

2008

# Testing a Multi-Channel Service Design Method

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## Recommended Citation

Simons, Luuk P.A. and Bouwman, W.A.G.A., "Testing a Multi-Channel Service Design Method" (2008). *BLED 2008 Proceedings*. 20. <http://aisel.aisnet.org/bled2008/20>

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## **Testing a Multi-Channel Service Design Method**

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### **Abstract**

Although the multi-channel shopper has recently become a dominant consumer type, firms are still struggling with consciously designing their multi-channel service mix. In this paper, a design method based on QFD (Quality Function Deployment) is introduced and tested for defining e-services that have to function in a multi-channel context. Within a design research perspective, a structured field experiment was conducted, using control group testing. Two measurement instruments were used: questionnaires for business participants (n=62) and a protocol for external observers (n=56) to measure performance of design tasks throughout the process. We found that business teams tend to bias towards the supplier's perspective at the expense of customers and channel partners. The new method scored significantly better than the control group method on a number of evaluation criteria: customer orientation, channel coherence and communication between different stakeholder perspectives.

**Keywords:** Service design, design research, e-services, multi-channel, design method, QFD

### **Introduction**

From the second half of the 1990's the world experienced the rise of Internet commerce. This period was characterized by multiple predictions of disintermediation to occur in traditional marketing channels. Physical retail stores were claimed to be 'doomed' in terms of competitive value. Instead, it was expected that the majority of customers would start buying directly from manufacturers. For example, Gilder (1994) stated that wholesale and retail would be eliminated and only Internet intermediaries would survive. Bill Gates (1995) predicted the 'death of the middleman'. And Prahalad (1998) saw disintermediation as one of the eight trends that would transform the economy. By the end of the 1990's, this world view was paramount and all firms on the major stock exchanges were required to present explicit Internet strategies. If not, they were considered to be laggards, and share prices and market capitalization would drop.

In contrast with these expectations, there is growing evidence that purely online retailing has its limits and that there would be significant value in 'click and mortar' approaches, combining online with offline presence. Developing explicit multi-channel strategies has advantages for businesses (Steinfeld, Bouwman and Adelaar, 2002; Simons, Bouwman and Steinfeld, 2002) and customers (Simons and Bouwman, 2004). And behaviors and expectations change. Over the recent years customers have increasingly become multi-channel shoppers, and find it quite natural to use websites and physical stores as part of the same buying process (Schueler, 2003). Already in 2004, Forrester Research showed that 65% of consumers in the US are cross-channel shoppers that search online and buy offline (Wilson, 2004). Also the other way around is popular: 69% of Americans perform orientation offline before buying online (Smits, 2006). Finally, research conducted by Forrester also suggests that cross-channel customers spend on average 30% more than single-channel customers. Thus, firms have a lot to gain by supporting multi-channel shoppers and their buying processes. Still, they struggle in consciously designing an optimal channel mix (Simons and Bouwman, 2005).

We look at channels from the viewpoint of marketing channels, using the following definition: sets of (independent) organizations involved in the process of making a product or service available for consumption or use (Stern, El-Ansary and Coughlan, 1996). The focus is not on multi-channel marketing strategy (Venkatesh, 1999; Steinfeld, Bouwman and Adelaar, 2002; Mueller-Lankenau, Wehmeyer and Klein, 2006) nor on multi-channel customer management (Neslin, Grewal, Leghorn, Shankar, Teerling, Thomas, Verhoef, 2006). Rather, we focus on the tactical design challenge: for a specific PMC (Product Market Combination), a given marketing strategy, and an existing channel mix, how can we support the design of e-services that have economic value in the channel mix (Bucklin, 1972)? For this purpose, we developed and tested a method for designing Internet services (e-services) which have to function in a multi-channel context: MuCh-QFD (or Multi-Channel QFD). We focus on 'auxiliary' or 'peripheral' services, which aid people in the buying and/or consumption process but are not a core product or service that customers pay for. Our main research question is: *Does the new Multi-Channel QFD method provide better multi-channel service design support than a more traditional design approach?*

From a design point of view, it is important to evaluate the effectiveness of a newly developed artifact (Hevner, March, Park and Ram, 2004), in this instance: MuCh-QFD. Hence, we made the criteria for evaluation explicit, as well as the expected performance of design tasks in relation to these criteria (Verschuren and Hartog, 2005). In previous research (Simons and Bouwman, 2006a) 'better support' has been defined in terms of seven criteria relevant for multi-channel service design. Four of them are aimed at design *outcomes*: 1) degree of customer oriented design, 2) channel coherence, or the degree in which channels coherently create value for customers, 3) channel synergy, narrowly defined as the re-use of assets across channels (Power, 2000) and 4) competitive positioning, indicating that design choices must be supported regarding which features to develop or discard as options for competitive differentiation. The next three of them focus on the design *process*: 5) speed, or degree of design progress per time investment, 6) a focused design process, as a counter balance to the number of service options and channel combinations that tends to explode and 7) communication between stakeholder perspectives: a wide range of perspectives must be incorporated (from CEO's to channel specialists, sales, marketing, service, IT & processes) and guided towards joint design decisions.

