The Role of Process Standardization in Achieving IT Business Value

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Abstract

We empirically investigate the interplay and impact of process standardization and IT intensity on business process performance in terms of efficiency, quality, control, and processing time. To this aim we surveyed the retail advisory operations of Germany’s largest banks. We find that standardization enhances efficiency, quality and control of the advisory process. Additionally, IT intensity on its own shows positive effects on efficiency and quality as well, while it leads to more customer facing time needed for a single customer. Also, the interaction effect with process standardization is relevant. We conclude that IT creates business value through facilitating process standardization and process control. Our results strongly indicate that managers have to look carefully at the type of the processes before standardizing it.

1. Introduction

Both practitioners and researchers frequently argue that standardization of business processes is desirable (e.g. [31, 32]) because it is expected to improve process efficiency and customer satisfaction, and to enable interchangeability and compliance with regulations [17].

Nevertheless, research has not yet offered a conclusive picture of the value of process standardization. In this paper, we address the following research questions: What is the impact of business process standardization on business process performance? How does IT intensity affect this relationship?

Our main goal is to explore this interplay between process standardization and IT business value.

As empirical application domain, we use quantitative data from a particular business process in the financial services industry, i.e. the financial advisory process, in order to test our hypotheses about the relationship between process standardization, IT intensity, and process performance. The results show that process standardization has not only a positive effect on process performance, but that it can act as an explanatory factor in the IT business value debate.

The remainder is structured as follows: section 2 develops the theoretical model, section 3 presents the empirical analysis, section 4 discusses the results while section 5 provides a conclusion and outlook.

2. Model Development and Theoretical Foundation

In the following, we develop our research model, as displayed in Figure 1.

Figure 1: Research Model

2.1. Process Standardization

Much has been written on process standardization, and academics and practitioners clearly associate standardization with some sort of benefit [21, 42,
48], although the impact of process standardization might differ between industries and business segments. Melville et al. [34] suggest that a better understanding of the role of process standards can link research in the areas of standardization and IS business value.

Early contributions on the importance of standards in general underline the key role that standards and standardization have played in the evolution of information and communication technology, enabling compatibility and creating network effects [15, 20, 28]. The object of process standardization is a business process, according to Davenport and Short [14] defined as a "set of logically related tasks performed to achieve a defined business outcome". Business processes consist of several sub-processes or activities that are (logically) ordered and outputs trying to achieve a defined business goal. Jang and Lee [27, p. 69] define process standardization "as the degree to which work rules, policies, and operating procedures are formalised and followed". Process standardization ultimately defines a reference standard to which different versions of the business process, e.g. running in different business units, within the firm need to conform [18]. Consequently, process standardization is both the process and the result of achieving transparency and homogenization of business processes within a firm or even across multiple firms [13]. In the following, we restrict our research to a purely inner-organizational understanding of process standardization, i.e. we only intend to investigate the effect of inner-organizational process standardization on process performance.

Standardization research has so far largely focused on data and IT standards, and there is comparatively little literature regarding the impact of process standardization. Nevertheless, researchers have shown an increasing interest in the potential value of business process standardization. In the following sections, we review the literature which led to our research hypotheses.

2.2. Impact of Process Standardization on Process Performance

Process standardization within a firm can improve operational performance and reduce processing costs by eliminating errors, by achieving economies of scale, and by facilitating communication [38, 42]. Often, firms use multiple process variants simultaneously and these variants might differ strongly with respect to efficiency, quality and cycle time. First, standardizing these variants will most likely consoli-
decisions. A clearly structured advisory interview produces investment recommendations based on a sound target asset allocation. This additional guidance within a standardized process can help employees not to miss certain elements of the data collection, which could otherwise lead to an inferior outcome of the process in terms of quality. Moreover, the advisory process involves several business units with more or less centralization (decentralized sales units, centralized back office for post-processing the advisory interview results). Process standardization helps to reduce errors, problems and conflicts occurring at the interfaces between the different business units.

In contrast to other studies, which measure process performance as a single construct (e.g. [53]) or which aggregate several dimensions into a higher-order construct (e.g. [9]), we will explicitly investigate the impact of process standardization on all three basic dimensions of process performance: process efficiency, process quality, and processing time [35].

Hypothesis H1: Process standardization will increase process performance in terms of efficiency (a), time (b), and quality (c).

