundamental problem with how most BPM Suites integrate with the rest of your IT systems, that undermines reuse. This significantly reduces the efficiency of Process Designers and developers, adding greatly to the cost of ownership in terms of maintaining and improving automation. It also makes process content needlessly complex, thereby hampering effective collaboration between the business and IT.

In the second half of this paper we explain how the inclusion of a Shared Data Model and Data Virtualization capabilities within a BPM Suite can prevent the above mentioned problems from occurring.

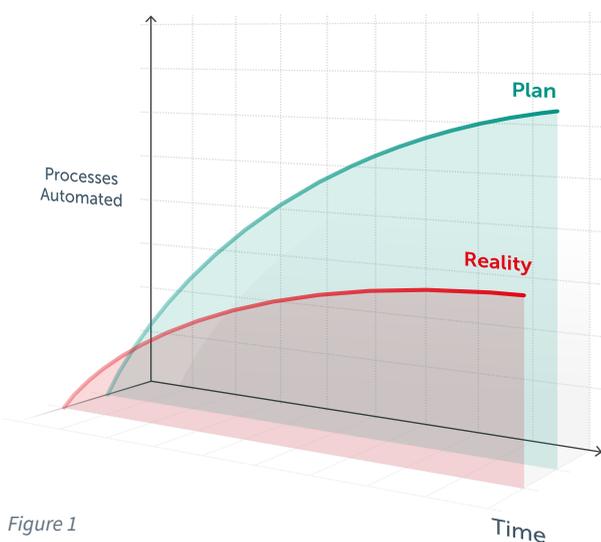


Figure 1

## The problem

Most BPM suites are visual programming tools, which define data at the process modeling stage with all “in and out” attributes for each activity. This is done in a similar way when programming - where procedures are created with input and output variables.

The way these BPM Suites connect to your enterprise applications and databases is summarized in this diagram.

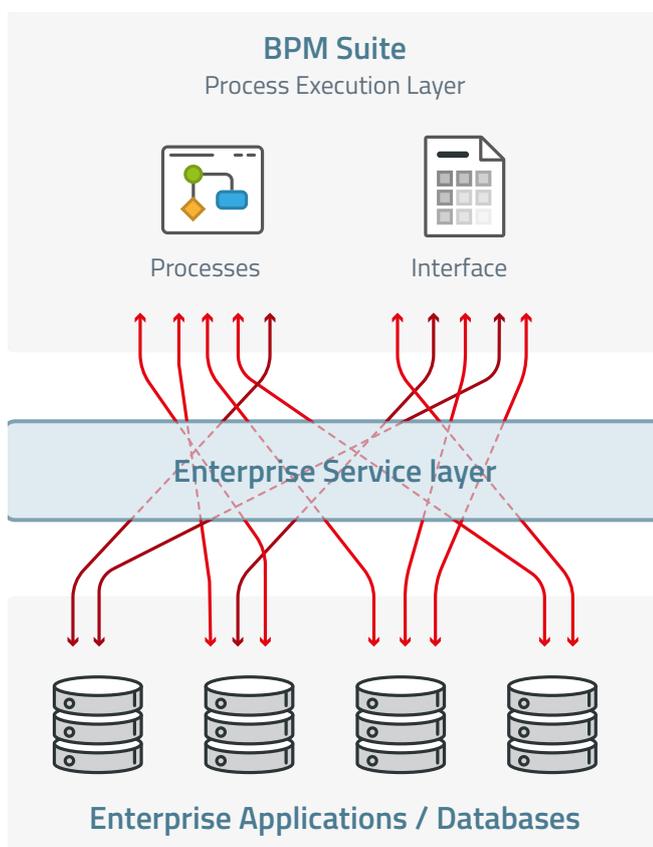


Figure 2

Data connections are typically needed by process steps, forms, and business rules. Wherever such data is needed the developer will declare a variable specifically for that purpose. The variable is mapped to a web service (provided by the Enterprise Service Layer) which then talks to the database concerned.

The BPM Suite therefore holds details of variables, but lacks any intelligence about how these variables relate to each other. Concepts such as entities and relationships

are not catered for by the BPM Suite in this approach. This loose coupling of the process layer to the rest of the IT architecture (represented by the red lines in this diagram) is fine on a small project; arguably any BPM Suite will cope easily.

