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Bart van den Hooff

VU University Amsterdam, Amsterdam, Netherlands, b.j.vanden.hooff@vu.nl

Tim Vermeulen

VU University Amsterdam, Amsterdam, Netherlands, timv90@hotmail.com

Frans Feldberg

VU University Amsterdam, Amsterdam, Netherlands, j.f.m.feldberg@vu.nl

Tibert Verhagen

VU University Amsterdam, Amsterdam, Netherlands, t.verhagen@vu.nl

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MIND THE GAP: IMPORTANCE-PERFORMANCE GAPS AS DETERMINANTS OF USER SATISFACTION WITH INFORMATION SYSTEMS

Van den Hooff, Bart, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands, b.j.vanden.hooff@vu.nl

Vermeulen, Tim, Alliander NV, Utrechtseweg 68, 6812 AH Arnhem, the Netherlands, timv90@hotmail.com

Feldberg, Frans, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands, j.f.m.feldberg@vu.nl

Verhagen, Tibert, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands, t.verhagen@vu.nl

Abstract

This paper develops a new explanation for user satisfaction with IS. Combining insights from expectation (dis)confirmation theory (ECT) and importance-performance analysis (IPA), we focus on the gaps between the importance of particular IS attributes, and the performance of a system on those attributes, as an explanation for user satisfaction. We identify 12 relevant system attributes and theoretically argue how the gap between importance and performance with regard to these attributes may affect user satisfaction. Our empirical study is based on a survey (N=298) among student users of a newly implemented Student Information System (SIS). The results empirically support the relationship between importance-performance gaps and user satisfaction. For five out of 12 attributes, we find a significant negative influence of a negative gap (i.e., high importance, low performance) on user satisfaction. Our main contribution to the literature is that we provide an integrated perspective on ECT and IPA and empirically validate the relevance of importance-performance gaps for explaining IS user satisfaction. Our second contribution is that we make use of the difference score technique to measure the importance-performance gaps for user satisfaction. Thus, our contribution to the IS literature is both theoretical and methodological.

Keywords: user satisfaction, importance-performance analysis, expectation (dis)confirmation theory, information systems.

1 Introduction

In the literature on Information Systems success (e.g. DeLone and McLean 1992; 2003; Gable, Sedera and Chan 2008; Petter, DeLone and McLean 2008; Seddon 1997), the satisfaction of users with an IS is often named as a particularly critical determinant of IS success (Au, Ngai and Cheng 2008). Since the extent to which users have a positive or negative evaluation of an IS strongly determines their attitudes and behaviour, research investigating determinants of user satisfaction is very relevant for the IS community.

In this paper, we focus on *importance-performance gaps* as determinants of user satisfaction with IS. We combine insights from literature using expectancy-(dis)confirmation theory (ECT) to explain users' attitudes and behaviours towards IS, with literature using importance-performance analysis (IPA) to explain customer satisfaction. Research based on ECT focuses on the differences between pre-usage expectations of a system's performance and actual experienced performance as the main determinant of user satisfaction. In ECT-based research, the application of the expectation construct demands caution. First, there is a lack of consensus in the literature on how to define and conceptualize the expectation construct (Bhattacharjee, 2001), leading to validity debates and hampering the interpretation of results across studies (McKinney, Yoon & Zahedi, 2002). Second, most scholars in the IS discipline have adopted a rather direct approach in measuring the (dis)confirmation of expectations. Instead of measuring expectations and actual performance separately, (dis)confirmation is measured directly by asking respondents whether the actual experience of a system's performance met their pre-usage expectations of the system's performance. This direct approach may not accurately reflect how and to what extent differences between expectation and performance lead to satisfaction (Venkatesh and Goyal, 2010). Furthermore, pre-usage expectations are likely to be altered by more recent usage experiences (Irving and Meyer, 1995).

