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DEVELOPING AND VALIDATING A QUALITY ASSESSMENT SCALE FOR WEB PORTALS

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ABSTRACT

The Web portals business model has spread rapidly over the last few years. Despite this, there have been very few scholarly findings about which services and characteristics make a Web site a portal and which dimensions determine the customers' evaluation of the portal's quality. Taking the example of financial portals, the authors develop a theoretical framework of the Web portal quality construct by determining the number and nature of corresponding dimensions, which are: security and trust, basic services quality, cross-buying services quality, added values, transaction support and relationship quality. To measure the six portal quality dimensions, multi item measurement scales are developed and validated.

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1. INTRODUCTION

Considering the fact that banks invest billions of Euros in the Internet infrastructure (the Deutsche Bank invests approximately half a billion Euros per year), customer satisfaction and customer retention become key success factors in e-banking as well. E-banking, in particular, will function profitably only if there is not a focus on the acquisition of new customers but rather on the retention of existing customers (Reibstein, 2002). This is required by the high acquisition costs in online banking that lie 20–40 % above those of traditional offline business (Reibstein, 2002; Reichheld and Schefter, 2000). Establishing long-term customer relationships is a prerequisite for generating positive customer value in the Internet.

During the last few years these findings have led to developing simple banking Web sites into comprehensive financial portals on which traditional bank products are no longer the only services offered. Instead, all financial problems customers face can be solved at this one source. Ideally, the user will no longer need to use many different Web sites. The variety of available portal resources should also create incentives for a longer site visit (stickiness) during each use. The marketing of a wide array of financial services and features at one single site has been noted as the most important development in e-banking (Jun and Cai, 2001; Strieter et al., 1999).

Meanwhile the first market shakeouts of financial portals have occurred in course of the massacre of dot.com firms (Mahajan et al., 2002). One example for such a dot.com failure is the Irish Internet-only bank *first e* that filed for bankruptcy at the end of 2001; the customers could not access their money for days. As Jun and Cai (2001) found out, most of the Internet banks are still lagging behind their customers' quality expectations. To enhance

customer loyalty portals need to focus on the quality demands of their customers which are increasing over time due to the high competition in the Internet banking industry (Jun and Cai, 2001). Thereby, loyalty has been recognized as a key path to long-term profitability. These findings hold especially for financial services providers, where reducing the defection rate by 5% can boost profits by up to 80% (Reichheld and Sasser, 1990).

For retail banks the introduction of E-Commerce has brought a dramatic change in the way relationships with customers are built and maintained. For banking, which has been traditionally a high contact service, the lack of direct human interaction in the online channel makes it necessary to use each service element as an opportunity to reinforce or establish quality perceptions for customers (Broderick and Vachirapornpuk, 2002). Moreover, because costs of comparing alternatives are lower in online environments service quality is a key determinant in differentiating service offers and building competitive advantage (Grönroos et al., 2000; Santos, 2003). This makes service quality a crucial issue in e-banking.

Although this linkage is quite clear, few academic efforts have been made to determine the criteria used by customers to judge Web portal quality. This is the case even though, the quality evidently determines the decision whether to use and remain loyal to a portal (Cox and Dale, 2001; Reibstein, 2002). In addition, there is hardly a clear definition which services and characteristics turn a simple Web site into an extensive financial portal. The answers to these questions will be given in this contribution.

2. THE PORTAL BUSINESS MODEL IN E-BUSINESS

2.1 The 4C-Model of an Online Portal

Portals are so-called hybrid or integrative business models that do not solely follow any of the four "pure" net business models—content, context, communication and commerce—, but integrate these "4Cs of the Internet" in a comprehensive business model (Afuah and Tucci, 2001; Bauer and Hammerschmidt, 2002). In contrast to so called pure play Web sites (or "simple Web sites") that are specialized on one of the four C-business models and emerge as information-only sites, transaction-only sites etc., portals represent "extensive Web sites" (Huizingh, 2002, p. 1225) (see Figure 1).

Content means offering financial information like stock-market rates, stock research or business news as well as decisions and analysis tools that are necessary for supporting the closure of business deals efficiently. The availability of relevant, accurate and quickly accessible information on each service line is frequently mentioned as the most important function of Web sites (Liu and Arnett, 2000; Wolfinbarger and Gilly, 2001).

The context function includes, for example, search engines and directories that structure and classify services and information. Shopping bots for example can scour databases for best deals with respect to specified criteria (Reichheld and Schefter, 2000). The context function focuses on minimizing customer effort through a playful and smooth navigation as well as a logical structuring of information (Srinivasan et al., 2002; Yang et al., 2001).

The communication function enables the exchange between the users and the online provider (C-to-B communication) as well as the interaction among the users themselves by

establishing user networks (C-to-C communication). Various instruments are available for both areas of communication including e-mails, chats, discussion forums and communities as well as voice over IP. Virtual communities are C-to-C networks that facilitate the exchange of opinions and product information and the building of long-term contacts to other members (Blanchard and Horan, 1998).