However this approach rapidly grows in complexity, as the BPM deployment starts to scale. Key requirements for an enterprise scale deployment are auditability (or transparency) and efficient development, by maximizing reuse of process components. These capabilities become even more important if the BPM Suite is going to deliver on its promise to support agile change. So imagine, that instead of one process as depicted above, you have multiple processes. Now instead of a few red lines in the diagram on the left, you have several hundred; each requiring the developer to declare variables and map them to a web service or data source. What are the implications?

### Poor Auditability / Transparency

With multiple Process Designers and developers working across many processes, you need to be able to quickly and accurately answer questions such as: Which processes connect to the CRM database? Where is the Customer Credit Check rule being used? What data elements does it depend on? Which rules does this form use, and what processes does it relate to? The answers to these questions are going to be very hard to come by if you need to inspect hundreds of pieces of development represented by the red lines in the diagram.

### Reduced Reusability

Answering the questions above is a key enabler of reuse. It applies to all sorts of process elements including: business rules, forms, form elements, sub-processes and resources. But, without such transparency, the decision to use as-is, or copy and adapt, or redevelop from scratch any such process component, becomes slow and error prone. Opportunities for reuse are spurned and missed as developers find it quicker or safer to redevelop. The consequence – even more red lines on the diagram above. Increasing complexity has a compounding effect. Each new development is likely to be slower and more painful than the previous one because the complexities associated with all the hard-coding were introduced at the early stages.

### The consequence

The lack of transparency and the missed opportunities for reuse mean that as the number of processes grows, the cost, effort and time to achieve automation climbs. This explains why so many BPM Suite deployments falter after the first two or three departmental projects. The following scenario shows this in practice.

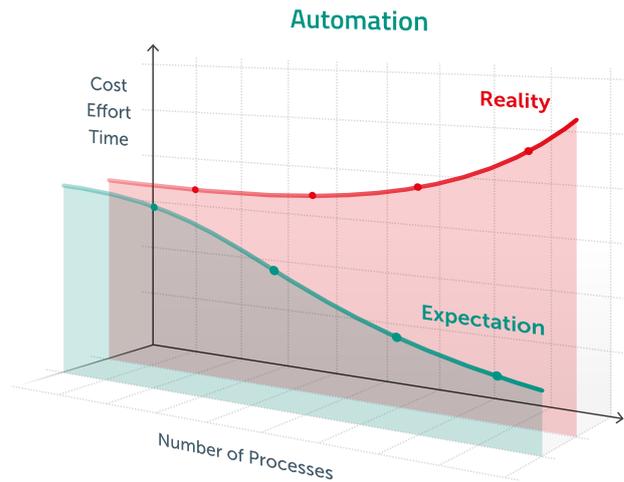


Figure 3

### Practical implications

An insurance company deployed a BPM Suite and the first process that they automated was “Sales”, which included an “Account Check” query to the customer database. Months later, the next process automation project was “Claims”. An account check query was required again. The developers (different members of the same team) had to hunt around in the sales process to see how the account check query was coded. Their needs were very similar, so they copied and pasted the Account Check sub-process from the sales process into the claims process. As illustrated below, they now had two sub-processes for account checking, each handling multiple variables from the customer database, each requiring similar process steps for handling data.

This copy and paste approach to reuse is danger-prone, especially when urgent changes are required. Let’s say that new compliance requirements imposed the need for additional customer checks. The developers had to audit all customer related processes, to amend variables, process activities and related forms and rules that had been built twice.

This reliance on individually coded variables to retrieve or write data between the BPM Suite and various enterprise systems can quickly become a maintenance nightmare as the red lines (depicted on Figure 2) proliferate. This can cause the cost of ownership of the BPM Suite to rocket, particularly as it encourages duplicative development of forms and rules that should really be built once and then reused.