This paper responds to these issues by offering an alternative view on the idea of "gaps" as determinants of user satisfaction as put forward in ECT. Based upon IPA we focus on the gap between performance of an IS on the one hand, and the *importance* of IS attributes on the other - rather than *expectations* with regard to these attributes. IPA is an analytical technique that focuses on the evaluation of the attributes of a service (or product) in terms of importance and perceived performance (Martilla and James 1977; Matzler et al. 2004). Our aim is to explore to what extent the gaps between actual importance and performance of IS attributes may serve as an explanation for user satisfaction. Although the idea of importance-performance gaps has been used by a few IS scholars before (e.g. Ainin & Hisham, 2008; Skok et al., 2001), it has (to our knowledge) not been integrated with ECT, nor has it been used to explain user satisfaction with IS. Hence, our aim is to contribute to the IS literature by answering the following question:

"To what extent do gaps between the importance that users attach to selected attributes of an IS, and the actual performance of an IS on these attributes, influence user satisfaction with an IS?"

Our main contribution to the literature is that we systematically apply IPA in the IS domain, and empirically validate the relevance of importance-performance gaps for explaining IS user satisfaction. As such, we aim to deal with the aforementioned limitations of using user expectations in gap-analysis and provide the IS community with a valuable alternative. Our second contribution will be that we make use of the difference score technique to measure the importance-performance gaps between three categories of system attributes (containing a total of 12 attributes). To the best of our knowledge, we are amongst the first to use this technique in the domain of IS user satisfaction. Thus, our contribution to the IS literature is both theoretical and methodological.

2 Theoretical Framework

2.1 IS Attributes

In order to be able to assess an IS in terms of importance and performance, we first need to identify the attributes that can be relevant to explaining user satisfaction with IS. A broad survey of the literature yielded 12 different attributes, grouped into three distinct categories: (1) information quality, (2) system design, and (3) system functionality.

Information Quality represents measures of the output of an IS (Pitt, Watson and Kavan 1995). This aspect is related to the faith that users have in the information a system provides. The content of the system should be complete, relevant and up-to-date (DeLone and McLean 2003) in order to satisfy the users. The following attributes are distinguished within this category:

- *Accuracy*: The degree to which information in the system is correct, meaningful and consistent (Nelson, Todd and Wixom 2005). Errors in the data lead to a generally poor perception of the quality of a system (Everard and Galletta 2006).
- *Completeness*: The extent to which all possible states relevant to the user population are represented in the stored information (Nelson, Todd and Wixom 2005).
- *Relevance*: The extent to which the information provided by the system is relevant to the user. If, for instance, the IS provides too much information, a large part of which has direct no value for the user, satisfaction is likely to be lower (Petter et al. 2008).
- *Timeliness*: This attribute refers to the information in the system being up-to-date (Nelson, Todd and Wixom 2005). In case the data in the system or displayed by the system is not sufficiently updated, users will be less satisfied with a system (Petter et al., 2008).

System Design refers to the ‘front-end’ that users see and interact with, which significantly influences system use (Nelson et al. (2005). Most present-day IS are web enabled and use browser software to interact with the system, which makes it appropriate to use website evaluation criteria to evaluate the design of an information system. The following attributes are related to design:

- *Ease of Use*: Previous empirical evidence has shown that perceived ease of use is one of the major determinants for technology adoption (Davis et al. 1989). This attribute indicates how well users are able to adapt to the system and know how it works.
- *Navigation*: This attribute refers to the ease with which users are able to search the various system forms in order to find the information they require, the extent to which they are able to “find their way” (Whyte, Bytheway and Edwards 1996).
- *Constraint Control* : The extent to which the IS provides control mechanisms on the actions that the users perform in the system, to prevent them from making mistakes, such as checks on the input, change and deletion of information in the system (Whyte, Bytheway and Edwards 1997).
- *Appearance*: The way information is presented on the screen including the lay-out of the pages and the impression it makes on the user. User satisfaction with a system is affected positively if there is a balanced and consistent implemented design scheme (Everard and Galletta 2006; Jarvenpaa 1989; Lim, Benbasat and Todd 1996; Todd and Benbasat 1991).
- *Consistency*: The extent to which the user feels that the system shows a consistent face (Bailey and Pearson 1983). This attribute is about the coherent look and feel of the system throughout different parts and functions, as experienced by the user.

