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Providing information and enabling transactions: which website function is more important for success?

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Creating Tomorrow

PROVIDING INFORMATION AND ENABLING TRANSACTIONS: WHICH WEBSITE FUNCTION IS MORE IMPORTANT FOR SUCCESS?

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ABSTRACT

In this study, we propose and test a chain of effects from website content, through informational and transactional success to overall website success and company performance. This framework enables us to determine the relative importance of the informational and transaction-related website functions for website success, and to show how website functions, through a number of intermediate performance measures, contribute to the financial performance of a company. The results are based on an empirical study of 380 companies across a wide range of industries. We find that both the informational and the transaction-related website functions have a significant positive impact on website success, but that the impact of the informational function is considerably larger. Our results show that firms can improve website performance through providing relevant website functions throughout the entire customer purchase process. An important result of our study concerns the mediating role of customer performance: customer performance in terms of e.g., customer satisfaction and retention, is a necessary condition for website success to result in financial performance. The chain of effects shows that firms profit from websites that are designed to meet customer needs and wants.

Keywords: Website success; Informational and transaction-related website functions; Company performance

1. Introduction

Companies are making large investments in their online businesses [DMA, 2013]. Not all website investments, however, lead to increased performance [Auger, 2005; Xue et al., 2006] and the search for ways to make the Web profitable is therefore still on. Commercial websites will have to provide high-quality information to meet customer needs at different stages of the customer purchase cycle [Flavián-Blanco et al., 2010]. Therefore, websites may offer different functions to customers related to providing information and/or enabling transactions [Otim and Grover,

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2006]. Hence, insights are needed on the link between website design features, website functions and finally website performance and firm performance [Mahmood et al., 2004].

Firms vary considerably in their use of e-business [Hsu et al., 2006]. As previous research suggests, a crucial factor for explaining differences in performance could be the extent to which a company uses a website for informational and/or for transactional purposes [Geyskens et al., 2002; Lee and Grewal, 2004; Mithas et al., 2006-7; Teo and Pian, 2004]. Although each website has an informational function, the extent to which this function is implemented in the site varies considerably, from providing only basic information about the company to extensive information about both the company and the specification and possible uses of its products. Similarly, the extent to which sites support transactions varies considerably. Previous research links web functions directly to customer and organizational performance measures. Otim and Grover [2006] found customer-perceived web-based service dimensions to influence repeat purchase intention. Saeed et al. [2002-3] found that web functions are related to business performance. In a subsequent study, Saeed et al. [2005] find the relationship between web functions and long-term financial performance to be mediated by short-term financial performance measures. However, the relationship between web functions and performance measures may be more indirect than these studies suggest.Conceptually, there is a large gap between operational marketing actions such as deciding about the characteristics of a web site, and organizational goals such as market share and ROI. Differences occur for instance in terms of time perspective, and different variables may act as mediators. Therefore, we follow previous studies that use a chain-of-effects model (e.g., [Rust et al.,2004; Rubera and Kirca, 2012]). We disentangle the chain of effects between website features and company performance, and suggest that website functions influence a company's financial performance through their effects on website success and customer performance. We thereby focus on two core web functions: informational and transaction-related functions [Young and Benamati, 2000; Otim and Grover, 2006; Hernández et al., 2009].

By proposing and testing the chain of effects from web site functions to company performance, we provide new theoretical and empirical insights into the relative importance of the informational and transaction-related function of company websites. Our study makes three important contributions. First, by establishing the chain of effects we link website design features through a number of intermediate performance measures ultimately to the financial performance of a company. Second, we are able to determine the degree to which the presence of informational and transaction-related content in a website results in success in the informational and transaction-related domain. Third, we determine the relative importance of success in the informational and transaction-related functions for overall website success. By empirically validating the links in the chain of effects, using a sample of 380 companies, we provide important arguments for the e-commerce accountability debate.

The paper is organized as follows. In section 2 we present our conceptual model and introduce the main constructs and hypotheses. After that, we describe the research design in section 3, including data collection and data analysis. In section 4 we present the results. We conclude in section 5 with a discussion, managerial implications and limitations.