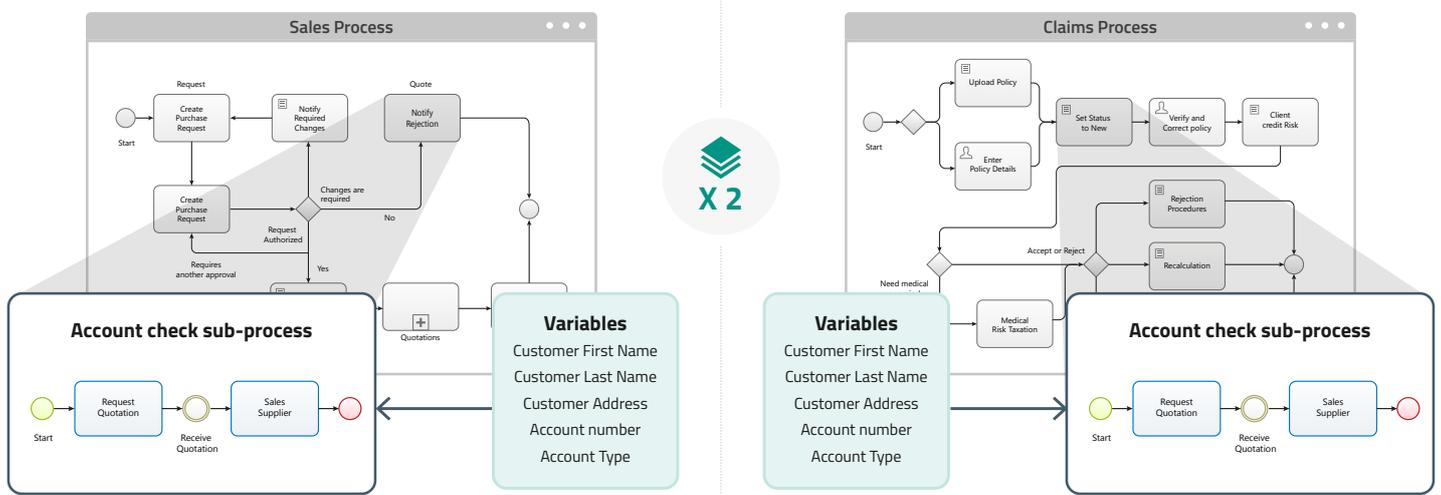


Figure 4

The BPM Suite will be stressed by any changes to the IT landscape. For example, should the customer database need to be upgraded or replaced, there will be dozens of sub-processes as illustrated above that will need duplicative changes. So much for the promise that the BPM Suite will support agile development and continuous improvement.

## Spaghetti BPM

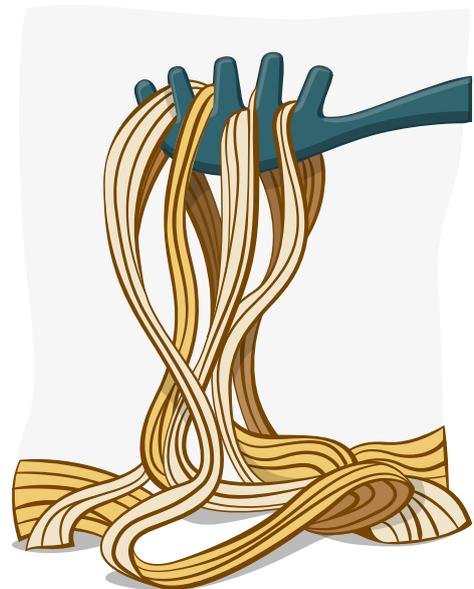
The shortcomings considered above impact mainly developers. However the business audience is also adversely affected; especially Process Designers and Process Owners.

Business process diagrams that were initially understood by business stakeholders become more complicated, as specific data handling steps are added to the process, many of which may get duplicated as illustrated above. It's what we call "Spaghetti BPM".

The consequence is that process improvement discussions between business and IT become slower, as they have to delve into multiple sub-processes. The business is becoming more reliant on IT to explain how things work, whereas the initial BPM vision was for automation to be directed and owned by the business.

In summary, the agility and cost of ownership of a BPM Suite in a heterogeneous IT landscape depends not on if it can integrate. It depends on how it integrates. In the next section of the paper we'll look at how Bizagi BPM Suite provides a solution to these problems thanks to its integrated "Virtualized Data Model".

### More Spaghetti anyone?



## The Bizagi way

To enable a BPM Suite to scale and deliver the agility needed to support continuous process improvement, we believe that it's necessary to connect to enterprise data sources in a more intelligent way. A way that facilitates change, improves visibility of how systems are connected and maximises the reuse of process elements across multiple processes. By getting this right we can:

- ★ Improve the efficiency across the process lifecycle
- ★ Lower the cost & effort of maintaining and improving automation
- ★ Keep process content simple and uncluttered, thereby improving collaboration between IT and business stakeholders.

