

Inter-Enterprise Architecture for Cloud and Service Sharing

Yan Zhao, Ph.D.,
ArchiTech Consulting LLC
Fairfax, VA, USA
yan.zhao@architechllc.com

Abstract—This paper introduces the notion of Inter-Enterprise Architecture (IEA) in response to the current evolution of business environment and landscape associated with the adoptions of common service, cloud computing, and social networking. The IEA describes the context, business environment, collaboration channels, partnership opportunities, influential components and relationships across enterprises and business organizations in selected business domain or service domain for a targeted enterprise or business organization(s). The IEA enables enterprises and business organizations to understand its position in currently connected and networked business world. Due to the open and dynamic nature of service adoption and collaboration, and the autonomy of current enterprise structure, culture, and operation environment, it is necessary to explore how business should be architected across boundaries to effectively response to the common service and collaboration environment. It is becoming more important for business to be agile and be able to incorporate collaboration elements across organization boundaries. If enterprise architecture is like a city plan, the IEA is more like a plan for a metropolitan.

This paper discusses the subject areas for IEA to address, the impact of common service facilitation, public cloud, and social media to enterprises, the challenges and the possible transitions with IEA adoption. Some examples will be illustrated as well.

Keywords: *enterprise architecture; cloud computing; service-oriented architecture; service-oriented enterprise; common service; collaboration; service-oriented infrastructure*

I. INTRODUCTION

The businesses and the world economy are so much more correlated nowadays due to global networking and boundary-less information flow. We can see that the current influence and dependencies for an enterprise are far beyond the enterprise boundary. The trend of common service commoditization will add the mutual dependencies of service providers, service consumers, and service facilitators. Partnership and collaboration are the nature of this forming dynamics. The Internet evolution and the technology enablement encourage such changes, such as the current popular efforts of SOA, cloud computing [1]-[7], and social networking platforms (e.g. LinkedIn, Facebook, Twitter, YouTube). It is essential for enterprises and business organizations to understand their business context, environment, landscape, collaboration channels, partnership opportunities, influential components and relationships across

enterprises and business organizations. The IEA is introduced for this purpose.

II. THE ENTERPRISE LANDSCAPE EVOLUTION

Enterprise landscape is evolving due to the change towards a new paradigm and the presented new opportunities. The trend of the enterprise landscape evolution is illustrated in Figure 1.

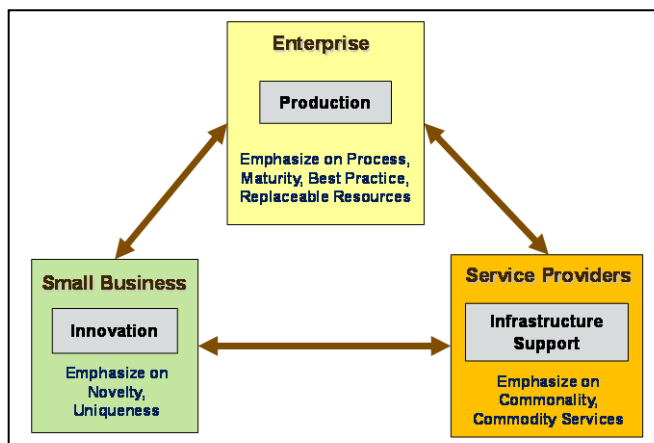


Figure 1. The Enterprise Landscape Evolution

We can see that the inter-enterprise re-structuring is happening to fit the new economy and the changing paradigm. The roles and responsibilities for the players are evolving. The focuses for good-sized enterprises are more on productivity, process-driven, maturity, and industrialization with replaceable components and resources, while the tasks of innovation are moving to small companies that will likely be acquired by large companies when getting matured. The infrastructure service is forming and separating from enterprise business, becoming a business of itself to provide common commodity services. The Inter-Enterprise Architecture (IEA) is helpful in providing such description for businesses, both large and small, to have a clearer picture for effective business propositions and game plans. IEA is helpful in being aware of business context, environment, mutual dependencies, collaboration and partnership opportunities.

III. THE NOTION OF INTER-ENTERPRISE ARCHITECTURE

The Inter-Enterprise Architecture is an abstract presentation of a selected business domain, with the coverage across the enterprises and business organizations in the domain, and with the descriptions in terms of scope, context, environment, roles and responsibilities, structure, components, relationships, interaction mechanisms, business process flow, information flow, etc. More details are as the following.

The scope: Describe a selected business domain or a service domain. A business domain can be healthcare, education, financial service, retail, etc. A service domain can include service providers, service consumers, and service facilitators.

Business context and environment: Identify the context for the targeted enterprise/enterprises or business organization/organizations. Identify their associated business environment.

Roles and responsibilities: Identify the roles and responsibilities of the players in the IEA scope.

