Business Process as a Service (BPaaS)

Model Based Business and IT Cloud Alignment as a Cloud Offering

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Abstract. Cloud computing proved to offer flexible IT solutions. Although large enterprises may benefit from this technology by educating their IT departments, SMEs are dramatically falling behind in cloud usage and hence lose the ability to efficiently adapt their IT to their business needs. This paper introduces the project idea of the H2020 project CloudSocket, by elaborating the idea of Business Processes as a Service, where concept models and semantics are applied to align business processes with Cloud deployed workflows. Four architectural building blocks proposed for (i) design, (ii) allocation, (iii) execution and (iv) evaluation are discussed before providing and outlook.

Keywords. Business Process as a Service, Business Processes in the Cloud, Business and IT Alignment, Meta Modelling and Semantic

1 Introduction

Cloud Computing is undoubtedly the current mega trend that has the potential to massively influence current use of IT, especially for business applications. Estimated improvements caused by efficient, flexible and networked IT resources range up to 30%[1]. Hence, Cloud Computing is a chance for start-ups and smart companies that enter this global IT marketplace and obviously a risk for those who do not appropriately take advantage of Cloud Computing.

he ultimate challenge is to overcome so-called business and IT alignment, and bridge the gap between the business and IT domains. With respect to cloud offerings, this means that the current application view needs a corresponding business process view. Currently, typical parameters for SaaS – which is regarded as the current and upcoming market - are of a technical nature such as pricing models considering technical parameters, computing power, availability or network capacity. Business parameters such as legal aspects, business packages, process interoperability, or avoidance of vendor lock are used for distinction between different market players. Business Domain specific parameters like customer relationship for SMEs in the health domain, or web-appearance of an IT company are potential future options.

Hence we observe the need to abstract parameters from pure technical distinctions up to business and domain specific characteristics, which describe and distinguish cloud offerings.

In the following, the approach of the EU project CloudSocket [2] for tackling the aforementioned issues is introduced.

2 BPaaS Use Cases

Our primary targets are SMEs that are currently excluded from using the cloud due to a lack of competence and high entry barriers. There is a gap between pragmatic, legally influenced and well-defined business processes, which are understood by SMEs, and a gigantic cloud market with numerous offerings that rarely consider the business episodes of an entrepreneur but focus on technical details. Startups and SMEs typically focus on their core business. Hence, there are several business processes such as customer relations and advertising, administrative issues on registration, IT services as well as after sales support that are necessary for business success, but can only be insufficiently supported by the IT resources of those organizations.

For a complete analysis of the use cases, please refer to [3].

2.1 Business Incubator Use Case

The Business Incubator focuses on supporting the "Coaching and Finance" efforts of start-ups facilitating designing, analyzing and simulating individual business plans and processes. These aspects also demand a high degree of adaptability of Cloud Services for Start-ups, e.g. Customer Relationship Management, Order Management, Human Resources Management.

Ecological Agriculture:

A 28 year old biologist has an idea to take biological waste from a restaurant and stimulates a biological decomposition process. Usually such a process takes several years but the idea of the startup is to use worms to speed up this process.

- Initial situation: The startup presented the ideas to the business incubators. After this, the consultants have discussed with her about how to transform this business idea into a solid business model.
- CloudSocket technology intervention: The startup may require a range of different BPaaS, especially for customer relationship and worm production management.

Green Energy:

This startup is a small-scale virtual power plant which connects to a grid infrastructure with power generation from wind, photovoltaic, and biogas. The company serves its customers with environmentally friendly energy for households and provides smart home functions through its remote access capability for turning appliances on or off.

- Initial situation: The company is intending to expand its services to include mobile energy sources for recharging electric cars and offer them for rental as a range-extension for drivers e.g. for a long weekend trip. The startup contacted the business incubator consultants.
- CloudSocket technology intervention: The startup may require a range of different BPaaS especially for customer relationship, partner management and internal management processes.