2.3. Mediating Impact of Control

Using process standards not only increases efficiency by utilizing economies of scale and identifying best practice, but also reduces complexity [13, 16, 42], thus allowing better coordination and monitoring. For example, within a banking organization, it would be easier to compare the outcomes of different advisory interviews conducted by different employees if they had to follow a standardized process with standardized data to enter in a centralized information system. Thus, the standardization of the advisory process will enable improved control of advisor activities, enabling banks to manage the sales and distribution of financial products more effectively.

In their study of BPO success, Wüllenweber et al. [53] argued that process standardization leads to higher transparency, which facilitates control and contract completeness, which in turn leads to higher BPO success. Based on agency theory, we claim that this mediating effect of measurability also exists in an intra-firm context [2]. A standardized process allows an easier definition and monitoring of key performance indicators (KPIs), offering the chance to react quickly to unexpected negative changes in KPIs to keep quality, efficiency, and time at the desired levels. Process standardization leads to higher transparency, which facilitates control, and, thus, drives process performance:

Hypothesis 2: Standardization is positively related to process control.

Hypothesis 3: Control is positively related to process performance in terms of efficiency (a), time (b), and quality (c).

2.4. IT Intensity

The literature on IT usage suggests that usage explains the impact of information technology on process performance, and that the so-called productivity paradox might be caused by omission of usage variables in prior research designs [19].

Generally, there are very few studies analyzing the performance of IT investment in banking firms at all. Markus and Soh [33] examine the correlation between spending on IT and profitability in the US banking industry and find that only a small fraction of banks actually achieve clear financial benefit from spending on IT, and that the results depend on banks size. Similar results are found in the European banking market by Becalli [3]. By contrast, Davamanirajan et al. [12] and Haynes/Thompson [24] find evidence that IT creates positive productivity benefits. Focusing on the role of IT usage, Wagner et al. show that this variable is an important explanatory factor for the achievement of process performance [4, 49, 50]. In their analysis of the German banking market, they study the effect of different organizational capabilities and show that IT usage is nearly as important as business expertise for superior process performance in the banking business.

Hypothesis 4: IT intensity is positively related to process performance in terms of efficiency (a), time (b), and quality (c) as well as to process control (d).

Above, we have already argued that process standardization is facilitated by IT and that the benefits from process standardization, both in terms of efficiency and control, are more likely if the process is strongly supported by IT and if the process workflows are embedded in IT systems. Consequently, we conjecture a complementary relationship between IT intensity and process standardization, modeled as a moderating effect of IT intensity on the impact of process standardization on process performance [2].

Hypothesis 5: IT intensity will positively moderate the direct effect of process standardization on process performance in terms of efficiency (a), time (b), and quality (c) as well as the effect on control (d).
3. Analysis

3.1. Unit of Analysis

Empirically, this paper analyzes the role of process standardization and IT support for the performance of the financial advisory process in German banks. Retail banking is a highly regulated industry with largely commoditized products where process standardization is potentially beneficial. The advisory process is ideal for our research as German banks believe there is great potential for standardization and efficiency gains, and plan to significantly enhance IT support for this process in the near future [44]. The re-engineering of the advisory process is likely to be the next step in the ongoing redesign of the banking value chains where, after the back-office, banks are now beginning to industrialize their front-office activities. The financial advisory process can be divided into five phases: assessment of customer needs and goals, asset allocation, product selection, transaction and follow-up [23]. In step one, investors have to determine their current financial situation, taking into consideration not only current assets and liabilities, but also expected future cash flows. The review of the investor’s situation is completed with an assessment of individual risk aversion, investment goals and investment horizon. Step two is when the investor’s situation and goals are mapped to an individual allocation to specific asset classes (strategic asset allocation). Step three is the selection of specific securities from the asset classes (tactical asset allocation). In step four, the selected security has to be purchased or sold. In step five, the portfolio has to be monitored and adjusted regularly.

IT can contribute to the financial advisory process throughout every phase. For example, in order to systematically determine the customer’s current financial situation, a supporting technical system might visualize the customer’s current portfolio. IT supported sample portfolios might assist in the asset allocation, for instance by simulating the impact of an investment on the risk of a customer portfolio. IT can, furthermore, be a powerful tool in enabling customer advisors to permanently monitor the performance of customer portfolios. But, ultimately, the IT support of the advisory process requires individualization depending on the range of financial products offered and the customer segments of the bank [8].