2. Conceptual framework

2.1. Conceptual model: a chain of performance measures

Establishing the (indirect) link between website functions and company performance is necessary to justify e-commerce investments [DeLone and McLean, 1992, 2004; Dutta and Roy, 2004]. In order to establish this relationship, we propose the chain of performance measures displayed in Figure 1. In this way, we relate relevant success measures on varying levels to each other. We start the chain of website performance measures by assuming that the degree to which informational and transaction-related functions are present in websites influences the performance in the informational and transaction-related domain. Next, the model assumes a relationship between informational website success and transactional website success on the one hand and overall website success on the other hand. Overall website success in turn influences company success, where we distinguish between customer performance and financial performance (e.g., [Kirca et al., 2005]). We will now elaborate on the constructs and formulate hypotheses.

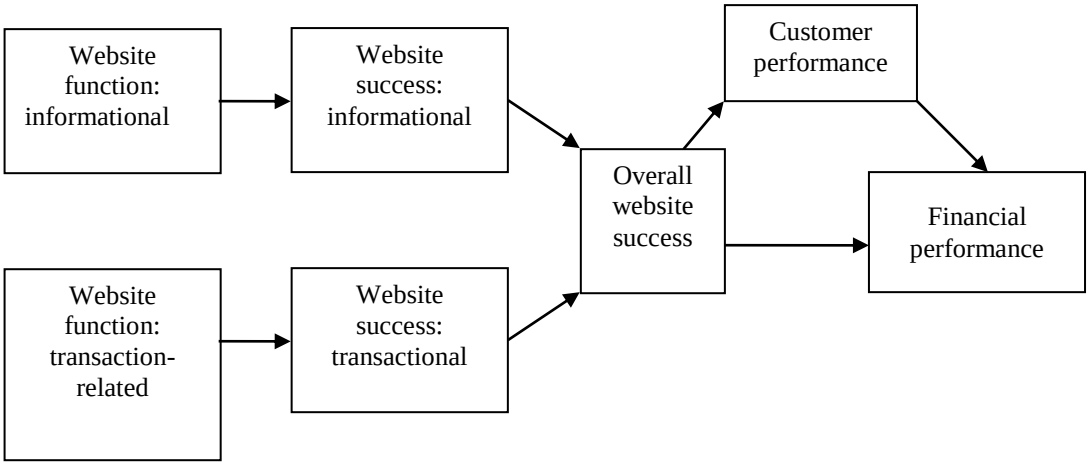

Figure 1. Conceptual framework.

2.2. Informational and transaction-related website functions

It is often stated that only websites developed to meet customer needs and wants will survive and prosper [e.g., Huizingh, 2002b; Luo and Seyedian, 2003-4]). Site visitors may be driven by different needs, such as finding pre-purchase information about products, finding information about the use of a product, ordering products, or contacting the organization. The website should serve as a support tool for customers in the different stages of their purchase process [Lu et al., 2012]. Thus, knowledge of the customer purchase decision process should drive the design of a website [Huizingh, 2002a]. To understand the stages that customers go through in acquiring a product, the consumer decision-making process literature presents various models (e.g., [Engel et al., 1995; Howard, 1977]). In the context of electronic commerce the customer service life cycle (CSLC) framework has often been used [Huizingh, 2002b; Saeed et al., 2002-3; Saeed et al., 2005]. The CSLC model [Ives and Learmonth, 1984; Ives and Mason 1990] covers the stages of requirement, acquisition, ownership and retirement. Since we focus on the website's customer support in the purchase and usage process, we leave the retirement stage outside the scope of this study. Following Ives and Learmonth [1984] and Ives and Mason [1990], we further specify the CSLC-stages into activities related to considering, buying and using products or services (see Table 1). The pre-purchase stage of requirement consists of the activities of need identification, supplier selection and product selection. In the acquisition stage, customer activities include ordering, paying, obtaining the product and monitoring the order progress. Activities in the post-purchase stage of ownership concern learning how to use the product, maintaining and/or repairing the product, giving feedback and participating in loyalty schemes. Each stage in the CSLC can be linked to specific supplier tasks, as displayed in Table 1, and – if performed through a website – to specific website functions.

We build on extant e-commerce literature (e.g., [Mithas et al., 2006-7; Teo and Pian, 2004]) by focusing on informational and transaction-related website functions. We define the informational website function as the degree to which a website supports customer activities in the pre- and post-purchase stages of the buying process, while the transaction-related function refers to the degree to which a website supports customer activities in the acquisition stage, the stage in which the actual buying takes place. Website functions are operationalized in features that define the possibilities of the website and that are either present or absent in the firm's website. The informational website function includes website features that enable customers to search and evaluate products and services and to acquire and/or exchange information with regard to product use. This function therefore relates to website features that support the customer activities belonging to both the requirement stage and the ownership stage of the CSLC. The transaction-related website function refers to website features that enable customers to perform and monitor transactions. We develop scales for measuring the website functions. We will elaborate on this in section 3.2.1.

