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Customer Ranking Model for Project Businesses: A Case Study from the Automotive Industry

Regular Paper

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Abstract For technology-orientated enterprises that operate project-based businesses, the goal-oriented allocation of scarce marketing resources has great potential to help consolidate their competitive position. An important precondition for goal-oriented management is the identification of the most valuable customers. This enables technology-orientated enterprises to segment markets in order to make tactical marketing decisions. This theory-based paper aims to develop and test a holistic customer ranking model. By deploying the five steps presented in this paper, customer relationship managers are better able to identify and to rank their customers in project-based businesses. A case study provides an example of the application of the method from the automotive industry in Austria. The experiences derived from this case study show that using a customer ranking framework is a crucial factor for enterprises in narrow technology markets to be successful and to achieve their corporate goals.

Keywords Customer Ranking, Customer Relationship Management, Project Business, Case Study, Automotive Industry

1. Introduction

Sustainably managing the relationships between suppliers and customers is considered to be a crucial strategic core competency by those active in the field and this is supported by the value-based customer management literature.

For this, two main functions have to be fulfilled: Firstly, customer relationship management (CRM) should separate unattractive from attractive customers. Secondly, CRM should provide a ranking of the entire customer base of an enterprise and make it transparent on an economic level [1].

Both theorists and those active in the field accept that the following four aspects are prerequisites for a successful CRM ("4 C's") in enterprises (Figure 1): (i) customer focus leads to (ii) customer satisfaction as well as (iii) customer loyalty and results in the customer being of (iv) high value to the enterprise. The customer value affects the success of an enterprise to a great extent [2].

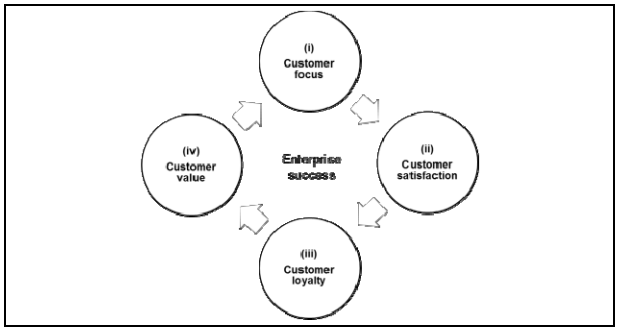

Figure 1. The "4 C's" of successful CRM [3]

Managers of enterprises have recognized that customer relationships are an investment in the future. For that reason, customer orientation, as well as focusing on relationships with individual customers, has received a lot of attention from managers [3]. Moreover, the concept of CRM has been the subject of substantial research in the fields of marketing and management [4]. Furthermore, linking mechanisms between customer knowledge management and IT-based business model innovation is currently an issue of significant interest domestically as well as internationally [5]. There has also been a notable trend of CRM studies that explore the significance of developing relationships between enterprises and specific customers [6, 7]. In practice, an increasing number of enterprises consider their customer strategies purely in terms of turnover maximization.

For many enterprises in narrow technology markets, it is important to optimize their business relationships because of the high level of complexity of their products and because of the resulting increased effort required to support their customers. Practitioners assume that one key factor in the success of customer orientation is the identification of the "right", i.e., "important", customers. In addition to their existing product-oriented business strategies, managers of technology-orientated enterprises consider customer and product orientation as complementary principles as they consider specific coordination needs [8]. Therefore, it is necessary to identify the value-adding, i.e., the "profitable" or "valuable" customers and promote them continuously. Thus, a positive cost-benefit ratio should be sought for the customer base in the longer term. Consequently, in industry and especially in high-tech industry the question as to whether and how the value of customer relationships can be measured has become an important issue [9].

The challenge for the CRM is to integrate a means of measuring economic aspects into the marketing target hierarchy, as the customer value could be seen as a measure of the economic importance of a customer to the enterprise.