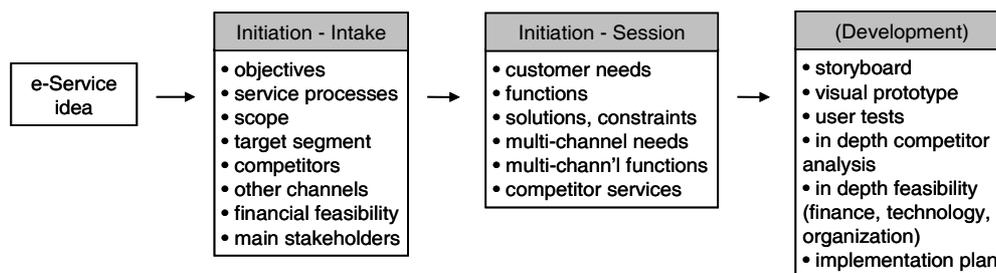
For developing and testing our method we use these seven criteria as the requirement list for selecting, modifying and evaluate various methods and approaches. As a first step we reviewed several existing methods for service and product design: service blueprinting (Shostack, 1984), service system planning (Normann, 2000) and its subtask of service delivery system planning (Heskett, Sasser and Reichheld, 1997), service concept definition (Goldstein, Johnston Duffy and Rao, 2002), fundamental engineering (Cross, 1994; Clausing, 1994) and QFD for services (Mizuno and Akao, 1994; Ramaswamy, 1996; Mazur, 1993). The conclusion of this review was that that a modified version of the QFD (Quality Function Deployment) approach would likely have the highest performance in relation to the design requirements (Simons and Bouwman, 2005).

Two important considerations for modifying QFD were: speed ('ready in half a day') and incorporating multi-channel issues.

Section 2, theory, introduces the 'Multi-Channel QFD' method, as well as hypotheses regarding its performance compared to the more traditional 'Fundamental Engineering' approach. Section 3 describes the methodology of the field experiment we conducted. Section 4 presents the main findings, which are discussed in section 5. And in section 5 we present our main conclusions.

## Theory

In this section we describe the background of the design methods we used in our field experiment: 'Fundamental Engineering' (FE) and 'Multi-Channel QFD' (MuCh-QFD). Both methods are aimed at supporting the 'initiation' phase of the design process, which precedes the development and implementation phases (Alter, 1999). The initiation phase addresses the purposes and goals of the e-service idea, scope and feasibility, and functional specifications. Another approach (Kar, 2004) distinguishes the following phases: analysis, preparation, synthesis, implementation and testing. In terms of this approach we focus on the analysis phase. Within that phase we address service process design (comparable to service blueprinting), customer requirements analysis, existing services analysis (comparing online and offline services) and functional specification.



*Figure 1: Initiation versus development phase tasks*

Given the importance of efficiency and speed (Gordijn, 2002; Verhey, Herder, Wijnia, Subrahmanian, Katsikopoulos and Clausing, 2007) and interaction between stakeholder perspectives (Clausing, 1994; Rigby, Reichheld and Schefter, 2002) we chose to use the format of design sessions with all relevant stakeholder perspectives present. To avoid design session goals that would be too broad (Verschuren & Hartog, 2005) we conducted an intake, using a structured protocol, prior to the sessions. This also helps in offloading some of the analysis tasks from the sessions to an earlier moment, see Figure 1. For example, service process mapping is done during the intake and per case only the commercially most crucial part of the overall customer interaction process is chosen as focus point for the sessions. As an illustration of the larger design context, Figure 1 also shows development phase tasks which are outside the scope of the initiation phase.

The MuCh-QFD session has significant roots in QFD (Quality Function Deployment). This is a customer-centered design methodology for designing quality products and services, originating in Japan (Mizuno & Akao, 1994). It helps a design team to communicate with each other, even when their backgrounds are different. It uses matrix formats, 'the House of Quality' (HoQ), which are filled during the design process. In the first matrix customer needs are used to evaluate the importance of functions ('rooms 1, 2 and 3 of the HoQ'). For more details on QFD and 'the House of Quality' see Ramaswamy, 1996; Chan and Wu, 2002).

MuCh-QFD sessions start with presenting the results of the intake to the team, see also Table 1. This is the moment when a shared starting point is created and where potential unclarities can be addressed as a group. Then the design tasks start. Part I of the agenda identifies the main customer needs and e-service functions. In part II customer needs are used to evaluate the importance of functions, the service proposition is summarized in a slogan and potential constraints and solutions for functions are discussed. This all still follows ‘standard’ QFD, except that a ‘short hand’ version is used in the sense that customer needs are not separately elicited during a ‘gemba’ visit to customer sites (Mazur, 1993) and that an electronic decision support system, GroupSystems™, is used to structure and speed up the process. Part III provides a multi-channel extension to QFD. There is an exploration of support that customers desire from other channels and of potential for cooperation between channels. On the basis of this, the service matrix from part II is extended with multi-channel customer needs and functions, while logging additional constraints and solutions mentioned by the group. In part IV competitive positioning is discussed in relation to the main two competitors. This is followed by scoring the new service definition as well as the competitor services in relation to customer needs (‘HoQ room 4’).

