
A Process Model for Data Warehouses Integration to Enable Business Intelligence: An Applicability Check for the Airline Sector

Bachelorarbeit

Zur Erlangung des akademischen Grades „Bachelor of Science (B.Sc.)“ im Studiengang Wirtschaftswissenschaft der Wirtschaftswissenschaftlichen Fakultät der Leibniz Universität Hannover

Vorgelegt von

Name: Edwards

Vorname: Cary



Prüfer: Prof. Dr. M.H. Breitner

Hannover, den 09.05.2014

Table of contents

Sperrvermerk - Restriction Note	II
Index of Figures	IV
Index of Tables	IV
List of Abbreviations	V
1. Introduction	1
2. Practical background and description of the current state problem	3
2.1 Business organization profile TUIfly and TUI Airlines.....	3
2.2 Description of the current state problem	4
3. Theoretical foundations and related work	6
3.1 Business Intelligence	6
3.2 Data Warehouse	7
3.3 Critical success factors for BI and DWH projects.....	14
3.4 Process model for Data Warehouses integration	17
4. Research Design	25
5. Designed - DWHs Integration Process Model	27
5.1 Initial project planning.....	29
5.2 Analyze existing DWH systems	31
5.3 Plan future DWH system	34
5.4 Design prospective DWH system.....	36
5.5 Implement and test new DWH system.....	40
5.6 Deploy new DWH system	43
6. Evaluation	44
7. Discussion, Limitations and Recommendations	47
8. Conclusion and Outlook	51
References	VI
Appendix	XIV
Ehrenwörtliche Erklärung	XXXI

1. Introduction

Since the first introduction in the 1990s, the topic Business Intelligence (BI) and Data Warehousing (DW) received great attention by many business organizations and their internal business information management. Especially in today's hypercompetitive market many executives use several BI applications to make strategic organizational decisions. For this purpose, business organizations often implement the Data Warehouse (DWH) as their main BI instrument to analyze a large amount of operational data. More specifically, the DWH allows the extraction of needed information for organizational decision making processes (see Olaru, 2012, p. 19). However, business organizations often face the problem that many heterogeneous DWHs accumulated over the past. As a consequence, executives and business users are often unaware of the existence of accurate information, which are necessary to achieve organizational goals. Without a consistent view on the corporate performance, executives have fewer possibilities in making the correct strategic decisions. According to a survey conducted by the BusinessWeek Research Services approximately 77% of the executives were unable to make correct decisions because inaccurate and incomplete information existed (see Hammond, 2004, p. 11).¹

Furthermore, many DWH systems often lead to data redundancy. These redundant, not integrated analytical systems are often wasteful and may increase the DW costs rapidly. Consequently, numerous business organizations should have the main objective to minimize their analytic systems landscape through a successful integration project. Nevertheless, the problem in this context is that integrating the heterogeneous DWH systems can be very complex. Integration projects often face two major challenges. The first challenge is to make an efficient decision on the prospective DWH integration strategy, which defines the procedure of restoring and integrating the heterogeneous data in to one core database. The second challenge involves cultural and established structures of distributed power. Thus, solution approaches regarding technology competencies and corporation wide measures, structures and responsibilities must be identified (see Bauer, 2013, p. 397). This leads to the central research question of:

RQ: How can Data Warehouses be successfully integrated to Enable Business Intelligence?

Based on the practical problem of the globally operating TUI airlines, the main objective of this work is to design in corporation with the TUIfly airline a process model for DWHs integration, which can be applied to solve the aforementioned problem. Although, such practical issues often exist, where executives need to obtain a unique overview of their business organization through an integrated DWH system, the research on this topic has received little attention (see Olaru, 2012, p. 20). The complexity of this task requires a well-structured and systematic approach. Therefore, proposed by Gregor and Hevner (2013) the structure of this

¹ The survey conducted 675 executives and managers from American and European business organizations.

work is as follows: After this introduction including the description of the topic motivation and contribution to the DW topic, the practical background on the TUIfly- and TUI airlines, and the current state problem are explained. Then, the theoretical foundations and related work are addressed, including business intelligence, data warehouse, critical success factors for BI and DWH projects and process model for data warehouses integration. Afterwards, the research design, which consists of two phases, is presented. Once this is described, the principal part of the work begins. More specifically, the designed iterative DWHs integration process model is illustrated and each related phase is explained in further detail. On this basis, the developed model is evaluated within the TUIfly airline. Subsequently, the discussion on the results and observations follows, and the identified limitations and further research and practical implications are drawn. Finally, the work ends with a provided conclusion and outlook.

The overall structure of the following work is illustrated in figure 1.