Table 1. Customer service life cycle stages, success measures and website functions.

Customer service life cycle stages	**Customer activities**	**Supplier tasks/ Website success measures** *The degree to which the website is successful in each of the stages:*	**Website functions**
Pre-purchase: Requirement	1a. Need identification 1b. Selecting an appropriate supplier 2. Selecting an appropriate product/service	1. Image building 2. Assisting customers in selecting products	Informational
Acquisition	3. Ordering 4. Paying 5. Obtaining the product/service 6. Monitoring the delivery process	3. Online ordering 4. Online payment 5. Online delivery 6. Order progress update	Transaction-related
Post-purchase: Ownership	7a. Learning/Using the product/service 7b. Maintaining/repairing the product 8a. Giving feedback/ issuing complaints 8b. Participate in loyalty schemes	7. After-sales services 8. Strengthening relationships with customers	Informational

2.3. Website functions and success

Website success is relevant from both a customer and a supplier perspective. While the customer perspective is important because customer perceptions determine online customer behavior [DeLone and McLean, 2004; Loiacono et al., 2007], the supplier perspective provides insight into the economic contribution of the Internet to the firm and the justification of e-commerce investments [Dutta and Roy, 2004]. Several studies explored the link between website functions and company performance. Coelho et al. [2003] and Biyalogorsky and Naik [2003], for example, investigated the impact of the transaction-related website function on company performance. Also, the effect of the informational function on success has been studied [Deleersnyder et al., 2002; Geyskens et al., 2002]. Moreover, Lee and Grewal [2004] considered retailers that adopted the Internet through the impact of the speed of adoption on Tobin's Q, a stock-based measure of firm performance. They found that faster adoption of the Internet as a communication medium enhances performance, but adoption for transaction-related functions had no effect, except for firms with preexisting catalog operations.

We disentangle the effect of website functions on company performance into a chain of effects. The first step concerns the relationship between the presence of specific features in the website and the website's success in a specific domain. The more a website fulfills the supplier tasks that support the customer's needs in his/her specific stage in the purchasing process, the more successful the website is in supporting his/her process. We therefore hypothesize a positive relationship between the degree to which features related to a website function are present in a website and the degree of success in the corresponding domain:

***H_1**: The degree to which an informational function is present in a website positively influences informational website success.*

***H_2**: The degree to which a transaction-related function is present in a website positively influences transactional website success.*

Most research on website and company success considered either the informational or the transaction-related functions. However, in practice most websites are likely to have different degrees of both information and transaction richness [Mithas et al., 2006-7]. Therefore, we determine the extent to which each web function affects overall website success. Overall website success is defined as the degree to which the website achieves its overall objectives, e.g., in terms of attracting customers and strengthening the competitive position. Hence, it reflects the extent to which the website is considered a useful instrument to interact and transact with the company's customers. Both the informational and the transaction-related website function contribute to the overall success of the website,

although their relative contribution may differ [Liang and Lai, 2002]. Our conceptual framework captures these relationships and allows for different contributions.

***H3**: Informational website success positively influences overall website success.*

***H4**: Transactional website success positively influences overall website success.*

2.4. Overall website success and company performance

Company performance may be measured in both customer-related measures and financial measures (e.g., [Kirca et al., 2005]). Customer performance refers to the degree to which a company is successful in satisfying and retaining customers. Financial performance reflects the company's success in reaching sales growth and profit. Websites that successfully assist customers in going through the various stages of the customer service life cycle are expected to enhance both customer performance and financial performance. This is in line with previous studies showing that websites can contribute to customer satisfaction [Wade and Nevo, 2005-6] and financial performance [Zhu and Kraemer, 2002]. However, following other researchers in the field of customer related performance (e.g. [Goméz et al., 2004; Rust et al., 2002]) we expect that customer performance influences financial performance. Hence, the overall website success has an indirect influence (mediated by customer performance) on financial performance. We hypothesize:

***H5**: Overall website success positively influences customer performance.*

***H6**: Customer performance positively influences financial performance.*

***H7**: Overall website success has an indirect positive influence on financial performance, mediated by customer performance.*

3. Methodology

3.1. Sample characteristics and data collection

We collected survey data among Dutch firms with a website and at least 50 employees. The firms operate in various industries, ranging from financial services to construction. Three customer managers were asked to pre-test the questionnaire. Based on their feedback, some items in the questionnaire were reworded. The mail survey was conducted using commercially available contact information, provided by the Dutch database company Cendris. The sampling frame included 1,600 firms. The respondents are customer managers and CEOs. Three weeks after distributing the first mailing, a reminder was sent to non-respondents. Both mailings included a personalized cover letter, a self-administered questionnaire and a postage-paid envelope. This procedure resulted in a 24 percent response rate (380 usable questionnaires). As we needed to be able to link each questionnaire to characteristics of the company website (see section 3.2.1), the questionnaires were not administered anonymously.