Unlike most BPM Suites in the market, Bizagi provides a Virtualized Data Model which allows you to separate the **Process Layer** from the **Data Layer** as illustrated below, which is indispensable to support enterprise wide BPM initiatives.

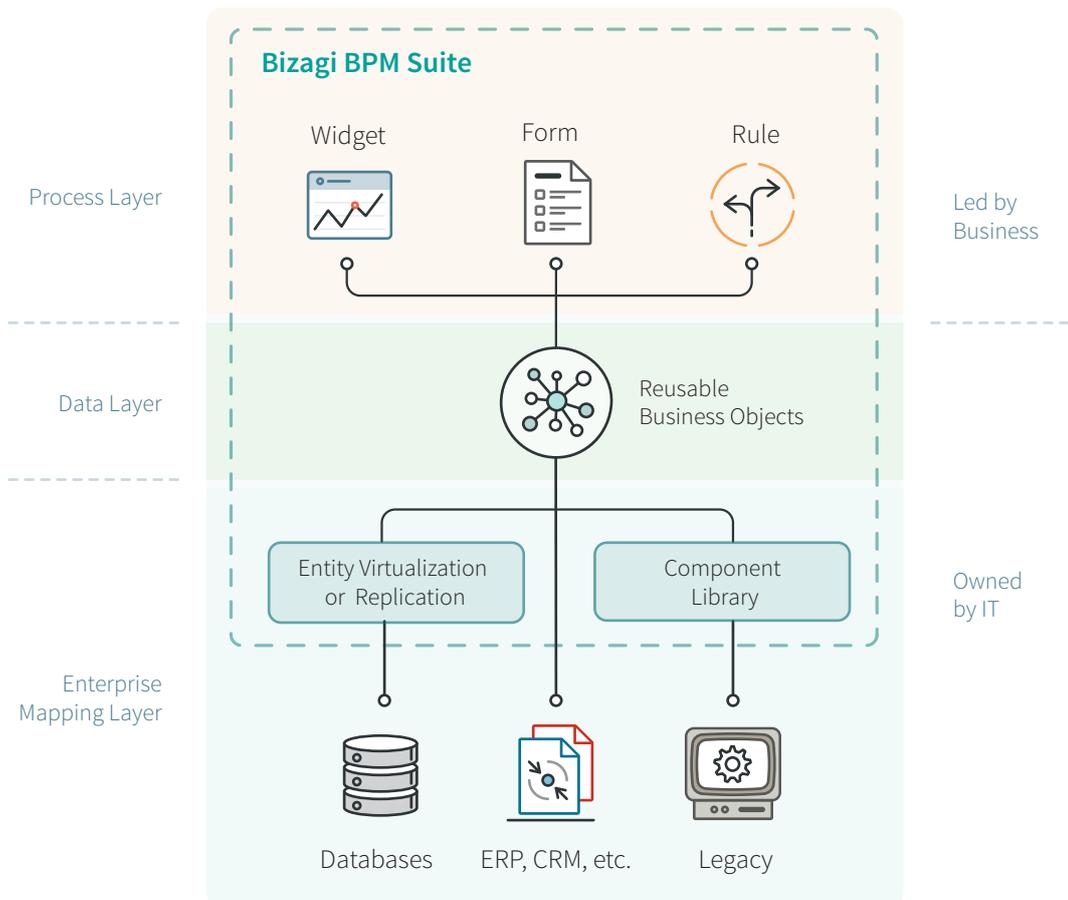


Figure 5 - Bizagi BPM Stack

“A key differentiator for Bizagi is its unique data modeling approach that allows process designers to create a virtualized data model that provides a consistent way to manage and synchronize between business process models and source data and legacy applications. This approach allows process analysts and designers to minimize process model complexity.”

