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Recommended Citation
Urbach, Nils; Smolnik, Stefan; and Riempp, Gerold, "Improving the Success of Employee Portals: A Causal and Performance-Based Analysis" (2010). *ECIS 2010 Proceedings*. 54.
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Journal:	*18th European Conference on Information Systems*
Manuscript ID:	ECIS2010-0109.R1
Submission Type:	Research Paper
Keyword:	Collaboration technology, IS success/failure, IS evaluation, Structural modeling

IMPROVING THE SUCCESS OF EMPLOYEE PORTALS: A CAUSAL AND PERFORMANCE-BASED ANALYSIS

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Abstract

The purpose of this study is to gain a better understanding of employee portal success and to identify the levers for its improvement. We introduce a theoretical model for this that is based on the DeLone and McLean IS Success Model, which considers the specific requirements of employee portals. We tested the associations between our model's different success dimensions by using more than 4,400 employees' responses. These responses were collected in a survey of twelve companies across different industries participating in an international benchmarking study. We applied structural equation modeling to carry out the causal analysis. Furthermore, within a performance-based analysis, we investigated the success dimensions' improvement potentials from both a strategic and action-oriented perspective. The results of our causal analysis indicate that besides the factors contributing to the success of IS in general, other success dimensions – like the quality of the collaboration and process support – have to be considered when aiming for a successful employee portal. The performance-based analysis emphasizes the significance of collaboration quality to improve an employee portal and indentifies the respective fields of action. The study's findings make it possible for practitioners to understand the levers with which to improve their employee portals and to prioritize their investments accordingly. By empirically validating a comprehensive success model for employee portals, the study's results advance the theoretical development in this area and present a basis for further research in this field.

Keywords: Employee Portals, IS Success, Causal Analysis, Performance-based Analysis, Priority Maps.

1 INTRODUCTION

Over the past decade, company intranets have been transformed from collections of static web pages into highly integrated and interactive information systems (IS). Whereas first-generation intranets only provided a comfortable interface to information, today's employee portals (EPs) build a "single point of access" by enabling the integration of information, communication, knowledge sharing, applications, and business processes within corporations. In many cases, an EP is the primary tool through which employees do their work. Ideally, EPs yield different benefits for organizations and employees, such as reducing information overload, decreasing organizational costs, improving corporate communication and knowledge management (KM), as well as enhancing employee productivity (Tojib et al. 2006).

Many companies, especially large ones, offer their employees a portal. The use of EPs has been growing steadily and – despite many companies' restricted information technology (IT) budgets – investments in portal solutions are still growing (Forrester 2006). However, portal projects are usually complex, time and cost-consuming, and entail a high failure risk (Remus 2006). And although IT departments and decision-makers have to justify portal investments, a significant number of companies do not assess their portal implementations' actual benefits (Brown et al. 2007). The assessment of portal benefits is, however, often problematic, since common cost-benefit analysis methods do not take intangible impacts and intervening environmental variables into account.

The purpose of this study is to gain a better understanding of EP success and to identify levers for its improvement. Existing research on EPs investigates single aspects of EP success, but none of the studies we reviewed make use of a comprehensive, integrated approach. Consequently, we developed a success model that considers EPs' specific requirements. We collected data for the empirical assessment through a survey of the employees of twelve companies across different industries. In a first step, we validated the theoretically derived causal model in order to understand the interrelations of the suggested success dimensions. In a second step, by means of a performance-based analysis, we investigated the success dimensions' improvement potentials from a strategic and action-oriented perspective.

The next section describes theoretical foundations of EPs, IS success measurement, and portal evaluation. In the subsequent section, we explain how we developed our theoretical model. The method section outlines our approach to operationalizing the constructs and collecting empirical data. In the causal analysis section, we report on the measurement models' and structural model's assessment by means of structural equation modeling. The performance-based analysis section presents our findings on the levers for improving EPs. The conclusion summarizes the results and outlines the implications, limitations, and contribution of this research.