System Functionality refers to the system being able to perform various processes to fulfill the needs of the users (Clegg et al. 1997). The system’s effectiveness or usefulness, seamless integration of different components and availability are part of this aspect.

- *Effectiveness*: Effectiveness is the capability of the system to produce a desired result for the user and is therefore closely linked to usefulness (Venkatesh and Davis 2000). It focuses on how well the system operates and executes tasks in the view of the user (Whyte et al., 1997).

- *Integration*: Bailey and Pearson (1983) describe this attribute as the ability of systems to transmit data between (sub)systems. This attribute concerns users' perceptions on how well these different applications are integrated with each other and presented as a unified system (Whyte, Bytheway and Edwards 1997).
- *Availability*: The provision of a dependable service, on which users feel confident to rely (Zeithaml et al. 1990). This attribute is closely related to server uptime, webpage loading time and availability of functions of the system (Petter, DeLone and McLean 2008; Bailey and Pearson 1983).

2.2 User Satisfaction

User satisfaction is defined as “an end-user’s overall affective and cognitive evaluation of the pleasurable level of consumption related fulfillment experienced with an IS” (Au, Ngai and Cheng 2008, p. 46). A considerable body of research has identified user satisfaction as an important element of IS success. Since it is strongly related to users’ willingness and ability to use information systems, user satisfaction is a strong determinant of intended, actual and continued use of IS (Au et al. 2008; Bhattacharjee, 2001; Iivari 2005; Hong, Thong and Tam 2006).

In explaining the determinants of user satisfaction, IS researchers have often used insights from expectancy-(dis)confirmation theory or ECT, where the differences between pre-usage expectations of a system’s performance and actual experienced performance are seen as the main determinants of the level of user satisfaction (Bhattacharjee 2001; McKinney et al., 2002; Remenyi and Money 1991). Although these studies provided valuable insights into how IS performance influences user satisfaction, some objections have been raised against comparing expectations and performance. Shaw, DeLone and Niederman (2002), for instance, contend that asking respondents for their expectations “builds in some measure of accommodation for their actual prior experience” (p. 43). In other words, negative prior experiences may lead to lower expectations, and positive prior experiences to higher expectations. Hence, the gap between expectations and performance may be artificially small, and may not necessarily give a reliable indication of the difference between what ought to be and what is.

In this study, we draw upon Abalo, Varela and Manzano (2007) in focusing on the gap between importance and performance instead of the one between expectation and performance. This connects to literature using IPA to explain customer satisfaction. IPA is an analytical technique that entails the evaluation of a service or product. This evaluation is based on selected attributes of the product or service in terms of each attribute’s importance to the consumer and its perceived performance (Azzopardi and Nash, 2012). By comparing importance and performance scores, service or product attributes can be identified on which an organization should focus to achieve customer satisfaction: primarily on those attributes where importance is high, and performance is low. If both importance and performance are high, the organization should “keep up the good work”, and in the case of low importance and high satisfaction, there may be “possible overkill”. Finally, when both importance and satisfaction are low, there is low priority (Matzler et al. 2004; Magal, Kosalge and Levenburg 2009; Skok, Kophamel and Richardson 2001).

Skok et al.’s (2001) study is one of the few examples of applying IPA in order to diagnose IS success. In line with most importance-performance studies, however, Skok et al.’s (2001) analysis remains descriptive. Typical importance-performance studies identify important attributes on which to focus, but do not use the gap between importance and performance to explain satisfaction. In this study, we take this step. Analogous to consumer behavior literature on service quality that posits gaps between expectations and performance as determinants of consumer overall evaluations (e.g. Parasuraman, Zeithaml and Berry, 1985; 1994), we propose importance-performance gaps as determinants of satisfaction. The logic for this proposition is derived from adaptation-level theory (Bowling, Beehr, Wagner and Libkuman, 2005). Following this paradigm consumers use a subjective standard when experiencing a stimulus. Such a standard can be prior experience, an expectation or, as posited in this

paper, the personal importance attached to a stimulus. The gap between the experience and the standard (here: personal importance) is assumed to influence overall evaluations (cf. Brown and Schwarz, 1989) and consumer satisfaction in particular (Bowling et al., 2005; Oliver, 2010).

