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LIMITS OF IMITATING MARKETPLACE DESIGN: THE CASE OF AN AUTOMOTIVE SERVICE MARKETPLACE

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Abstract

In recent years, platform-based service marketplaces emerged as a new way of software and service deployment which radically changed the mobile service domain. Today, platform-based service marketplaces like Apple's App Store dominate the field of mobile service deployment and have proven to be an enormous competitive advantage. At present, this concept is diffusing into other domains like the automotive industry. Desiring to make use of this competitive advantage, car manufacturers strive to explore its possibilities. However, to date there is no thriving platform-based service marketplace in this industry. Thus, this paper aims to describe the identified challenges in designing an automotive service marketplace. The authors present the results of a Delphi study based on a qualitative study, embedded in an industry research project, exploring the design of an automotive service marketplace. The results emphasize on the identified critical design issues in the automotive domain and provide evidence that imitating platform-based marketplace design from one domain to another has limits. Therefore, the authors suggest addressing the open issues by implementing an independent management body that can dynamically adjust the design.

Keywords: platforms, marketplaces, governance, automotive services, cloud computing

1 Introduction

Platform-based service marketplaces became popular with the enormous success of Apple's App Store. They enable third-parties to provide complementary functionality to a core product and thereby radically changed the mobile industry (Ghazawneh and Henfridsson, 2013). Empowering third-parties permits marketplace owners to serve markets where demand is fast changing and not yet known while shifting service provision risk to third-parties.

As it lowers service provision cost, it may serve as a competitive advantage in the automotive industry where the costs of service provision have increased enormously over the past years (Zauner et al., 2010). However, several more challenges come up in the automotive industry compared to smartphone industry. First, cars have a much longer lifecycle. Thus, car IT needs to be decoupled from the car itself. Second, market revenue potential for third-party providers in the automotive industry is multiple times smaller. Third, limited drivers' distraction has to be ensured to prevent authorities from banning in-car services (Manner et al., 2013a). These issues could be addressed through a platform-based automotive service marketplace for non-branded automotive cloud data and services as presented in Figure 1. The solution combines the market share of several car manufacturers (OEM) increasing the revenue. Cloud services distributed via an OEM backend enable decoupling and costs are smaller as a platform solution limits transaction costs for searching services and data offers. Branding by the car manufacturer itself enables control of service offerings and quality to customers, allowing competitive differentiation. Finally, car manufacturers can limit the driver's distraction by only offering services that are adapted to their tested operating installation.

This paper reports on a project of research organizations from various premium car manufacturers. To evaluate challenges for designing such a platform, the authors conducted a Delphi study based on a qualitative pre-study. Foundations of the Delphi study are best-practice research on four platform-based service marketplaces, as well as insights from platform governance research and broad market research in the automotive service industry. To analyze the results, the platform governance framework by Manner et al. (2012, 2013b) is employed. This enables a detailed investigation of the research question: "What are challenges in designing a platform-based automotive service marketplace and where are the limits of imitating platform design from different domains?"

The remainder of this article is structured as follows. Section two presents the platform governance framework used to structure the results of the Delphi study. In section three, the authors elaborate on the research approach before presenting the results in section four. Section five discusses the identified challenges and limits of imitating platform design from different domains for developing platform-based automotive service marketplaces. The paper concludes with remarks on the findings which are covered in section six.

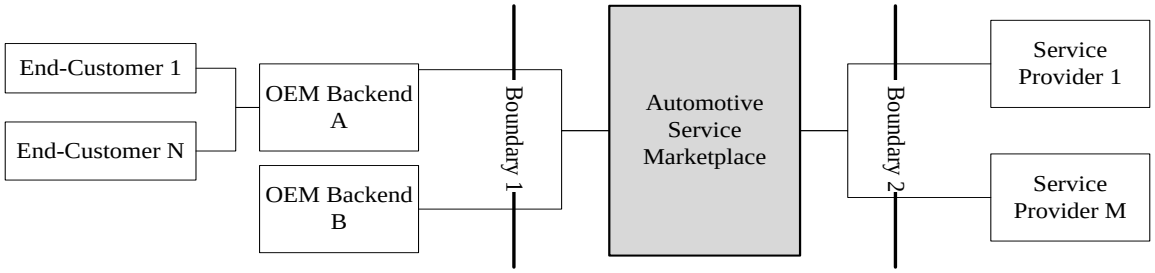

Figure 1. Conceptual setting of a platform-based service marketplace in the automotive domain

