Evolution of Electronic B2B-Marketplaces in the Automotive Industry: From Trade- to E-Collaboration-Platforms

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Abstract

In recent years, electronic B2B-marketplaces in the automotive industry have mainly provided commerce functions. It is claimed that the significance of collaboration functions for supporting inter-organizational cooperation is increasing in these marketplaces. From this we suspect that electronic B2B-marketplaces in the automotive industry will develop from commerce into e-collaboration platforms. The goal of this paper is to investigate this hypothesis. The results from an empirical study of seven European marketplaces in the automotive industry show that, at present, the significance of trade functions and e-collaboration functions in these marketplaces are approximately the same.

1. Introduction

In recent years, electronic B2B-marketplaces in the automotive industry have mainly provided commerce functions. Various authors claim [1, 2, 3] that the significance of e-collaboration functions for supporting inter-organizational cooperation is increasing. Especially in the automotive industry, which is marked by complex products, short innovation cycles and a multifaceted division of labour, it can be assumed that inter-organizational cooperation has a great significance [4]. From this we deduce that electronic B2B-Marketplaces of the automotive industry are developing further into e-collaboration platforms. Because up until now little is known about e-collaboration functions in electronic marketplaces of the automotive sector, the objective of this paper is to verify this supposition. To this end, the results of an empirical study of seven European marketplaces will be presented.

We define an electronic marketplace as an intermediary, inter-organizational, internet-supported information system, which is provided for many suppliers and customers as a platform for supporting transactions and interactions [1, 5, 6].

The second central term of this paper is “e-collaboration”. “Collaboration” contains the Latin root “collaborare” [7]. This means “to labor together” [7], or, in other words, to cooperate. Attaching the word “electronic” indicates that this cooperation is supported by information systems. We understand this cooperation to be a process or a succession of activities among several actors who try to achieve a common goal [8, 9]. This process is computer based and supported by internet technologies [10, 11]. E-collaboration is therefore an interactive, constructive, internet-supported process by which at least two autonomous actors use common resources and cooperate in order to reach a common goal.

This paper is structured as follows. In section two we discuss functions of electronic marketplaces. Section three provides an overview of the research on the evolution of electronic marketplaces and on e-collaboration functions. Building on this, we derive the thesis that electronic marketplaces of the automotive industry are developing from commerce into e-collaboration platforms. In the fourth section, the methodology of the empirical study is explained. Thereupon essential findings of our study are presented and we discuss our thesis. Section five summarizes the findings of this paper and provides suggestions for further research.

2. Functions of Electronic Marketplaces

Functions of an electronic marketplace are the sum of the services that are provided to marketplace participants by the information systems of the marketplace [3]. These functions can be subdivided into functions for supporting transactions – trading of goods and services – and interactions – planning of
products and their production processes [1, 13]. Many newer classifications use this differentiation [1, 14-17]. For example, Brunn, Jensen and Skovgaard [14] differentiate between commerce, collaboration and content functions. Commerce is comprised of functions for supporting transactions; collaboration contains functions for supporting interactions. Content describes functions for providing additional information, e.g. about participants and products.

We divide marketplace functions into commerce, collaboration, and content functions. Commerce is comprised of all functions that support a market transaction [18, 19], which we divide between information-, agreement-, processing-, and aftermarket-phases. We list all functions that support inter-organizational product planning and productions processes under collaboration. We consider content to functions for providing additional information. These functions are not necessarily needed for conducting transactions and interactions. In this paper we focus on collaboration and commerce functions.

3. State of the Art

In the following remarks we give an overview of research results on the evolution of electronic marketplaces and e-collaboration functions. Some of the research approaches focus on the economic and structural evolution of B2B-marketplaces, others analyze the evolution of IT systems, i.e. the technical evolution, of electronic marketplaces.

3.1. Research Results on the Structural Evolution of Electronic Marketplaces

Polzin and Lindemann [20] have designed an evolutionary model that describes a developmental path of electronic marketplaces in the area of transport of goods and logistics. Tomak and Xia [21] have developed an economically oriented model that should deliver clues about the structure of future business models of electronic marketplaces. Reimers [22] studies the institutional structure that electronic marketplaces need in order to expand. He has developed a framework that helps to define requirements for successful electronic marketplaces.