The Forrester Wave™: BPM Suites, Q1 2013 <sup>1</sup>

The Data Layer or the Shared Data Model can be shared between multiple processes, and allows you to define how data is stored and accessed. Business analysts access all the data as if it was local to Bizagi which implies they don't have to deal with the complexities of the physical data location, leaving this task to the BPMS that will seamlessly access the data from the right system at the right time. This layered BPMS architecture as advocated by Bizagi is unique in the industry and is a fundamental enabler of simplicity and re-use; the keys to BPM Suite scalability and lower cost of ownership. Let's look at the benefits that the Bizagi BPM stack brings:

### Clean, elegant yet powerful modeling

A separate Process Layer helps to deal with project complexities by removing data from the process discussions. The clean process model design brings together business and IT from the early stages, so both parties are actively involved in defining process requirements. Business people become engaged as they can visualize the process and drive the design. Process Owners remain in control of the process and all changes driving the design forward to ensure that the outcome meets the business objectives.

### Shared Data Model

To efficiently design a process solution it's important to structure and organize your data coherently. The data model allows you to define Business Objects called Entities. An entity can be thought of as a noun. For example a Customer, a City, a Company, an Invoice, a Car. Entities have attributes - for example a customer has a name, a social security number, a gender and an age. An Entity always has a unique key (an attribute or a combination of attributes) used for identification; for example, a unique customer number.

As shown in the image below, Entities can be related to each other; e.g. a customer has a gender. The normal variety of relationship types are all supported; one to many, one to one, and many to many.

So far this will all seem very familiar to anyone who has worked with a relational database such as Microsoft Access. Just as you model the process diagrammatically, you also model the data that is needed as part of the automation. It's a visual approach that business people, analysts and developers can all easily understand. This starts to get more interesting and powerful, when we explore the options to connect to external data, which is a crucial requirement when integrating with enterprise systems such as ERP, CRM or legacy applications. There are two alternative mechanisms for connecting to external data sources: **Virtualization** and **Replication**.

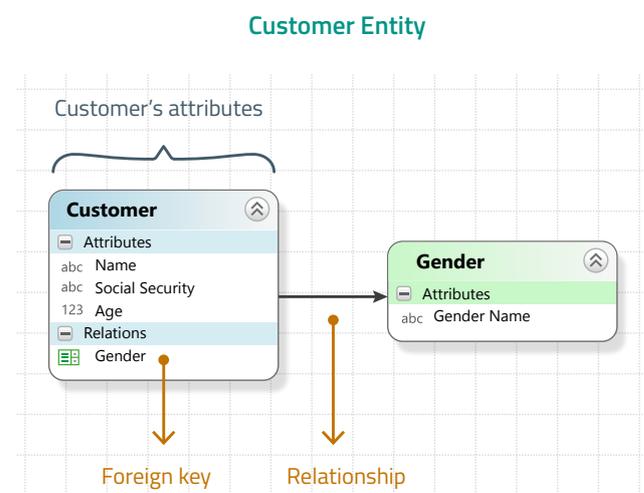


Figure 6

## Data Virtualization

According to Bizagi, data is the core Business Object. It doesn't belong to the BPM suite, it belongs to the back-end systems. The Bizagi model allows for an easy way to deal with the virtual data model.

The principle of data virtualization is that it allows an application to retrieve and manipulate data without requiring its technical details, such as how it is formatted or where it is physically located. In Bizagi BPM Suite this capability is known as "Entity Virtualization". Any entity that has been defined in the Data Model can be configured, so that the data doesn't actually reside in Bizagi BPM Suite, instead it remains in the legacy system. You only need to configure the data integration once, then any process, form or rule you need to develop that references that data can do so, without any concern as to how the data is physically accessed. Data virtualization enables clear mapping between the logical data model and distributed (virtual) data sources. This 1-to-many logical to physical mapping is very clean, structured and powerful, resulting in important advantages:

- ✓ It enables data integration in cases where the legacy system lacks support for Service Oriented Architecture.
- ✓ It separates the concern of data layer and integration from process modeling, allowing different members of the process improvement team to "play to their strengths".
- ✓ Business analysts are provided a clean, readable process model within the Bizagi BPM Suite, without needing to understand the complexities of physical data locations in multiple back-end systems.
- ✓ It facilitates simpler process content that enables fast changes, encouraging the continuous process improvement.
- ✓ It improves re-use, as all sub-processes, forms and rules that reference external data are built from the perspective of the Entity. Teams involved in the process modeling never have to deal with variables, data access or field mapping issues, so what they develop can be equally understood by business and IT. The improved transparency and trust are key to encourage reuse.