However, measuring customer value with variables is an unexplored area in the management and marketing literature. Furthermore, practical approaches using a holistic view of the customer have been neglected. This is partly due to the lack of availability of customer data. Although certain theories offer models for evaluating customers, a practical application is rarely given. Consequently, identifying factors that can make customer value manageable is of high priority both in the literature and practice.

In order to make customer value manageable this paper aims to develop a multidimensional and holistic customer ranking model for project businesses by taking considerations from a case study on the automotive industry into account. The developed model is a modified theoretical model and the practical application of the model is presented in five steps. Based on that, a value-based CRM model applicable to project and technology-orientated enterprises is introduced.

The outline of this paper is as follows: After the introductory Section 1, Section 2 focuses on the theoretical background of customer valuation including customer ranking and modelling the holistic criteria for the identification of important customers. A literature-based framework provides the basis for the project-based businesses customer ranking model. Section 3 presents the five step case study that was carried out on the automotive industry to test the project customer ranking model. Additionally, in Section 3 a brief overview of the cost-utility analysis method as well as a weighting scheme for the customer valuation criteria is given. Section 4 provides managerial implications for customers in different industries derived from the case study of the automotive industry to achieve a sustainable competitive advantage. The concluding section mentions limitations and suggestions for further research.

2. Theoretical Background

It is widely known in the literature [10] and accepted by those active in the field that the allocation of scarce resources to customers holds much greater potential for increasing profits than equally dividing an optimally sized marketing budget.

For enterprises to be successful the scarce resources of the marketing and sales budgets should be allocated to their most productive use. Therefore, the best economic approach is to evaluate the customers before the allocation of marketing resources and to use the resources specifically.

Different customer valuation models can be found in the literature (Table 1).

	Customer valuation model	Author(s)	Year of publication
One-dimensional & static	Return on Customer Investment	Bursk [20]	1966
	Customer Profitability	Howell/Soucey [21] Cooper/Kaplan [36] Mulhern [22]	1990 1991 1999
One-dimensional & dynamic	Customer Lifetime Value	Dwyer [23] Schulz [24]	1997 1995
	Value of the Customer	Levett et al. [25]	1999
	Customer Equity	Blattberg/Deighton [26] Rust/Lemon/Zeithaml [27]	1996 2000
Multidimensional & dynamic	Customer Relationship Value	Plinke [35] Rieker [28] Huldi/Staub [29] Cornelsen [13] Huldi [30] Rudolf-Sipötz [9]	1989 1995 1995 2000 1997 2001
	Customer Equity	Dorsch/Carlson [31] Wille [32]	1996 2005
	Customer Economics	Wayland/Cole [33]	1997
	Customer Economic Lifetime Value	Blattberg/Thomas [34]	1998

Table 1. Customer valuation models from the literature (exemplarily) [11]

2.1 Determinants of a "holistic customer value" model

The literature basically differentiates between one-dimensional and multidimensional valuation models with which to rank customers (Figure 2). One-dimensional models are based on one dominant quantitative factor used to describe the customer, whereas multidimensional models also consider qualitative factors.

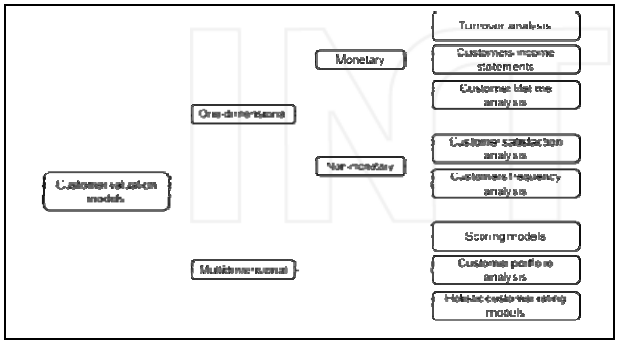

Figure 2. Customer valuation models (exemplarily) [12]