3.2. Research Results on the Technical Evolution of Electronic Marketplaces

Scharl [23] presents a stage model to describe the evolution of web-based systems. He uses his model to describe the developmental stages of information systems in an electronic marketplace for supporting market transaction phases. Schiefer [24] shows an overview of the developmental history of electronic marketplaces in the agricultural sector under special consideration of the utilized application systems. Three different developmental stages of electronic marketplaces are identified depending on the network infrastructure. Griese [25] describes the development of electronic marketplaces from the mid 1980s until 2003. He differentiates between three generations of electronic marketplaces dependent on the technical development.

3.3. Research Results on E-Collaboration in Electronic Marketplaces

Most authors [2, 3, 14, 26, 27] who analyse e-collaboration functions divide the services of electronic marketplaces into two classes. One class contains functions for supporting transactions. The other contains functions for supporting inter-organizational cooperation between marketplace participants, which we consider to be e-collaboration. Building on this, the authors develop recommendations for either selection or design of these functions. MacDuffie and Helper [28] show that traditional marketplaces, whose main emphasis consists of providing functions for supporting transactions, do not offer sufficient incentives for potential participants. Aside from this, many firms are not prepared to give up their existing relationships and trading partners when participating in the marketplace [3]. Wang and Archer [2] predict that the future focus of electronic marketplaces will consist of providing e-collaboration functions. In a study on the future of electronic B2B-marketplaces from 2002, Holzmüller and Schlüchter [1] predict that e-collaboration and transaction functions will have approximately the same significance for marketplace operators in the future.

3.4. Synopsis

It is widely accepted that B2B-marketplaces have evolved from platforms that mainly offered content functions to platforms that supply complex trading mechanisms [29, 30]. Various authors claim that B2B-marketplaces further develop to collaboration platforms [1, 2, 25, 28]. From this we conclude that the evolution of functions of electronic marketplaces has developed in three stages (cf. Figure 1).
The stages of the model in figure 1 build on one another. Marketplaces on stage one only provide content functions. Commerce functions are added in stage two. B2B-platforms on stage three additionally offer collaboration functions. In this paper, we will investigate to what extent the third stage in figure 1 has already been reached, so that one can speak well founded from an evolution of marketplaces to e-collaboration platforms. This leads us to derive the following thesis: electronic B2B-marketplaces of the automotive industry develop into e-collaboration platforms.

The results of e-collaboration research contain indications for confirmation of this thesis. However, from these results no statements can be derived that describe the current significance for collaboration and commerce functions compared with each other. Also, no statements for a specific industry sector like the automotive industry can be developed. In the next section we will present results of an empirical study of electronic marketplaces in the automotive industry. From these findings we will derive statements about the current significance of commerce and collaboration functions from the view of marketplace operators. We understand significance to be the importance that the marketplace operators give to the functions.

4. Empirical Investigation

The goal of the empirical study is to determine the current importance of e-collaboration functions compared with transaction functions from the point of view of marketplace operators. We will use these findings to discuss the thesis presented in section 3.4. The selection of subjects for the study resulted from a multi-step pre-analysis [31-34]. At first, marketplaces in the automotive industry were selected. This occurred by and large on the basis of the marketplace database eMarketServices (www.emarketservices.com) and individual marketplace studies [35, 36]. 28 marketplaces were identified worldwide. All marketplaces that did not operate in Europe were eliminated from the list. Then, marketplaces that did not exhibit a portfolio characteristic to the automotive industry and with no (or few) suspected B2B relationships were also eliminated. For the investigation 15 European marketplaces were contacted. From these, seven agreed to participate in our study and were interviewed.

Most of the interviews were conducted with senior managers. This speaks for a great interest for this topic. The marketplaces surveyed include, among others, autopartsbazaar.com, covisint.com, mascus.com, supplyon.de and teccom-eu.net. Because some of the firms interviewed requested not to be named, we will forego giving a full list. Instead of names, we will use the letters A through G to refer to the companies in the following sections.