Structure, components and relationships: Identify the structure and describe the influential components. Identify and describe the relationships between the components and to the targeted enterprise or business organization.

Interaction mechanisms: Identify media, channels, and mechanisms for interaction and communications.

Business process flow and information flow: Describe business and inter-business process flows, and describe business and inter-business information flows through identified media and channels.

IV. THE IEA WITH OTHER CONCEPTS AND EFFORTS

The relationship of IEA with other popular concepts and efforts is illustrated in Figure 2.

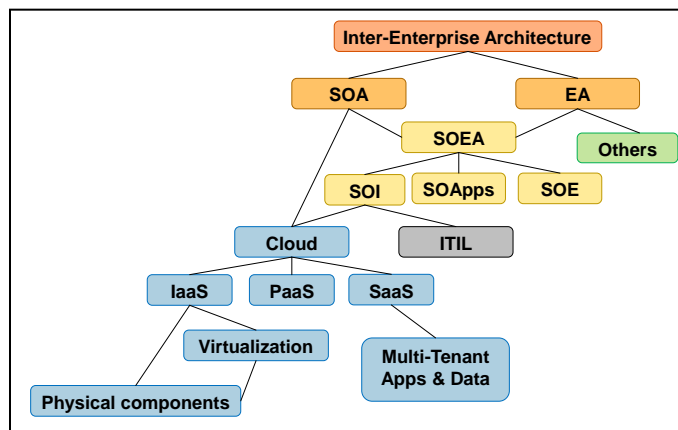


Figure 2. The relationship of IEA with other concepts and efforts

The IEA is constructed above each individual Enterprise Architecture (EA), while SOA is an architecture style and approach that can be applied to EA and IEA where appropriate [3]. By applying SOA to EA, we have Service Oriented Enterprise Architecture (SOEA) [3][6][7]. To implement a

SOEA, we can partition it into: Service Oriented Infrastructure (SOI), Service Oriented Applications (SOA), and Service Oriented Enterprise (SOE). The Cloud Computing enables SOI from the technical point of view, while ITIL enables SOI from the management point of view. Under Cloud Computing, we have Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The IaaS can be implemented by the combinations of virtualized and physical computing environment, though the trend is moving towards virtualization to maximize the benefits.

The IEA can help the cloud computing adoption by demonstrating the evolving landscape, business environment, and players for service provision, consumption, and facilitation; and demonstrating the environment and mutual dependencies for partnership and collaboration. It can help to describe inter-business structure for cloud computing adoption either public or private. Also, it can guide the cloud computing adoptions by providing business cases, concept of operations, solution options, technical implementation options, flexibility for changes in vendors and technologies.

V. IEA FOR ENTERPRISE TRANSITIONS

The IEA can guide enterprise transition to the new paradigm, which enables inter-enterprise architecture to be formed by intention instead of by accident from stove-piped implementations bounded inside each organization. It can make cloud computing and social media adoptions more effectively by identifying inter-business solutions and adapting to new inter-business relationships and dynamics by design and by the effective usage of social media.

The examples of IEA for cross-enterprise cloud service adoption include: Shopping Mall on Cloud for cross-retailers efforts and Library on Cloud for cross-libraries efforts. Also, it can guide the solutions for business domain oriented cloud. A public cloud implementation should be guided by an IEA, not other way around.

REFERENCES

- [1] P. Mell and T. Grance, The NIST Definition of Cloud Computing, version 15, Oct. 7, 2009, <http://www.nist.gov/itl/cloud/upload/cloud-def-v15.pdf>.
- [2] Y. Wei and B. M. Blake, Service-Oriented Computing and Cloud Computing: Challenges and Opportunities, *IEEE Internet Computing*, vol. 14, no. 6, pp. 72-75, Nov./Dec. 2010.
- [3] Y. Zhao, Cloud Computing and SOA from Enterprise Perspective, ArchiTech Consulting LLC, 2010, <http://www.architechllc.com/uploads/Publications/Cloud-SOA-Enterprise.pdf>
- [4] A. Arsanjani, S. Ghosh, A. Allam, T. Abdollah, S. Ganapathy, K. Holley, SOMA: A method for developing service-oriented solutions, *IBM SYSTEMS JOURNAL*, VOL 47, NO 3, 2008.
- [5] Y. Zhao, Service Oriented Infrastructure Framework, *2008 IEEE Congress on Services - Part I*, 2008.
- [6] Y. Zhao, EA and SOA: A Partnership, Perspectives of IASA Special Issues: Enterprise Architecture – A 20Years Retrospective, *International Association of Software Architects*, April 2007.
- [7] Y. Zhao, Enterprise Service Oriented Architecture (ESOA) Adoption Reference, *Proceedings of 2006 IEEE International Conference on Services Computing*, Sept. 200