Our central assumption is that for each of the system attributes identified above, the gap between importance (as rated by the user) and performance (as rated by the user) will determine the level of satisfaction of the user with the IS. Thus, we expect that user satisfaction with an IS is determined by the gap between the importance and performance of the IS as rated on the various attributes discussed before. When importance on a specific attribute is rated higher than performance, there is a negative gap. We expect such a negative gap to negatively influence user satisfaction. A positive gap, however (performance being rated higher than importance), will positively influence user satisfaction. This leads to the research model presented in Figure 1.

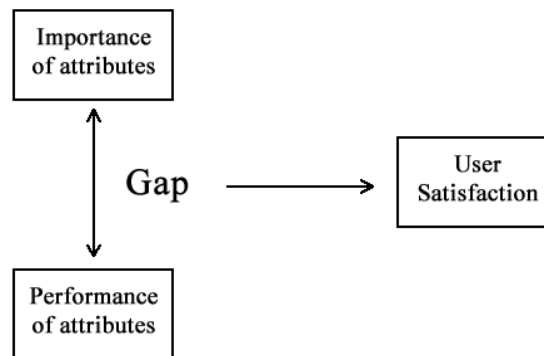


Figure 1. Research model.

3 Method

3.1 Study site

Our empirical study took place at a Dutch University, where a new Student Information System (SIS) had been implemented. The system go live was on March 28, 2011, just before a new semester started. At the end of this semester, two months after the implementation (May 30, 2011), a survey was conducted among students to measure their evaluation of this new system. In the two months preceding this survey, system use had been mandatory for students, since they had to go through all the steps in the usual process in a semester using the new SIS (from course registration to enrolling for exams, to checking their grades). The new SIS was based on SAP Student Life Cycle Management. The student side of this system was approached through a web browser and provided students with their own specific information about grades, enrollments and relevant updates. For staff, the new SIS provided support in their management of student information throughout several processes: recruitment, admission, registration, assessment, progression and graduation. Previously students had to access several different systems, whereas the new system provided them with one central point of access.

3.2 Research Design

A survey was sent out among students from five of the twelve Faculties at the University. Participation in the research study was completely voluntary. An email was sent through group email addresses to approximately 4,000 students at these Faculties. The email consisted of a request to participate in a study concerning the new SIS, and a link to an online survey.

The data collection effort yielded 298 responses, a response rate of about 7.5%. From these responses, 241 (80.9%) were from Economics and Business Administration, 29 (9.7%) from Human Movement Sciences and the 28 responses came from Philosophy and Theology (4.4%), Social Sciences (3.8%), and Law (0.2%). This means that the sample cannot be considered to be representative of the University's student population. However, since our research is aimed at method / context extension (Berthon et al., 2002), applying a new method to use an existing theory (IPA) in a new context (IS user satisfaction), generalizability of findings is not a primary aim. We will more elaborately discuss this issue in the limitations section of this paper.

The survey contained 12 statements, with each statement related to one of the 12 IS attributes identified previously in this paper. First, respondents were asked to indicate how important they thought a particular attribute was in an information system. Then, the same 12 statements were rated on system performance. The statements used to measure the attributes were based on the literature discussed in the previous section, particularly Remenyi and Money (1991), combined with seven exploratory interviews with students using the system. Perceptions of both importance and performance attributes were measured on 4 point scales: for importance, 1=Irrelevant, 2=Not important, 3=Important and 4=Critical, and for performance 1=Very poor, 2=Poor, 3=Good and 4=Excellent. Following common procedures in IPA the unit of the gap analysis is the single IS attribute. The gap is calculated by subtracting the scores on importance from the scores on performance. The largest negative gap is rated as the most important one, with the largest positive gap as the least important one. The level of satisfaction with the system was measured using a 7-point scale on four items, based on Hong et al. (2006) and Verhagen et al. (2011). Respondents were asked how they experienced their overall experience with the system, from 1=Very dissatisfied to 7=Very satisfied. Cronbach's alpha for this scale was 0.96, indicating a very high reliability¹.