3.2. Measurements

3.2.1. Measurement of website functions

For both the informational and the transaction-related website function we identified relevant website features and measured whether each of these features is available in the company's website. We used the following procedure. First, a list of relevant website features was compiled based on a literature review [Begin et al., 2001; Perry and Bodkin, 2002] and on analyzing the content of numerous websites. This procedure resulted in a list of 45 website features. Each feature was allowed to belong to only one stage and therewith to either the informational website function or the transaction-related website function. Therefore, two academics and three practitioners, all experts in e-commerce, allocated the features to the eight CSLC-stages identified in Table 1. The classifications were virtually identical between all five judges and the very few inconsistencies were solved through discussion. This procedure resulted in eight features sets consisting of altogether 45 features (see Appendix). The informational features set construct is measured by the features related to activities in the pre- and post-purchase stages: image building, product selection, after-sales service and relationship strengthening. The transaction-related features set construct is measured by the features related to the purchase stage: online ordering, online payment, online delivery and order progress update. Although some transaction-related features also may have an informational function (e.g., information about guarantee conditions), they were univocally allocated to the transaction-related website function by the experts. Each features set is measured as a percentage, reflecting the proportion of the features in a set that are present in the website. The scales of the features sets constructs are of a formative nature (see section 3.2.3).

To reduce the burden on the respondents, the 45 features were divided into two groups. One group consists of features that can easily be detected in a website; the presence of these features was determined by the researchers visiting the company website. The remaining features were included in the survey and the respondents were asked to indicate which of these features were present in their website.

3.2.2. Performance measures

Since objective e-commerce performance measures are often not available or not appropriate [Wade and Nevo, 2005-6], we follow previous research and adopt subjective performance measures. Furthermore, other studies found a strong correlation between subjective assessment and their objective counterparts [Dess and Robinson, 1984; Venkatraman and Ramanujam, 1986, 1987].

Informational and transactional website success

The measurement of a commercial website's performance is a complex task. Palmer [2002] argued that there are multiple dimensions of the performance of commercial websites. In particular, website performance should reflect the objectives of commercial websites [Alpar et al., 2001; Auger, 2005; Torkzadeh and Dhillon, 2002]. Therefore, in this study the performance of the informational and transaction-related functions is based on evaluating the realization of the goals underlying these website functions (see Table 1). This approach is important because it can provide a detailed and multifaceted description of success not necessarily bound by financial considerations [Wade and Nevo, 2005-6]. Informational and transactional success is defined as the degree to which a website is successful in reaching various informational and transaction-related site objectives. For the informational website function, the success measures are derived from the four supplier tasks in the pre- and post-purchase activities (image building, assisting customers in selecting products, providing after-sales services and strengthening the relationships with customers). For the transaction-related website function, the success measures are derived from the four supplier tasks in the acquisition stage (online ordering, online payment, online delivery, order progress update). As these success measures are of a formative nature (see Section 3.2.3), no factor loadings are presented.

Overall website success

The way in which we measure website success has to apply to all kinds of websites, including those that do not have a sales function. We used a multi-item measure that is composed of three items reflecting satisfaction with the number of (potential) customers visiting the website, satisfaction with the extent to which the website has strengthened the competitive position and an overall measure of satisfaction with the website's performance. This is a reflective construct; Table 2 shows the factor loadings of these items.

Customer performance and financial performance

For both customer performance and financial performance existing scales are used. Customer performance is measured by a multi-item scale, reflecting the level of satisfaction with respect to: achieving customer satisfaction, retaining existing customers, improving customer relationships and building a positive company image [Homburg et al., 2002]. Financial performance is measured by the level of satisfaction with achieving the desired ROI, customer share, profit and sales growth [Barua et al., 2001; Homburg et al., 2002; Lusch and Brown, 1996]. Table 2 presents the items and factor loadings for both customer performance and financial performance.