One-dimensional customer valuation models can be differentiated into models which take "hard" monetary (e.g., turnover) and "soft" non-monetary criteria (e.g., satisfaction) into account. In practice, the ABC-analysis is the method most commonly used by enterprises to determine customer values in order to rank them. A problem arises if enterprises have no monetary figures due to incomplete accounting systems. To deal with this issue, non-monetary factors, such as customer satisfaction or frequency of purchase, can be used instead to complement customer valuation with non-monetary factors. In multi-dimensional customer ranking models, monetary and non-monetary criteria are merged. For example, scoring models consolidate several criteria into a single figure. In portfolio approaches the customer's position is entered into a multi-dimensional evaluation space followed by a structural analysis [12]. To overcome the arbitrariness of evaluation approaches, holistic models of customer valuation were introduced in the literature. Cornelsen [13] developed a model, in which the determination of monetary customer values is central. The effects of customers in business-to-business settings which should have an impact on the success of the seller were empirically identified and monetized. The results show that criteria that determine customer value are, for example, (i) turnover of the individual customer, (ii) reference value, (iii) information value and (iv) cross-selling value [13]. The turnover of the customer is a monetary variable, while the reference value, the value of information and the cross-selling value need to be monetized for a holistic (multidimensional) customer value to be calculated. Before a holistic method can be applied, one important question has to be answered [9]: *Which customers are important for the enterprise to achieve a sustainable competitive advantage?* A holistic approach for identifying important customers which could provide a competitive advantage is presented in Section 3.

2.2 Criteria for detecting and identifying important customers

The literature reports that different industries need different criteria to evaluate the importance of customers for the success of their enterprises. Tewes [14] conducted a survey consisting of 40 expert interviews from different industry classifications to shed some light on this issue. The results show that customer segmentation in enterprises is largely carried out on the basis of turnover. However, the contribution margin also shows a high level of acceptance among experts in the field. Figure 3 shows the range of the most commonly used criteria for detecting and identifying important customers in order to differentiate between them.

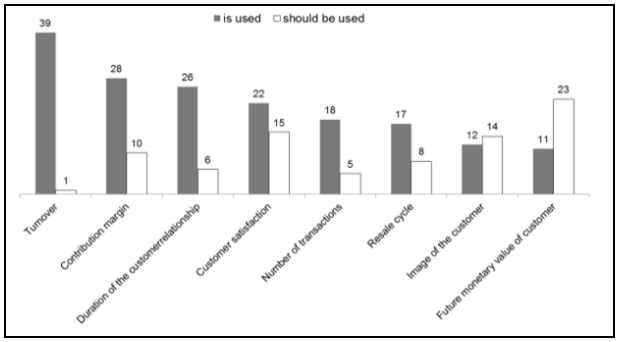

Figure 3. Criteria for detecting and identifying important customers: empirical findings [14]

The value, "future monetary value of customer", is used 11 times. However, 23 experts graded this value as "should be used" and thus, this should have an influence on future evaluations [14].

2.3 Putting a holistic customer ranking approach into practice

To generate the highest benefit for CRM for project-based businesses, when developing the concept of holistic customer value the following tensions that characterize an initial customer evaluation situation have to be considered: (i) data from the enterprise's internal accounting must be easily accessible, (ii) the data must be secure and able to be easily evaluated with subjective evaluations, keeping in mind that extrapolated future data are more difficult to access, (iii) CRM has to link the overall and indirect market information derived from trend analysis to direct customer data [9]. This shows the importance of integrating "soft facts" (e.g., subjective evaluation) and "hard facts" (e.g., turnover) into one evaluation scheme to design a basis which includes the same parameters. The aim is to describe the customer base in order to provide a meaningful comparison for the management decision system.

To put theory into practice, answers to the following three questions could help managers in CRM departments when working with a holistic customer rating model: *(i) What is the contribution of the customer to the enterprise today ("present contribution")? (ii) What potential for success does the customer pose for the enterprise in the future ("future contribution")? (iii) Does the customer help the enterprise reach its goals ("resource potential")?*

Questions (i) and (ii) address the market potential of a customer and question (iii) considers the customer as an enterprise resource. In Figure 4 the customer value is not shown in numbers, but in a three dimensional space as a vector [9].