2 Governance Framework for Designing Platform-based Marketplaces

The success of a two-sided market is dependent on the number of participants on both sides (Armstrong, 2006). Platform governance enables the alignment of stakeholder interests in the

ecosystem to control stakeholder attraction (Lerner et al., 2006, Eaton et al., 2011). The chosen framework provides an integral view on the design of platform-based marketplaces, beginning at the ecosystem layer and subsequently going down to the governance and control layer within a platform by a derivation process (Manner et al., 2013b). The ecosystem layer consists of technical, legal, socio-economic, competition and stakeholder behavior factors that need to be examined in order to design the market structure, which is the business model blueprint of a platform. Based on this, the elements of the market structure that need to be agreed on need to be determined. The market structure of platform-based marketplaces is defined by governance policies, addressing incentives for stakeholders, legal agreements, quality of service, distribution of services, financial streams and security installations, which need to be coordinated. By addressing each policy on the governance level, an integral view on design issues that need to be discussed and consented to is achieved (Manner et al., 2013b).

3 Method

This chapter elaborates the Delphi method employed in this research. Following Martino (1983), a qualitative pre-study is conducted to determine its scope and build the foundation of the first Delphi round. The authors therefore analyzed the factors legal, technical, socio-economical, stakeholder behavior and competition determined by the framework within the automotive domain. Then, four platform-based service marketplaces were examined to collect design possibilities for the evaluation within the Delphi study experts. For the pre-study, we examined the „SAP Store“, Apple’s App Store”; „force.com“ and „Amazon Web Services”. Amazon Web Services and force.com represent internationally successful cloud delivery services. While Amazon Web Services offers a wide range of cloud services like storage or virtual servers, force.com focuses almost exclusively on providing a development environment. Whereas Amazon Web Services and force.com are both B2B and B2C, the SAP Store is in this context a more special service platform as it is serves B2B exclusively. At last, Apple’s App store, as a pioneer, provides many insights for successfully cultivating a platform ecosystem over a long period.

After the pre-study, a Delphi study with the aim of consensus is developed (Haeder, 2002). Such a study needs to be designed quantitatively with statements that are evaluated with a 5-point Likert scale by experts. The consensus is determined by mean values as well as mean variation. This enables to identify design challenges by reviewing statements that provided conflict points. Based on the pre-study, a first Delphi round (DI) was derived and evaluated based on a Likert scale, rating attractiveness or suitability. The resulting study was issued to five representatives of experts from automotive industry and five researchers. The researchers qualified by being specialized in either automotive services (3) or cloud service platforms (2).

In total, over 300 statements for design possibilities were proposed to evaluate. Within the first Delphi study, 231 statements were proposed to the experts based on the mechanisms found in the pre-study. 84 of the statements were unchanged transferred to the second study (DII) to ask the opinion in light of the peer group opinion again. In the second iteration, some questions were left out, since a consensus had already been reached. Some topics that reached consensus were elaborated on as they were not detailed enough for designing the final marketplace. For example, within the first iteration the possibility of venture capital provision was asked. The experts agreed in the first iteration that venture capital should be provided for the providers. However, how the exact control and anchoring within the platform should look like for a practical execution needed more tuning. Moreover, new questions - that were solely discussed in the second iteration – arose in a workshop which took place between the two iterations where the conflicts of the first iteration were presented to the experts. Overall, in DII 167 statements consisting of DI repetitive, elaboration of DI topics and new topics affecting governance policy configuration were proposed. The results of the Delphi study are classified into six categories: Conflict, weak acceptance, strong acceptance, acceptance, weak rejection and rejection. In both rounds, participants were asked for an agreement score for each issue from 1 to 5. A mean score