Finally, the fourth C, commerce refers to the possibility of conducting commercial transactions electronically. Considering the breadth of the service offerings, distinguishing between horizontal and vertical financial portals is important. Vertical financial portals only offer bank-specific or near-bank services, whereas horizontal portals additionally markets completely non-bank services across various sectors and topics.

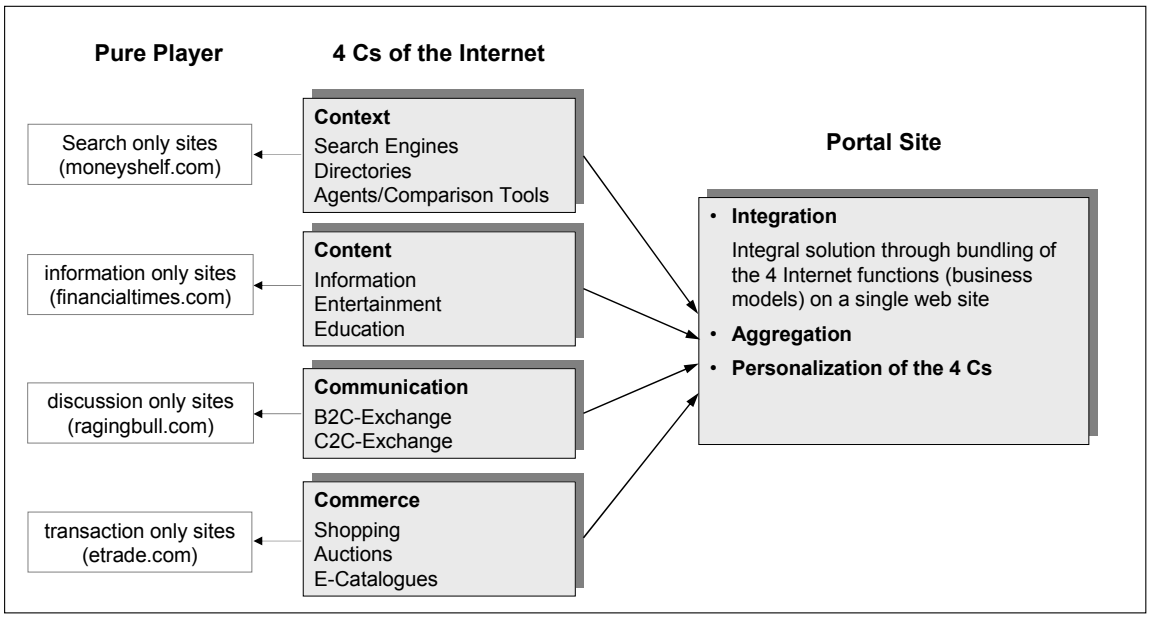

FIGURE 1: The 4C-Model of a Web Portal

As can be seen in Figure 1, portals integrate the basic Internet functions (i.e. all 4 Cs) on one single site and can, therefore, be characterized as integral problem solvers that follow an augmented service concept (Payne and Holt, 2001). Similarly, several authors describe

portals as an innovative type of self service technologies that offer a single point of access to services, an almost unlimited content, applications and excellent retrieval facilities that enables a "one-stop shopping" (Collins, 2001; Jun and Cai, 2001; van Riel et al. 2001). For financial portals this means that all stages of a financial transaction cycle (information provision, initiation, negotiation, execution/settlement, after sales support) can be processed electronically. This is achieved by substituting personal interactions and physical facilities by means of technological solutions. As a consequence, customers can make a variety of financial transactions at one site including paying their bills, viewing their bank statements, and purchasing stocks and other financial products (e.g. insurance). Financial portals transfer the "all in one" principle from the old economy – where it is implemented through brick-and-mortar branches - to the Internet (Bauer and Hammerschmidt, 2002; Jun and Cai, 2001).

Besides the integration principle discussed so far, there is a second portal distinction that is often brought into connection with the idea of one stop banking: the inclusion of services from third parties (aggregation). In order to guarantee this, portal providers must mostly invest into strategic alliances. This increases transaction efficiency and benefits for customers through wider offerings. Increasing the number of available alternatives at one single site can greatly reduce opportunity costs and costs of inconvenience due to virtual store hopping (Bergen et al., 1996; Srinivasan et al., 2002).

The third characteristic that makes a Web site a portal is the ability to personalize the described portal services and functions. In other words, the user can individually arrange the 4Cs according to his or her needs. The personalization must enable the user to create a "personal virtual bank". Personalization increases the user's perceived control of portal processes and elements as well as the freedom of choice (Hoffman and Novak, 1996). By

personalizing a customer can narrow down the alternatives and thus can reduce the time and costs to find appropriate offers.

