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Evaluation of Selection Methods for Global Mobility Management Software

Masterarbeit

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vorgelegt von

Name: Rohr



Vorname: Anna



Prüfer: Prof. Dr. Michael H. Breitner



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1 Introduction

One of the oldest intellectual challenges in science and engineering, is how to make the best decision in a given situation. This problem is as old as humanity itself. In some prehistoric civilizations, people attempted to decide about complex and risky problems by seeking advice from priests or educated individuals. Nowadays, the development of scientific disciplines such as statistics, operations research and management science, in association with the use of modern computers, serves as an aid in assisting people in making the best decision in a particular situation. Several techniques, such as linear or dynamic programming, hypothesis testing, optimization of queuing systems, and multi-criteria decision making (MCDM) have a mutual element: the search for the optimal decision. MCDM especially, has captured the attention of many people, as the decision among several alternatives and a set of decision criteria may arise in many different situations (cf. Triantaphyllou 2000, p. xxv).

Business decision making has also changed over the last decades. Decision environments have developed, from a single person *the Boss!* and a single criterion *profit*, to multi-person and multi-criteria situations. The awareness of this development is growing not only in theory but also in practice (cf. Triantaphyllou 2000, p. xxiii). Therefore, the following master thesis investigates a present business decision process.

1.1 Motivation and Relevance

The 21st century is marked, by rapidly transforming economic conditions in various fields of business (cf. Lin, Lin 2014, p. 43). The transformation of business processes raises the demand for reliable qualitative software packages. In order to meet specific needs of organizations, software firms are producing a variety of customizable and tailored software packages (cf. Jadhav, Sonar 2011, p. 1394; Palanisamy et al. 2010, p. 611).

However, due to the availability of large number of software products in the market, decision making in the field of software selection has become more complex (cf. Jadhav, Sonar 2008, p. 337). Furthermore, software package selection involves simultaneous consideration of multiple selection criteria, according to the user requirements, as well as complex technical, legal, and business considerations. Therefore, selecting the correct software solution is a challenging process for companies (cf. Jadhav, Sonar 2009b, p. 556; Kaur, Singh 2014, p. 3739; Palanisamy et al. 2010, p. 611; Howcroft,

Light 2006, p. 215; Arditi, Singh 1991, p. 39). This activity is also fraught with a high level of risk and uncertainty. The incorrect decision can adversely affect the business and dissipates a significant portion of an organization's IT budget (cf. Palanisamy et al. 2010, p. 611).

Therefore, the importance of outstanding performance in the management of IT projects is growing. The increasing demand of software as a service (SaaS), rising environmental tensions and uncertainty, decreasing time frames for IT projects and high quality requirements, make efficient management of IT projects a critical success factor of many companies (cf. Disterer 2002, p. 512; Harnisch 2014, p. 11).

These conditions have led scientists to scrutinize if evaluators within IT projects are using the most appropriate methods and techniques in software selection processes (cf. Jadhav, Sonar 2008, p. 337; Kontio et al. 1996). Furthermore, researchers explore the best ways of evaluating and selecting software packages. Several MCDM approaches were proposed to address the problem of coping with multiple evaluation criteria (cf. Jadhav, Sonar 2009b, p. 556; Kaur, Singh 2014, p. 3739; Palanisamy et al. 2010, p. 611).

In order to decide which MCDM is appropriate for a certain decision making problem, it is important to have an understanding of their comparative value (cf. Triantaphyllou 2000, p. 5). There are many detailed publications available regarding this topic. Analytic hierarchy process (AHP), as one of the MCDM techniques, was found to be widely used for the evaluation of software packages (cf. Jadhav, Sonar 2009b, p. 555).

AHP is a theory of measurement for dealing with quantifiable and intangible criteria. The procedures of AHP are applicable to individual and also group decision settings (cf. Jadhav, Sonar 2009b, p. 559; Lai et al. 1999, pp. 222). The technique allows decision makers to structure a decision making problem into a hierarchy, helping them to understand and simplify the problem. Scientists appreciate AHP as a flexible and powerful technique, which allows consideration of both qualitative and quantitative criteria in selecting the best alternative (cf. Jadhav, Sonar 2009b, p. 560; Kaur, Singh 2014, p. 3740). Since the AHP approach involves time consuming mathematical steps, several supporting tools (software solutions) are available.

1.2 Study Objectives and Research Questions

The selection of packaged software, that offers support for a particular business function, remains a largely underrepresented research area in mainstream information system (IS) literature (cf. Howcroft, Light 2006, p. 21). This thesis contributes to this stream of research by using the single/holistic case study methodology according to Yin (2014), in order to describe and analyze the process of selection and acquisition of a software package within an international corporation.

The software selection project of the case company is also driven by globalization and internalization. The International Assignment Management (IAM) department of Continental AG (CAG) has to cope with increasing numbers of assignments and their destinations, as well as the growing complexity of regulatory compliance (cf. Deloitte 2012, p. 29). CAG has recognized that there is a need to develop standard global mobility capabilities that are fast, cost efficient, effective, and reliable. To facilitate the simplification of mobility management through automated and organized processes, the company has to execute evaluation and selection of suitable global mobility management (GMM) software.