3.2. Approach

To test our hypotheses, our research model has been operationalized and transferred into a structural equation model in order to be analyzed with the Partial Least Squares (PLS) approach [10].

The data for this analysis comes from a survey among the top 500 German banks conducted in the first quarter of 2007. The participating banks were chosen based on their total assets in 2006. The 500 largest banks in Germany were contacted by telephone in order to identify the head of the advisory department. The questionnaire together with a prepaid, self-addressed envelope was then mailed to the managers identified. Six weeks later, all non-responding banks were called again and encouraged to participate. After entering the data into a data base, consistency of the data was verified by a second individual.

Our survey of the top 500 German banks resulted in 65 completed and usable questionnaires, equivalent to a response rate of about 13.0 percent. The sample covers savings banks, cooperative banks and private institutions, and nearly matches the distribution in the market. Furthermore, the sample is representative of the German banking market by size of the responding banks in terms of total assets. Finally, the sample covers all federal states and thus represents banks from every region of Germany.

The survey questionnaire was designed on the basis of a comprehensive literature review and in cooperation with the leading German provider for financial market data and customized IT solutions for financial service providers. A series of interviews with top executives of the company provided a framework for identifying the range of well-known information technologies used in the financial advisory process. Furthermore, the questionnaire was pre-tested several times with various bank managers who did not later participate in the survey.

The first independent variable process standardization is measured with regard to internal business process standardization and not with respect to external industry reference processes. Therefore, we used three questions in order to assess whether the steps in a business process are mandatory, have mandatory content, and are standardized [13, 38, 42, 52, 53].

For the second independent variable IT intensity, we developed a new scale based on Powell and Dent-Micallef [41] which matches with our application domain. It identifies all (potentially) available information technologies a bank has implemented to support the financial advisory process and records the actual usage of the available technologies. Out of the 23 items regarding all information technologies in a
bank, we used 3 items about the information systems regarding the portfolio of a customer. We asked 3 questions about the existence of an IT system for different tasks in the advisory process on a multi-item scale (integrated solution; isolated application; local application; no IT support; do not know). In addition, we asked 3 questions about the same tasks on another multi-item scale (yes, very often; yes, often; no, but desirable; no, not desirable) in order to assess the intensity of the tasks supported by the IT systems.

Finally, IT intensity is measured by combining the 6 questions regarding the existence of an IT system and the use to 3 items. The items are about the possibility to access the structure of customers' portfolios, to visualize the structure of their portfolios, and to show the performance of the portfolio. So each of the 3 items represents the combined answer of the existence of an IT system and the use of it for one of the two tasks.

This study relies on self-reported IT usage, which provides an important indicator in assessing how intensively IT is used within an organization. We are aware that there are limitations to the accuracy of self-reported usage measurement [45]. We treated answers of “do not know” regarding the IT support as “no IT support”.

The dependent variable in this study is the relative performance of the financial advisory process. There are two possible approaches to measuring the level of advisory process performance across banks. First, quantitative productivity measures such as process cycle time could be used. The second option is to assess the quality of the output of this process. In this study, we combine both approaches in order to understand the impact of IT on the relative performance of this process across competing firms. As a quantitative performance measure, the survey captures the process cycle time of the advisory interview with two items on metric scales. Please note that we grouped the quantitative answers (stated in number of minutes) and coded them inversely to emphasize the “performance” aspect of the time dimension: the shorter the time, the higher the performance. Therefore, a positive influence on time means an improvement of this dimension, which results in shorter process time. The recoding leads to all three dimensions having the same orientation.

The remaining dimensions of process performance, quality and efficiency, were measured qualitatively with two formative items for each latent variable. The appendix provides a table with all indicators used.

3.3. Results

Before we present and discuss our results, we deal with non-response bias and common method bias and control for the validity and reliability of the PLS measurement models.

3.3.1. Non-response Bias and Common Method Bias

We followed Armstrong and Overton [1] by comparing the early with the late respondents in order to test for a non-response bias. To that end we divided those respondents who answered all relevant questions into two groups: (1) the first 31 respondents were treated as early respondents and (2) the last 34 respondents were treated as late respondents [29]. Comparing the questionnaires of these two groups using the Mann-Whitney test showed no significant differences for any of the items used.