In summary, portal sites manage to capture distinctive user segments by providing a whole range of customized facilitating and supporting services that add value to the core products. Thus, portals offer many advantages over simple Web sites which are expected to positively affect satisfaction and loyalty of e-customers. Ideally, these advantages result in the fact that a portal is not only the first stop on the Web surfer's journey, but the one and only place a Web surfer needs. They are discussed in the next section.

2.2 Portals as Instruments for Customer Retention in the Internet

Due to its unique structural and technological conditions the Internet comes with its own economics of loyalty. The Internet approaches the paradigm of a perfect market, where consumers can compare products and defect at the click of mouse, reducing search and transaction costs to virtually zero (Reibstein, 2002). Therefore, with lower switching barriers and variety seeking costs together with a much more attractive range of alternatives, in electronic markets customer loyalty is of paramount importance. Additionally, in cyberspace frustrated customers can easily reach 5.000 instead of five people in the real world. Word of mouse spreads faster than word of mouth. E-loyalty can be sustained only if specific loyalty oriented business models are developed. The emergence of Web portals reflects this necessity. Various effects that result from the portal concept keep customers continuing to visit and shop at the portal site (Bauer and Hammerschmidt, 2002; Reichheld and Schefter, 2000):

- The ability to personalize the portal creates economic switching barriers in the form of the risk of not being able to obtain a "tailored bank" from competitive providers or of having to put the effort into re-creating this personal bank.
- The informational exchange and person-to-person interaction (e.g. chats and news boards) in virtual communities of current and potential users provide social capital. This network of social relationships forms a resource that individuals can draw upon (Coleman, 1990; Hofferth et al., 1999). Social capital, based on shared norms and preferences can create mutual trust (aggregated trust) and, through enhancing social switching barriers, higher customer loyalty (Bauer and Grether, 2003; Blanchard and Horan, 1998). Evidence exists that the mutual trust within communities is projected onto the supplier (Bauer and Grether, 2003; Coleman, 1990). Thus, even people who do not take great effort to maintain relations to a portal can, through gaining access to useful resources provided by third parties, remain loyal to the provider.
- Additionally, the provider itself is able to signal individual trust to the consumer by providing unbiased product information such as customer feedback and real world brands on the portal. The provider's trustworthiness has an increased importance in electronic markets because of the spatial separation between buyers and sellers (Brynjolfsson and Smith, 2000; Mahajan et al., 2002). Building individual trust can establish psychological switching barriers. This reduces uncertainty and lowers the costs of decision making.
- Due to the multitude of service options that are constantly updated, portals can offer a high degree of variety and innovativeness. This way the user's variety seeking behavior can be enabled on his/her own portal site. Broadening and deepening the product range

constantly, which is possible because of the absence of physical limitations, increase online satisfaction (Bergen et al., 1996).

- On account of the portal's all-in-one solution the user no longer faces transaction costs (fees, time, risks, stress) and insecurity that would otherwise result from the search for special sites. The advantage that users do not have to leave the portal site offers a high convenience benefit. Portals bundle an extensive range of services and information centrally in a virtual room, which results in a high market transparency.

3. CONCEPTUALIZATION OF SERVICE QUALITY DIMENSIONS OF FINANCIAL PORTALS

After having discussed the general portal concept and the issues of e-loyalty in brief we now examine the fundamental quality demands of customers in evaluating financial portals. Evidence exists that the quality of services delivered through a Web site is a more critical success factor than low prices and Web presence (Lynch and Ariely, 2000; Zeithaml et al., 2002). Along with numerous empirical findings, quality can be considered as the key factor for achieving customer satisfaction and customer loyalty (Cox and Dale, 2001; Cronin and Taylor, 1992; Kelley and Davis, 1994; Parasuraman et al., 1988; van Riel et al., 2001).

The most important step in providing a sophisticated level of service in e-banking is to identify and measure the dimensions of portal quality. This is the basic prerequisite for effective quality management. A portal's market success depends greatly upon the customer-oriented definition of quality. What really makes up the financial portal's quality is solely controlled by the customers' expectations and demands, not objective or technical characteristics (Zeithaml et al., 2002).

3.1 Literature Review

So far, research on consumer evaluations of self service technologies like Web portals has been scarce. Little attention has been paid to the differences between evaluations of service offerings on the Internet and in the physical marketplace. Parasuraman and Grewal (2000) emphasize that past conceptualizations of service quality, created to evaluate traditional services which are characterized by human interactions between customers and employees, cannot adequately applied to virtual environments where customers interact with technology rather than with service personnel. This holds true especially for the SERVQUAL scale as the most prevalent traditional concept for measuring service quality. As Cox and Dale (2001) argue, most of the dimensions and items of the SERVQUAL model (Parasuraman et al., 1988) are developed to capture the nature of interpersonal service encounters. It assumes human interactions throughout the whole transaction process, which is irrelevant for interactions between the customers and online information systems. Here the quality of the Web site (portal) as the technical interface becomes the "moment of truth". Several authors (Meuter et al., 2000; Parasuraman and Grewal, 2000; Santos, 2003; van Riel et al., 2001) propose to discard quality scales that are based on specific service encounter characteristics. Instead they suggest using general categorizations of services as a framework for developing new quality models for Internet-based services. Following this proposition we consider the SERVQUAL model not as an appropriate basis for developing a quality model for Web portals. Instead our study draws on those existing approaches which use global terms to define service quality. Propositions from these studies are outlined next.