over 4.1 as well as a scattering below 1.5 between the answers was accepted as consensus for strong acceptance, whereas over 3.7, it was considered as acceptance and over 3.3 it was considered as weak acceptance. A mean score below 2.7 with low scattering was considered as weak rejection, and below 2 was considered as rejection. The answers of the representatives from the industry were weighted by factor two as they do not only represent expertise but also strategic knowledge from their firm.

4 Results

This chapter reports on the results of the whole Delphi study on the basis of the governance framework as summarized in Table 1. In DI 231 issues and in DII 167 policy options were evaluated. This leads to a total of 314 policy options. Governance policies are interdependent. Hence, some design statements like venture capital implementation affect finance and incentive policies. Due to this multiple assignment within the governance policy framework, 536 policy options can be identified. Studying the conflict percentage we can clearly identify challenges. Within DI we achieve a consensus of 89%, whereas in DII it is only 87%. On reviewing this result in more detail, we recognize 18 of the overall 33 conflicts after DII can be attributed to DI.

Disregarding these conflicts, we would achieve a consensus of 94% after DII. This is an astonishing result. Moreover, as the display of the peer opinion in DII could not achieve a better consensus, we regard termination of the Delphi study after the second round as justified and consider the conflicts as identification of design challenges.

Quality of services, distribution, legal design and finance design policy issues are dominant with 26%, 21.5%, 22.2% and 14.8% respectively. For the aspect of finance design policy issues, the experts had the highest conflict in opinion. After DII we identify only 72% of consensus. Also the quality of service design issues proposes with a consensus of 84% some conflict between the experts. Contrary to that, legal, incentive and security design issues are all above a consensus of 89%. Reviewing the policy domains that were elaborated in the second study, we find incentive issues were added by 32.5%, distribution by 29.6% and finance with 26.6%.

Governance Policies	**Legal aspects**	**Quality aspects**	**Distribution aspects**	**Finance aspects**	**Incentive aspects**	**Security aspects**
Amount of policy aspects in DI+DII	119	140	115	79	40	43
Proportion of policy aspects in DI+DII	22.2%	26.1%	21.5%	14.7%	7,5%	8%
Degree of Conflict	10.9%	15,7%	10%	28%	10%	5%
Degree of Elaboration for DII	14,3%	22,1%	29,6%	26,6%	32,5%	20,9%

Table 1. Summary of the survey results structured according to the governance framework.

5 Discussion

Examining the degree of elaboration displayed in Table 1, it can be stated that there is no link between the elaboration degree and conflict. Moreover, we found that 15 of the 33 conflicts remaining after the second study were also evaluated within the first round and therefore are not the result of elaboration. Next, we sum up the most critical issues for an automotive service marketplace.

Table 2 provides a summary of the major issues. Several of these issues relate to the specific multi-shareholder situation. Thus, problems arise when reaching the question “who has to pay for what” and “how to adapt to OEM in-house processes”. This is resembled in the strikingly low consensus on finance policy issues in DI and DII. In DI, agreement was reached on the question whether billing should be based on flat rate or pay-per-use. The experts agree on how car manufacturers want to be billed, if it is directly connected with an exchange. However, if it is indirect costs, which arise, for example, from the support service design, conflicts can be found. Most conflict issues in the finance

domain display independencies with other domains. Table 2 shows some of the critical design issues displaying the multiple assignments.

