Business Integration
as a Service

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ABSTRACT

This paper presents Business Integration as a Service (BlaaS) which enables connections between services operating in the Cloud. BlaaS integrates different services and business activities to achieve a streamline process. The authors illustrate this integration using two services; Return on Investment (ROI) Measurement as a Service (RMaaS) and Risk Analysis as a Service (RAaaS) in two case studies at the University of Southampton and Vodafone/Apple. The University of Southampton case study demonstrates the cost-savings and the risk analysis achieved, so two services can work as a single service. The Vodafone/Apple case study illustrates statistical analysis and 3D Visualisation of expected revenue and associated risk. These two cases confirm the benefits of BlaaS adoption, including cost reduction and improvements in efficiency and risk analysis. Implementation of BlaaS in other organisations is also discussed. Important data arising from the integration of RMaaS and RAaaS are useful for management of University of Southampton and potential and current investors for Vodafone/Apple.

Keywords: BlaaS Case Studies, Business Integration as a Service (BlaaS), Cloud Computing, Risk Analysis as a Service (RAaaS), ROI Measurement as a Service (RMaaS)

1. INTRODUCTION

Cloud Computing is transforming the way many organisations work and offers added values for operation management and service computing. Researchers have demonstrated the positive impacts it can offer for business engineering and service level management (Amburst et al., 2009; Brandic et al., 2009; Buyya et al., 2009). Amburst et al. (2009) identified cost reduction in IT services from using Cloud Computing. They also presented their Cloud Computing economics and ten major challenges for Cloud Computing. They emphasise a shift of risk from maintaining data centres and the capital costs of running them to the loss of data while managing Clouds. Buyya et al. (2009) assert that Cloud Computing offers billing-based Service Level Agreements (SLA) which can be used for operational management offering cost-savings and streamlining business activities and processes. In addition, Cloud Computing offers a variety of other benefits including agility, resource consolidation, business opportunities and green IT (Foster et al., 2008; Weinhart et al., 2009; Schubert, Jeffery, & Neidecker-Lutz, 2010;
Computing Clouds are commonly classified into Public Clouds, Private Clouds and Hybrid Clouds (Ahronovitz et al., 2010; Boss et al., 2007; Sun Microsystems, 2009). The type of Cloud an organisation adopts will depend on its needs and the volumes and types of services and data they plan to have and use.

1.1. Business Integration Literature

In their pioneering paper on business integration, Krippaehne et al. (1992) proposed a strategy matrix for vertical integration to present strategies, goals and factors influencing successful business integration. Business Integration (BI) in Information Technology started from the concept the Business-to-Business (B2B) e-commerce which provides an architecture for integration of different activities and technologies. Bhaskaran et al. (2001) describe their B2B architecture which is divided by into technological frameworks. They explain each component and how they co-operate. Trastour et al. (2003) propose their NILE System to demonstrate Business Integration and explain how XML schema and RDF work together in their system. Vojdani (2003) identifies six application groups for utility companies in his business integration platform and explains how these components work. He uses Business Process Management (BPM) to present Business Integration and Collaboration. Vinok (2005) proposes Java Business Integration (JBI) by the use of enterprise application integration (EAI) offered by Java and Service Orient Architecture (SOA). Iyengar et al. (2007) introduce BI using IBM WebSphere Business Integration (WBI) technology which consists of Service Component Architecture (SCA), basic business processes and workflows. They use business process management (BPM), SOA/BI scenarios, architecture, patterns and WS-BPEL related technologies to demonstrate BI. Rebstock et al. (2008) demonstrate ontology and semantic-based architecture and deployment on BI and explain their rationale and business cases. Chrisdutas (2008) consolidates the proposal from Vinok (2005) and presents SOA Java BI. He explains the operation of JBI including each individual component and the interactions between different JBI containers. This work is based on SOA architecture which either focuses on JBI or semantic approaches.

Papazoglou and van den Heuvel (2011) present two models related to BI. The first is cloud delivery model in which they explain interactions between virtualised applications, clients and a stack comprising IaaS, PaaS and SaaS suitable for Business Process as a Service (BPaaS). Their second model, the blueprint model, is proposed to allow BPaaS or SaaS applications to run dynamically on virtualised clouds to enable service virtualisation. There are three components to the model: (i) blueprint definition language (BDL); (ii) blueprint constrain language (BCL) and (iii) blueprint manipulation language (BML). They also explain an architectural scenario showing how blueprint support for the cloud service life cycle can work. However, their approach is at the system design level without details of implementation, testing or use cases. Moran et al. (2011) present Rule Interchange Format (RIF), RIF Mapping, RIF-expressed rules and a use case. They explain how semantic-based integration can be achieved on IaaS level. However, their notion of BI is not the same as ours for the following reasons. Firstly, their integration is based on data exchange between different VMs to update RIF status in the Cloud. Secondly, it is not clear whether their use case only works for IaaS, although they seem to imply this approach may work on PaaS and SaaS level in future work. Ring et al. (2009) explain the integration of Grid and Cloud systems using two approaches. Their first is to redesign architectures of different Grid systems and their second is to implement interoperability, which includes re-implementations of Unicore 6, Globus 4, GLite, OMII Grid and so on which also contain other components such as security, standardisation and service discovery.
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