**Table 1:** Summary of MuCh-QFD and FE sessions

<b>MuCh-QFD Agenda</b>	<b>FE Agenda</b>
Introduction: summary of intake results	Introduction: summary of intake results
I: Identify customer needs and Internet functions - Identify customer needs and Internet functions - Create and prioritize customer needs clusters - Create functionality clusters	I: Define objectives - Identify objectives - Create objectives clusters - Prioritize objectives clusters
II: Define e-service - Correlate functions and needs in service matrix - Define service slogan that summarizes proposition - Discuss solutions and constraints for functions	II: Define e-service functions - Define e-service functions for each objective - Create functionality clusters - Prioritize functionality clusters
III: Tasks of other channels - Check the desired support from other channels - Check win-win between e-service and other channels - Extend matrix: multi-channel needs and functions	III: Define solutions / new e-service - Define service slogan summarizing proposition - Define e-service based on output part I and II - Indicate why to invest or not
IV: Competitive position - Strong and weak points in relation to competitors - Score new and competing services on customer needs	IV: Assess new e-service - Score e-service on objectives - Discuss scores and whether objectives were met

The FE session is based on three key elements that are common in traditional design approaches taught in technical schools: 1) objectives, 2) functionalities, 3) solutions. These elements are completed with an evaluation whether the objectives have been met. Table 1 shows that these elements also provide the structure for the FE agenda. In part I objectives are identified, clustered and prioritized. In part II potential functions are identified for the objectives, functionality clusters are formed and they are prioritized. The same electronic decision support system GroupSystems™ is used as in MuCh-QFD sessions to structure and speed up the process. In part III the proposition of the new e-service is summarized via the service slogan, service details are defined based on the outputs of parts I and II, and there is a discussion whether the service definition merits investment. In part IV the service definition is scored in relation to the objectives and a discussion is held whether the objectives of part I have been met.

**Table 2: Differences and similarities between MuCh-QFD and FE sessions**

	MuCh-QFD sessions	FE sessions
Intake review	Yes	Yes
Session format (electronic/speed/focus)	Yes	Yes
Customer needs as starting point for functions and for design evaluations	Yes	No
Multi-channel coherence and synergy considerations	Yes	No
Competitors' benchmark	Yes	No

Table 2 summarizes similarities and differences between both sessions. This leads us to the hypotheses that MuCh-QFD sessions outperform FE sessions on customer focus, multi-channel coherence and synergy, competitive positioning and addressing the issues of multiple stakeholder perspectives collectively (customers, marketing, and channel partners), see Table 3. And given the nature of the tasks, we expect parts I and II of MuCh-QFD to contribute most to customer orientation. We expect part II of MuCh-QFD to contribute most to channel coherence and channel synergy. And we expect part IV of MuCh-QFD to contribute most to competitive positioning (See hypotheses 6 to 10 in Table 3.)

*Table 3: Hypotheses on MuCh-QFD sessions outperforming FE sessions*

Hypothesis:
1. MuCh-QFD more customer orientation than FE
2. MuCh-QFD more channel coherence than FE
3. MuCh-QFD more channel synergy than FE
4. MuCh-QFD more competitive positioning than FE
5. MuCh-QFD more stakeholder communication than FE
6. MuCh-QFD more customer orientation than FE in part I ('room 1' of QFD HoQ)
7. MuCh-QFD more customer orientation than FE in part II ('room 3' of QFD HoQ)
8. MuCh-QFD more channel coherence than FE in part III (multi-channel extension)
9. MuCh-QFD more channel synergy than FE in part III (multi-channel extension)
10. MuCh-QFD more competitive positioning than FE in part IV ('room 4' of QFD HoQ)

## Methodology

In the theory section we hypothesized on design task effectiveness in relation to the evaluation criteria (Verschuren and Hartog, 2005). This section describes the research design and measurements for testing the hypotheses (Hevner et al, 2004). To determine differences between MuCh-QFD and FE performance, we performed a structured field experiment. The FE sessions were used as control groups.

