Service oriented Enterprise Architecture for Enterprise Engineering

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I. POSITION STATEMENT

Several developments, such as the success of cloud-computing show that not the ownership of IT resources but their management is the foundation for sustainable competitive advantage [1]. According to [2], smart companies define how they (will) do business (using an operating model) and design processes and infrastructure critical to their current and future operations (using an enterprise architecture).

Enterprise Engineering (EE) is the application of engineering principles to the design of Enterprise Architectures. It allows deriving the Enterprise Architecture from the enterprise goals and strategy and aligning it with the enterprise resources. Enterprise architecture [2], [3] aims (i) to understand the interactions and all kind of articulations between business and information technology, (ii) to define how to align business components and IT components, as well as business strategy and IT strategy, and more particularly (iii) to develop and support a common understanding and sharing of those purposes of interest. Enterprise architecture is used to map the enterprise goal and strategy to the enterprise’s resources (actors, assets, IT supports) and to take into account the evolution of this mapping. It also provides documentation on the assignment of enterprise resources to the enterprise goals and strategy.

There are different paradigms for creating enterprise architecture. The most promising is to encapsulate the functionalities of IT resources as services. By this means, it is possible to clearly describe the contributions of IT both in terms of functionality and quality and to define a service-oriented enterprise architecture (SoEA). SoEA easily integrates widespread technological approaches such as SOA or emerging ones as cloud computing because they also use service as structuring and governing paradigm. The enterprise goals and strategies are thus mapped to a SoEA.

SoEA differentiates four layers of services. Thus, its scope is much broader than the scope of the service-oriented architecture (SOA) and also includes services not accessible through software such as business and infrastructure services. Services of different layers may be interconnected in service (value) nets to provide higher-level services.

Business services are services, which directly support business processes. Business processes can be implemented dynamically (on-the-fly) using business services which are available in a repository for a given business domain. An example is call-centre services provided by an external service provider.

Software services exist as two types: (i) human-oriented applications, which are provided as Software as a Service, (ii) application services which are part of SOA.

Platform Services provide support of the development of applications. They provide services for the execution of applications, middleware stacks, web servers etc. Another important class of platform services are integration services. They enable the seamless exchange of business information between enterprises.

Infrastructure services are services providing virtualized computing resources such as virtual machines, storage etc. They may have a human addressee but mainly they are used to support services on higher abstraction levels. They are an important topic in management and practice collections such as ITILV3 or standards such as ISO/IEC 20000 have gained a high popularity.

II. GOAL AND OBJECTIVES

The goal of the workshop is to develop concepts and methods to assist the engineering and management of service oriented enterprise architectures and the software systems supporting them. Especially four themes of research have been pursued:

1. Alignment of the enterprise goals and strategies with the service-oriented enterprise architecture
2. Design of the service-oriented enterprise architecture
3. Service-oriented enterprise architecture and Cloud-Computing
4. Mapping of service-oriented enterprise architecture to enterprise resources

III. MAIN ORGANIZATIONAL ASPECTS

SoEA4EE workshop is a full day workshop in conjunction with EDOC’2012.
We received 11 submissions from Brazil, Canada, China, Finland, France, Germany, India, Morocco, The Netherlands, Portugal, and Tunisia. All of them have been peer-reviewed by at least three members of the international program committee.

A. Programme.

The workshop has been opened by a mini-keynote on the new trends in Enterprise Architecture by Rainer Schmidt and Selmin Nurcan.

Four full papers, one position paper and one technological challenge paper have been presented during the SoEA4EE’12 workshop.

The six papers were organized under four sessions:
- Enterprise service definition and discovery (1)
- Service networks and ecosystems (2 & 3)
- Services on the cloud: a way to the elasticity of enterprise architectures (4 & 5)
- Technological challenges related to services on the cloud (6)

Finally, the aim of the panel was to deepen the common understanding of service-oriented enterprise architecture and its associated methods. To achieve this, a questionnaire distributed to the participants was used. It contains questions about the fundamental understanding of service-oriented enterprise architecture, and presents status and possible further developments.

B. Papers presented at SoEA4EE’2012

The first paper, Business Service Definition in Enterprise Engineering - A Value-oriented Approach argues that defining and expressing the purpose of a system is non-trivial as, by definition, it arises from the relation with its environment. João Pombinho, David Aveiro and Jose Tribollet provide a state-of-the-art and highlights that the main shortcoming in addressing the identified problem space essentially resides in flexibly dealing with relativity of enterprise frontier definition. To address this issue, authors focus on modeling different perspectives of enterprises as systems, namely construction, function and contribution. More specifically, specifying the value in a contribution perspective allows improved specification of the rationale behind value network establishment and system/subsystem bonding. One can thus specify how each component of a system S contributes (provides value) not only to the purpose of S but to other purposes present in the value chains S participates in.

