Information modeling of payment services for e-commerce

Analysis of payment service provider Triple Deal

Master Thesis Information Science

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Table of Contents

1. Introduction

The document in front of you, describes the research plan for my master thesis of Information Science. This chapter's purpose is twofold. Firstly, it's introductory. The context of this research is described in order to understand the business setting and the processes involved in the payment services for e-commerce industry. This research is executed in cooperation with a major Dutch payment service provider, Triple Deal. Secondly, it describes the research objective, the specific goals and the approach to these goals. Furthermore, the motivation for this research and its relevance is pointed out.

Firstly we will start with a brief introduction about Triple Deal and the processes involved in the payment services for e-commerce domain. Next the problem statement is described followed by the relevance of the research. Finally, we end with the approach, objectives and an overview of the timeline.

1.1 Triple Deal

In 1999 Triple Deal was founded in the Netherlands by Conclusion, with the objective to improve the online trading between buyers and sellers. The Triple Deal Escrow services acted as an intermediary to secure a transaction between a buyer and a seller on a virtual market place. From this first service, Triple Deal developed the Triple Deal Payment Service, enabling merchants that sell over the Internet, to accept e-payments over a secure infrastructure. A third service was added to the Triple Deal service offering in 2005: the Triple Deal Contribution services, facilitating the inning and pay out of contribution funds between members and their sport clubs.

Triple Deal was founded by Conclusion and among the first shareholders were Conclusion, ABN AMRO Participations and InterNL.net. In 2005, the shares of ABN AMRO Participations and InterNL.net were transferred to DOCdata. DOCdata is transforming Triple Deal from a mainly Dutch payment service provider into an international provider of financial services.

To be able to target corporate customers in an international environment the sharing of information is critical. Triple Deal has identified the need to improve the way they communicate with their customers. The current interface (Triple Deal Back office) needs to be completely reviewed and changed. The Triple Deal customers (internal and external) need to have up-to-date access to a highly scalable and configurable set of data presented in several different ways and formats.

1.2 Problem Analysis

The assignment is to make an information model of the information need of payment service providers, especially Triple Deal, and the processes involved in the payment services for e-commerce domain. The research presents also an analysis of how you can build adaptive and scalable web applications for payment services. This is carried out within Triple Deal and involves the back office for merchants. The central question in this research is:

How can we build adaptive and scalable web applications for payment services that provide different types of users with a specific set of usable financial information?

The financial information model and processes of Triple Deal, and the payment service for e-commerce domain in general, are fairly complex. There are dozens of payment methods, real-time transactions, batch processing, real-time processing and complex path's in time. There are also many stakeholders and users involved: merchants (small - large, manual integration – fully automated integration), Triple Deal (helpdesk, sales, management, financial controllers), issuers, acquirers, banks, processors, brands, etc. It is important that the costs are transparent for the merchant because there are different cost models of the banks and payment method providers.

Some requirements for the back office are:

- I18n
- Triple Deal vs merchants
- Functional scalability
- Technical scalability
- Usability
- Integration with back offices of merchants
- J2EE Technologies

1.3 Relevance to research

For the master thesis I have chosen to do a research for an external company because I wanted to have some practical experience regarding Information Science, especially information modeling and building web applications. The internet is still a fairly new concept and there is still a lot of research needed for information modeling of web applications. Building web applications that are efficient and effective for the user is the still very difficult. There is no silver bullet for building web applications. The practical experience learned in this project is of great value for my career and can also be useful for further research. Of course, this research is very valuable for Triple Deal because they are growing fast in the international e-commerce market.

1.4 Theoretical background

The theoretical background can be split up in three categories: process modeling of payment services, information modeling of payment services and building web applications for payment services. Analyzing the theoretical background of the payment services for e-commerce domain is part of this research what means this chapter will be filled in later. The research domain can be assigned to the knowledge domain of information science and computer science.

1.5 Research approach

The research approach is split up in the sub questions mentioned below. We start with an analysis of the processes involved in the payment services for e-commerce domain and parallel an information model of this domain is build. Next we make an analysis of how we can build adaptive and scalable web applications for the payment services for e-commerce domain.

These sub questions will give us an answer to the research question:

1. ***What are the processes involved in the payment services domain?***
   This sub question will give us an overview of the processes involved in the payment services for e-commerce domain. To answer this question an analysis is made of the processes that Triple Deal is involved in. The method used to answer this question is data flow modeling. [Gia01] [Zho07]

2. ***What is the underlying information model in the payment services domain?***
   This sub question will give an information model of the concepts in the payment services for e-commerce domain and the roles these concepts play in the domain. The method used for this question is Object Role Modeling (ORM). [Pro04][Hal01] The motivation behind the use of ORM is that it is an excellent tool to model complex domains. [Ble05]

3. ***How can you build adaptive and scalable web applications for payment services?***
   This question will give a solution for building adaptive and scalable web applications for the payment services for e-commerce domain. To answer this question an analysis is made of the different software architectures suited for web applications. [Ros01][Pre01]

To answer the sub questions the personnel of Triple Deal (management, software developers and support desk), the software developers at First8 and some users (merchants) will be interviewed. These sub questions should give an answer to the research question:

How can we build adaptive and scalable web applications for payment services that provide different types of users with a specific set of usable financial information?

Finally a prototype is build for the back office of Triple Deal, but this is not the primary goal of this research. The main objective of this research is to make an information model of the complex financial processes of payment service for e-commerce domain and to present a solution to build adaptive and scalable web applications for this domain.

1.6 Overview

Below you can see a short overview of the timeline of the research and the deliverables for each activity.

Week	Activity	Deliverable
33	**1. Preparation**	Researchplan
34	**2. Information modeling**	
35		
36		
37		Information Model(ORM)
38	**3. Proces modeling**	
39		
40		
41		Process Model (DFD)
42	Study in India Sat 13 oct - Tue 23 oct	
43		
44	**4. Web application modeling**	
45		
46		
47		Software Architecture
48	**5. Implement framework/prototype**	
49		
50		
51		Prototype (J2EE)
52	Christmas break	
1		
2	**5. Write thesis**	
3		
4		Thesis
5	**6. Presentation**	

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