Preceding the field experiment, we conducted three rounds of pretesting to refine session details and measurement instruments. Next, 14 design sessions were conducted with eight cases. The cases came from two sectors: insurance and telecommunication. For six of the eight cases, a MuCh-QFD session (n=24) and a FE session (n=25) took place, each addressing the same design problem. Participants were randomly assigned to either session, while keeping the overall expertise mix identical for each session per case. For two cases only MuCh-QFD sessions were conducted (n=13). For the cases with control groups, background variables of participants were available and checked to be comparable across experimental and control condition. They

represented the following functions: fourteen directors, eight IT/operations professionals, three line managers, twenty marketers and four others. On average, 63% of them indicated they had previous service innovation experience and 47% had previous experience with service definition sessions. We found one significant difference (two-tailed t-test;  $t=2.52$ ;  $df=45$ ;  $p<0.05$ ): in MuCh-QFD sessions participants had on average 15 years of experience in the sector, in FE sessions the average was 10 years. This did not significantly impact our measurements. Despite the small number of observations and the need to assume interval scales, we used covariance analysis to check for disturbing factors and interaction effects. Variables like for example industry background, firm size, participant expectations, years of working experience did not show disturbing influences. However, regarding stakeholder perspective, we found that IT/operations professionals are relatively less and marketing professionals relatively more perceptive of competitive positioning issues during the sessions. Again, this did not impact our main experimental findings.

Two types of measurement instruments were used, see Appendix A. Firstly a questionnaire, completed by participants directly after the sessions ( $n=62$ ) and complemented with a personal interview to capture qualitative feedback and any unclarities. Secondly an observation protocol to measure the effects of each of the four agenda parts of the sessions ( $n=56$  observers). Each observer scored an FE and a MuCh-QFD session to make sure that systematic effects would be the same for both sessions. An overview of the items used in both instruments is provided as appendix. We checked cross-observer consistency of scoring and removed items with a consistency  $< 80\%$  from our analysis. Additional to the measurements, debriefing meetings were held with the case participants one month after the design sessions. During those meetings we collected information on participants' opinions on the longer run.

While checking reliability and consistency of the data we found an interesting effect for construct 4, which was competitive positioning. About half of the items (items 4a, 4e, 4f, and 4g) had higher average item scores for FE than for MuCh-QFD sessions. This ran counter to the overall trend across all items, and also to the other items for the construct (4b, 4c, 4d) where on average MuCh-QFD scored higher. A closer look at the wording of the items reveals that the latter items all address 'competitor focus' and the first four items address more general 'marketing strategy' issues. Thus we decided to split construct 4 into 4a, 'competitor focus' and 4b, 'marketing strategy'. Interestingly, participant and observer scores showed exactly the same split across items, confirming the prudence of our face value analysis via cross-instrument consistency.

## **Field Experiment Results**

In 4.1 we present background information on participants and results from the participant questionnaires and observer scores. In 4.2 we illustrate MuCh-QFD session output and highlight some of the qualitative case findings.

### **Measurement Results**

One of the main things we wanted to check was if MuCh-QFD and FE participants would be equally satisfied. If not, we would run the risk of disrupting our measurements via the 'dr Fox' effect (Ware and Williams, 1975): increased scores on other items due to higher satisfaction. In our field experiment, satisfaction results were the same for FE and MuCh-QFD participants. We used 5-point Likert scales to measure satisfaction and we asked for a session rating. Neither created significant differences. For example, FE participants gave an average rating of 7.5 and MuCh-QFD participants of 7.6 out of 10. Hence, our efforts succeeded to create FE and MuCh-QFD sessions that were equal in terms of quality perceptions of participants.