A general model proposed by Berry (1987) distinguishes between two types of generic services being perceived by customers: routine services leading to a regular level of quality,

and non-routine services where the expectations for a quick and easy resolution are likely low. Here, the conditions are ripe to achieve a high level of perceived quality. Brandt's (1988) penalty-reward-approach suggests a similar categorization of service dimensions. Minimum elements include all elements and processes that are penalized with demerits if the provider fails to fulfill related customer requirements. Value-enhancing services encompass all elements that exceed customer expectations and are rewarded by bonus points. Grönroos (1990) makes a distinction between functional and technical quality. The functional quality refers to "how" the service is delivered, while the technical dimension refers to "what" customers receive. Zeithaml et al. (2002) distinguish between core services and recovery services. Core services are accessed by customers during a routine Web site experience, i.e. when no questions and problems occur. Recovery services are expected only when customers have questions or run into problems. They involve the ability to provide appropriate information and guarantees, return costs of handling the problem and provide a live service agent online or through phone. Santos (2003) proposes that customers perceive an incubative and an active dimension of e-services. The incubative dimension is defined as providing a properly designed and easy to navigate Web site, offering an easy access to content. Incubative service elements are developed once before a Web site is launched and can increase a Website's hit rates. Active elements involve offering a good support, fast speed, various contact channels, security and attentive maintenance. Active elements must be provided throughout the period that a Website remains active and can increase customer retention and encourage positive referrals.

Kano's (1984) method for measuring customer defined quality follows a similar logic and suggests three fundamental quality demands that are relevant for quality evaluation:

basis-, performance- and enthusiasm demands (Kano, 1984). These demands are fulfilled by three types of performance elements. Basic performances are Must-Be elements and are not explicitly voiced any longer. Spoken attributes are typically voiced while surprise attributes are again rarely voiced because they are unexpected.

Grönroos et al. (2000) propose a service concept consisting of core service, facilitating and supporting services. Since it is often difficult to differentiate between facilitating and supporting services the approach of van Riel (2001) uses the term supplementary services to more generally denote services that are not part of but closely connected with the core service. As a third category of services offered through a portal site they introduce complementary services that are neither facilitating nor supporting the core service. Whereas supplementary services add value to the core service and are used to differentiate it from similar competing offerings, complementary services have the potential to add value to the portal in its entirety.

Empirical evidence shows that the perceived quality of complex services is not reflected by a single quality rating of customers (Cox and Dale, 2001; Meuter et al., 2000; van Riel et al., 2001). Instead a service consists of different partial performances (service components) and users are likely to evaluate the quality of each sub-process during a visit to a Web portal (Santos, 2003). The concepts discussed so far focus on that distinction of general service categories to which the users' quality judgments refer. Thus, they seem to be a more appropriate basis for exploring the fundamental quality dimensions in e-banking.

3.2 Development of a Quality Model for Financial Web Portals

Integrating the findings of the literature review we propose that the three-dimensional service concept is still valid for Web portals. We denote these three categories of portal services as

core services, additional services and solution services. Consequently, the partial quality evaluations of these three service components are the basis for assessing Web portal quality. Given the arguments presented here, portal quality is conceptualized as the extent of performance to which the three fundamental service components are delivered. Once the construct dimensions are defined, we will now conceptualize each dimension within the context of e-finance.

The first dimension which meets the basis demands is related to the traditional bank products like payment processing (cash management, transfers, balance inquiry, bill paying) or brokerage (Furst et al., 2002; Jun and Cai, 2001). Furthermore ease of use, formed by technical characteristics as a minimum speed for data transfer, a clear and consistent Web site design and a functional navigation constitute core services (van Riel et al., 2001; Yang et al., 2001). In addition, secure payment methods, search facilities and transaction archives could be interpreted as core services (van Riel et al., 2001). Usually, these core products of bank portals (the so called hardware) are expected as minimum elements and are assimilated in highly competitive markets.

A portal's additional services, which are explicitly demanded by the customer, consist of, for instance, the possibility of obtaining a loan online and a selection of branded financial products like brand funds or insurances (Furst et al., 2002). By transferring the reputation of trusted conventional brands on the Web portal, the provider can leverage trust and loyalty on the Internet (Srinivasan et al., 2002). However, a challenging and entertaining Web site design facilitating a flow experience also belongs to the additional services, which can be described as the "software" of a portal (Novak et al., 2000).