The observation in the first use case – the Business Incubator - is that supportive business processes can be applied across several startups. So BPaaS addressing e.g. Customer relationship can be offered to a wide range of startups.

2.2 Cluster Process Broker Use Case

The Business Process Broker use case identifies typical business episodes of potential SMEs in different application domains such as eHealth, Manufacturing, Photonics, Government, Security, e-Commerce, Retail, etc. but share a common set of business processes.

Internet Research and Procurement Process:

An SME sells software and integrated appliances/electronic components that make devices "internet ready" in a few seconds.

- Initial situation: The SME continuously verifies prices of the electronic and mechanical components in the market and buys only products that match specific requirements in terms of customer needs and pricing. Monitoring the prices and the quality is a costly activity, which requires an ongoing analysis and trade-off between quality and price.
- CloudSocket technology intervention: The Company needs a solution that reduces the costs for procurement activities by improving the effectiveness. Generic self-management infrastructures or specially designed research processes including crawler and result databases have the potential to run in the cloud and to raise the productivity of this SME.

Kiosk Distribution Process:

A company aims at distributing newspapers and magazines to kiosks and other points of sales in an Italian town. Every day, around 250 different Italian and foreign newspaper are delivered to 600 points of sales.

- Initial situation: Current customers are small kiosks with very limited IT infrastructure. Often the orders are realized via Facebook comments. To improve the maturity of the ordering and interaction process with those points of sales, a new but still light-weight Web-application must be provided.

- CloudSocket technology intervention: A new order process can be handled in the cloud, without IT installation on either the supplier or consumer sides. Furthermore the process can reflect a better understanding of the customer needs.

The observation in the second use case – the Cluster Broker - is that most of the potential end users of the CloudSocket have the potential need for a generic business process but also for more specific business processes. Hence the flexible configuration of business processes, hiding the complexity of the cloud and providing easy to use solutions, is a promising market potential.

2.3 The SME End User Perspective

In addition to the two aforementioned use cases – that describe the targeted end users market – we identify the steps of interested end users in a process-oriented approach.

We propose three steps for a typical SME as an end user.

- Check Cloud Readiness
- Transform Business Processes to be executable in the Cloud
- Enter the marketplace to access BPaaS

The project provides a checklist for SMEs and start-ups in order to check if they are capable of entering the cloud with their business processes. This framework is provided as an online questionnaire relating to business processes, see [4].

The transformation of business processes to be executable in the Cloud is divided in two transformations, whereas the first transformation is a horizontal one that transforms from one business process to another one and the second transformation is a vertical on transforming from business process to workflows. Although both business processes are not executable, the latter one has clear anchor points, where cloud offerings make sense. Hence the horizontal transformation extracts those parts of the process where a cloud offering can actually be applied.

The next transformation is a vertical one that maps to an executable workflow in the cloud - this actually provides the cloud offerings and enables the execution in the cloud. This next step is performed by entering the market place and selecting the most appropriate workflow that runs in the cloud. This selection can be supported by smart mechanisms.

2.4 The CloudSocket Broker Perspective

The so-called CloudSocket is a market place, where BPaaS are offered in a similar way to how SaaS are offered. Hence, from a market place point of view, the same mechanisms can be applied as for SaaS, as each “executable business process” can be identified as a workflow in the cloud with a corresponding end point. The difference between a SaaS and a BPaaS is the description in the form of a business process and its semantic annotation for enabling smart selection.

For organizations aiming for becoming a CloudSocket broker we propose: Plan, Build, Run, Check.

"Plan Business Processes" denotes the use of business process management tools to acquire, design, analyse and simulate and finally release domain-specific business processes. Here we understand business processes as a know-how platform of an organisation, hence those processes have the potential for domain-specific consultancy and improvement. Traditional business process management tools such as ADONIS® [5] are used.

