

# Enterprise Architecture, Implementation, and Infrastructure Management

H. Michael Chung  
 California State University, Long Beach  
[hmchung@csulb.edu](mailto:hmchung@csulb.edu)

Graham McLeod  
 University of Cape Town, South Africa  
[mcleod@iafrica.com](mailto:mcleod@iafrica.com)

## 1. Introduction

Enterprise Architecture (EA) is a comprehensive model of an enterprise: a master plan, which acts as a planning, structuring, and integrating guideline and force for an organization. EA covers business structure and context, information technology dimension and organizational structure, and workflow dimension in achieving the organization's goals and strategies. It seeks to promote synergy between the various dimensions, aligned with achieving overall business purposes.

While the concept of centralized business systems planning has become less popular, rapidly changing e-business environments, along with the more decentralized nature of the organizational resources, demand not only more flexible and adaptable but also cohesive and value creating role of information systems infrastructure and its management. In particular, synchronizing business goals and strategies; governance principles; organizational structures, processes and data; business applications, their systems and databases; and network infrastructure (internal and external to the enterprise) become more critical.

However, planning, designing, operating, and controlling such a distributed system to ensure achieving the intended goals of an organization is often challenged and defeated by the immediacy of day-to-day problem solving caused by the factors often outside the control of management. Decentralization of network services, diverse architectural arrangement, and internal application demand make coherent and coordinated infrastructure management more difficult. Multi vendor environments as well as rapidly advancing technologies further complicate the problem.

## 2. Research Papers

This year we discuss several different issues: First, we look at an enterprise model of an organization and a model in a heterogeneous mobile environment. The multi-perspective enterprise modeling paper describes an approach to integrate strategies, business processes, and information resources, and then illustrates a modeling language that specifies such integration. The network operation center paper describes a conceptual framework of managing communication and knowledge in an open wireless platform.

Second, we discuss a large system issue in a service centric distributed environment. The paper presents a way to organize and control service demands and capacity for a corporate business at the system layers. The enterprise reference model paper presents a formal quality reference model of an enterprise based on the ISO 9000 specification. The model addresses the re-usability and sharability concerns.

Finally, we summarize the issues in architectural consideration, model implementation, and infrastructure management, review the industry trends and practice, and discuss the performance metrics of the architectural models.

## 3. Research Directions

As EA research advances, we try to add more specific dimensions in order to have a balanced and holistic perspective: technological and business, stable and evolving, and conceptual and implementation-oriented ones, etc. In addition to meta modeling, business modeling, middleware and prototype implementations, we would like to see more rigorous examples of interoperability and integration in large-scale systems, studies on mobility, scalability, security, and reliability as well as on the strategies and pricing of network

management service, and standards and regulations among others.

In particular, we would like to discuss how we align EA with the business strategies and project governance, etc. How do we create an adaptive architecture in a constantly changing business and technology environment? Furthermore, we ask how we enable the integration of supply chain and/or customer relationship management in e-Business? Can it be a foundation of an architectural planning? How do we link the business value proposition with effective measurement? They may not be new questions and we can learn from the theories and case studies in the literature.

The issue of integrating applications and databases is an important area to further examine not only from a technical perspective but also from a resource management one. Another area is to study the software architecture that plays a critical role of translating business strategies into an architectural arrangement.

methodologies and technological resources. Finally, it is necessary to discuss what are the lessons we can draw from practice in advancing the EA research.

#### 4. References

- [1] M. Fayad, D. Hamu, and D. Brugali, "Enterprise Frameworks Characteristics, Criteria, and Challenges," *Communications of ACM*, 43,10, 2000, pp. 39-46.
- [2] M. Fox and M. Grueninger, "Enterprise Modeling," *AI Magazine*, AAAI Press, 19, 3, 1998, pp.109-121.
- [3] D. Linthicum, *Enterprise Application Integration*, Addison Wesley, 1999.
- [4] M. Maier and E. Rechtin, *The Art of Systems Architecting*, (2<sup>nd</sup> edition), CRC Press, 2000.

Unified Modeling Language (UML), Extensible Markup Language (XML), and component-based development are to be discussed within the context of resource management and implementation. System complexity needs to be investigated. We also would like to consider the development of a repository of the EA