Business Process Management 3

How can a cloud based environment support the BPM approach applied for administrative processes

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ABSTRACT

Clouds and BPM are hypes nowadays in the IT sector; they came with great promises such as faster time to market, more agility and cheaper maintenance. In this paper we investigated how cloud services can be used to support a simple administrative business process with a BPM approach

Based on the findings of this investigation concluded is that BPM in the cloud still is in the early stage of maturity and adoption. There are many practical issues that need to be solved such as process orchestration over cloud-services, uptime guaranties and single sign on principles. There are solutions for these problems but these solutions need to be more mature and standardized. Besides the technical issues the concept needs to grow, so that more services will come available. Also the business adoption needs to grow, businesses still have an feeling with in-house systems and applications they can "touch" this needs to change.

Keywords (Required)

BPM, Cloud, Services, cloud-services

INTRODUCTION

BPM and Cloud computing are new concepts that come with great expectations such as faster time to market, more agility and cheaper maintenance.. Within this paper is investigated if these expectations can realized for a simple administrative process. The investigation question is formulated as:

> "How can a cloud based environment support the BPM approach applied for administrative processes"

To give an clear answer on this question at first a common definition is needed for the terms BPM en cloud-computing. Based on this definitions investigated is how these can be realized for a simple process and what issues will arise.

WHAT IS A CLOUD BASED ENVIRONMENT

A hot new buzz word in the IT sector is Cloud computing, is reaching the top of Gartners hype-cycle (Gartner, 2008). There are many definitions for cloud computing. Within this paper we make a distinction between hardware and platform related services such as windows azure and Amazon web services. McKenzie calls this clouds. On a cloud services can be deployed, these services are the applications which run on a cloud. The services are called by McKenzie cloud-services, examples of this services are applications like Gmail or salesforce.com. To make the distinction clear the figure below illustrates the difference between clouds and cloud services. (McKinsey & Company's, 2009)
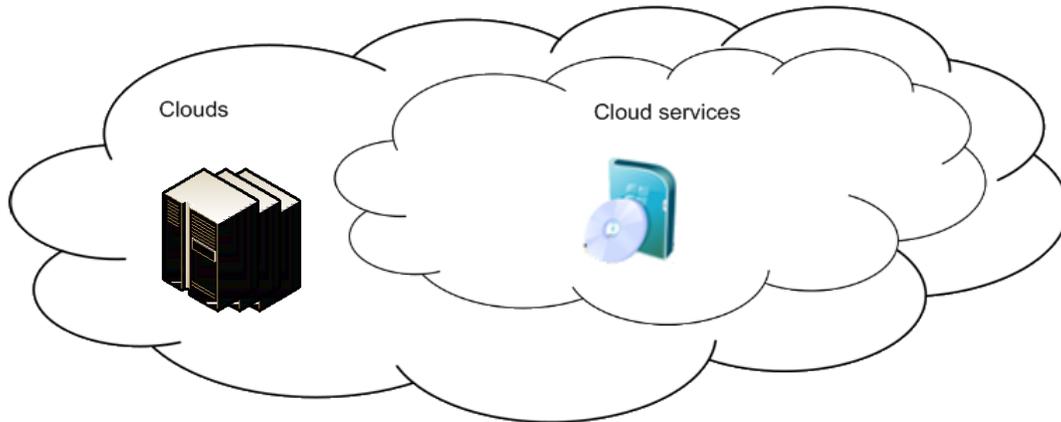