Common method bias: If both the criterion variables and the predictor are taken from only one source, it could happen that the variance would originate in the measurement method instead of the constructs represented by the measure [39]. In order to cope with common method bias, Podsakoff et al. [39] suggest procedural and statistical remedies. We concentrated on procedural remedies due to countering acquiescence effects with reverse-coded items; we ensured the anonymity of respondents to offset social desirability effects; we eliminated ambiguous or complex items from our survey by using pre-tests and we used different scales for the different constructs (Likert scales, multi-item scales) including metrics, (processing times). As a “statistical remedy”, we applied Harman’s one-factor test [40], which did not produce one single factor which would account for the majority of variance of all used items.

3.3.1. Measurement Model

We tested our model based on reflective and formative measures. Hence, the PLS measurement model was examined with respect to content validity, indicator reliability and construct validity. Content validity defines the degree to which a construct reflects the supposed meaning in its measurement [6]. We ensured content validity by developing questions for indicators taken from preceding research as well as by adaptation or elimination of individual questions as a result of ambiguities found in pre-tests.

Indicator reliability deals with the linkage between an indicator and its corresponding construct. We applied PLS bootstrapping with 500 samples to
test for statistical significance [10]. Table 2 contains the loadings/weights as well as the t-values for determining their significance. As all loadings of the indicators with their respective construct are above the recommended threshold of 0.707 [26] (see Table 1) and significant at the 0.001, 0.01 or 0.05 level, indicator reliability of the tested model is ensured.

<table>
<thead>
<tr>
<th>Table 1: Indicator Loadings/Weights</th>
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</thead>
<tbody>
<tr>
<td>Construct</td>
</tr>
<tr>
<td>Process Standardization (PS)</td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>IT Intensity</td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Control</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Time</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
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<tr>
<td></td>
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<tr>
<td>Quality</td>
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</tbody>
</table>

Construct validity deals with the degree to which measurement items describe the constructs. Construct validity consists of convergent and discriminant validity [46, 47]. Convergent validity is about the internal consistency of the indicators if multiple measures are used for a single construct [26]. This is examined using composite reliability and the Average Variance Extracted (AVE). Nunnally recommends a composite reliability above 0.7 [37] and Chin suggests an AVE above 0.5 [10]. Table 2 shows that all reflectively measured constructs of our model fulfill these recommendations.

<table>
<thead>
<tr>
<th>Table 2: Convergent Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite Reliability</td>
</tr>
<tr>
<td>PS</td>
</tr>
<tr>
<td>IT Intensity</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

For the analysis of the discriminant validity we focused on two aspects. First, the square root of the AVE (shown in the shaded cells of Table 3 of every construct is greater than the inter-correlations between the latent variables. This indicates a good fit between the measurement items and their latent variables [22].

<table>
<thead>
<tr>
<th>Table 3: Correlations of Latent Variables and AVE Square Root (Shaded Cells)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
</tr>
<tr>
<td>PS</td>
</tr>
<tr>
<td>IT Intensity</td>
</tr>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Time</td>
</tr>
<tr>
<td>Efficiency</td>
</tr>
<tr>
<td>Quality</td>
</tr>
</tbody>
</table>

Second, we examined the cross-loadings between indicators and found that all indicators used in our analysis are in accordance with the required high loadings for their associated constructs, while having low loadings for the other constructs.

After having validated our measurement models, the next section analyzes the causal relationships with regard to the PLS structural model.

3.3.2. Structural Model

The results of our PLS calculation, based on the whole sample (65 cases) are shown in tables 4 and 5:

<table>
<thead>
<tr>
<th>Table 4: PLS Results: β and t-Values of Direct Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
</tr>
<tr>
<td>Process standardization</td>
</tr>
<tr>
<td>IT Intensity</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

1 Formative measures
2 Significance levels: **** p <= 0.001; *** p<= 0.01; ** p<= 0.05; * p <= 0.1
Process standardization, control and IT intensity have a strong and significant positive impact on process efficiency and quality (H1a, H1c, H3a, H3c, H4a, and H4c confirmed). In addition, IT intensity has also a positive and significant effect on efficiency (H4a confirmed). Calculating a model without control as mediator leads to reduction of R2 from .533 to .286 (efficiency), from .126 to .117 (time), and from .233 to .178 (quality). Thus, we conclude that there is a strong partial, but not a complete mediation effect, especially for efficiency. Moreover, the link from process standardization to control is positive and significant (H2 confirmed). Additionally, the moderating effects of IT intensity on the relationship between process standardization and time, quality, and control are positive and significant at the 0.1 level (H5b,c,d confirmed). Based on [11], the strength of the interaction effect has to be categorized as weak.