Table 2. Reflective construct factor loadings and t-values.

	Factor loading	**t-value**
Overall website success items		
Satisfaction with:		
Number of customers visiting the website	0.810*	27.386
The website strengthening the competitive position	0.868*	48.940
Overall performance of the website	0.855*	47.808
Customer performance items		
Satisfaction with:		
Achieving customer satisfaction	0.699*	14.560
Retaining existing customers	0.604*	9.831
Building a positive company image	0.746*	18.470
Improving customer relationships	0.811*	28.755
Financial performance items		
Satisfaction with:		
Market share	0.751*	21.048
Sales growth	0.845*	40.375
ROI	0.886*	52.746
Profit	0.859*	38.435

** significant at α=0.05 (one-sided, t > 1.65).*

3.2.3. Formative and reflective constructs

Our measurement model is composed of both formative constructs (informational and transaction-related website functions, and informational and transactional success) and reflective constructs (overall website success, customer performance and financial performance). We computed correlations and performed a factor analysis. The items of each formative construct are indeed not highly correlated, in almost all cases (94%) the correlation is below 0.35, whereas the items of each reflective construct are highly correlated and clearly belong to the same factor.

For the reflective constructs, nearly all items have a loading higher than 0.7, explaining about 50 percent of the variance [Chin, 1998] and all t–values are highly significant (Table 2). Only one customer performance item (retaining existing customers) has a loading of 0.60, which is close to the commonly-used cutoff value. In addition, construct reliability was evaluated by checking whether Cronbach's Alpha met the threshold of 0.70 [Nunnally and Bernstein, 1994], while the convergent validity index was also higher than 0.50 [Fornell and Larcker, 1981]. The analyses showed acceptable results for all three reflective constructs. The alphas and convergent validity indices are: overall website success (0.80 and 0.71), customer performance (0.70 and 0.52) and financial performance (0.86 and 0.70). Additionally, to verify discriminant validity, Table 3 presents the correlations between the latent variables of the model, which turn out to be sufficiently low. To conclude, the formative and the reflective constructs satisfy the required measurement criteria.

Table 3. Correlations between the latent variables.

	1	2	3	4	5	6	7
Informational features sets (1)	1						
Transaction-related features sets (2)	0.338	1					
Website success informational (3)	0.428	0.174	1				
Website success transactional (4)	0.214	0.626	0.067	1			
Overall website success (5)	0.275	0.107	0.480	0.290	1		
Customer performance (6)	0.101	0.011	0.200	-0.051	0.194	1	
Financial performance (7)	0.122	0.120	0.143	0.068	0.130	0.364	1

3.3. Methodology

We estimate our model using a partial least squares (PLS) method for structural equation modeling (SEM) [Lohmoller, 1989; Tenenhaus et al., 2005; Wold, 1985]. In comparison to the covariance-based method of SEM estimation (e.g. LISREL), PLS requires less strict assumptions about the distributional characteristics of the raw data and sample size [Fornell and Cha, 1994]. Since the distribution of the data deviates from normality, this technique is considered more adequate in the current research project. PLS also allows for the use of both formative and reflective variables, which is not generally achievable with covariance-based structural equation modeling techniques [Chin, 1998]. We use SmartPLS software [Ringle et al., 2005].

4. Results

4.1. The model fit

In PLS the R-square values of the dependent constructs show the extent to which the model explains the variance of each variable separately [Hulland, 1999]. Based on Cohen [1988], the effect sizes in our model can be categorized as large for transactional success (0.39); medium for informational success (0.18), overall website success (0.24), and financial performance (0.14); and small for customer performance (0.04). In general, the R-square values indicate an acceptable fit for the model. Tenenhaus et al. [2005] proposed a global fit measure (GoF) for PLS. GoF (with values between 0 and 1) is calculated by taking the square root of the product of the average communality of all the constructs and the average R-square value of the endogenous constructs. GoF criteria for small, medium and large effect sizes are 0.1, 0.25 and 0.36 respectively. Our GoF index reaches 0.327, indicating a medium model fit.

In the following subsections, the interpretation of the model results (Table 3) is conducted in two stages [Chin, 1998; Hulland, 1999]. First, the measurement model is assessed to study the features sets. Next, we use the structural

model to examine the size and significance of the relationships between the features sets and the various performance measures.