Figure 1 Distinction between clouds and cloud-services

The business idea behind clouds and cloud-services is that hardware and software is shared among different businesses, in this manner costs are saved. Usually the business pays for the actual use of the services. Besides the savings of costs scalability is within a hands reach, the different offering parties have huge datacenters in which an extra server is up and running in a short time. A faster time to market is reached trough the standardized offerings of cloud-services. Cloud-0services are based on a one too many model also called multitenancy(Fisher, 2007). This means one (instance ofa) service is used by multiple businesses (tenants).
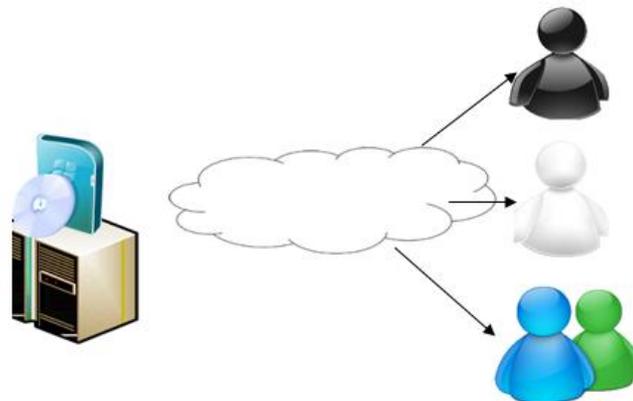

Figure 2 multitenancy concept visualization

So based on the finding presented above we could conclude that a cloud based environment is "a broad array of web-based services aimed at allowing users to obtain a wide range of standardized functional capabilities on a 'pay-as-you-go' basis that previously required tremendous hard-ware/software investments and professional skills to acquire. Cloud computing is the realization of the earlier ideals of utility computing without the technical complexities or complicated deployment worries. (Vaquero, 2009 vol. 39)

WHAT IS BPM

Besides cloud-computing BPM is also a hot buzz word which is in top of the Gartner Hype-cycle (Gartner, 2008), BPM stands for Business Process Management. Business Process Management is a field of knowledge at the intersection between Business and Information technology, encompassing methods, techniques and tools to analyze, improve, innovate, design, enact and control business processes involving customers, humans, organizations, applications, documents and other sources of information (Aalst, ter Hofstede & Weske 2003).

As interpreted from the definition above BPM is not an IT term but a business term, and to realize this business field of knowledge there are IT systems to support it, these systems are called Business Process Management Systems (BPMS). BPMS provides not only the tools and infrastructure to define, simulate, and analyze business process models, but also the tools to implement business processes in such a way that the execution of the resulting software artifacts can be managed from a busi¬ness process perspective (Leyman, 2002)

This means a BPMS system must offer functionality to

- Define process models;

- Simulate process models;

- Analyze process models;

- Execution of process models;

- Managed execution of process models;

- Integration

Most BPMS systems work as said with process models common modeling techniques for the modeling of business processes are UML activity diagram of BPEL. These process models can be placed (or made) within the BPMS system in such a way the process will be executable.

A SAMPLE ADMINISTRATIVE PROCESS

Defining the process

To check whether set of cloud services could support an administrative process, a simple administrative process is modeled with an UML activity diagram. Within the process a customer places an order trough a website form in which the customer fills his personal data and a product amount. Based on the personal data of the customer the data is registered or updated. Next to the registration of the customer details, an order is registered and the determined delivery date is mailed to the customer and a delivery company is ordered to ship an order.
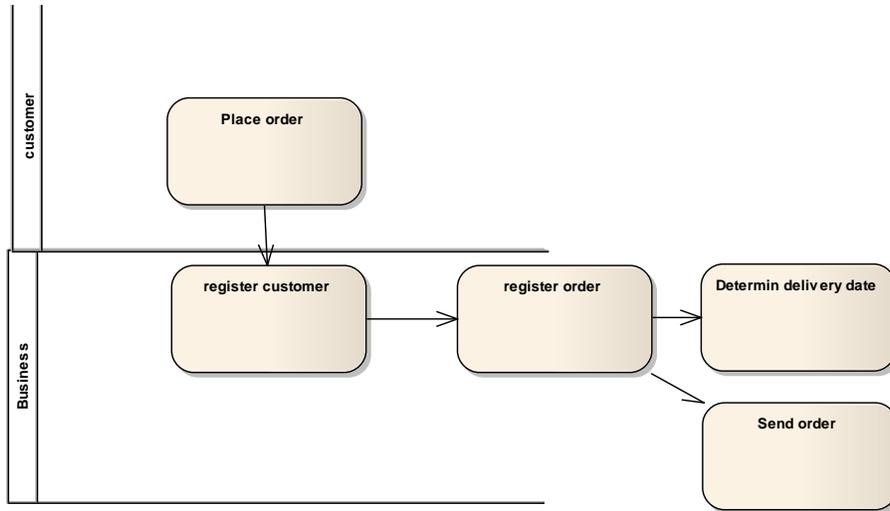
Figure 3 An sample administrative order process