The problem-solving services (so-called solutionware) form the highest level of portal services. Bank services that still create unique benefits in the current competition context and go beyond the explicitly voiced customer demands belong to this category. Examples are exclusive conditions for registered or long-time users, an individualized content access, an offering of discussion boards and newsgroups or the possibility of combined offline and online advice. Proactively offering customized information and products by e-mail promotions or newsletters also belongs here (van Riel et al., 2001). Availability of interactive calculation and decision support tools enable financial engineering via the Internet (Srinivasan et al., 2002). We could also think of self-contained, non-bank products such as travel and car rental services. Problem-solving services can attain an effective differentiation in competition and are appropriate instruments for achieving “excitement”.

In summary, using a financial portal site can be understood as complex process consisting of sub-processes that refer to the use of the three service components. Consequently, we assume that customers evaluate the quality of each of the three components separately. A customer may be satisfied with the usability of the search engines but dissatisfied with the advice and recommendation services (van Riel et al., 2001). Thus, applying the proposed hardware-software-solutionware-concept we suggest three fundamental quality dimensions of financial Web portals shown in Table 1. Each of the three quality dimensions can be described in terms of several quality indicators.

Core services quality (Hardware quality)	Additional services quality (Software Quality)	Solution services quality (Solutionware Quality)
• Offering a broad and deep range of classic bank products (payment, bonds, stocks) • Ease of use • Understandability • Creditability • Security of payment and data transfer	• Offering online loans • Offering branded financial products • Experience quality • Entertainment • Variety	• Offering non-bank products and services • Advice (Call back, personal adviser) • Personalizing information and conditions • Providing individual tips and recommendations • Providing interactive decision support tools • Offering newsgroups/communities

TABLE 1: The Conceptual Framework for Measuring the Quality of Financial Portals

Whether the three quality dimensions actually capture customer perceptions of Web portal service quality is tested empirically in the following study.

4. EMPIRICAL VALIDATION OF A QUALITY MEASUREMENT MODEL FOR FINANCIAL PORTALS

4.1 Methodology

Based on the conceptualization of quality dimensions of Web portals we developed a set of evaluation criteria (quality indicators) that capture the nature of the three dimensions. The few empirical studies that have dealt with Website quality assessment focus on simple Web sites (pure play Web sites) mostly examining only particular Internet functions and resources (Liu and Arnett, 2000; Szymanski and Hise, 2000; Wolfinbarger and Gilly, 2001; Yang et al., 2001; Zeithaml et al., 2002). The relevant aspects of these studies have been discussed when

exploring the 4 Cs in section 2.1. No study has investigated the construct of portal quality so far.

The generation of an initial item pool was ascertained by expert interviews at banks and e-business consultancies as well as through in-depth discussions with portal users. Pre tests of the initial 110 item questionnaire with twenty online users led to a refinement of the instrument. The modified 80 item pool was presented to 280 German users of financial portals by an online survey. Respondents were asked to refer to their own banking Web site (the one that they are using regularly) when answering the questionnaire. In order to assess the representativeness of the sample, we collected and compared socio-demographic data of the respondents with those reported in a large national study of e-banking users conducted by *Focus Magazine*, one of the two leading German business magazines. Our comparison revealed a close match between the samples.

For measuring the quality items we used a performance-based scale advocated by Cronin and Taylor (1992). We measured the extent to which the participants agreed with performance statements (e.g. "The navigation on the portal is user-friendly and understandable") on a seven-point scale, ranging from "completely disagree" to "completely agree". A growing body of literature (see the review at Cronin and Taylor, 1992) suggests that the performance-minus-expectations scale of the SERVQUAL approach is inappropriate for measuring quality. The major issue is, that a disconfirmation-based scale measures the transitory judgment made on the basis of a specific service encounter or transaction episode. In contrast, we aim to measure the overall quality of the portal services in the sense of a long-term attitude. A performance-only measure better reflects long-term quality, because it is not constrained to actual consumer experiences. In contrast, a disconfirmation-based

measurement requires the formation of specific expectations for each aspect of an actual transaction. A further issue is related to validity problems due to the need that respondents have to state their pre purchase-expectations ex post. Thus, expectations are biased heavily by the perceived performance. Bolton and Drew (1991) show that a performance-only measurement of quality delivers psychometrically superior results especially for continuously used services which predominate in e-banking. Hereby consumers do not constantly process prior expectations about performance and the quality assessment solely depends on perceived performance.

We decided to use a large initial item pool, because the scholarly literature dealing with measuring the user's quality assessment in electronic markets is minimal. In this way it should be ascertained, that no potentially relevant quality determinants were ignored. The empirical validation of the measurement model for portal quality was performed by exploratory and confirmatory factor analyses as well as reliability analyses, following the guidelines of Churchill (1987) and Gerbing and Anderson (1988). This method of construct validation has been widely established in the literature (Baumgartner and Homburg, 1996).