2 FOUNDATIONS

Employee portals can be regarded a specific type of enterprise portal. An early definition of a portal in the corporate context appeared in a Merill Lynch report (Shilakes & Tylman 1998). In this report, a portal was considered an application that primarily integrated the company's information and provided users with a single interface. The perception of portals has changes over time, as reflected in the different publications in the field (e.g., Shilakes & Tylman 1998, Detlor 2000, Chan & Chung 2002, Chan & Liu 2007). During the past few years, EPs have evolved from low-end intranets into highly integrated IS. Today, such portals enable the integration of information, communication, applications, and business processes (Benbya et al. 2004). Before portal technology was available, the web-based intranet was a popular tool for building workforce commitment (Azzone & Bianchi 2000). Although it yielded benefits for organizations in this regard, these intranets lacked personalization, offered poor navigation, and did not provide centralized access to information, which often led to losses in

productive employee time. To overcome these problems, organizations began to implement EPs (Tojib et al. 2006). An EP is a web-based interface to access personalized information, resources, applications, and e-commerce options with which employees can reach a range of internal and external sources through a network connection in a password-protected setting (Sugianto & Tojib 2006). In addition, business applications are increasingly integrated into EPs (Schelp & Winter 2002). Thus, the role of the EP has become crucial in many organizations, especially when an entire business process can be completed by means of the portal (Chan & Chung 2002). In some organizations, an EP is the primary tool through which employees do their work (Tojib et al. 2006).

The ***measurement of IS success*** has been widely investigated by the IS research community. A recent literature review by Urbach et al. (2009b) indicates that the D&M IS Success Model (DeLone & McLean 1992, 2003) is the dominant theoretical basis of IS success measurement. The first version of this IS Success Model (DeLone & McLean 1992) is the result of an attempt to provide a general and comprehensive definition of IS success, one that covers the various, previously published definitions and measures of IS success. Ten years after the publication of their first model, and based on the evaluation of the many contributions to it (e.g., Seddon & Kiew 1994, Seddon 1997, Rai et al. 2002), DeLone and McLean (2003) proposed an updated IS success model that can cope with the growing e-commerce world's measurement challenges. Several success models for evaluating specific types of IS have been developed on the basis of the D&M IS Success Model.

There is little documented empirical research on ***portal evaluation***. Some studies investigate single aspects of portal success, but none of the studies we reviewed took a comprehensive, integrated approach. In order to measure user satisfaction with EPs, Sugianto et al. (2007) and Tojib et al. (2008) proposed using the B2EPUS model, which goes back to the work of Doll and Torkzadeh (1988). Bin Masrek (2007) has proposed another approach to assessing user satisfaction with campus portals, which is based on an extract of the updated D&M IS Success Model. A similar framework for investigating corporate intranet effectiveness has been suggested by Hussein et al. (2008). Focusing on the user-perceived service quality of web portals, Yang et al. developed and validated an instrument based on different conceptual models in the areas of IS and technology adoption (Yang et al. 2005). Finally, based on the Technology Acceptance Model (TAM) (Davis 1989), de Carvalho et al. (2008) analyzed the effects of technological and organizational features on intranet and portal use. In our review of the IS success literature, we found no study specifically aimed at comprehensively examining the success of EPs. However, we considered the existing approaches when developing our causal model.

3 THE CAUSAL MODEL

Since EPs are widespread but there is no known comprehensive, integrated theoretical framework for measuring their success, we developed a new theoretical model to do so. Our model's core principle is based on the D&M IS Success Model (DeLone & McLean 2003). We studied the definitions of the D&M IS Success Model's success dimensions, contrasted them with EPs' specific properties, and merged the different points of view into a revised classification scheme. Consequently, we started by including the following success dimensions in our theoretical model: *System quality*, *information quality*, *service quality*, *use*, *user satisfaction*, and *individual impact*. Furthermore, we extended the original model, which did not fully cover EPs' characteristics. EPs are not only utilized to exchange information, but also to electronically support work processes (Martini et al. 2009). In addition, they are used to support collaboration and knowledge sharing between users (Benbya et al. 2004). Consequently, we expected the quality of these features to influence our model's effectiveness level (*use*, *user satisfaction*, *individual impact*) as a further success dimension. Thus, we added the following two additional success dimensions to consider these features, which, contrary to other types of information systems, are specific to EPs (e.g., Benbya et al. 2004, Puschmann & Alt 2005):