The experts struggle when discussing the marketplace provider value streams that only indirectly have a link with the car manufacturers' benefits. The experts also want to ensure the viability of the marketplace. Providing a high class service for sellers and buyers directly affects the revenues of such a marketplace. Thus, settling for cost drivers like support to service providers initiated a conflict. Hence, the finance conflict carries over to policies like the distribution, incentive and quality of services. Due to the interdependencies of policies this is unavoidable. Providing monetary incentives or venture capital links finance and incentive policies. These topics were covered in DI and are resembled by a low degree of consensus in the quality of services domain in DI. Within the workshop, which took place between the Delphi rounds, it became clear that the reason for conflict is that the direct link of such indirect costs to the value added is missing.

A major challenge is the limited knowledge of this new market which can be recognized by the remaining undecided and rejected issues in the quality of services police. For example, the experts had problems defining categories like information on coupons and gas station information for the marketplace. Consensus was only achieved in already existing categories. Furthermore, how to segment the service qualities for the service buyers provided conflict in DI. After discussing it within the workshop and adding three categories for segmentation at least some consensus was achieved. However, this shows the uncertainty of the experts of what offer is expected in such a marketplace and therefore represents a further challenge.

It is considered to be a challenge to incentivize service providers in an emerging market but in the case of our study, the experts came to the decision after DII that the usage of venture capital is to be rejected. This is startling, as we found venture capital installments in best practices, as for instance Apple's iFund proves. As the issues for incentives are in this study not predominantly represented by only 40 aspects, this rejection must be considered seriously. In results the participants' incentive measures of service providers relates solely to monetary incentives. Other mechanisms, such as a help desk, providing collaboration partners for joint projects were not regarded as relevant and therefore were rejected in consensus. Disregarding non-monetary incentives for stakeholders might be a pitfall to marketplace designers. On first sight, money is what attracts people but incentive topics go far beyond (e.g. creative freedom, non-monetary rewards and similar). Struggle was also imminent with the right of exclusive service purchases. Conversely, this is an important legal issue that needs to be controlled as such a marketplace only achieves viability with high amounts of transactions.

In summary, our experts are biased, as half of them can be considered future shareholders. They fear that giving away any rights might harm their competitiveness and are consequently reluctant to find consensus. Working together on the marketplace to save transaction costs and bypassing the platform is a great challenge.

Issue	**Boundary 1**	**Boundary 2**	**Framework Policy**
Exclusive purchase rights	X		Finance, Legal
Support for stakeholders		X	Quality of Services, Distribution, Finance
Review System design	X		Quality of Services, Distribution
Venture capital provision		X	Incentive, Finance
Service Portfolio and segmentation		X	Quality of Services, Distribution
Lack of (non-monetary) incentives		X	Incentive, Finance

Table 2. Summary of critical design issues and display of policy interdependencies.

6 Concluding Remarks

This paper presents critical design issues in a multi-shareholder service marketplace environment for the automotive industry. The initial setting, as outlined in chapter one, solves the issues of a

comparatively small market, decoupling of car and service lifecycles and driver's distraction. In the course of events, a Delphi study was conducted. It is based on a platform governance framework developed by Manner et al. (2013b) to structure and analyze the results. Thereby, further critical issue dependencies between governance policies like the quality of services link with the finance policy are identified. The study started with an open qualitative approach as suggested by Martino (1983) and went along with a tight scope to achieve selected and targeted feedback to the proposed design statements for an automotive service marketplace. For quality assurance in between the studies a second workshop was conducted to avoid influencing the experts. All in all, the Delphi study was a success, as a high degree of consensus was achieved (87% in DII) and critical design issues, which need further investigation, were identified. These were discussed in chapter 5.

Such multi-shareholder provider solutions must not be considered as specific to the automotive service industry as the transfer of platform-based service marketplaces to other domains has just begun. Other industries will find at least partially similar difficulties. The detected uncertainty of the issues can be settled by designing them loosely and testing which way works best. Hence, an independent management body for this multi-shareholder environment needs to be studied. This would enable quickly changing platform design, where failures in adapting to the ecosystem occur. Even though, imitating marketplace governance design is considered a common strategy (Burkard et al., 2012), this research presents evidence that imitation has boundaries when it comes to transferring platform-based marketplaces to new domains.

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