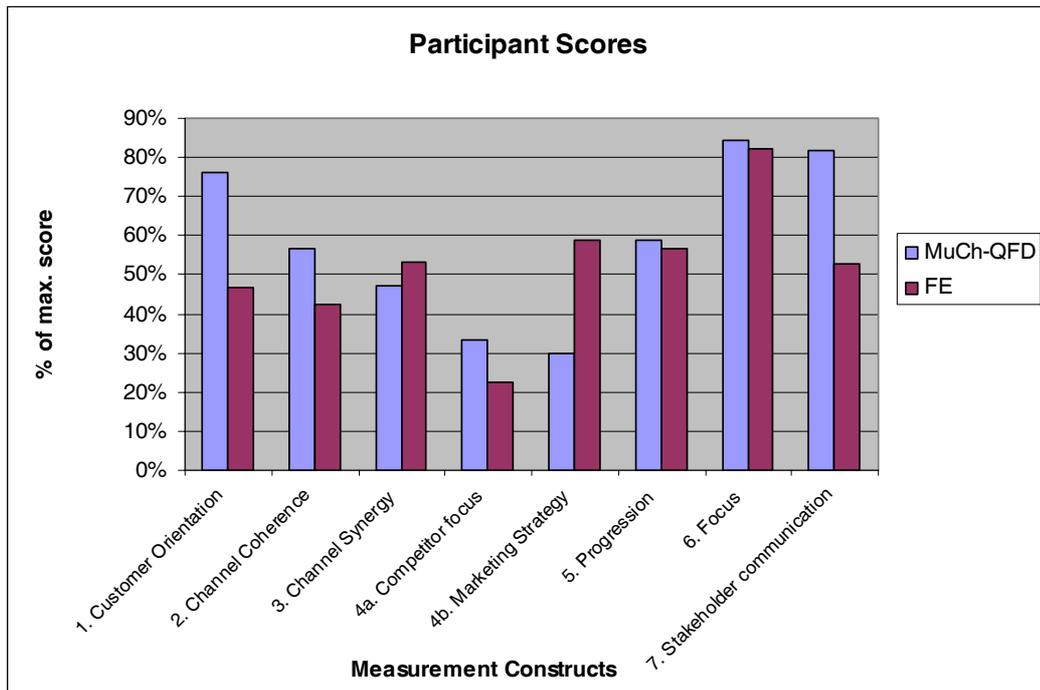


Figure 2: Differences between MuCh-QFD (n=37) and FE (n=25) scores

As a next step in our analysis, Figure 2 presents the results of our participant questionnaire. In general, MuCh-QFD outperforms FE, except for marketing strategy, but not all differences are significant. In Table 4 we summarize which hypotheses have been confirmed and which have not. Based on Mann-Whitney tests, hypotheses on customer orientation (Mann-Whitney U=144; Z=-4.72; p<0.001), channel coherence (Mann-Whitney U=325; Z=-2.00; p<0.05) and stakeholder communication (Mann-Whitney U=218; Z=-3.61; p<0.001) have been confirmed, and the others have not, given the p<0.05 threshold. In other words, those constructs show significantly higher scores for MuCh-QFD than for FE sessions.

It is interesting to see that after we split up construct 4 a new significant difference has emerged: construct 4b on 'marketing strategy' shows significantly higher scores for FE sessions (Mann-Whitney U=215; Z=-3.66; p<0.001). These results indicate that MuCh-QFD is a relatively strict method compared to FE sessions. It prescribes how to connect customer priorities, service functions and performance levels, multi-channel needs and functions and competing offers, but it does not stimulate the more abstract marketing strategy discussions.

Table 4: Confirmation of hypotheses on session effects overall

Hypothesis:	Confirmation
1. MuCh-QFD more customer orientation than FE	Yes
2. MuCh-QFD more channel coherence than FE	Yes
3. MuCh-QFD more channel synergy than FE	No
4. MuCh-QFD more competitive positioning than FE	No
5. MuCh-QFD more stakeholder communication than FE	Yes

Finally, we would like to present some of the observation scores to generate additional insights into the differences between MuCh-QFD and FE for each agenda part. In this paper we focus on the design 'outcome' requirements: customer orientation (1) to marketing strategy (4b), since they show most pronounced differences across agenda parts. ('Progression' and 'focus' scores were between 60% and 90% for all agenda parts of MuCh-QFD and FE. And integration of the various stakeholder perspectives mainly took place in part III and IV of MuCh-QFD, which fits the intentions behind the MuCh-QFD agenda.) The results are shown in **Napaka! Vira sklicevanja ni bilo mogoče najti.** The graphs display MuCh-QFD scores on the left and FE scores on the right, averaged over the sessions.

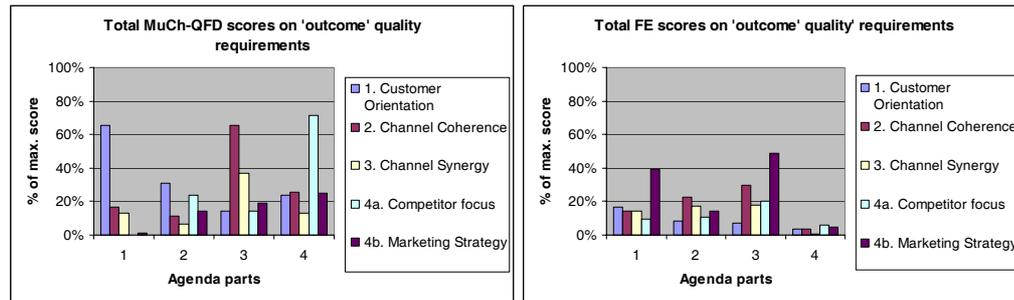


Figure 3: Observer scores for MuCh-QFD (n=28) and FE sessions (n=28) per agenda part

In part I of the agenda, customer orientation scores relatively high (65% of the maximum score) in the MuCh-QFD sessions, which is significantly higher than in the FE sessions (Mann-Whitney  $U=71$ ;  $Z=-5.86$ ;  $p<0.001$ ). Also in part II of the agenda, customer orientation scores significantly higher in MuCh-QFD sessions than in FE sessions (Mann-Whitney  $U=197$ ;  $Z=-3.63$ ;  $p<0.001$ ). This confirms hypotheses 6 and 7 of Table 5. Moreover, this part II score is significantly higher than the highest FE score, which is found in in agenda part I (Mann-Whitney  $U=269$ ;  $Z=-2.19$ ;  $p<0.05$ ). This indicates that e-service discussions via an e-service matrix (HOQ room 3 in QFD) appear to generate a higher level customer orientation in the design approach than any FE task (discussing objectives, functions, solutions or investment readiness).