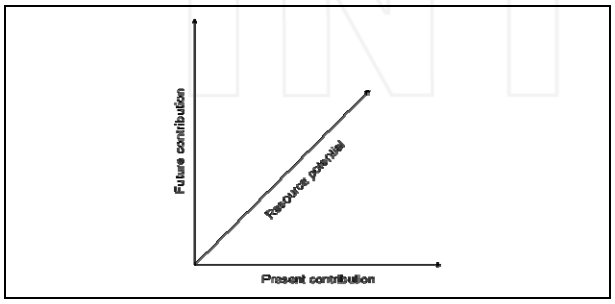

Figure 4. Theoretical Model based on the "three dimensions of holistic customer rating" by Rudolf-Sipötz and Tomczak [9]

The separation of the market potential of a customer into a present and a future situation makes sense, since the present contributions are generated from facts and figures from accounting. The future success potential, on the other hand, is usually based on estimates [9].

3. Case study: A customer ranking model for project-based businesses tested on the automotive industry in Austria

Theory shows that it is important to allocate scarce marketing resources in consideration of the importance of customers. Therefore, customers should be classified by their relevance for the enterprise. Not all customers are important for every project-based business in the enterprise. The classification of the customer base was therefore carried out in this case study by subdividing customers belonging to the different projects. The case study in this contribution presents how the process was implemented in an enterprise in the automotive industry. As a basis for further investigations, in this paper Rudolf-Sipötz and Tomczak's model (shown in Section 2.3) is used.

In the five step case study carried out, the customer ranking model for project businesses was tested. Steps one to five demonstrate the use of an approach to introduce a customer ranking model for project businesses into an enterprise: Step one focuses on the modification of the theoretical model to a practical, applicable customer ranking model. The modification depends on the project businesses of the enterprises. Step two presents the selection and categorization of criteria for the customer ranking model for project businesses. In step three the mutual weighting of criteria takes place. Step four valuates sub criteria with a cost-utility analysis. Finally, step five shows an example of the customer rating model.

3.1 Step 1: Modification of the theoretical model

As mentioned in Section 2, dominant factors for the tested model have to be considered in order to obtain an easily manageable customer ranking model. In interviews designed as a pre-test with three managers in the CRM department of one Austrian enterprise in the automotive industry, the following three dominant requirements for a customer ranking model were identified: (a) easy maintainability of the customer ranking model, (b) simple and dynamic representation of the customer ranking model and (c) consideration of the future potential of a customer for a specific project.

To satisfy requirements (a) and (b), the three-dimensional model of Rudolf-Sipötz and Tomczak [9] presented in Figure 4 has to be reduced to a two-dimensional system. The third axis, which is described in the theory as the "resource potential" was omitted because the pre-test classified it as "impracticable and complicated" for daily-routine-valuation and the maintainability of the system.

Requirement (c) was considered by adopting the axis "future contribution" of the model of Rudolf-Sipötz and

Tomczak. The "future contribution" in the model shown in Figure 5 indicates the "future relevance of customers" for a specific project-based business and is a basic representation of the customer ranking model for project-based businesses.

Figure 5. Customer ranking model for project-based businesses

The abscissa in Figure 5 describes the current relevance of the customers (A), at the year the data was collected and the ordinate describes the future (at least longer than one year) relevance of the customers (B). The "relevance" was operationalized using an ordinal scale which made it possible to determine the hierarchy of customer importance for a specific project-based business. Nevertheless, it is still impossible to measure ratios. The relevance of the customer is determined using a cost-utility analysis (Section 3.4).

3.2 Step 2: Selection and categorization of criteria for the customer ranking model

To obtain a dynamic representation of the customers (see the ranking model in Figure 5) in the coordinate system, ranking criteria for both axes have to be chosen. The selection of ranking criteria has to be discussed for every project in the enterprise with the managers responsible for the project in the CRM department. For a better overview, the managers in the CRM department decided to divide the criterion for both axes into different levels: The upper criteria and the sub criteria. First, the axis "current relevance of customers" (A) is divided into two upper criteria, i.e., "customer" (A1) and "customer and the enterprise" (A2) (Figure 6).