“Avoiding traditional implementation stages (analysis, design, test, etc.) and utilising agile methods with Bizagi has many advantages. Mission-critical projects are delivered in weeks rather than months. Process pieces are implemented quickly then improved if necessary.”

Alberto Serfaty

Senior Manager Performance Improvement, EY

## Data Replication

Data Replication is a simpler read only connection to external data sources. Here you schedule a periodic task to replicate static / non-transactional data. For example, a list of countries does not change dynamically. By bringing this data into a local table inside Bizagi BPM Suite, we simplify the architecture, reducing the number of interfaces required to legacy systems. You only need to configure the replication once.

Together, Entity Virtualization and Data Replication prevent the challenges of "Spaghetti BPM" described earlier in this paper. This not only improves the productivity, but also incubates collaboration between the business and IT as both communities can work together from the early stages of requirements capture; process owners remain engaged as they can easily understand the constantly evolving process models.

## The benefits - from our customers' viewpoint

Process content is kept simple and clean, thereby improving collaboration between IT and business stakeholders.

In Bizagi, *the process is the application*. This means that business and IT professionals can share a unified communication language. Business people work alongside IT in defining requirements, building and automating processes, which produces fast results.

Process teams no longer need to concern themselves with how to access and manipulate data and the process content does not need to include data handling routines, ensuring that the process modeling is easier for both developers and business stakeholders to understand. From a perspective of continuous improvement, this effective collaboration between business stakeholders and IT produces better quality of final results and a faster improvement cycle. All stakeholders can speak the same language, which accelerates decision making, thereby improving business agility.

“Typically there's process modeling for understanding and process modeling for automation. With Bizagi BPM Suite we are doing the two together. The user friendliness of the process modeling environment and the simplicity of process content mean that we are able to engage business people from an early stage. Other BPM tools we evaluated failed to bridge this gap, only suiting a highly technical audience...

**It's important for end users to understand the process. For example when handling a case, relevant processes are shown visually on the screen. Users can see the flow and review the 'case history'. Being able to visualize the process at runtime helps engage everyone in process improvement.”**

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Eduardo Gonzalez.

*Collaboration & Workflow IT Manager, adidas Group*

With Bizagi, adidas and anida (part of BBVA) mastered agile methods based on the assumption that a process is never perfect. Once you reach a certain level of functionality (v1.0) you move to the next stage, whereby pieces of the projects are implemented quickly then improved if necessary (work broken into small chunks and the design is not considered complete before the work is started).

## Improved operational efficiency

The Virtualized Data Model improves efficiency by simplifying process modeling and increasing reuse. Team members no longer need to concern themselves with how to access and manipulate data and where the data is physically stored. This helps to deal with complex processes by removing the data from the process discussions, while data is handled by the data layer which improves the speed of development.

“Bizagi’s business entity virtualization is a key factor for enabling simplicity. It helps us to deal with complex, relational data, stored across multiple systems, but treats all the data the same way, as if it is local. This significantly simplifies the work, promotes reuse and accelerates development.”

Eduardo Gonzalez

*Collaboration & Workflow IT Manager, adidas Group*

Requirements capture, process modeling and process changes become faster as business rules, forms, form elements and sub-processes can be re-used. The data model becomes more complete as new departments and related processes are tackled, meaning development accelerates as the BPM deployment matures. Similar processes get re-used, for example helpdesk ticketing system got re-used many times at adidas across different departments. The re-usable processes, sub-processes, business rules, forms and UI components are now available to all adidas BPM teams through the company-wide Workflow Re-use Catalogue created by the adidas Workflow Team.

## Lowered costs & efforts of maintaining and improving automation

Bizagi’s Virtualized Data Model lowers the cost and effort of maintaining and improving automation, because data integration is no longer built on an ad-hoc basis for multiple processes, forms and rules. Instead of using the duplicative approach, the entities that you have defined in the data model provide a transparent, single source of truth for how your automated processes connect to multiple back-end systems.

“In phase one we dealt with the patient registration process. In phase two we automated the patient admissions process. Thanks to the data model and entity virtualization we halved our development time of subsequent processes by reusing 100% of the data integration with our hospital information system, as well as reusing form widgets and rules built in phase one.”