Based on existing theoretical work on software selection methods and their variants, including software selection criteria, evaluation techniques and tools, the general research question of the thesis is as follows:

1. Is it possible to improve the software selection process of Continental AG?

The investigation of this question is determined through the comparison of the theoretical software selection and acquisition methods, including selection criteria and techniques with the practical software selection method of the case company. Additional objective is to identify scope for improvement for both sides, theory and practice. Particularly interesting is the question, whether the AHP approach and respective software tool is applicable to the genuine IT project. This interest leads to the following specific research questions:

2. How can the software selection and evaluation process be supported with an AHP based software?

3. Why is it advantageous to consider a change of the manual evaluation technique?

1.3 Structural Approach

This master thesis is divided into ten chapters. figure 1 summarizes the structure of the thesis and provides a brief description of the main content of each chapter. Adjacently to the introduction, the theoretical foundations are explained. Since the selection process of a GMM software is subject of this thesis, the field of IAM is introduced in order to indicate the urgency of the implementation of a supporting software solution. The second part of the theoretical background refers to packaged software and the delivery model of SaaS. Further, this chapter provides a review of theoretical investigation in the field of software evaluation and selection methods (including criteria and techniques). Additionally, AHP, a widely used existing software evaluation technique is illustrated in detail. Chapter 3 is dedicated to the applied methodology, the case study of the IAM department and the research questions. In chapter 4, the evaluation and selection process of CAG is described in detail, including the presentation of requirements, evaluation criteria and the evaluation technique. The selected vendors (alternatives) are also briefly presented. Subsequently, in chapter 5, AHP based software solutions are briefly introduced, the decision problem of CAG is translated into the AHP approach and evaluated with TransparentChoice, an appropriate AHP based software. In chapter 6, the results of this thesis are elaborated through the comparison of the theoretical and the practical approach, regarding the entire process (method), the evaluation criteria and the evaluation techniques. The results are critically discussed and answers to the research questions are formulated in chapter 7. Resulting implications for research and practice are formulated in chapter 8. Chapter 9 provides limitations of the thesis, while chapter 10 concludes the work with a short summary and outlook.

10 Conclusion and Outlook

The present thesis deals with software selection methods in a unique context of IAM. To show the particular context, IAM related processes were identified, which emphasizes the great degree of complexity linked to this particular HR function. Since increasing globalization fosters companies to promote more international assignments, the function of an international assignment manager is becoming increasingly important, however the employment of GMM software offers a possibility to support this area of operations. Technology such as GMM software can improve the situation and decrease mentioned risks and discontent. The market offers new and improved technology solutions across the entire mobility lifecycle. The case company is currently facing the challenge of selecting an appropriate software solution for the IAM department. In this context, existing theoretical work on software selection methods, including software selection criteria, evaluation techniques and tools were examined. Consequently, the "Generalized Software Selection and Acquisition Process Model" was shown and described, the generic set of software evaluation criteria was introduced as well as a range of MCDM techniques. The MCDM technique AHP was widely used for evaluation of software packages in theory and practice, therefore this technique was presented explicitly.

For the practical investigation, the case company and the current situation was introduced as a holistic, common and revelatory case. The execution of the software selection process at CAG was depicted in detail, as well as the elaboration of requirements and the determination of evaluation criteria in conjunction with the evaluation technique. The general research question was formulated in order to investigate whether the software selection process of CAG can be improved. The exploration of this question was realized through a comparison of the theoretical software selection methods, including selection criteria and technique with the practical software selection process of CAG. Additional to the general research question, two specific questions were examined. The investigation should show, whether the AHP approach associated with the decision-software TransparenChoice, is applicable for the genuine IT project of CAG. And why it could be favorable to consider a change of the manual evaluation technique. The software selection process of CAG turns out as a very structured and almost straight forward process. Therefore, it was inferred that practitioners are aware of the important steps, however in some points the quality of the execution admits room for improvement. In theory and practice neglected or successful steps were exposed and

discussed, and resultant lessons learned for both sides (theory and practice), were formulated.

Through comparison of the evaluation techniques, great potential for improvement could be shown. The demonstrated transfer of the decision problem to the AHP based software, admittedly indicates the same result, since the data was taken from the original evaluation matrix to the TransparentChoice software and no additional judgements were made. Nevertheless, a deliberate evaluation of vendors with such a tool, would enable the organization to profit from advantages and additional features of the software. In particular, the comparative judgments of all criteria and the group decision process, could be facilitated by an AHP based software. The software is able to display results of different groups, which can be reviewed and discussed, in order to reach consensus. Furthermore, automated result charts are available which can be used to convince stakeholders.

However, the AHP approach faces typical resistance by practitioners in the case of formulation and quantifying analysis models. Especially for practical issues, software support can decrease barriers to applying AHP and can improve acceptance by decision makers. Consequently, AHP is relevant for solving group decision problems. The case company could enhance and standardize their software selection and evaluation process by deployment of an AHP based software, since the software is constructed to facilitate group decision problems. Companies should be aware that technology is simply an enabler. The selection of any software system begins and ends with a realistic estimate of what the value-adding processes should be. Practitioners have to ensure that the existing processes should be recorded, reviewed and re-structured, in order to standardize and enhance the existing process.

Since group decision-making is a widespread topic within companies, the deployment of a supporting software might be favorable for several departments that are challenged by group decision-making. AHP based software in general, is relevant for each organization and several kinds of group decision problems. Therefore, organizations can profit by choosing one decision-software, which can be used for several decision problems.

Furthermore, several areas for further research were identified, in particular investigations regarding new developments like cloud computing and SaaS or issues of virtualization. In this regard, researchers could figure out what criteria are particularly relevant. Additionally, further research could investigate appropriate leadership styles for

multinational, multi-linguistic teams with virtual context and explore which internal and external factors may influence the software selection process and how.