Due to the explorative nature of our study, first the set of 80 items was factor analyzed using principal component analysis to test our a priori assumptions about the underlying factor structure. The result was a total of 18 facets. We then calculated Cronbach's Alpha for each factor to ensure satisfactory levels of internal consistency and to select the best items for each facet. Scale purification led to a significant elimination in the number of items. After rerunning an exploratory factor analysis with the remaining 68 items the same factor structure was extracted. We then conducted a factor analysis of second order (Byrne, 1998), which led us to further reduce the quality factors to six fundamental quality dimensions, based upon the

users judgment of the overall quality of a financial portal. According to the respective items we named the extracted dimensions as “security and trust”, “basic services”, “cross-buying services”, “added values”, “transaction support” and “relationship building”. At a first glance, the dimensionality of the portal quality construct is different to the one expected.

Next, these dimensions were tested for reliability and validity by running confirmatory factor analyses (unweighted least squares) with LISREL 8.53. Various fit measures are suggested in order to assure valid construct measurements: goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) as overall fit measures that are used in the following to evaluate the dimensions; and the local fit indices - indicator reliability, Cronbach’s Alpha, average variance extracted (AVE), factor reliability and total variance explained (see Baumgartner and Homburg, 1996; Churchill, 1987) - to test the validity of the factors and indicators. The corresponding fit measures suggested the elimination of 7 indicators to refine the scales, leaving a total of 61 items.

In order to further validate our model we combined two of the six quality dimensions and ran a confirmatory factor analysis for all possible pairs of dimensions. The three particular pairs of dimensions shown in Figure 2 exhibit the lowest AIC (Akaike's Information Criterion) measure, which is a well-accepted criterion for the selection of several measurement models (Akaike, 1974). Looking at the underlying factor structure of these three extracted pairs of dimension, it appears creditable to interpret them as the three generic services we proposed for financial portals in section 3. Additionally, the χ^2/df ratios for the three pairs indicate a good model fit (Bagozzi and Baumgartner, 1994). The ratio values are 1.3 for the core services-pair, 1.7 for the pair of dimensions that reflects additional services

and 2.6 for the problem-solving services. The statistical results led us to conclude that the model shown in Figure 2 is the best operationalization of the portal quality construct.

4.2 Results and Implications for the Quality Management of Financial Portals

The following six Tables summarize the results of the scale validation process using the above-named fit indices to develop and validate a measurement instrument for portal quality. The structure of the final measurement instrument, including 61 items, is shown in Figure 2. The instrument is set up hierarchically. The six named fundamental quality dimensions emerge on the uppermost level. They are represented as a rectangle and are formed by the 18 quality factors (sub-dimensions) on the level just below. Each factor is measured by a multiple-item scale provided in Tables 2 through 7. Because we have extracted 18 quality facets that are perceived by customers we provide 18 multi-item scales that are necessary for service providers to assess the quality of their portal.

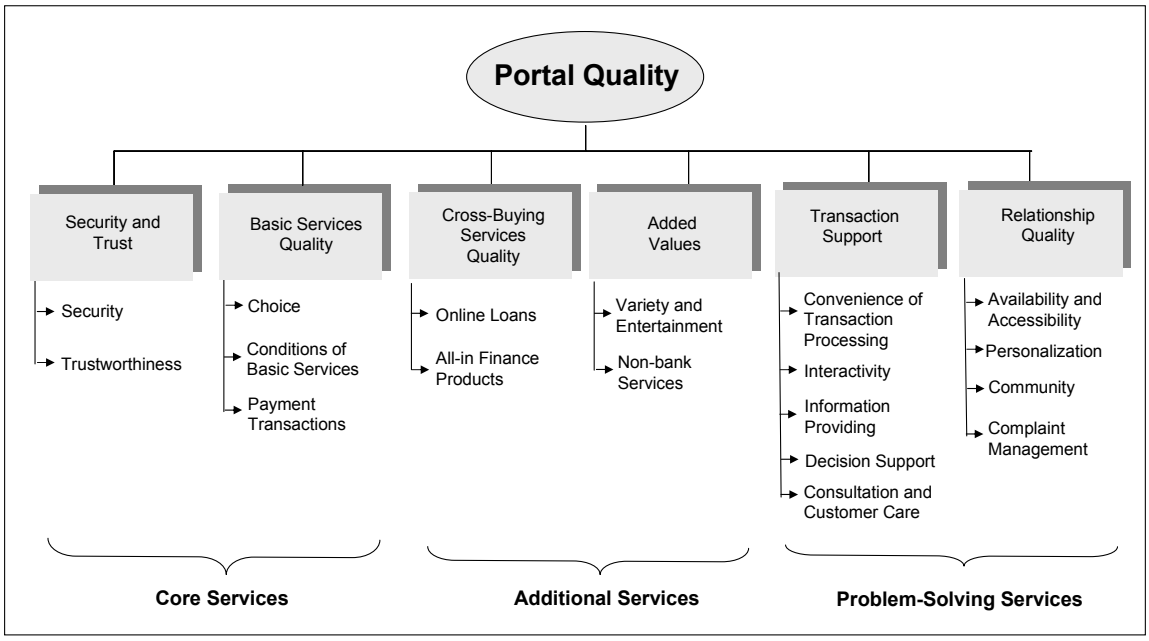

FIGURE 2: The Validated Measurement Model for Portal Quality

The fit statistics in Tables 2 to 7 suggest a good model fit for all dimensions with most of the fit measures valuing on or above the cutoff points, which are .9 for GFI and AGFI, .6 for Cronbach's Alpha, .4 for indicator reliability and .5 for factor reliability and AVE (see Bagozzi and Baumgartner, 1994; Nunnally, 1978). The measurement model, therefore, contains a sufficient degree of reliability as well as convergent and discriminating validity.