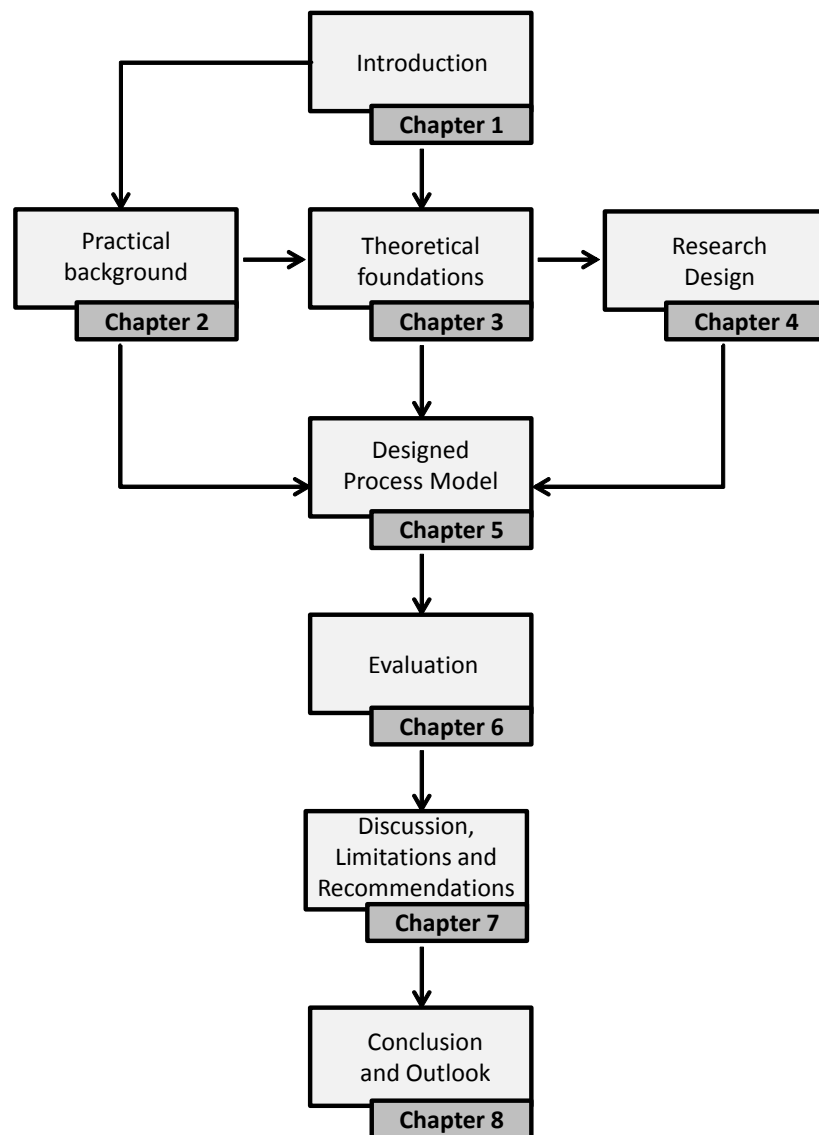


Figure 1: Structure of the work

8. Conclusion and Outlook

With the beginning of a review on DWHs integration research in the IS domain, this work focuses on how to integrate heterogeneous DWHs that exist within a business organization. First of all, the CSFs for a general BI and DWH project were described. It has become apparent that undertaking BI and DWH projects must receive attention from the organizational, technical and process oriented levels. Based on some CSFs we presented a practical DWHs integration approach, which describes in a short overview how a business organization should proceed to integrate diverse analytic systems. Within design science research, we then developed an iterative DWHs integration process model, which describes in further detail the phases and activities that an integration project should follow to successfully integrate DWH systems. The practical applicability of the approach was then initially performed at the globally operating TUIfly airline.

In conclusion, integrating heterogeneous DWHs requires a great deal of work. Although DWHs integration accomplishes many benefits, business organizations often face the challenge that these projects require highly technical and functional knowledge. Especially the long implementation periods and the high funding required may lead to a project failure. For that reason, it is most important that an organizational culture and attitude towards the integration purposes are developed. This especially requires top level management support, the commitment of the business users on delivering consistent data and a continual investment in time and budget. Once these requirements are fulfilled the DWHs IPM can be used to minimize the organizational DWH landscape.

Today's business organizations tend to use more and more the cloud computing service, which is a virtual network of the web. Instead of using the computer to access local services, a virtual cloud is accessed through the internet to receive the needed information (see Salazar and Jiming, 2012, p. 721). According to Gartner (2011) one of the key DW trends is to implement a DWH into a cloud environment. The major advantages of such technology are the hardware and software costs reductions, but also the enablement of worldwide data access and sharing possibilities. This makes it for business organizations a lot easier to collaborate. Therefore, future research can address the integration of heterogeneous DWHs into a cloud environment. In this context, however, security is often the major obstacle (see Salazar and Jiming, 2012, p. 721 et seqq). Consequently, when analyzing the potentials of DWHs integration into a cloud environment, the security measures have to receive a great attention.