System use varied from once a month (20% of the respondents), to weekly (51%) to daily (29%). Almost all (99%) of the students had at least one year experience with an SIS and thus knew what to expect of an SIS when they filled in the survey. To assure that the data do not suffer from common method bias (Podsakoff, MacKenzie, Lee and Podsakoff, 2003), we conducted Harmon's single-factor test before proceeding with the analysis. An Exploratory Factor Analysis (EFA; principle components) was run for all items in the survey. The results indicated that this was unlikely to be an issue as the EFA resulted in multiple factors, the largest factor accounting for 26.7% of the variance.

4 Results

4.1 Attribute Importance

Table 1 shows the mean scores of the ratings on importance given by the respondents on each attribute. The standard deviation is also shown in the table, indicating the consensus of the users on a particular score. The relative rank is included to show which attributes the users find most and least important.

Attribute	Rank	Mean	SD
Accuracy	1	3.64	0.56
Completeness	2	3.61	0.57
Timeliness	3	3.56	0.61
Effectiveness	4	3.53	0.62
Availability	5	3.46	0.66
Ease of Use	6	3.29	0.71
Navigation	7	3.26	0.68

¹ The items used to measure these variables are available on request.

Relevance	8	3.04	0.70
Integration	9	3.04	0.70
Constraint Control	10	2.98	0.75
Consistency	11	2.68	0.85
Appearance	12	2.51	0.75

Table 1. Attribute importance.

Table 1 shows that users perceive Accuracy, Completeness, Timeliness, Effectiveness and Availability to be the most important attributes of an SIS. The ranking shows that the design attributes are perceived as least important.

4.2 Attribute Performance

Table 2 shows the mean scores of the ratings of performance given by the respondents on each attribute.

Attribute	Rank	Mean	SD
Consistency	1	2.97	0.74
Appearance	2	2.74	0.78
Integration	3	2.58	0.84
Relevance	4	2.57	0.77
Availability	5	2.49	0.82
Ease of Use	6	2.48	0.92
Constraint Control	7	2.40	0.70
Navigation	8	2.37	0.86
Accuracy	9	2.34	0.79
Effectiveness	10	2.33	0.91
Completeness	11	2.19	0.87
Timeliness	12	2.17	0.92

Table 2. Attribute performance.

Table 2 shows quite a different ranking from table 1, with Consistency and Appearance scoring highest on performance (both of which were at the bottom of the importance ratings), and Accuracy, Completeness, Timeliness and Effectiveness (the top-four in terms of importance) exhibiting the lowest scores in terms of performance. This clearly hints at the existence of importance-performance gaps, which will be further explored below.

4.3 Importance-performance Gaps

Table 3 shows the gap between importance and performance scores for each of the attributes of the SIS.

Attribute	Rank	Gap
Completeness	1	-1.42
Timeliness	2	-1.39
Accuracy	3	-1.30
Effectiveness	4	-1.20
Availability	5	-0.97
Navigation	6	-0.89
Ease of Use	7	-0.80
Constraint Control	8	-0.58
Relevance	9	-0.47
Integration	10	-0.45
Appearance	11	0.24

Consistency	12	0.29
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Table 3. Importance-performance gaps.

Gaps were computed by subtracting importance scores (from 1 to 4) from performance scores (from 1 to 4). Hence, a negative gap indicates that the importance score is higher than the performance score, whereas a positive gap means that the performance score is higher than the importance score. As importance-performance analyses tend to conclude that efforts to improve customer satisfaction should focus on the area where importance is high and performance is low, attributes showing a negative gap are considered the focal attributes in our analysis. Therefore, the largest negative gap is rated as the most important one, with the largest positive gap as the least important one.

Most attributes have a negative gap, except for appearance and consistency, which are the attributes that are seen as the least important by respondents. The average gap is -0.75, which indicates that the overall perception that respondents have of the system is that performance scores lower than importance. The largest gaps are found for the attributes Completeness, Timeliness, Accuracy and Effectiveness.