By contrast, the links from process standardization and control to time are insignificant (H1b and H3b not confirmed). Additionally, the direct effect of IT intensity on control (H4d not confirmed) and the moderating effects of IT intensity on the relationship between process standardization and efficiency (H5a not confirmed) are not significant (H4 and H5b not confirmed).

Interestingly, the path between IT intensity and time is significantly negative (H4b not confirmed).

### Table 5: PLS Results: β and t-Values of Interaction Effects

<table>
<thead>
<tr>
<th>PS x IT Intensity</th>
<th>Control</th>
<th>Time</th>
<th>Efficiency</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>β (t)</td>
<td>0.205 (2.263**)</td>
<td>0.226 (2.027**)</td>
<td>0.105 (0.925)</td>
<td>0.164 (1.406*)</td>
</tr>
<tr>
<td>f²</td>
<td>0.04</td>
<td>0.05</td>
<td>0.02</td>
<td>0.04</td>
</tr>
</tbody>
</table>

### 4. Discussion and Limitations

Overall, the results from our PLS calculation based on data on the advisory process of German banks seem to support the propositions claimed by this paper. Process standardization has a significant positive impact on process performance, both in a direct manner (leading to higher efficiency and quality, e.g. by achieving economies of scale, identifying best practices, etc.) and in an indirect way, mediated by facilitating control capabilities, as also shown by Wüllenweber et al. [53]. Moreover, IT positively moderates the most effects of process standardization.

But, when focusing on the details, we find some deviations from this overall picture. One of the first results which needs to be discussed is the negative link between IT intensity and the time dimension of process performance. The most likely explanation for this is that time was measured by the customer facing time of the advisory process. Since we focused on the use and existence of information systems regarding the analysis of customers’ portfolios, the use of these additional information systems in the customer advisory process is more time-consuming than when the advisor can skip this additional tasks. If the measurement model focused on other kinds of IT support in the advisory process, the results would likely change.

The insignificant path between process standardization and time can be explained analogously. Despite the fact that this relationship is not significant, it can be assumed that a standardized process requires the advisor to follow a pre-specified path through the information system when consulting the customer (accessing her portfolio structure, visualizing the structure of her portfolio, and showing the performance of her portfolio) without having the option to individualize, i.e. shorten, the data collection procedure.

Consequently, the question that arises is that of the relationship between time and the remaining dimensions of process performance: quality and efficiency. If more customer facing time was related to higher quality and customer satisfaction, the trade-off between efficiency (time as resource consumption) and quality (time as a value contributor) would have to be optimized by the banks. In the other case, if there was no positive relation, the question would arise of how customer facing time can be reduced, in order to increase efficiency and maybe even customer satisfaction. In environments with high IT intensity this has to be achieved by adapted information systems which allow for more flexibility and bypasses along the advisory process.

### Table 6: PLS Results: β and t-Values of Direct Effects of a Model without Interaction Effects

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Time</th>
<th>Efficiency</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process standardization</td>
<td>0.171 (1.452**)</td>
<td>-0.124 (1.133)</td>
<td>0.284 (3.196****)</td>
<td>0.212 (1.650**)</td>
</tr>
<tr>
<td>IT Intensity</td>
<td>0.048 (0.547)</td>
<td>-0.211 (1.957**)</td>
<td>0.092 (1.253)</td>
<td>0.199 (1.464*)</td>
</tr>
<tr>
<td>Control</td>
<td>0.120 (1.284*)</td>
<td>0.593 (7.167****)</td>
<td>0.272 (2.110*)</td>
<td>0.272 (2.110*)</td>
</tr>
</tbody>
</table>

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3 Significance levels: **** p <= 0.001; *** p <= 0.01; ** p <= 0.05; * p <= 0.1
For future research, the implication of this result would be that the type of business process investigated determines the process performance measures. It is not always about time, cost, and quality. For example, when comparing this study with [53], it becomes clear that we are focusing on a customer-oriented process at the same time as process performance to keep customer satisfaction at a high level where necessary in the long term. As modernization often goes hand in hand with high IT intensity, as our data indicates, managers should give special attention to highly flexible workflow management systems in order to allow the customization of the advisory interview with respect to the specific customer needs while it is being performed.