CIO, Prince Sultan Military Medical City

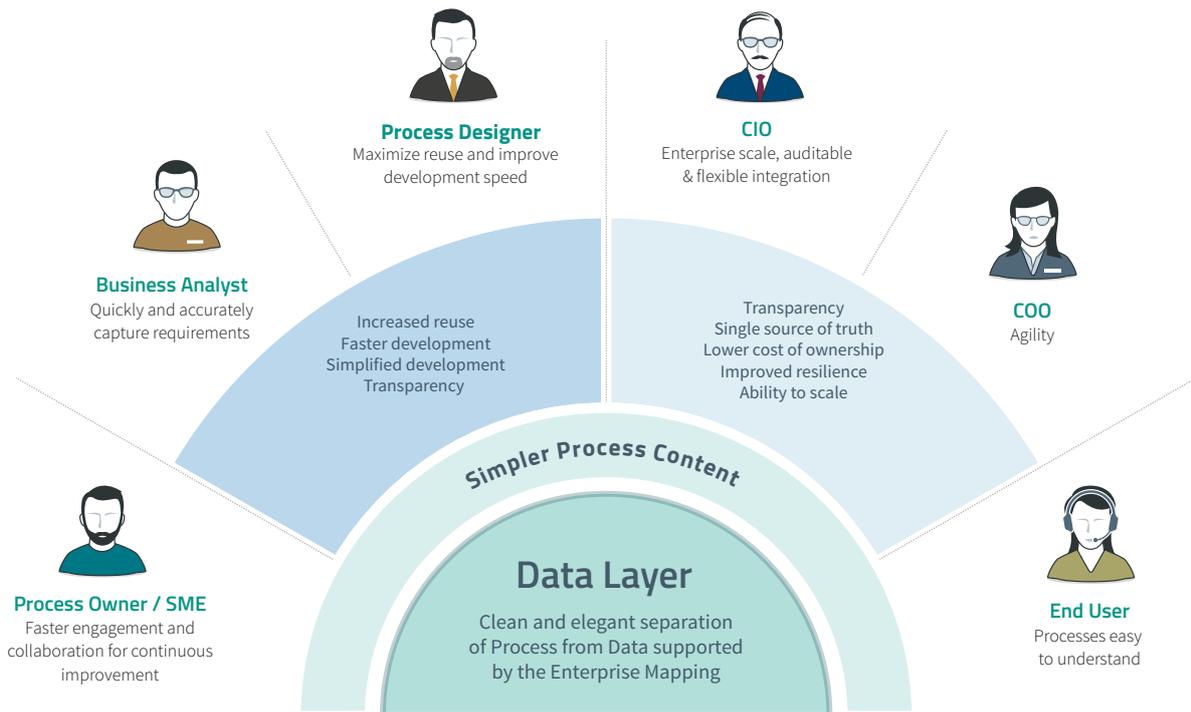
This provides far greater agility to cope with changes to your IT landscape. For example, if you upgraded or replaced a CRM or ERP system to which Bizagi BPM Suite was integrated, instead of investigating potentially hundreds of sub-processes, forms and rules to update variables and other data handling code, you would only need to update relevant entities in the data model once. Compared to other BPM Suites, this improved transparency really helps Bizagi deployments scale more quickly and robustly, with a lower total cost of ownership.

“We’re in the process of retiring our legacy Hospital Information Management System. Bizagi’s entity virtualization capability has enabled us to take a phased approach. We’ve delivered immediate processes, performance and quality improvements without having to change the entire back-end. Without the shared data model, this approach would not be practical or cost effective.”

CIO, Prince Sultan Military Medical City

### Satisfying process stakeholder requirements

As you begin to evaluate BPM Suites, the presence and capability of a data model and data virtualization should be key criteria. All BPM vendor marketing materials claim easy integration, but as argued in this paper, it's not a question of *if* a BPM Suite can integrate with other systems, it's a question of *how* that integration is efficiently architected. In the following diagram we look at this from the perspective of six process stakeholders and how the capability of Bizagi's Virtualized Data Model contributes to meeting their requirements.