4.4 Gaps and user satisfaction

On the user satisfaction scale, the mean score was 3.39 with a standard deviation of 1.41. This mean score is below the scale median of 4, which suggests that generally speaking, users are slightly dissatisfied with the IS. In order to determine the extent to which user satisfaction is influenced by the importance-performance gaps discussed above, a regression analysis was conducted with user satisfaction as dependent, and the 12 gap scores from table 3 as independent variables. Before interpreting the results we verified whether the regression analysis had not been subject to collinearity. Following Hair, Black, Babin and Anderson (2010) we first studied the correlation matrix for the independent variables, that is, the 12 gaps. As no correlations of 0.90 and higher were found (the highest correlation being 0.63), a first indication for the absence of collinearity was revealed. We then computed the Variance Inflation Factor-scores (VIF-scores). As the highest VIF score was 1.99, clearly below the cutoff value of 10 (Hair et al., 2010), we concluded that multicollinearity had not been an issue.

We continued with the regression analysis. The importance-performance gaps were found to explain a significant proportion of the variance in user satisfaction: Adj. $R^2 = .46$, $F = 21.49$ ($p < .001$). Table 4 shows the beta scores and significance for each attribute's importance-performance gap. Attributes are again ordered by gap size (as in table 3), with the largest negative gap on top and the largest positive gap at the bottom.

Dependent: user satisfaction	Beta
Completeness	-0.12*
Timeliness	-0.10†
Accuracy	-0.26***
Effectiveness	-0.19**
Availability	-0.07
Navigation	-0.19**
Ease of Use	-0.06
Constraint Control	0.04
Relevance	0.01
Integration	-0.03
Appearance	0.03
Consistency	0.10

† = $p < .10$; * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 4. Results of regression analysis.

Table 4 shows a number of significant relationships between importance-performance gaps and user satisfaction. All significant relationships concern attributes (Accuracy, Completeness, Timeliness (which is only significant at the $p < .10$ level), Navigation and Effectiveness) that have a negative influence on user satisfaction. This means that an increase in gap size results in less overall satisfaction. Also, the attributes with a significant influence are generally the ones with the larger negative gaps, which is a relevant finding: those attributes that tend to have the highest negative discrepancy between performance and importance, are also the ones exerting the strongest negative influence on user satisfaction.

5 Discussion

The results of our study empirically support the relationship between importance-performance gaps and user satisfaction. For five out of 12 attributes, we find a significant negative influence on user satisfaction. These five belong to the six attributes with the largest negative gaps (high importance, low performance): Accuracy, Completeness, Timeliness, Navigation and Effectiveness. Translating this to the level of categories of attributes, we see that Information Quality is the most important category here, since three out of these five attributes (Accuracy, Completeness and Timeliness) are part of this category. The other two categories are relevant as well, since both System Design (Navigation) and System Functionality (Effectiveness) contain attributes for which a negative importance-performance gap has a significant negative influence on user satisfaction.

These results are in line with, but also contribute to, one of the central tenets of importance-performance analyses: the area where there is high importance coupled with low performance, is the area that is designated with the term “concentrate here” (Skok et al. 2001). Our results indicate that such “negative gaps” are indeed the most relevant gaps in terms of user satisfaction, since these are the gaps that mainly influence satisfaction of users with an IS.

Although we found support for the influence of five importance-performance gaps on user satisfaction with IS, we did not find such support for the other seven gaps. We distinguished one other attribute for Information Quality (Relevance), four other attributes for System Design (Ease of Use, Constraint Control, Appearance and Consistency) and two others for System Functionality (Integration and Availability) for which we did not find a significant influence of an importance-performance gap. This does not mean, however, that these attributes are not relevant: other than for Navigation (System Design) and Effectiveness (System Functionality), these attributes generally scored quite low on importance and relatively high on performance, and the gaps found between importance and performance were generally not very large. Hence, in this particular case these attributes may not have been very relevant, but that certainly does not mean that they will not be relevant in other cases – where the balance between importance and performance for these attributes may be very different. The only attribute for which the above does not completely hold is Availability: this shows a larger negative gap between importance and performance than Navigation, but this gap is not found to significantly influence user satisfaction.