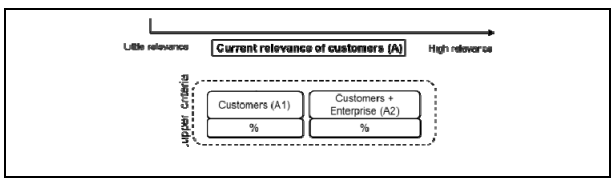

Figure 6. Upper criteria of "current relevance of customers" (A)

The first upper criterion (A1) describes the customers' current situation for the specific project-based business and is divided into five sub criteria in the case study: (i) "total turnover", (ii) "research and development (R&D) expenses", (iii) "number of employees", (iv) "active projects" and (v) "number of locations" of the customer (Figure 8).

The second upper criterion (A2) describes the customer in his/her current situation for the specific project-based business in connection with the enterprise. In the case study, the second upper criterion (A2) is divided into (i) "duration of the business relationship" (BR), (ii) "customers' turnover in the enterprise", (iii) "number of projects" with the customer and (iv) "degree of contact" with the customer.

Second, the axis "future relevance of customers" (B) is divided into three upper criteria, namely, "customer" (B1), "customer and the enterprise" (B2) and "subjective" (B3) (Figure 7).

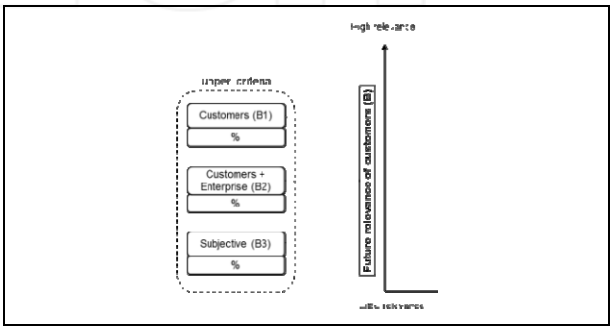

Figure 7. Upper criteria of "future relevance of customers" (B)

Figure 8 shows all the criteria in a target hierarchy for the project business.

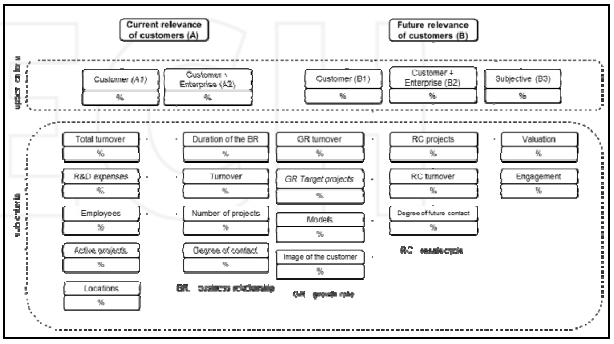

Figure 8. Target hierarchy of the criteria for project-based businesses used in the case study

The first upper criterion (B1) describes the customers' future situation for the specific project business and is divided into four sub criteria in the case study: (i) the "annual growth rate (GR) of the turnover", (ii) the "annual growth rate of target projects", (iii) "number of expected different models in the project business" and (iv) the "image of the customer".

The second upper criterion (B2) describes the customer in his/her future situation for the specific project-based business in connection with the enterprise. In the case study the second upper criterion (B2) is divided into (i) "resale cycle (RC) of projects", (ii) "resale cycle of turnover" and (iii) "future degree of contact with the customer" (see Figure 8). The third upper criterion (B3) describes the subjective opinion of managers concerning the different customers with a special focus on the subjective assessment of the future relevance of the customers for the project-based businesses. This is divided into (i) "subjective valuation of the customer" and (ii) the "engagement of the customer" to develop the specific project-based business.