In part III of the agenda channel coherence scores significantly higher for MuCh-QFD sessions than for FE sessions (Mann-Whitney  $U=132$ ;  $Z=-4.35$ ;  $p<0.001$ ). This confirms hypothesis 8. Channel synergy scores higher, but not significantly. Hence hypothesis 9 is not confirmed. In part IV of the agenda construct 4a, competitor focus, has a relatively high score (70%) for MuCh-QFD sessions, which is significantly higher (Mann-Whitney  $U=34$ ;  $Z=-6.22$ ;  $p<0.001$ ) than for FE sessions. Although this does not directly confirm the original hypothesis 10 regarding competitive positioning, it does point in the same direction. One could say that the assumption that more attention is paid to competitors in MuCh-QFD sessions is confirmed. Marketing strategy issues at the other hand are more discussed during FE session parts I, defining objectives, and III, defining solutions, e-service slogan and investment. The part I score for FE sessions is not significantly higher than it is for part IV of the MuCh-QFD agenda, competitor comparisons, but the part III score is (Mann-Whitney  $U=225$ ;  $Z=-2.91$ ;  $p<0.01$ ). This implies that the part III topics of FE sessions (e-service slogan, online solutions, invest or not) trigger most marketing strategy discussions. The findings in relation to our hypotheses are summarized in the Table below.

**Table 5: Confirmation of hypotheses on agenda parts**

Hypothesis:	Confirmation
6. MuCh-QFD more customer orientation than FE in part I	Yes
7. MuCh-QFD more customer orientation than FE in part II	Yes
8. MuCh-QFD more channel coherence than FE in part III	Yes
9. MuCh-QFD more channel synergy than FE in part III	No
10. MuCh-QFD more competitive positioning than FE in part IV	Partly

## Qualitative Results

This section addresses two topics. First we illustrate the type of output a MuCh-QFD session generates. Next, we present several qualitative case study findings on the design process.

Regarding design outcomes, MuCh-QFD and FE sessions both generate three types of output. Firstly, information captured via GroupSystems™: brainstorm results; clustering results (for example the main customer needs in MuCh-QFD), and priorities as scored by participants. Secondly, flip-charts from breakout exercises. And thirdly a summary of the service definition output using templates created in MS Excel.

The MuCh-QFD output summary is illustrated in Appendix B. The left column contains the customer needs ('HoQ room 1') and the top row the main functions ('HoQ room 2'). The extent to which the functions fulfill the needs that have been identified can be written in the cells ('HoQ room 3'). Following standard QFD practice, a 9 is used to indicate a strong correlation and a 3 to indicate a weaker but significant correlation (Cohen, 1995; Ramaswamy, 1996; Herzwurm, Schockert Dowie and Breidung., 2002). The darker shaded areas indicate the multi-channel additions. The columns to the right indicate how the old (e)-service, the new e-service and the competition's e-services score in relation to customer needs ('HoQ room 4'). At the bottom, there are remarks which participants made with regard to solutions and constraints per function. The top left corner shows strengths and weaknesses as seen by the participants, and the service slogan is stated just below the strengths and weaknesses.

Next, we would like to mention some of the qualitative case study findings on design process quality. More qualitative details can be found elsewhere (Simons and Bouwman, 2006a); they are outside of the scope of this paper. However, it is interesting to mention here that the FE session process is judged by participants to be of higher quality (in terms of progress, focus, usefulness of results and satisfaction in comparison to previous service definition experiences) than 'regular' service definition processes those participants have experienced in their own company settings. Secondly, this field experiment showed that when groups are left to themselves (even the multi-disciplinary groups of FE sessions) to determine objectives, functionalities, online solutions and how to position an auxiliary e-service, they tend to focus on supplier interests (except when the explicit goal of an e-service was to improve support for customers or other channels). Thirdly, in several of our corporate cases it was interesting to see that the MuCh-QFD participants were quite surprised at the extent of multi-channel issues coming up during the session. They admitted that they were more used to developing e-services in isolation from other channels, but came to see this for their cases not very prudent. This confirms findings from other research that the added value of a new channel service should be evaluated relative to the existing channel mix (Simons and Bouwman, 2006b). Fourthly, from participant feedback solicited in relation to agenda item usefulness, it appears that MuCh-QFD usefulness stems from: starting from customer priorities, explicitly connecting them to service functionality priorities, incorporating multi-channel customer needs and functions, connecting stakeholder perspectives in the relationship matrix and (which is formally outside the scope of the field experiment, but was indicated by multiple participants:)

aiding the communication of design decisions to others after the session with the use of the relationship matrix.