In general terms, however, the attributes distinguished in this paper are relevant aspects on which to investigate the gap between importance and performance. Distinguishing these twelve attributes is a relevant contribution to the IS literature, providing a clear framework for the evaluation of IS by users. Within these categories, System Design is a category that has received relatively little research attention, but is a relevant factor determining user satisfaction. A second contribution of our paper is a methodological one: letting users rate both importance and performance in terms of these twelve attributes provides input for a valid measurement of the gaps between both. Using these gaps as independent variables explaining user satisfaction, in turn, provides a convincing explanation of user satisfaction (explaining 46% of the variance in satisfaction). This explanation is not only convincing in terms of statistics, however, but also in terms of the theoretical mechanisms underlying it. Using importance-performance gaps seems to be a valid alternative for using expectancy-performance gaps as explanations for user satisfaction. As Shaw et al. (2002) note, “importance” seems to lead to a more

accurate assessment of the required performance of a system than “expectation”, since such an expectation is likely to include at least some degree of previous experience with a similar system (in a broad sense) on a particular attribute. Incorporating previous experiences into expectations may lead to artificially small gaps, whereas “importance” is a characteristic that can be considered independent of previous experiences and thus can be argued to lead to a more “realistic” measure of the gap between what is desired and what is delivered.

For practice, the use of importance-performance gaps can be relevant as well. This method provides a relatively simple way of measuring both importance and performance of relevant attributes, and can be used to identify the attributes on which IS management should focus in their efforts to improve performance – these would be the attributes with the largest “negative gaps”. By improving performance, a negative gap can be decreased, or even turned into a positive one, thus increasing user satisfaction with the IS. In the case of the Dutch University, management would be best advised to focus on improving Information Quality, but also on Navigation and Effectiveness. Also, when implementing a student information system, student satisfaction should be one of the primary concerns. This group will be one of the main user groups (certainly in size). Students, as users, should be more involved in the system implementation process in order to better understand how the SIS can effectively be improved. Managers implementing an SIS should look for ways to incorporate student evaluations in their decision making processes.

Finally, like all studies, this one has its limitations. First, the specific focus of our study (an SIS, evaluated from the students’ perspective, within one University, with respondents who mainly come from one Faculty) limits the extent to which our findings can be generalized. As mentioned in the methods section, however, in a study such as this one which primarily aims at a methodological contribution, “concerns about representative samples may be sacrificed in favor of addressing threats to internal validity” (Greenberg, 1987, p.158). Especially concerning the evaluation of the validity of the measuring instruments developed in this study we find that homogeneity outweighs representativeness. Second, system use was mandatory in our research setting. Prior studies (e.g. Venkatesh and Davis 2000) showed that usage setting (voluntary versus mandatory) influences usage behavior. Finally, the moment at which our data were collected (two months after implementation of the system) may have led to particular results, since the balance between importance and performance for relevant attributes might have been different in another phase of the process. In terms of Markus and Tanis’ (2000) ES Experience Cycle, our study clearly took place in the “shakedown” phase. This is the phase in which the organization “is coming to grips with” the information system, a phase characterized by much possible turmoil that ends with the system being integrated in “normal operations”. On the one hand, this is a very interesting and crucial phase to study user satisfaction in. On the other, it also means that our findings are typical for this phase, and that a replication of our study in the “onward and upward phase” is called for. In conclusion, in order to further determine the value of our approach, future research should apply the analysis of importance-performance gaps in different settings. A more longitudinal approach would be valuable here as well, to determine whether the balance between importance and performance, and the influence of this balance on user satisfaction, will indeed be different in different phases of the process of IS implementation and incorporation. Applying importance-performance gap analysis in a variety of organizations and for a variety of IS and in different phases of the process will be valuable in further validating and enriching the approach outlined in this paper.

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