3.3 Step 3: Weighting of criteria with respect to each other

The weighting of the criteria is part of the third step of the case study. The method chosen was the pairwise comparison method (PCM), for it is recognized as a suitable method for the strategic evaluation of different issues. PCM shows the importance managers give to a given priority and also includes a ranking of priorities [18]. In the PCM we used, a criterion can be more important (two points), equally important (one point) or less important (zero points) in comparison with the others. Table 2 shows an example of a pairwise comparison method to weight the sub criteria of customers (A1) using an assessment matrix.

	Turnover of the customer	R&D expenses of the customer	Number of employees of the customer	Active projects of the customer	Locations of the customer		Rating Factor
Turnover of the customer	1	1	2	0	0	3	15,00%
R&D expenses of the customer	1	1	2	0	0	3	15,00%
Number of employees of the customer	0	0	1	1	0	1	5,00%
Active projects of the customer	2	2	1	1	0	5	25,00%
Locations of the customer	2	2	2	2	1	8	40,00%
						20	100,00%

Table 2. Pairwise comparison method with an assessment matrix

The first step within the assessment matrix (Table 2) is to rate the first criterion in the first row with each criterion in the different columns. The second step is to add up all the numbers of each row and to calculate the rating factor for each criterion. The weighting of the criteria has to be specified for the respective enterprises and project-based businesses.

An example for the rating factor of "total turnover of the customer": Rating factor = 3 / 20 * 100 = 15% (Table 2)

The outcome of the PCM is the rating factor which is used for the weighting of the criteria with respect to each other. To obtain a meaningful result, the evaluation of the PCM has to be carried out by several managers to calculate an average rating factor (Table 3). At this stage, the experience of the management plays a major role in this method of weighting the criteria.

The weighting of criteria with respect to each other, using the assessment matrix, has to be performed for all the sub criteria and upper criteria. Finally, the output of step 3 is the average rating factor which can be transferred to the target hierarchy presented here.

	Manager 1	Manager 2	Manager 3	Average
Turnover of the customer	15,00%	15,00%	25,00%	18,33%
R&D expenses of the customer	15,00%	20,00%	5,00%	13,33%
Number of employees of the customer	5,00%	15,00%	5,00%	8,33%
Active projects of the customer	25,00%	20,00%	20,00%	21,66%
Locations of the customer	40,00%	30,00%	45,00%	38,33%

Table 3. Calculation of an average rating factor (exemplarily)

3.4 Step 4: Valuation of sub criteria by a cost-utility analysis

In this fourth step of the case study, a cost-utility analysis was used to evaluate the sub criteria quantitatively. As a consequence, they become comparable. The cost-utility analysis is a field-tested tool to support decision-making processes. It assigns action alternatives according to the preferences of the decision makers [15]. The order of preferences is represented by utility values. Furthermore, non-monetary values can be included and quantified. A formal structure (e.g., the target hierarchy) is essential when performing a cost-utility analysis [16].

In the cost-utility analysis carried out for the case study, the sales employees in the CRM departments were asked to evaluate the scale of the sub criteria with target values ranked from one to 10 points (Table 4). For all sub criteria, scales have to be specified dependent on the specific project-based business. One example of a scale for the sub criteria "total turnover" is shown in Table 4.

Total turnover of a customer [mio. €]		
From	To	Points
1	99	1
100	499	2
500	999	3
1.000	4.999	4
5.000	9.999	5
10.000	19.999	6
20.000	49.999	7
50.000	79.999	8
80.000	99.999	9
100.000	> 100.000	10

Table 4. Sample of a scale (target values and points) of the sub criterion "total turnover"

For the evaluation, a point scale with "zero as the worst" and "ten as the best" was used. Each "sub criterion" includes an input value that is automatically assigned between one and 10 points. A customer with a total turnover of 398 million euros per year (input value), for example, is assigned two points. Subsequently, for each criterion an overall result should emerge. The individual criteria are not equally important to the overall goal of presenting a customer ranking and therefore an individual weighting was employed in step 3. By multiplying the number of points of the input values with the average rating factor of the criteria, the cost-utility values of each criterion are determined. If the "total turnover" of the customer is 398 million euros per year as in our example, the respective cost-utility value is calculated as follows: 2 * 18,33% = 3.66

An equivalent sum of the all cost-utility values of an evaluation object results in its total cost-utility value [17]. Furthermore, in the case study the evaluated criteria are divided into upper criteria and sub criteria. The combined sums of the cost-utility values of the sub criteria represent the cost-utility value of the upper criteria and the sums of the cost-utility values of the upper criteria characterize both axes of the customer ranking model.