## **Discussion and Conclusion**

This section addresses: limitations, generalization of findings, management implications and the overall conclusion. There are three limitations to our study we would like to discuss. Firstly, we used process measurements instead of output measurements. Hence, if we measure that MuCh-QFD significantly outperforms FE in terms of customer orientation, for example, this means that the design process has been more customer oriented, but it does not necessarily mean that the service definition output of the design session is more customer oriented. We circumvented this to some extent by performing our own subjective output comparisons. The good news is that we found that there is a strong correlation between process performance and output performance, but this finding is not as rigorous as it would have been if we had used a more objectified measurement instrument. A second limitation is that the experimental design tested the effectiveness of only part of our MuCh-QFD method. There were many similarities between the MuCh-QFD and FE groups (for example service definition structuring via the intake, use of the GroupSystems™ decision support system, and multi-disciplinary teams were similar for both groups). Still, our measurements show that the differences in design tasks were significant enough to generate different results. Thirdly, due to the nonparametric nature of our items we could not perform a factor analysis to analyze construct validity. We did perform a reliability check that was empirical in nature: to what extent do qualitative case analyses, the questionnaire measurements and the observer scores show similar results? We found that the observation scores were fully in line with the qualitative case analyses, whereas the participant questionnaire scores were deemed 'moderately reliable' for four constructs: channel coherence, channel synergy, competitor focus and progression. This means that for two or three of our sessions (either FE or MuCh-QFD), they scored either higher or lower than expected on the basis of the qualitative case analyses (and observer scores).

Next, there is the important empirical question of generalization beyond the field experiment: 'How does the performance of MuCh-QFD and FE sessions compare to 'regular' service definition processes in firms?' For this matter, we would like to recapitulate several of the findings. Firstly, the FE session process is judged by participants to be of higher quality than 'regular' service definition processes. Secondly, the FE design teams have a tendency to focus mainly on supplier interests. Thus, although FE sessions have higher than 'regular' process quality and actively involve multiple stakeholders, more often than not customer-related and multi-channel issues are left untouched. This implies that 'real world' e-service processes are likely to ignore these issues as well, which is confirmed by research across 19 'click and mortar' implementations (Simons and Bouwman, 2005). Finally, MuCh-QFD sessions perform significantly better than FE sessions on customer orientation, channel coherence and communication between stakeholder perspectives. And MuCh-QFD participants explicitly state that these are valuable contributions. Moreover, they appreciate the way the MuCh-QFD service matrix (or 'relationship matrix') helps communicate to others the choices on the basis of the various perspectives after the session is completed. This shows that the additional attention to customer and multi-channel considerations in MuCh-QFD sessions is not 'artificial', but that it has business value.

These findings have several important implications for management. They mean that in practice, even though many people pay lip service to customer orientation, it is often no more than just that. Our field experiment indicates that there tends to be a bias towards the supplier's point of view and optimizing services based on supplier priorities rather than customer or channel partner priorities.

In conclusion, the MuCh-QFD method offers a fast way to define e-services for click and mortars, to maintain balance between multiple stakeholder perspectives (including the customer perspective) and to make choices explicit. The main reason for usefulness of the MuCh-QFD

session agenda is: starting from customer priorities, explicitly connecting them to service functionality priorities, incorporating multi-channel customer needs and functions, connecting stakeholder perspectives in the relationship matrix and aiding the communication of design decisions to others after the session. Based on our experiences we believe that especially large organizations, less experienced multi-disciplinary teams and e-service initiatives that are in their earliest phases benefit most from MuCh-QFD. This is due to the high degree of structure and direction provided by MuCh-QFD, the integration of different disciplines and the speed with which initial design choices are made. From a design sciences perspective (Hevner et al, 2004), we have been able to standardize design activities across cases and experimentally show significant differences between the performance of design activities (MuCh-QFD and FE) in relation to evaluation criteria.

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**Appendix A: Items per measurement construct (questionnaire versus observations)**