- *Process quality*, which summarizes measures capturing the quality of an EP's supporting processes such as approvals, applications for leave, meeting room reservations, procurement requests, time registration, travel expense reports, and invoice releases. The quality of process support should be measured in terms of efficiency, reliability, and accuracy, amongst others (Puschmann & Alt 2005, Martini et al. 2009).
- *Collaboration quality*, which covers the quality of an EP's enabling of collaboration between users. It evaluates the extent to which the utilization of EPs, for example, enhances communication, and improves information sharing as well as social networking's effectiveness and efficiency (Detlor 2000, Raghavan 2002, Benbya et al. 2004).

In order to control for the influence of distinctive characteristics within the sample, we identified a set of control variables that we thought could impact our model's effectiveness level: *knowledge-intensity of tasks* (Eppler et al. 1999), *process standardization* (Wüllenweber et al. 2008), and *management support* (Sharma & Yetton 2003).

Based on the previous findings of DeLone and McLean (2003) and related studies, as well as on our additional success dimensions, we propose a theoretical model (see figure 1) which assumes that *system*, *information*, *process*, *collaboration* and *service quality* are linked to an EP's *use* and *user satisfaction*. Furthermore, we propose that both of these are intercorrelated and, in turn, influence the individual impact of an EP. Many researchers have discussed and demonstrated the difficulty with measuring the organizational impact of individual IS initiatives (e.g., Goodhue & Thompson 1995). Consequently, we do not consider organizational impact, although an overall impact of employee portals' utilization likely exists in addition to the impacts perceived by individual users. A detailed theoretical derivation of our causal model for investigating EP success has already been published (Urbach et al. 2009a).

4 METHODOLOGY AND DATA

We initiated an international benchmarking study to gather data for the empirical assessment of our theoretical model. We used an end-user survey to collect data within twelve organizations of different industries. In order to operationalize the constructs of our conceptual model, we followed various authors' recommendation (e.g., Kankanhalli et al. 2005) to use tested and proven measures, if available, in order to enhance validity. Thus, we have adapted items identified in previous studies and modified them for use in the EP context if required. Where there were no items, and they had to be created, we paid particular attention to testing the constructs' measurement models. After several validation steps, such as the card-sorting and item-ranking approach, we selected the items presented in table 1 for data collection. Furthermore, we added additional questions to capture the respondents' demographic characteristics.

Our study was conducted in twelve internationally acting companies. We acquired these companies' participation by inviting them and other companies to participate in a benchmarking study. Participation was encouraged by offering the companies both the individual results and the other participants' anonymized comparative data. We provided each of the twelve companies with a hyperlink to an online survey, asking them to distribute it to all or a subset of their EP's users via e-mail. In order to minimize bias caused by differences in addressing the survey participants, we also provided the companies' coordinating persons with invitation templates. The invitations to the EP users were sent out at the beginning of the survey period. Two weeks later, we asked the companies' contact persons to send their employees a reminder. After the survey period of about five weeks, we closed the online survey. In total, 4,470 EP users completed the online survey fully. This provided an average response rate of 26.5%.

Construct	Items (No. of items)	References
System quality	Navigation, design, searchability, structure, usability, functionality, accessibility, responsiveness (8)	Items adapted from Ahn et al. (2004), McKinney et al. (2002)
Information quality	Usefulness, understandability, interestingness, reliability, completeness, timeliness (6)	Items adapted from Lin and Lee (2006), McKinney et al. (2002), Yang et al. (2005)
Process quality	Efficiency, reliability, accuracy, ease of initiation, understandability, traceability, completeness (7)	New items derived from Puschmann and Alt (2005), Martini et al. (2009)
Collaboration quality	Ease of use, comfort, effectiveness, efficiency of different collaborative features (7)	New items derived from Benbya et al. (2004), Detlor (2000), Raghavan (2002)
Service quality	Responsiveness, empathy, reliability, assurance (4)	Items adapted from Chang and King (2005), Pitt et al. (1995)
Use	Extent of using different features (8)	New items derived from Almutairi and Subramanian (2005)
User satisfaction	Adequacy, efficiency, effectiveness, overall satisfaction (4)	Items adapted from Seddon and Kiew (1994)
Individual impact	Task performance, job performance, productivity, job effectiveness, job simplification, usefulness (6)	Items adapted from Davis (1989)
Knowledge-intensity	Level of complex knowledge and understanding, amount of information required, overall knowledge-intensity (3)	New items derived from Eppler et al. (1999)
Process standardization	Repetitiveness, transparency, overall process standardization (3)	New items derived from Wüllenweber et al. (2008)
Management support	Encouragement, leadership support (2)	New items derived from Sharma and Yetton (2003)

