# Enterprise Architecture for Decentralized Environments

Thomas Speckert

Stockholm
University

# Enterprise Architecture for Decentralized Environments

Thomas Speckert

# Abstract

Qui terempri isuam liam incum aris forteat strudentre quid inculoc iviliaet; nihilius. Catimor demquam tam, senterf rmactum ompec orum, ne culvitimis se constusquam pratastiam porum rem, que poptert batia vidiem, sendum patus? Paturo vis esum inessus, furnimi iliciem ent vidit rebaturei potiu quam ductame teris, conductam me consum retis consuniu ma, speriam rem firisum publi, quam factod norehem et grat. Maesse, se orteliciemus cem. Fuidena ilicien ervid C. M. C. me quid rem moente, conimus nit practanti, tabena, Ti. Habunterfer que avoltum quam hinaterniam abem nonside labistiae, intelic vidi ium erce enatici ecturox nulviribem hostio nesimoeritia rei inatis.

# Keywords

enterprise architecture, distributed computing, decentralized organizations

# Contents

# 1.  Introduction

## 1.1   Background

Large enterprises have traditionally implemented formal, centralized forms of organizational structure [6], such as hierarchical or matrix structures. In these structures, communication patterns and decision rights are strictly defined and controlled by management. This has the advantage of clarity, in that it is always simple to determine exactly who is responsible for what. This clarity comes at the expense of agility, it is difficult for these organizations to quickly adapt to a changing environment. While they were appropriate for the business environments of the past, modern business environments demand a high level of agility.

Common components of modern business environments include cooperation with different organizations, rapidly changing business activities and processes, and a rapidly changing competitive landscape. In order to properly handle these components, a high level of enterprise agility is necessary. Instead of having strict hierarchies and formal processes that need to be followed, it is important for enterprises to have a more flexible, decentralized organizational structure that allows for members to make their own decisions and change the way they work. More decentralized structures, such as networked [6] organizations are examples of this. It is important to note that a lack of rigidity and formal structure does not mean a lack of organization. It is still important for a decentralized organization to maintain a level of organization.

In the technical world, distributed computing applications are the solution for maintaining organization in a decentralized environment. These types of applications are becoming increasingly popular in modern computing. For example, one of the most common architectures for distributed computing applications is peer-to-peer: an architecture in which the peers communication directly to each other, without the need for a central server. Peer-to-peer applications are being used in many different areas, such as file sharing [3], content distribution [4], revision control [1], and even as a digital currency  [5].

On the organizational level, Enterprise Architecture (or EA) is a discipline for creating an architecture for an enterprise. EA takes a holistic view of an enterprise in order to bring its many components (such as goals, strategies, information systems, and processes) into alignment with each other. Many different EA frameworks currently exist, for example The Open Group Architecture Framework (TOGAF) [2] and the Zachman Framework [7].

All frameworks address one or more of the following three different aspects: the process of creating an enterprise architecture, how to describe enterprises architecture, and a description of how to actually implement the described architecture. Together, these three aspects form a solution to the problem of how to organize the components of an entire enterprise.

## 1.2   Problem

The problem of how to organize an entire organization is a relevant problem for all types of enterprises, regardless of whether they are centralized or decentralized. Enterprise Architecture methodologies and frameworks seek to outline a formal way in which to

solve this problem. This thesis argues, however, that modern EA frameworks are designed for centralized enterprises, and are not an adequate solution for decentralized enterprises. As modern enterprises are becoming increasingly more decentralized, this shortcoming of modern EA frameworks is an increasingly important problem. Consequently, this thesis addresses the problem of creating a suitable EA for decentralized enterprises.

## 1.3   Research Questions

In order to adequately solve the problem presented in section 1.2, this thesis will answer two separate research questions. The first question will address the problem of whether or not current Enterprise Architecture methods and frameworks are suitable for use in decentralized environments. The second question addresses the problem of creating an EA framework that is suitable for decentralized environments. Answering these two research questions will enable this thesis to make a contribution the field of EA by providing a basis for how EA can be extended to areas where, currently, it is not typically applied.

The two research questions for this thesis are:

1. Are current enterprise architecture methodologies and frameworks suitable for application in decentralized environments?
2. Are there principals from distributed computing that can also be applied to Enterprise Architecture in order to create an EA framework for decentralized environments?

# 2. Scientific Base

# 3. Method

# 4. Results

# 5. Conclusion and Discussion

# Bibliography

[1] Scott Chacon. *Pro Git*. Apress, Berkely, CA, USA, 1st edition, 2009.

[2] The Open Group. *TOGAF Version 9.1*. The Open Group, 2011.

[3] Bittorrent Inc. The bittorrent protocol specification. `http://www.bittorrent.org/beps/bep_0003.html`, 2008.

[4] Blizzard Entertainment Inc. Blizzard downloader troubleshooting. `https://eu.battle.net/support/en/article/blizzard-downloader-troubleshooting`.

[5] Satoshi Nakamoto. Bitcoin: A peer-to-peer electronic cash system. *Consulted*, 1:2012, 2008.

[6] Keri E Pearlson and Carol S Saunders. *Strategic Management of Information Systems*. John Wiley & Sons, 4th edition edition, 2009.

[7] John A Zachman. John zachman's concise definition of the zachman framework. `http://www.zachman.com/about-the-zachman-framework`, 2008.