

Emerging Markets Queries in Finance and Business

Modeling Cloud architecture in banking systems

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Abstract

With the development of the Internet's new technical functionalities, new concepts have started to take shape. These concepts have an important role especially in the development of corporate IT. Such a concept is „the Cloud”. Cloud computing represents a big change in the way computing is done in corporations. It encompasses all the optimizations that a company needs in order to succeed nowadays. Among the base elements of many familiar technologies across the years there were the distributed systems that contributed to the development of Cloud computing, Grid computing and Utility computing. From our work experience we are going to analyze and assess the cloud adoption decision in a banking environment's context. This paper presents a use-case that shows business problems addressed by using Cloud computing and business considerations that influence an organization to use Cloud computing.

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1. Introduction - Cloud computing - concept, trends, integration with banking sector

Innovation in banking is a concept in continuous change. Cloud computing technology allows banks to use their resources more efficiently by a better budget management and resource allocation. There were released many definitions in order to explain Cloud Computing concept. The National Institute of Standards (NIST) agreed on highlighting in the proposed definition that: “Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage,

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applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”. Banks are adopting cloud services, with SaaS [Software as a Service] being the most-widely deployed form, mainly in peripheral, non-core solution areas, such as collaboration, customer relationship management and human resources department, but exceptions do exist. Adoption varies by banking segment, with more small-tier and large-tier banks adopting SaaS than banks in the mid-tier segment. The adoption of Cloud Computing model imposes a list of capabilities involved in the comprehension of the model strategy. The Cloud Maturity model implies concepts such as: capabilities, domains, maturity and adoption.

2. Main requirements - implementing Cloud Computing in banking systems

From the infrastructure point of view there can be identified capabilities that refer to the service infrastructure and instruments that can offer technical background for the Cloud adoption. In cloud infrastructure can be named elements such as services, provisioning and model packaging. On the other hand, from the architecture point of view there are capabilities that define the entire architecture and different indications for the Cloud incorporation. The model also can include self service and interoperability. The business and strategy component of the Cloud Computing model allows the Cloud initiative to proceed. It compasses elements such as business innovation, desired benefits, coordinating principles, anticipated costs. Capabilities that gain importance in Cloud initiative are represented by the service selection and service level agreements. The key drivers in Cloud Computing model can be defined in components such as: agility, lower the barrier to entry, cost and efficiency. The traditional application deployment from the administrative point of view supposed to specify, procure, configure and deploy the hardware component, deploy the database and application and configure settings. Pendayala and Holiday, 2010 In Cloud, the model management supports build-time functionality, exposes cloud resources to developers, stores developer’s models for deployment and validates cloud models. Service management controls the run-time aspects of the cloud: the capacity management and the service management and it is the operator’s main point of contact for the cloud, provisions and monitors resource tier and contains configuration management repository which is the current state. The security and policy management provides services common to build-time and run-time functions of the cloud management tier: security management and policy management, customer management and orchestration. It depends on model management and service management to carry out complex tasks Gu et al, 2011 .

The Cloud Deployment can be characterized from the user driven platform perspective (platform as a service deployment) and from the deployment portal perspective: the application deployment request, the adjustment of the capacity as demand changes, the retirement application when it is not needed. As illustrated in the picture, *cloud deployment is a distributed one*, since cloud systems are an important platform for distributed applications.

Paper Mell and Grance, 2011 proposes four Deployment Models as part of a cloud model which offers access to a shared pool of computing resources: *Private cloud, Community cloud, Public cloud, Hybrid cloud*. For most banks, the first major foray into cloud computing will be via *private clouds*. Private clouds are built within a company’s data center and are designed to provide & distribute virtual application, infrastructure and communications services for internal business users. These service components are highly elastic, and expand and contract as needed to meet service-level requirements. The technologies behind Cloud that refer to resource pooling are represented by the **virtualization, clustering and grid**.

The server virtualization and clustering provide resource pooling and elastic scalability. The server virtualization determine one resource to seem to be like multiple virtual resources. The clustering technology makes one resource to be a single virtual resource. The benefits of the these technologies are: high efficiency, quality of the service and flexibility. Customers have the choice of deploying these technologies in public or private clouds. The Grid technology makes it easier to dynamically replace nodes in a cluster. This allows service levels to be easily and efficiently maintained while lowering costs still *further through improved optimization*. Dabas, 2010 Banks are a step ahead and have already embraced virtualization and are using cloud

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