Data was gathered via telephone interviews. To this point, an interview guide was prepared and then sent to the interviewees prior to the telephone conversation. This procedure had the advantage that the interviewees could prepare for the questions prior to the interview. During the interview, there was an opportunity to clarify ambiguities and misunderstandings arising from the interview guide. The interviews were conducted between 22nd November, 2004 and 15th December, 2004. Each interview lasted between 30 and 50 minutes. During the interview, answers were written by hand and the conversations were tape-recorded. Afterwards, the handwritten answers were compared with the audio clips. The verified data was then entered into an Excel spreadsheet and became the base of our data analysis. In order to ascertain the importance of e-collaboration functions, several criteria were consulted. In the context of the empirical study, we analyzed three functions: collaboration, commerce, and content. The collaboration and commerce functions were the core of the study. However, in order to ensure completeness, and because we differentiate between three functions, all three functions will be listed with the results in section 4.1. In section 4.2 only the results of the commerce and collaboration functions will be consulted for the discussion of the thesis.
4.1. Results of the Investigation

Data was gathered in three steps.

1. Direct Determination of Importance

Marketplace operators initially assessed the comparative importance of the three functions collaboration, commerce, and content directly. The term “importance” was not defined further. The interviewees were able to answer based on a three-step ordinal scale (“most important,” “important,” “less important”) for each function. Figure 2 illustrates the number of answers, which were given for each function.

![Figure 2. Current relative importance of the functions](image)

In order to guarantee a better comparison of the collected data, the scale was coded with numbers (“most important”: 3; “important”: 2; “less important”: 1). The coded numbers were added up and a mean was calculated for each function. The results are displayed in Table 1.

<table>
<thead>
<tr>
<th>Function</th>
<th>Collaboration</th>
<th>Commerce</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.14</td>
<td>2.29</td>
<td>1.71</td>
</tr>
</tbody>
</table>

Table 1. Mean of the current relative importance of the functions

From Figure 2 and Table 1 emerges that the interviewees consider the current importance of the collaboration and commerce functions to be approximately equal.

2. Indirect Determination of Importance

In the second step, the interviewees were asked to characterize the term “importance.” They were asked to name the criteria they used to determine importance in the first step. Because each of these criteria is merely an indicator of importance, and because importance can only be determined indirectly with their help, we describe them as indirect criteria of importance. The interviewees could choose several indirect criteria of importance for each function from a pre-defined list. They also had the opportunity to name criteria not mentioned on the list. However, no interviewee chose to make use of this option. One interviewee chose not to answer this set of questions.

For each function and indirect criteria of importance, the number of times mentioned by all interviewees was added together. A ranking of all indirect criteria of importance for the three functions was created according to the frequency distribution. Table 2 is an excerpt of the most frequently mentioned criteria.

<table>
<thead>
<tr>
<th>Function</th>
<th>Collaboration</th>
<th>Commerce</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>N</td>
<td>Criterion</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>Benefits for the User</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Operator’s Competitive Advantage</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>User’s Competitive Advantage</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 2. Ranking of indirect criteria of importance for appraising importance

In order to guarantee a better comparison of the collected data, the scale was coded with numbers (“highest”: 3; “high”: 2; “lowest”: 1). The coded numbers were then added up for each function across all marketplaces and the mean of each function was calculated. The results are displayed in Table 3.

<table>
<thead>
<tr>
<th>Function</th>
<th>Collaboration</th>
<th>Commerce</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2.00</td>
<td>2.14</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Table 3. Mean of current relative frequency of use for each function

In order to guarantee a better comparison of the collected data, the scale was coded with numbers (“highest”: 3; “high”: 2; “lowest”: 1). The coded numbers were then added up for each function across all marketplaces and the mean of each function was calculated. The results are displayed in Table 3.

Figure 3 and Table 3 make clear that the interviewees consider the current frequency of use of
collaboration and commerce functions to be approximately equal.

The interviewees A through F made statements in regard to the number of users in terms of percent share of the total number of users of all functions of the marketplace (cf. Table 4). Interviewee G made no statements here. We calculated the mean from the relative frequency of use of each function in the surveyed marketplaces. The results are displayed in Table 4.