Obviously, the criteria portal users perceive to be essential to assess quality can be reduced to a small number of dimensions. The result of this research is a reliable, valid, and generalizable scale to measure the quality of bank portals that is easy to apply in management. Figure 2 as well as Tables 2 - 7 show, how portal quality dimensions can be modified in order to raise the total quality of the portal. Figure 2 shows the factors that make up the quality dimensions. The Tables then contain information about which single indicators measure the factors with what strength. The latter information results from the indicator reliabilities that represent the squared factor loadings. The higher the factor load of an indicator the higher is the importance of that indicator for the respective quality factor, which provides useful implications for quality management.

We want to restrict our comments about the identified quality dimensions to a few distinctive or surprising results, concerning theoretical and managerial issues:

Dimension 1: Security and Trust GFI: 0.99 AGFI: 0.97						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Security	Secure payment system Data / transfer security	0.50 0.36	0.57	0.40	0.57	73.0
Trust-worthiness	Reliability of quotes and prices Understandability Discretion	0.36 0.36 0.60	0.59	0.31	0.57	53.0

TABLE 2: The "Security and Trust" Dimension

While the factor "security" is predominantly related to the quality of the online systems, "trustworthiness" is mainly dependent on the reliability and credibility of the provider. A particularly strong feeling of security can obviously be conveyed through a guarantee of higher reliability during electronic money transactions (payment, transfers, debits). Trustworthiness can obviously be intensively promoted through a high level of discretion. Therefore, customer data, for example, should neither be sold to competitors nor should they be evaluated for market research purposes without the customer's consent or knowledge.

Dimension 2: Basic Services Quality GFI: 0.96 AGFI: 0.91						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Choice	Breadth of service range	0.50	0.81	0.71	0.83	0.67
	Depth of service range	0.90				
Conditions of basic services	Services from outside providers	0.49	0.72	0.52	0.80	0.64
	Payment transaction conditions	0.28				
	Securities conditions	0.74				
	Funds purchase conditions	0.58				
Payment transactions	Breadth of services	0.62	0.87	0.78	0.88	0.67
	Possibility of opening account online	0.94				

TABLE 3: The "Basic Services Quality" Dimension

Evidently, the bank portal quality is strongly associated with product variety and diverse features. Moreover, the assessment of the basic services conditions is determined by the item "availability of services from outside providers". Evidently, the portal's conditions are evaluated more favorable if the spectrum of services from alternative providers and therefore the competitive pressure increases. Perhaps the reason is that the choice of cheap or less expensive products becomes available.

Dimension 3: Cross-Buying Services Quality GFI: 0.97 AGFI: 0.94						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Online loans	Loans through other providers	0.54	0.80	0.53	0.82	0.71
	Mortgaging Securities portfolio	0.62				
	Fast loan grants	0.55				
	Loan conditions	0.43				
All-in finance products	Choice of competitive all-in finance products	0.67	0.81	0.56	0.84	0.61
	Brand name all-in finance products	0.64				
	Brand name funds	0.47				
	Depth of performance	0.48				

TABLE 4: The "Cross-Buying Services Quality" Dimension

The range of cross-buying services represents an independent main dimension for the assessment of a portal. Obviously, a financial portal's attractiveness also depends on whether complementary financial services besides the traditional bank products (e.g. insurances, construction financing, private retirement savings schemes) become available. This makes one stop shopping possible. Cross-buying services are a prerequisite for turning a portal into an integral problem solver. The expansion of demand from the initial core products (usually payment transaction processing and security purchasing) to near-bank products facilitates the extension and intensification of customer relations. Having unlimited access to wide range of competitive products represents a further quality attribute.

Dimension 4: Added Values GFI: 0.99 AGFI: 0.98						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Enjoyment and entertainment	Visual appeal (graphics, pictures)	0.60	0.83	0.58	0.85	0.62
	Animation	0.61				
	Multimedia elements	0.63				
	Exciting site design	0.46				
Non-bank services	Airline timetables/ travel service	0.69	0.89	0.67	0.89	0.73
	Rental car reservation	0.73				
	Car purchasing	0.63				
	Online shop	0.64				

TABLE 5: The "Added Values" Dimension

The results show that the factor "enjoyment and entertainment" is a relevant criterion for assessing quality of bank portals. This finding can easily be explained in the light of the flow theory (Hoffman and Novak, 1996). As the nature of Internet users is to enjoy exploring the new technology, providing entertainment and fun elements can create a flow experience (i.e. a state of emotional activation that can be describes by enjoyment and absorption of attention) when using the Web site. Providing a flow experience increases user loyalty and duration of site visits. To achieve this goal a challenging, sophisticated portal design is necessary in order to generate excitement and a feeling of joy in experimentation (Hoffman and Novak, 1996). Our findings prove that hedonic effects even play an important role for evaluating the quality of professional, information-based Web services which are predominant in Internet banking.