"Build Business Processes" denotes that each of the aforementioned business processes are made executable by a set of deployable and executable workflows. We agreed to use the term workflow for processes that are orchestrated and executable on an IT platform to strengthen the difference to human orchestrated or executed business processes. Traditional workflow design tools like yourBPM [6] may be used.

"Run Business Process" indicates the provision and operation of processes as a service within a market place that are executed and run across services offered in the cloud. Although this is technically the most challenging part, the focus of this paper and the focus of the introduced CloudSocket project is on the alignment, hence the mapping between domain specific business processes and cloud deployable and executable workflows.

"Checking Business Processes" indicates the abstraction, using conceptual models and semantic, to introduce a semantic meaning into the purely technical data and process logs from the execution environment in the cloud. The meta model platform ADOxx [7] will be used to develop conceptual and semantic models that can be analysed and mapped to business processes.

3 BPaaS Reference Architecture

CloudSocket will provide business solutions to SMEs, which can be offered in an open and interoperable form. A particular focus is on startups which do not want to invest in their own IT infrastructure but concentrate on the development of their business. IT services need to be adapted according to the changes and evolution of the organization and business.

CloudSocket comprises four phases, each phase supported by a corresponding building block: (a) the design environment to describe business processes, business requirements and workflows (b) the allocation environment linking deployable workflows with concrete services, (c) the execution environment that executes and monitors the workflow as well as (d) the evaluation environment that lifts key performance indicators back to the business level.

Fig. 1 introduces the four major building blocks, whereby each of the four building blocks supports one phase of the BPMS paradigm when applied for business process management in the cloud. The BPMS is a well-established business process management system paradigm that can be applied also on business process management in the cloud. More information on the architecture is available at [**Fehler! Verweisquelle konnte nicht gefunden werden.**].

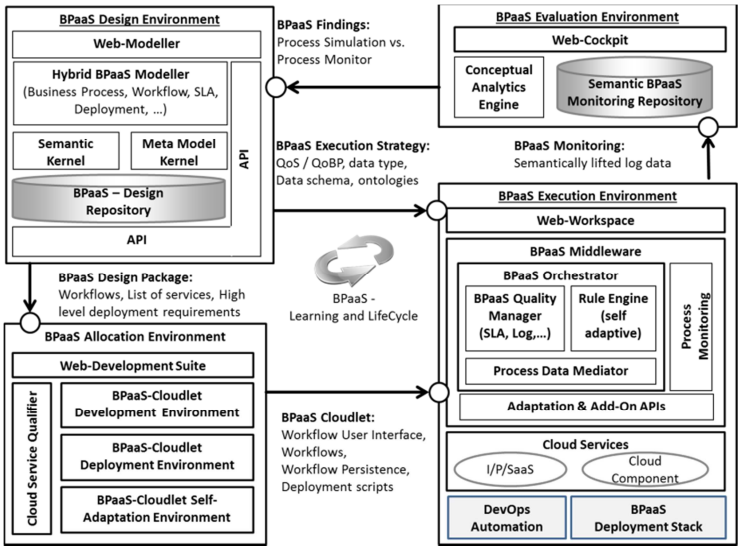

Fig. 1. CloudSocket High Level Architecture

4 Outlook

This paper introduces the idea of BPaaS in the context of the H2020 project CloudSocket, which started 01.01.2015. Hence this paper introduces the project idea of BPaaS and the use of a model-based approach to align domain specific business processes with cloud related executable workflows. First findings in identifying business episodes and possible business process models have been introduced and the current status of the architecture is briefly presented. By the time of the conference, the project can provide the first set of business episodes, a first reference architecture and an environment to check the cloud readiness of an end user.

All prototypes are available either as open source, open use or as provided services. A roadmap for technology provider indicates how alternative tools can be provided for a CloudSocket broker. Results on smart mapping domain specific business processes and cloud based executable workflows are expected by the end of 2015.

5 References

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