<b>Questionnaire items</b>	<b>Observation items</b>
<b>1. Customer orientation: Are customer needs and customer value incorporated into the design?</b>	
<ul style="list-style-type: none"> <li>a. Five main customer needs</li> <li>b. Ranking customer needs</li> <li>c. Customer needs checked with customers</li> <li>d. Customer needs starting point of design</li> <li>e. Design choices related to customer needs</li> <li>f. Checked if e-service has added value for customer</li> </ul>	<ul style="list-style-type: none"> <li>a. Five main customer needs</li> <li>b. Ranking customer needs</li> <li>c. Customer needs linked to design choices</li> <li>d. Scores on customer needs compared to competitor</li> </ul>
<b>2. Channel coherence: Do the e-service and existing channel services provide complementary value?</b>	
<ul style="list-style-type: none"> <li>a1. Discussed existing e-services on web</li> <li>a2. Discussed existing services other channels</li> <li>b. Discussed (dis)advantages of other channels</li> <li>c. Combining channel advantages</li> <li>d. Discussed 'handovers' between channels</li> <li>e. Discussed if web reduces time needed across channels?</li> <li>f. Evaluated possible service solutions</li> </ul>	<ul style="list-style-type: none"> <li>a. Discussed existing services other channels</li> <li>b. Discussed existing e-services on web</li> <li>c. Discussed (dis)advantages of other channels</li> <li>d. Discussed if web reduces time needed across channels?</li> <li>e. Discussed 'handovers' between channels</li> </ul>
<b>3. Channel synergy: Are assets re-used across channels?</b>	
<p>Discussed if new e-service:</p> <ul style="list-style-type: none"> <li>a. re-uses existing customer relations</li> <li>b. re-uses existing brand awareness</li> <li>c. re-uses existing logistic processes</li> <li>d. re-uses existing information systems</li> <li>e. re-uses information between channels</li> <li>f. automates supplier tasks via self-service</li> <li>g. reduces the necessity to train employees</li> </ul>	<p>Discussed if new e-service:</p> <ul style="list-style-type: none"> <li>a. re-uses existing customer relations</li> <li>b. re-uses existing brand awareness</li> <li>c. re-uses existing logistic processes</li> <li>d. re-uses existing information systems</li> <li>e. re-uses information between channels</li> <li>f. automates supplier tasks via self-service</li> <li>g. reduces the necessity to train employees</li> </ul>
<b>4. Competitive positioning: Does the e-service fit the marketing strategy and improve competitive position?</b>	
<ul style="list-style-type: none"> <li>a. Explicitly placed e-service in overall marketing strategy</li> <li>b1. Discussed e-services of 1 competitor</li> <li>b2. Discussed e-services of 2 competitors</li> <li>c1. Discussed marketing strategy of 1 competitor</li> <li>c2. Discussed marketing strategy of 2 competitors</li> <li>d. Evaluate what (not) to do same as competitors</li> <li>e. Checked if e-service fits brand and communication</li> <li>f. Checked retention or win back of customers</li> <li>g. Checked financial benefits</li> </ul>	<ul style="list-style-type: none"> <li>a. Explicitly discussed e-service in overall marketing strategy</li> <li>b. Discussed e-services of competitors</li> <li>c. Discussed marketing strategy of competitors</li> <li>d. Evaluate what (not) to do same as competitors</li> <li>e. Checked if e-service fits brand and communication</li> <li>f. Checked retention or win back of customers</li> <li>g. Checked financial benefits</li> </ul>
<b>5. Progress: How much progress did the team make within the timeframe of the session?</b>	
<ul style="list-style-type: none"> <li>a. Discuss customer needs</li> <li>b. Discuss value for customer compared to competitors</li> <li>c. Discuss relationship between strategy and customer value add</li> <li>d. Discuss other customer contact points along web site</li> <li>e. Discuss the way channels work together</li> <li>f. Create alternative service solutions</li> <li>g. Discuss fine tuning of service solutions</li> <li>h. Evaluate the technical (im)possibilities</li> </ul>	<ul style="list-style-type: none"> <li>a. Did team achieve desirable result?</li> <li>b. Focused on reaching results?</li> <li>c. Team efficient?</li> </ul>

<b>6. Focused design process: Does the team remain focused, despite uncertainties or differences in opinion?</b>	
a. Decisions made together by team b. Clear to everybody which issues to discuss c. Clear to everybody what expected output was d. Structured discussions	a. Decisions made together by team b. Clear to everybody which issues to discuss c. Clear to everybody what expected output was d. Structured discussions
<b>7. Stakeholder communication: Do the various stakeholders understand each other and integrate their perspectives?</b>	
a. Agreed on customer needs as starting point b. Agreed on competitor position as starting point c. Agreed on other channels as starting point d. Agreed on consequences of customer needs e. Agreed on consequences of competitor position f. Agreed on consequences of other channels	a. Every participant's perspective clear? b. Agreed on customer needs as starting point c. Agreed on competitor position as starting point d. Agreed on other channels as starting point e. Agreed on consequences of customer needs f. Agreed on consequences of competitor position g. Agreed on consequences of other channels

**Appendix B:** MuCh-QFD output illustration (case C: Intermediary portal; importance =  $\sum$  weights x scores)

Strengths		Functions													New			Present			Direct writers			Banks																							
Price/quality		Weights													8			3			7			6																							
2 options: customer or IM initiative		Customer needs													9			5			4			4																							
The time is right		1. Price information and price benefit													9			5			4			4																							
Weaknesses		2. Comparing premiums and conditions													7			6			7			7																							
Politics: Finding partners; building scale		3. Quality product													7			7			7			7																							
Effective PR: how?		4. Quality provider													7			7			7			7																							
Slogan= 24x7 your personal advisor at home		5. Tailor-made advice													7			7			7			7																							
		6. Product information													7			7			7			7																							
		7. Insight into process													7			7			7			7																							
		8. Insight into legal process													7			7			7			7																							
		(9. User-friendliness)													8			7			7			7																							
		10. Offer me channel that I am used to													7			7			7			7																							
		11. Need for other products													6			7			7			7																							
		Importance:													80			81			122			179			135			78			156			119			66			70			70		
																		Flow chart			Maximize sales			Online ab offer & offline xy			Say: we handle it			Say: online= fast & easy			Price incentive			Other brand?											
																		(Small print)			Use known customer info			Check boxes issues & products			(Standard protocols)			Mail: online xyz, visit abc			Marketing & PR														
																		Package deal			Show package deal																										