Table 4. Current relative number of users for each function

<table>
<thead>
<tr>
<th>Market place</th>
<th>Collaboration</th>
<th>Commerce</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8,33%</td>
<td>16,67%</td>
<td>75,00%</td>
</tr>
<tr>
<td>B</td>
<td>0,66%</td>
<td>66,23%</td>
<td>33,11%</td>
</tr>
<tr>
<td>C</td>
<td>70,00%</td>
<td>20,00%</td>
<td>10,00%</td>
</tr>
<tr>
<td>D</td>
<td>10,00%</td>
<td>1,00%</td>
<td>89,00%</td>
</tr>
<tr>
<td>E</td>
<td>27,38%</td>
<td>67,26%</td>
<td>5,36%</td>
</tr>
<tr>
<td>F</td>
<td>0,11%</td>
<td>99,89%</td>
<td>0,00%</td>
</tr>
<tr>
<td>G</td>
<td>N/a</td>
<td>N/a</td>
<td>N/a</td>
</tr>
<tr>
<td>Mean</td>
<td>19,41%</td>
<td>45,17%</td>
<td>35,41%</td>
</tr>
</tbody>
</table>

It emerges that the interviewees consider the current number of users for the commerce function much higher than for the collaboration function.

Relative statements were also made with regard to revenue. Interviewees shared with us the percent share of total revenue of all functions for each function (cf. Table 5). Here too we calculated the mean of each function for all surveyed marketplaces.

Table 5. Current relative revenue of each function

<table>
<thead>
<tr>
<th>Market place</th>
<th>Collaboration</th>
<th>Commerce</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0,00%</td>
<td>50,00%</td>
<td>50,00%</td>
</tr>
<tr>
<td>B</td>
<td>30,00%</td>
<td>50,00%</td>
<td>20,00%</td>
</tr>
<tr>
<td>C</td>
<td>42,86%</td>
<td>35,71%</td>
<td>21,43%</td>
</tr>
<tr>
<td>D</td>
<td>15,00%</td>
<td>1,00%</td>
<td>84,00%</td>
</tr>
<tr>
<td>E</td>
<td>20,00%</td>
<td>75,00%</td>
<td>5,00%</td>
</tr>
<tr>
<td>F</td>
<td>15,00%</td>
<td>85,00%</td>
<td>0,00%</td>
</tr>
<tr>
<td>G</td>
<td>0,00%</td>
<td>88,24%</td>
<td>11,76%</td>
</tr>
<tr>
<td>Mean</td>
<td>17,55%</td>
<td>54,99%</td>
<td>27,46%</td>
</tr>
</tbody>
</table>

Table 5 shows that the interviewees consider the current revenue generated by the commerce function much higher than by the collaboration function.

4.2. Discussion

From Figure 2 it emerges that the interviewees consider the direct importance of collaboration and commerce to be approximately equal. The results of Table 1 make clear that only a marginal difference of 0.15 exists between the means of the individual appraisals of direct importance of both functions. Also, the result of the survey of the indirect criterion of importance frequency of use (cf. Figure 3) is approximately equal for both functions. Here, the difference of the corresponding means amounts to a mere 0.14 (cf. Table 3). At this point, all presented criteria speak for the same importance of the functions collaboration and commerce. However, the results of the two indirect criteria of importance revenue and number of users speak against this equality. Tables 4 and 5 clearly show that, for most of the surveyed marketplaces, the commerce function obtains the greatest revenue and the most users. The corresponding mean for the collaboration function is considerably smaller than that of commerce. But then how can it be explained that marketplace operators still consider the direct importance of collaboration and commerce to be approximately the same?

We suspect that, although the collaboration function compared with the commerce function has obtained neither the same number of users nor the same revenue, the interviewees classify the acquisition potential of collaboration and its potential to bind marketplace users in the long term to be very high. On the basis of the current development of electronic marketplaces, we put forward another supposition. The number of marketplaces is still declining. It emerges, that not enough advantages arise for the marketplace participants from the commerce functions traditionally offered by marketplaces [1]. Marketplace participants neither seem to have achieved substantial cost savings nor increased revenues. Because of the ongoing consolidation, marketplace operators feel that they have to offer features beyond pure commerce functions in order to be able to differentiate themselves from the competition [37]. For this reason, we suspect that marketplace operator assess the offering of collaboration functions to be highly important.