4.2. Measurement model results

For each of the two website functions, we measured four features sets. In the measurement model, the relative importance of these features sets is examined. For the informational website function, three features sets have significant weights on the construct. Relationship strengthening (0.69) has the highest weight, followed by product selection (0.32) and image building (0.27). The weight of the after-sales service features set (0.17) is relatively small and not significant. For the transaction-related website function, again three features sets have significant weights. The largest weight is for order progress (0.67), followed by online ordering (0.28) and online delivery (0.18). The weight of the online payment features set (0.09) is small and not significant.

4.3. Structural model results

The structure coefficients indicate the strength and direction of the relationships among the latent variables (see Figure 2). The statistical significance of parameter estimates is assessed using a bootstrap procedure which generates the t-value of each coefficient. Almost all constructs are significantly affected by the antecedent variables.

The path coefficient of 0.428 shows that informational website success is positively influenced by informational features sets, with an R-square value of 0.18. Furthermore, the transaction-related features sets have a positive and strong impact on transactional website success (coefficient 0.627), explaining 40% of its variance. Hence, the design of the websites, represented in our study by the various features sets, has a positive and significant influence on achieving success in the corresponding website functions, which confirms hypotheses 1 and 2.

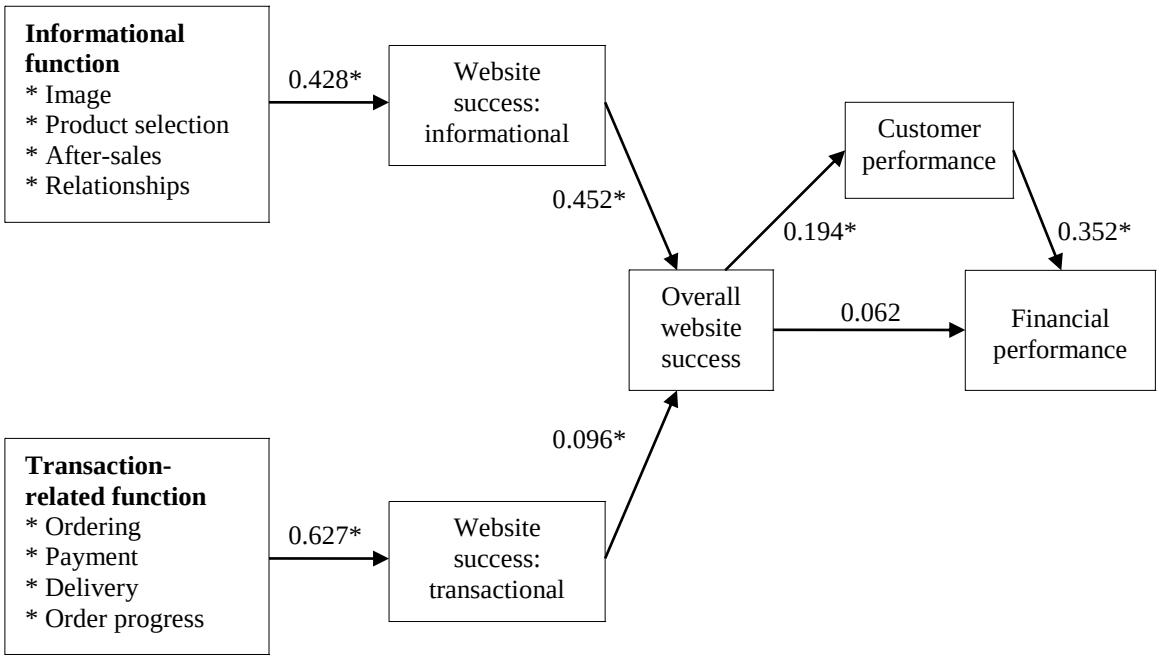

Figure 2. Results of the PLS model

** significant at α=0.05 (one-sided, t > 1.65).*

Overall website success is positive and significantly affected by success on both website functions. Transaction-related and informational website successes together explain 24% of the overall website success variance. However, success in the informational function (0.452) has a considerably greater effect on overall website success than success in the transaction-related function (0.096). Hence, we find empirical support for hypotheses 3 and 4.