Define application Domains

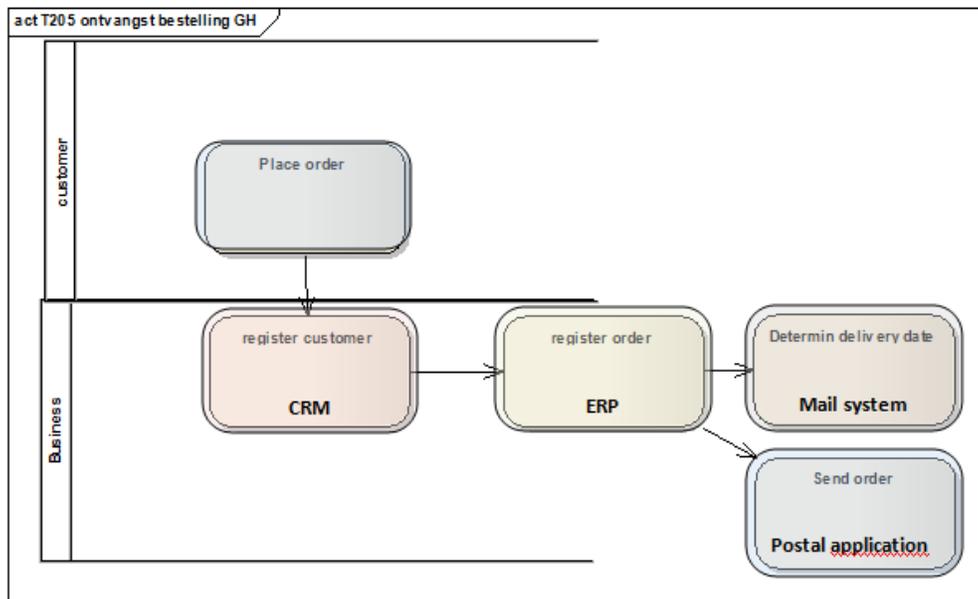Based on the modeled process typical application domains can be defined.

Figure 4 application domains defined

Define services

Within this paper we scoped our investigation too Microsoft related software and/or services. Based on the defined application domains, software services can be chosen and the requirements can be mapped.
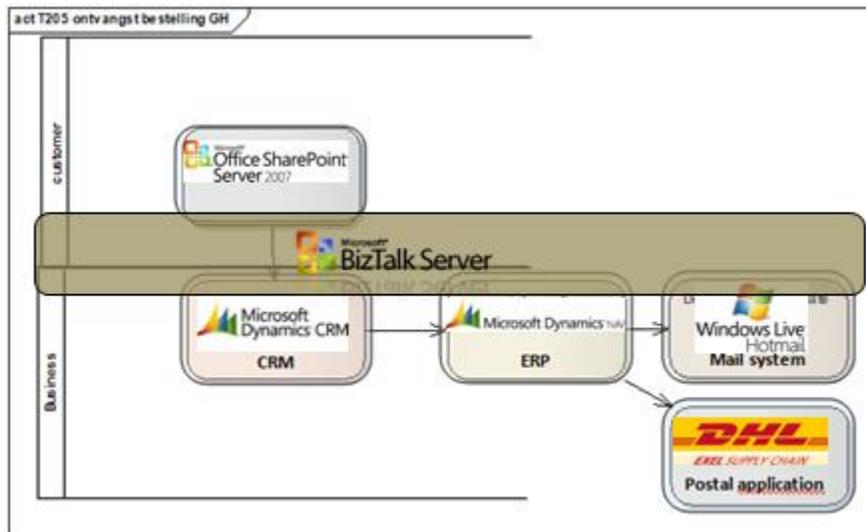