The second paper, An architecture framework for facilitating sustainability of open service ecosystems, explores the passage from monolithic, product driven business models to networked and service-based business. Toni Ruokolainen and Lea Kutvonen define a service ecosystem as a socio-technical complex system that enables service-based collaboration between entities such as enterprises, institutions or individuals. Authors present the Service Ecosystem Architecture Framework that facilitates sustainability of service ecosystems by supporting operation and addressing concerns of ecosystem stakeholders. Feasibility of the architecture framework is evaluated by modelling a modern open service ecosystem.

The third paper, Towards Smart Service Networks: An Interdisciplinary Service Assessment Metrics, defines Service Networks as open systems accommodating the co-production of new knowledge and services through organic peer-to-peer interactions. Yan Wang, Yehia Taher and Willem-Jan van Den Heuvel argue that the key to broad success of service networks in practice is their ability to foster and ensure a high performance thanks to the joint effort of interdisciplinary collaboration, cooperation and coordination among the network participants. To reduce the confusion - resulting from different interpretations of the shared terminology - in the multi-disciplinary communication of service networks participants, authors propose a novel framework of bi-dimensional (business vs technical) performance metric indicators built on the basis of a systems thinking mindset. The issue is to provide a correct understanding of the service scope and required resources in operation to the interdisciplinary service participants and also a way to examine the performance traceability of the services within a service network.

The fourth paper, Conceptualisation and Lifecycle of Cloud Based Information Systems, defines cloud based information systems as configurations of services and resources provided by dynamic cloud-environments. To promote the development of a design methodology, Rainer Schmidt shows a way to conceptualise cloud based information systems using the entities provided by cloud environments. This static view is complemented by the definition of a life cycle described for cloud based information systems. The notion of flexibility in cloud based information systems is also discussed, and first ideas for the enactment of business processes in the cloud are introduced.

The fifth paper, Purchasing and offering of cloud software services by a central procurement agency: a case study, is a short experience paper. Valère Dussaux studies the specific problems experienced in the definition of cloud software services when implementing cooperative procurement. Cooperative purchasing is a procurement model in which a trusted third party can conduct either a pooling procurement or a contract referencing in behalf of its members. This model has since long been used by government entities to obtain better purchase conditions. In the case of software services procurement, the new techniques of the cloud computing make use of the cooperative purchasing model even more popular. The author shows the importance of the scalability of the SLA defined in contracts and identifies the best practices that can be used to manage SLA.

The sixth paper, Policy based Power Management in Cloud Environment with Intel Intelligent Power Node Manager, is a technological challenge paper. Wei Chen, Fengqian Gao and Yuan Lu argue that from the emergence of cloud computing, large scaled deployment make power
management become a realistic and urgent demand. Thanks to the virtualization technology, several guest virtual machines can be distributed on a single host server; thus, resource allocated for virtual machines is virtualized from physical resource into a ‘platform as a service’. In cloud computing environment, some physical servers bear large computing tasks with high temperature and accordingly cost of power and cooling capabilities in datacenters increases. Authors propose to implement power management by defining two basic policies, policy based migration and power capping, and integrate them with Open Source Private Cloud to manage power in cloud computing environment.

C. Organizers

Selmin Nurcan is Associate Professor at the Business School of the University Paris 1 Panthéon Sorbonne and a senior researcher at the ‘Centre de Recherche en Informatique’ (CRI). She has a Ph.D and an engineering degree in Computer Science. Her research activities include enterprise computing, business process management, change modeling, and business/IS alignment, process (re)engineering and IS engineering and CSCW. Selmin Nurcan is also co-organizer of the BPMDS workshop series at CAISE and the BPMS2 workshop at BPM and member of IFIP WG 8.1. She is acting as a program committee member of a number of international conferences and serving on the editorial board of numerous International Journals. She has been a guest editor of a number of journal special issues related to business process modeling, development and support, and to enterprise and information systems modeling.

Rainer Schmidt is Professor for business information systems at Aalen University. He has a Ph.D. and an engineering degree in Computer Science. His current research areas are service science, business process management, social software and the integration of these themes. Rainer Schmidt is co-organizer of the BPMDS workshop series at CAISE, the BPMS2 workshop at BPM and member of the program committee of several workshops and conferences. Rainer Schmidt is serving on the editorial boards of International Journal of Information Systems in the Service Sector and International Journal on Advances in Internet Technology. Rainer Schmidt applies his research in a number of projects and cooperations with industry. He has industrial experience as a management consultant and researcher.

IV. ACKNOWLEDGEMENTS

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