Further analysis of the relative effects of the two feature sets also supports the importance of the website's informational function[2]. Although the effect of transaction-related features on transactional success (0.627) is larger than the effect of informational features on informational success (0.428), the effect of transaction-related features is

[2] We acknowledge an anonymous reviewer for suggesting this post-hoc analysis.

offset by the smaller effect of transactional success on overall success (0.096, versus 0.452 for informational success). Because the coefficients in the PLS-model are standardized, we are allowed to compare the various effects and compute indirect effects. The relative effect of informational features on overall website success can then be computed as (0.428 * 0.452) / (0.627 * 0.096) = 3.21. This implies that the indirect effect of informational features on overall website success is more than three times larger than the indirect effect of transaction-related features on overall website success. This difference in effects is also suggested by the smaller correlation between transaction-related features and overall website success (0.107, versus 0.275 for informational features, see Table 3). In addition, the correlation of transaction-related features with customer performance is also smaller (0.011 versus 0.101), again suggesting that the impact of informational features is larger.

Next, overall website success is positively and significantly related to customer performance (0.194), but its direct effect on financial performance (0.062) is not significant. Finally, customer performance has a significant and positive impact on the financial component of company success (0.352). Hence, as expected, the relationship between overall website performance and financial performance is mediated by customer performance (Figure 2). If customer performance is omitted, the direct relationship between overall website success and financial performance has a significant coefficient of 0.142. When including the mediation effect, this coefficient is reduced to 0.062. Therefore, the effect of overall website success on financial performance is partially mediated by 48 percent, as computed by 0.194*0.352/0.142 [Shrout and Bolger, 2002]. To conclude, we find support for hypotheses 5, 6, and 7.

4.4. Alternative models specifications

As some studies (e.g. [Verhoef et al., 2007]) found that informational and transaction-related components of a website influence each other's degree of success,, we investigate a number of alternative models, namely with (1) informational website success affecting transactional website success, (2) transactional website success affecting informational website success, and (3) the interaction effect of informational and transactional website successes on overall website success. The results show that each of these relationships is significant (at $\alpha = 0.05$) and positive. The path coefficients of the three model extensions are respectively 0.211, 0.251 and 0.247. The interaction effect shows that the components strengthen each other, but the positive interaction effect is rather small. Although these additional relationships were found to be significant, they did not produce a substantial increase in the overall goodness of fit. The increase of the GoF index is between 0.004 and 0.007. Since adding complexity to the model hardly improves the overall fit, we have chosen the parsimonious model that is presented in the conceptual framework (Figure 1).

5. Conclusions

The Internet plays an important role in today's business. Learning how to apply this channel effectively is essential. In this study, we proposed and tested the chain of effects from website features, through informational and transactional success towards overall website success and company performance. This framework enables us to determine the relative importance of the informational and transaction-related function of a website, to identify which website features impact on website success and to show that website features (the site content), through a number of intermediate performance measures, contribute to the financial performance of a company.

The websites we studied operate in various industries. Our analyses show generic effects, and do not differentiate among industries. Our results indicate that both the informational and the transaction-related functions contribute to website success. This finding is in contrast to Lee and Grewal [2004], who studied Internet adoption as a communication channel and as a sales channel. Only in the first case they found a positive effect on firm performance. However, their study involved data from the Internet bubble period until 2000, and since then Internet use by both suppliers and customers has matured significantly [Chu et al., 2007]. Our sample consisted of a wide range of companies. For these companies, both the informational and the transaction-related functions contribute significantly to overall website success. Nevertheless, informational success still has a much stronger impact on overall website success than transactional success. This finding underscores the importance of using the website to support customers in their requirements and ownership stages, as found by Saeed et al. [2005]. A well-designed informational website improves a company's customer performance and indirectly contributes to higher financial performance. These findings are in line with the belief that the Internet is an important information channel. However, this conclusion does not imply that firms should ignore the transaction-related function of the website. Transaction-related features may support customer retention and enhance the customer experience during the purchase process, thus stimulating future purchases from the same company [Saeed et al., 2005].

By linking website functions to various levels of performance measures, we are able to demonstrate the importance of having the right content for website success. Both informational and transaction-related features sets have a positive impact on their respective website functions' success. For each website function there are three important features sets. To accomplish informational website success, the features related to strengthening

relationships with customers are clearly most important, followed by features for product selection and image building. To achieve transactional website success, the features related to order progress tracking are most important, followed at a considerable distance by online ordering and online delivery. These findings differ from Saeed et al. [2002-3], who found no support for the relationship between website features in the acquisition (our transaction-related function) and ownership stages (our informational function), and performance. Our results show that firms can improve website performance through providing relevant website features throughout the entire customer purchase process. Our results also show that this eventually results in increased firm performance. In this respect, an important result of our study concerns the mediating role of customer performance: customer performance in terms of indicators such as customer satisfaction and retention, is a necessary condition for website success to result in financial performance. The chain of effects we display shows that firms profit from websites that are designed to meet customer needs and wants. Managers can use the list of features included in the Appendix as a starting point for developing ideas for website improvement projects.