Dimension 5: Transaction Support GFI: 0.99 AGFI: 0.98						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Convenience of transaction processing	Flexibility Easy access to information Simplicity of order placement Easy transaction completion	0.36 0.33 0.56 0.41	0.66	0.43	0.69	0.57
Interactivity	Plausibility check Direct help/tutorials Confirmation of execution	0.41 0.49 0.24	0.64	0.38	0.64	0.57
Information provision	General information Information about special interests Actuality of personal information Actuality of general information	0.45 0.44 0.71 0.66	0.84	0.57	0.84	0.69
Decision support	Newsletter Reference to personally relevant services Reference to special conditions Interactive calculation and comparison tools	0.32 0.23 0.31 0.36	0.64	0.31	0.63	0.58
Customer care	Friendliness Speed Prompt connection to contact person Competence Availability via e-mail	0.34 0.45 0.51 0.57 0.25	0.77	0.46	0.77	0.53

TABLE 6: The "Transaction Support" Dimension

"Customer care" builds an aspect that has been identified as being important for financial portals. The "advice-free banking" principal ("click *or* brick") that is consistently claimed in Internet banking must be questioned or at least cannot be maintained simply as it is. Evidently, the customer also demands being able to access on advice and help in a conventional manner when conducting online banking ("click *and* brick"). The effective synchronization of online and offline business, which is identified as a key success factor by

Mahajan et al. (2002), is also a crucial facet for the portal assessment from the customer's perspective.

Dimension 6: Relationship Quality GFI: 0.97; AGFI: 0.96						
Factor	Scale items	Indicator reliability	Cronbach's Alpha	AVE	Factor reliability	Total variance explained
Availability and accessibility	Hotline Call back button No service breakdown (24/7) Promptness and accuracy of response	0.17 0.71 0.62 0.69	0.63	0.54	0.82	0.55
Personali-zation	Individually tailored services Individual conditions Individual investment tips News field Information on personal interests	0.22 0.21 0.13 0.55 0.61	0.77	0.34	0.70	0.69
Community	Chat rooms Newsgroups	0.53 0.48	0.79	0.51	0.67	0.83
Complaint management	Separate device for handling complaints	1.00	-	-	-	-

TABLE 7: The "Relationship Quality" Dimension

The ability to personalize the portal services and functions is still no standard and therefore a good opportunity to gain a competitive advantage. Through the ability to personalize, heterogeneous user needs can be accommodated through one portal site. Only through this it is possible for the customer to receive an individually tailored product and content offering and to be able to actively control the design of the portal functions and contents ("build your own bank" principle). Here lies a central explanation for the portal's high bonding effect that is not only reflected in the lasting business relationships but also in long portal visits.

5. CONCLUSION AND SUGGESTIONS FOR FUTURE RESEARCH

As the present research shows, Internet users perceive three generic services delivered through a Web portal, which serve as the key dimensions for evaluating portal quality: Security/trustworthiness and basic services represent as the portal's "hardware" the basic demands of portal users. Attractive cross-buying services and added values make up a second dimension representing the "software" (additional services) around the core products. A third dimension used for quality assessment consists of transaction support and relationship building services that have to be facilitated through personalized offers and contents and interactive decision tools.

Consequently, financial portal quality is not a uni-dimensional customer rating. Instead it is a multi-dimensional and multi-factor construct that is composed of partial quality judgments for the portal's different service categories. Our study provides validated measurement scales for each factor. The empirical results strongly support the understanding of portals as integral solutions. Portals represent a bundle of various services and functions. Based on our findings management can establish early warning systems by continuously measuring quality in e-banking and can foster appropriate improvements when any dimension is falling below an acceptable level. Although some of the factors identified are equally relevant for brick-and-mortar business as for e-business, Web site interactions throw up unique quality attributes due to the technical interactions that substitute personal encounters.

The major limitation to the present study is the fact that participants selected their own Web portal for answering the questionnaire. Thus, a variety of banking portals was chosen. There might be validity improvements by analyzing data directly collected from randomly selected users of pre-specified portal sites via mail surveys.

In regard to suggestions for future research, first, it could be tested whether the identified measurement model could be generalized to other portal types than financial portals. Second, the relationship between the extracted quality dimensions and customer satisfaction and loyalty need to be investigated. Third, comparing our e-service quality model with traditional service quality models would be interesting.

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