Figure 5 application functions realized with Microsoft technology

The mapping of requirements is somewhat different form the usual software development methods in which a stakeholder tell his requirements and everything is realized according to this requirements. In a cloud based environment there are several services available that can meet most of the requirements (Ramsin, 2008). Because of the standardization of these services the stakeholders request could not be realized to its full extend, so there must be a tradeoff between standard functionality and stakeholder requests.

To find the right cloud-service an ordinary search engine will not do, they present too generic results because the underlying structure and semantics of the services are not exploited, but there are special webservice search engines such as Woogle that will give better results (Dong, 2004). But not for every piece of functionality there will be a cloud-service, cloud-services will only be developed when multiple customers will use its functionality.

In this case we chose Microsoft CRM online as solution for storing the customer data. Microsoft Dynamics NAV 4.0 in a hosted version for order handling . Hotmail for domains for mail distribution. And a webservice from DHL which gives DHL an assignment to ship a package form a warehouse to a customer. The website for the customers will be provided by a SharePoint server with a InfoPath form, this will be the input for the process.

At some stage all the different services are selected and are ready to use, in, but the process is not supported. There are some functions supported but the overall process is split up into several services.

To support and guide the whole process integration is needed between the different services. Through this integration data is shared and actions are started within the services. To realize integration between the services webservices and an integration service is used (BizTalk server in the picture).

A Web service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description using SOAP-messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards. (W3c, 2003)

The integration layer needs in some cases to translate the data from the webservice of cloud-service A to the webservice definition of cloud-service B. Since the cloud-services are standardized the webservices available are also standardized this could mean the not all the needed data is available through the webservice, this is a point which needs attention in the selection phase of the cloud-services.

Figure 6 Data integration trough webservices: mapping definitions

But to realize a BPM in its full extend some more elements are needed. According to the chosen definition functionality for defining, simulating, analyzing, executing process models is needed as well as the management of runtime process models. This needs to be offered by the integration layer; in this layer the available webservices will be orchestrated to support the whole process. This orchestration needs to be modeled, simulated and analyzed before it can be used in production (executing the process model). To realize this there are modeling environments such as BizTalk, these enviriments can read process models such as BPEL.
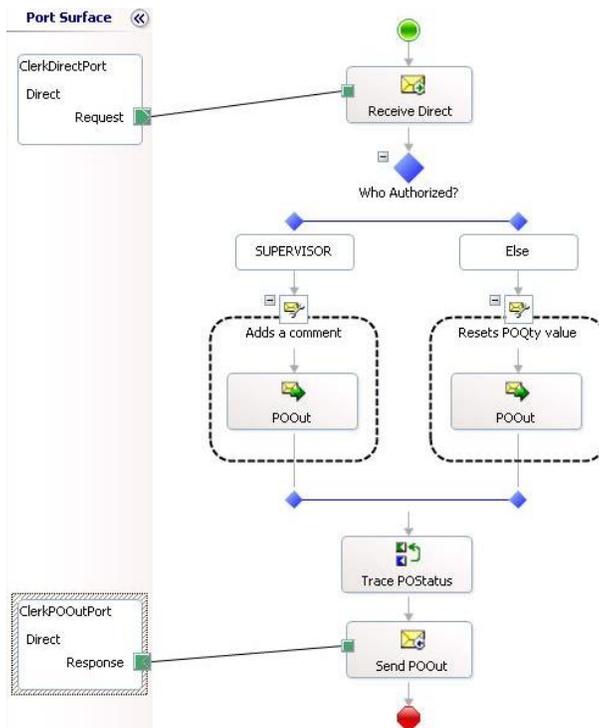