Now that the dotcom bubble is a decade past, the need for accountability of e-commerce efforts is increasing. To our best knowledge, we are the first to show empirical support for the causal chain of e-commerce effects, starting with website features, which refer to website content, through the intermediate steps of informational and transactional website success, overall website success and customer performance, ultimately to financial performance. Having established such a full chain of effects is not only useful for academic researchers, it is also helpful for managers trying to justify e-commerce investments. An established link with financial performance, albeit through some intermediate steps, is essential in e-commerce accountability debates. The intermediate success measures are also useful. In performance dashboards, such as the balanced scorecard, they can be applied as early-warning indicators.

No study is without its limitations, and we would like to acknowledge our study's. The first limitation is the use of non-objective success measures. Although the literature shows perceptual measures are highly correlated with objective measures [Venkatraman and Ramanujam, 1986, 1987], future research could combine objective and perceptual performance measures [Auger, 2005]. Also, the managers' expectations may influence their satisfaction with performance. Therefore, in future research, perceptual measures based on expectancy-disconfirmation (e.g., [Parasuraman et al., 1994]) may be considered. Secondly, our study relies on cross-sectional data. The proposed framework may obtain even better support if it could be applied in a setting where longitudinal data is available. Thirdly, we used only a single instrumental variable, website content, and linked that to the chain of e-commerce effects. However, there are many other variables that could be linked to this causal chain, most notably various measures of website quality [Ahn et al., 2007; Barnes and Vidgen, 2006; Ethier et al., 2006] and site user experiences [Castañeda et al., 2007; De Wulf et al., 2006]. Fourthly, we measured the website functions as the number of features that are present in a specific domain and did not focus on individual website features. Future research could focus in more detail on individual features: which features are most important for success, which are not, which are hygiene factors? A comparable more detailed analysis could be done for the second step in the model, where informational/transactional success is linked to website success: which supplier task is most important for success? And to what extent is the effect of informational (transaction-related) features mediated by informational (transactional) success? Finally, this study covers a broad range of industries. On the one hand, this is a strength, because we can show that the model holds across multiple industries. However, it is likely that the importance of features varies across industries, and also across characteristics such as target customer groups and specific website objectives. Therefore, additional research focusing on one or more specific industries (target groups, objectives) can determine the relative importance of the various features sets within industries (target groups, objectives). We hope that our efforts will serve as a useful building block for other researchers exploring the issue of e-commerce accountability.

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Appendix: The website features for each of the customer purchase process stages

Informational dimension	
Image building	1. Mission statement 2. A list of business partners, dealers, suppliers, alliances or customers 3. A list of memberships in associations, forums, councils etc. 4. Quality certification information 5. Downloadable folder of the organization 6. Non-digital contact information: telephone, fax or postal address 7. Introduction of management team, board of directors or CEO 8. Press releases with news about the organization 9. Conferences or events organized by the organization 10. Financial news or annual report 11. Community relations activities or sponsoring
Product selection	1. Catalog of products 2. Information about special offers 3. Information about product reviews performed by third parties 4. Information about new products/services 5. Customer reviews of products/services 6. Presentation of different products/services for specific target groups
After-sales service	1. Information about complaint policy 2. Information concerning the use or maintenance of products 3. Customers are invited to express their product experiences 4. Frequently Asked Questions section about product use or maintenance
Relationships strengthening	1. Opportunity to subscribe to a mailing list 2. Web page contents adapted based on information about visitors 3. Visitors can access information stored in previous site visit 4. Visitors can customize the site 5. Memberships or loyalty programs 6. Pages where access is limited with a user name/password
Transaction-related dimension	
Online ordering	1. Ability to order products/services online 2. Information about how to complete the order before actually ordering 3. Information about expected delivery date and/or costs 4. Information about guarantee conditions 5. Information about return policy 6. An option to specify when or how an order has to be delivered 7. After selecting a product, the website presents related products 8. Information about previous orders
Online payment	1. Possibility of paying online 2. Multiple payment methods 3. Information about online payment security
Online delivery	1. Ordered products/services are delivered through the site 2. Instructions on how to download the product/service 3. Instructions on how to use the online services
Order progress	1. It is possible to view/request the order's status 2. Customer receive automatically an order confirmation 3. After submitting the order it is possible to change or cancel it 4. It is possible to receive a text message by start dispatch order