### 5. Conclusion

Our key finding is the positive impact of process standardization on process efficiency and process quality. The effect unfolds both directly and indirectly through the mediating effect of control. Moreover, our data revealed an unexpected relationship between the constructs themselves. Therefore, we claim that process standardization is an important complementary facet in the IT business value debate which has shown lasting recent years that complementary organizational resources and routines have to be considered in order to explain whether and how IT investment leads to higher process and firm performance [34].

Based on our results, we can draw the following managerial implications. Managers should carefully evaluate the role of time in sales processes with respect to a possible trade-off between quality and efficiency. If managers are aware that customer satisfaction is a key success factor for their sales processes, they should not try to decrease the time of the process in order to increase efficiency while sacrificing quality. Therefore, managers have to look carefully at the type of the processes before standardizing them in order to consciously optimize the three dimensions of process performance to keep customer satisfaction at a high level where necessary in the long term. As modernization often goes hand in hand with high IT intensity, as our data indicates, managers should give special attention to highly flexible workflow management systems in order to allow the customization of the advisory interview with respect to the specific customer needs while it is being performed.
6. References

IT Intensity

Our consultants can access the current portfolio structure of their customer at any time.

Construct

Time

T1 How long does the first advisory interview take with a new customer? (Duration in minutes)

T2 How long does the advisory interview take with an existing customer? (Duration in minutes)

Quality

Q1 IT support improves the quality of the financial advisory process.

Q2 The IT supported advisory process help to derive collaborative and equitable product recommendations for the customers.

E1 IT support of the financial advisory process decreases the time for the advisors to search and compile customer information.

E2 IT support of the financial advisory process enables a better monitoring of the financial advisors.

C1 IT support of the financial advisory process improves the supervision of sales and distribution.

C2 IT supported business process outsourcing (BPO): the good, the bad, and the ugly, 8th Pacific-Asia Conference on Information Systems (PACIS), Shanghai, China, 2004.

PS1 The financial advisory interview runs through mandatory process steps.

PS2 There are mandatory specifications for each process steps of the financial advisory interview.

PS3 The financial advisory interview is highly standardized.

Appendix A: Indicators used in the PLS calculation:

<table>
<thead>
<tr>
<th>Construct</th>
<th>Label</th>
<th>Indicator (fully disagree (1) ... fully agree (7); if not state otherwise) (translated from German)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Standardization</td>
<td>PS1</td>
<td>The financial advisory interview runs through mandatory process steps.</td>
<td>[13, 38, 42, 52, 53]</td>
</tr>
<tr>
<td></td>
<td>PS2</td>
<td>There are mandatory specifications for each process steps of the financial advisory interview.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PS3</td>
<td>The financial advisory interview is highly standardized.</td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>C1</td>
<td>IT support of the financial advisory process improves the supervision of sales and distribution.</td>
<td>[13, 16, 42]</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>IT support of the financial advisory process enables a better monitoring of the financial advisors.</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>E1</td>
<td>IT support of the financial advisory process decreases the time for the advisors to search and compile customer information.</td>
<td>[25, 31, 32]</td>
</tr>
<tr>
<td></td>
<td>E2</td>
<td>A standardized and IT supported advisory process improves process profitability.</td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>Q1</td>
<td>IT support improves the quality of the financial advisory process.</td>
<td>[17, 48]</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>The IT supported advisory process help derive collaborative and equitable product recommendations for the customers.</td>
<td>[7, 42]</td>
</tr>
<tr>
<td>Time</td>
<td>T1</td>
<td>How long does the first advisory interview take with a new customer? (Duration in minutes)</td>
<td>[7, 30]</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>How long does the advisory interview take with an existing customer? (Duration in minutes)</td>
<td></td>
</tr>
</tbody>
</table>

IT Intensity

I1 Our consultants can access the current portfolio structure of their customer at any time.

I2 Our consultants can visualize the current portfolio structure of their customer at any time.

I3 Our consultants can show the customer the current portfolio performance at any time.

<table>
<thead>
<tr>
<th>Construct</th>
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