3.5 Step 5: Representation of an example of the customer ranking model

Figure 9 shows an example of target customers evaluated for a specific project-based business in this case study.

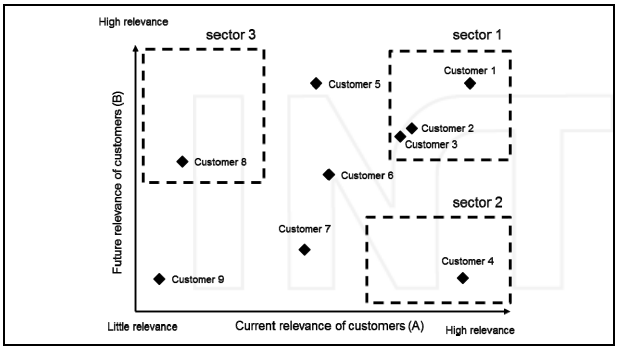

Figure 9. Representation of the customer ranking model (example)

The ranking of the customer base is easily manageable using the dynamic representation shown in Figure 9. To derive managerial implications from the customer ranking model the model is divided into different sectors.

4. Application of the customer ranking model and managerial implications

In sector 1, in the top right corner of Figure 9, customers one to three are rated the highest. All of them have a high current and high future relevance for the enterprise in the specific project-based business. Customer loyalty is apparently very high in this sector. On the one hand, the allocation of scarce marketing resources to the customers of sector 1 allows for high future customer loyalty. On the other hand, those customers apparently need few marketing resources because they are familiar with the enterprise and their project work. Therefore, they should have some cross-selling potential.

In sector 2, in the bottom right corner of Figure 9, the customers have a high current relevance for the project-based business. However, it seems that these customers have no future relevance. The management has to decide if it is worth investing the scarce marketing resources in these customers. If they are important customers for the enterprise but if they do not focus on that specific project-based business in the future, then, it would appear to be a waste of resources.

In sector 3, in the top left corner of Figure 9, the customers have a high future relevance for the project business but are currently not relevant for the enterprise. Managers have to decide how much of their marketing resources are necessary to acquire those customers. It appears that these customers are new to the enterprise and therefore they would most likely need a lot of marketing resources to be won over.

5. Conclusion

For an executable "easy-to-use" customer ranking system, on the one hand, a sufficient data generation process is necessary to combine internal with external data as well as present data from accounting with future data from the market. On the other hand, users of holistic customer ranking systems in CRM departments have to establish a procedure by which to take data variation within the customer base into account.

This paper gives an overview of different customer ranking models from the literature. As a basis for the case study the customer ranking model presented in Section 2.3 was chosen. One main criterion for this choice involves the holistic contemplation of customers. The holistic customer ranking model was tested in a case study in the automotive industry and then adapted in order to rank customers for the project-based business.

The outcome of this paper is a field-tested procedure to select criteria and to evaluate them by deploying a cost-utility analysis. This approach has several limitations such as the issue of how to increase the number of criteria addressed without increasing the complexity of the system. Furthermore, the model presented, as well as the five step procedure to rate customers, was tested on just

one enterprise. The fact that culture has an influence on the customer rating of enterprises must also be considered. In future CRM projects performed with practitioners, the holistic customer ranking system should be tested in different enterprises and different countries to obtain a comparison and to generate benchmarks. Additionally, the testing period should be several years in order to obtain longitudinal knowledge of customers.

6. Acknowledgment

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