The results in Table 2 support our suppositions. From the rankings, it emerges that most operators draw upon the criteria revenue and number of users, as well as frequency of use to ascertain the importance of the commerce function (Rank 1 and 2). However, other criteria were used to assess the collaboration function. In this case, most operators used the criteria benefits for the user, user’s competitive advantage and operator’s competitive advantage (Rank 1 and 2). Apparently most operators consider these criteria to be so important that the results of revenue and number of users, which seemed to speak against the equality of importance between the functions collaboration and
commerce, are balanced out. Beyond this, the criteria benefits for the user, user’s competitive advantage, and operator’s competitive advantage also confirm the suppositions mentioned above. By generating a benefit for the user, and a competitive advantage for the user, the platform of the marketplace becomes more attractive for the participant. Hence, through the initiation of collaborative functions, incentives for using the marketplace can be created. These incentives can elevate the acquisition potential of the marketplace and can strengthen the bind of the participants to the marketplace. Beyond this, many marketplace operators estimate that they will be able to extend their own competitive advantage by providing collaboration functions, which can lead to the marketplace differentiation described above. This would explain why the direct importance (cf. Figure 2) for the functions collaboration and commerce is considered to be about the same. Based on these considerations, we reason that for marketplace operators in the automotive industry today, e-collaboration functions are as important as transaction functions.

5. Conclusions

The goal of this paper is to find out to what extent electronic B2B-marketplaces in the automotive industry have already developed into e-collaboration platforms. On the basis of a literature research we have ascertained that the functionality of electronic marketplaces develops in various stages. In recent years electronic B2B-marketplaces have mainly provided functions for supporting transactions. Today, marketplaces in the automotive industry increasingly offer e-collaboration functions. On the basis of this observation we put forward the thesis that electronic marketplaces in the automotive industry develop further into e-collaboration platforms. It is worth questioning what significance the e-collaboration functions have on these marketplaces, and if one can speak well-founded from an evolution of the marketplaces to e-collaboration platforms. In order to resolve these questions, results of an empirical study of seven European B2B-marketplaces in the automotive industry were presented and discussed. We found out that, for most marketplaces, commerce functions currently acquire the greatest revenue and the most users. We were able to show, however, that marketplace operators consider the importance of commerce and collaboration to be approximately the same. We suspect that this results from the operator’s conviction that the potential of collaboration functions to acquire new participants, to bind current participants, and to create a competitive advantage is very high. From this, we conclude that our thesis “electronic B2B-marketplaces of the automotive industry develop into e-collaboration platforms” (cf. section 3.4.) has been proven for the investigated sample.

We have identified 28 B2B-marketplaces in the automotive industry worldwide. 15 of these marketplaces operate in Europe. We have included seven European B2B-marketplaces in the automotive industry in our study. Obviously, the findings of our study are not statistically significant for marketplaces in the automotive industry worldwide. However, we have included almost 50 % of the relevant European marketplaces. We are confident that our study is a good basis to understand the current importance of e-collaboration on European B2B-marketplaces in the automotive industry.

With the help of our study we were able to substantiate the claim that electronic marketplaces of the automotive industry develop into e-collaboration platforms. However, it is still worth questioning how the relative significance of collaboration functions compared to commerce functions will develop in the future. For this reason, consequent studies should be repeated on a regular basis, in order to observe the development of e-collaboration in the marketplaces. In future studies, benefits for marketplace participants as well as competitive advantages for marketplace operators should be analyzed in more detail. Our study focused solely on marketplaces of the automotive industry. There are a number of other industry sectors that have similar characteristics. We suppose that electronic marketplaces in these industries provide strengthened functions for cooperation, too. For this reason it would be interesting to expand the investigation performed here to other sectors. In our study only the appraisals of marketplace operators were considered. To obtain a more complete picture of the significance of e-collaboration functions, marketplace users should also be surveyed.

6. References