Figure 7 BizTalk process orchestration

After these steps a process is supported trough out the different cloud-services, users who use the functionality will be using the user interface of the specific cloud service. In some scenarios there will be the demand for a standardized user-interface trough out the whole process, in that case the cloud-services will just perform actions and will be started and fed with information by user from a portal which is designed to meet the demand of the webservice and the user (Kassoff, 2003).

A point of attention in a scenario of using the cloud-services user interface is the user management. It is very frustrating and risky for users to have many usernames and passwords (Elahi, 2008). In the cases of different services which are in the cloud user management needs attention. Some services provide a solution such as federated identities, this means that the service thrusts the authentication system of the business, so that the end user only has to sign in once (Gomi, 2005).
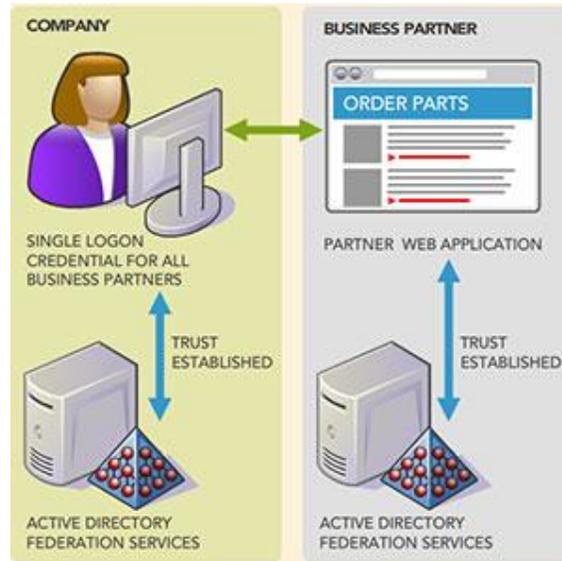

Figure 8 federated identity (Microsoft, 2005)

IN PRODUCTION

Although uptime guaranties are at a high level downtime will be there, but since the cloud-services are not always from the same supplier downtime will be at different moments. This will result in a greater total downtime based on an overall process view (Hofmann, 2004). Also SLA monitoring is a bit harder because the services are not in house and the company internet connection has a limited uptime guarantee.

SWITCHING

One of the big promised of cloud-services is the flexibility, this should mean that switching of cloud-service provider should be easy. The opposite is true; in practice you will see that data requirements of services will be different. The cloud-service provider offer limited import options but al 100% guarantee that import from A to B is possible is not there. (Gavrilovska, 2005) (Shoshani, 1975)

CONCLUSION

Cloud-services and BPM sound like the perfect combination and the expectations are high. Within this paper we studied the how this could be realized with a simple administrative process. And we bumped into some issues, at first the needed cloud-services need to be found and they need to support the requirements of the organization. At second integration between these cloud-services is needed to support a process over these cloud-services which need to solve integration problems such as mapping and translation of data. The 3rd problem that will arise is user management, the different cloud-services all will have different user credentials which will result much frustration for the users, so integral user management solution is needed such as federated identity. When these issues will be over won the process can go live but maintaining the process is another difficult thing, different suppliers will have different downtime moments. A latest issue this paper highlights is that switching for cloud providers is not as simple as all the great promises say, because of the different definitions of data and services.

Overall we can conclude that for all technical problems a solution is found but it needs to be more mature and standardized to function well in a cloud based BPM environment. But next to the technical problems a feeling of the business plays an important role whether or to use BPM over cloud-services. The services are not in the building, this give businesses an anxious feeling.

ACKNOWLEDGMENTS

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