<p><b>Process Owner / SME</b></p> <p>“I want to keep processes simple and uncluttered so we maximize understanding and collaboration between the business and IT.”</p>	<p><b>Business Analyst</b></p> <p>“I want to keep processes simple and uncluttered, so that business stakeholders remain engaged in process requirements capture and continuous improvement.”</p>	<p><b>Process Designer</b></p> <p>“I want to maximize transparency so I can see all data integration touch-points in one place. I want to maximize reuse, not just of the data, but the routines, rules and forms that are associated with the data.”</p>
<p><b>CIO</b></p> <p>“I want the BPMS to connect consistently and robustly with all of our systems. I need transparency of integration points and system dependencies. Data must be stored where it belongs, not unnecessarily duplicated on the BPMS platform.”</p>	<p><b>COO</b></p> <p>“I want both business and IT to be engaged in process improvement for the long-term, to achieve improved business agility. I want to keep processes simple and uncluttered, to support our goal of continuous improvement.”</p>	<p><b>End User</b></p> <p>“When I use systems it’s helpful to see a simple visual map of how a process works, or where a particular case has got to in the process.”</p>

“ **Nine processes completed in less than two years deliver automation across various departments at adidas including supply chain, marketing, finance, retail and eCommerce while reducing the time to market by two thirds when compared with the traditional in-house development.** ”

Eduardo Gonzalez

*Collaboration & Workflow IT Manager, adidas Group*

## Summary

In this paper we've examined why BPM Suite deployments so often stagnate after two or three departmental projects. We've identified ineffective methods of data handling and integration as a root cause for the complexity that slows progress. We've explored how complexity undermines the transparency especially if a BPM Suite is integrated to multiple data sources across an organization's IT landscape, and how this obscures opportunities for reuse, not just of Business Objects but the routines, forms and rules that rely on this data. We've explained how this adds to the cost of ownership of a typical BPM Suite, how agility can be stifled and how business engagement and understanding is hampered by process content that becomes bloated and complicated.

All of these ills stem from a typical BPM Suite architecture that buries the detail of data and legacy integration in needlessly complicated process content, where it's hard to untangle and therefore often duplicated; a syndrome that we've termed "Spaghetti BPM".

By separating the Process Layer from the Data Layer and providing a central virtualized data model that is shared by multiple processes, Bizagi introduced a BPM stack that allows for a clean separation of activities performed by business and those owned by IT, as illustrated in Figure 5. Data virtualization is an established practice that means developers can retrieve and manipulate data without requiring technical details about how data is formatted or where it is located. Together these capabilities deliver the following benefits:

- ★ Separate the concerns of process execution and data handling
- ★ Keep process content uncluttered and more business-user-friendly
- ★ Deliver greater transparency of how integration is architected
- ★ Promote reuse of interfaces, subroutines, forms and rules
- ★ Less coding, faster development
- ★ Lowered cost of maintenance and greater agility.

In summary, development with a BPM Suite that offers a shared data model and supports data virtualization gets faster and easier as the deployment matures. The integration with legacy systems is much faster and easier with Bizagi as it is enabled within the BPM stack with web services.

As the data model becomes richer and more complete, there's increasing reuse of existing entities. BPM tools without the shared and virtual data model have challenges in coping with complex data structures.

The BPM promise of agile, continuous improvement requires improved collaboration between the business and IT. Bizagi BPM Suite's process layer, data layer and enterprise mapping make that possible by eliminating "Spaghetti BPM". It's an approach that not only improves the efficiency, but ensures a better alignment between the project outcome and the organizational goals as business stakeholders are in control of the process definition stage. These are key capabilities for a BPM Suite deployment to achieve enterprise scale.

This approach has been spearheaded by Bizagi for over 20 years. Recently our clients have gained awards and recognition for the maturity and scale of their BPM initiatives, at the WfMC Global Awards for Excellence in BPM and Workflow<sup>2</sup>. To learn more about these awards visit [www.bizagi.com](http://www.bizagi.com).

## About Bizagi

Bizagi (which stands for business agility) is a privately-owned company run by software entrepreneurs who are experts in Business Process Management (BPM). Over 350 global customers have selected Bizagi to model and automate their business processes which results in improved operational efficiencies, shorter time to market and business agility.

Our customers gain significant competitive advantage through Bizagi's freemium model, which allows enterprises to try and test software without financial commitment. Underpinned by agile methodology, customers can expect their first process to be delivered in 7 weeks: a risk-free approach that explains Bizagi's 100% project success rate.

With global headquarters in the UK, offices in Europe, US and Latin America, Bizagi is supported by a strong implementation partner network worldwide. For more information, please visit [www.bizagi.com](http://www.bizagi.com).



Start your BPM journey today  
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