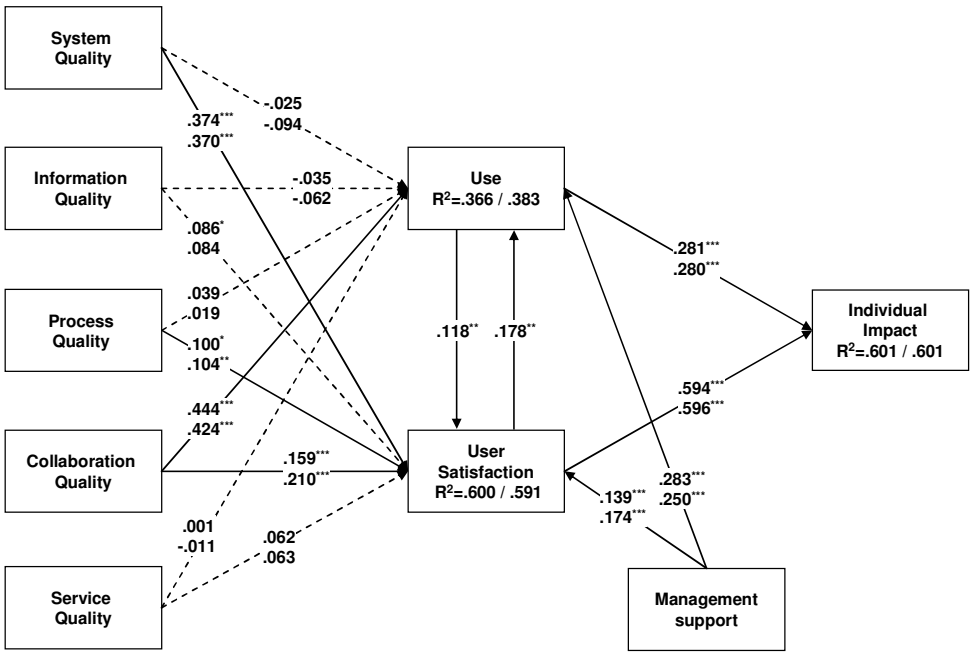
Table 1. Constructs and items

5 RESULTS OF THE CAUSAL ANALYSIS

In the first step of the data analysis, we assessed the measurement properties and tested our research model's hypothesized associations by means of the survey's empirical data. We chose the partial least squares (PLS) approach (Chin 1998) for data analysis as it is advantageous compared to covariance-based approaches when the research model is relatively complex and relationships between indicators and latent variables should be modeled in different modes (Chin & Newsted 1999). We made use of the software package SmartPLS (Ringle et al. 2005) for the statistical calculations. We used both reflective and formative indicators for the operationalization of the model's constructs. Following the validation guidelines of Straub et al. (2004), we tested the reflective measurement models for convergent validity, reliability, and discriminant validity by applying standard decision rules. Furthermore, we checked the formative measurement models for multicollinearity with the variance inflation factor (VIF). After the validation of the measurement models, the structural model was analyzed and the hypothesized relationships between the constructs were tested. Since our theoretical model includes a mutual influence between *use* and *user satisfaction* that cannot be simultaneously tested, we tested two different models. Model 1 assumes the influence to be from *use* to *user satisfaction*, whereas model 2 works from *user satisfaction* to *use*. The results of the tests performed on the two structural models are depicted in figure 1. The upper path coefficients reflect model 1's results and the lower ones, those of model 2.

The quality of the structural models was evaluated by means of squared multiple correlations (R^2). Overall, both models explain a considerable portion of the latent variables' variance. More than half of the variance of the endogenous dependent variables *individual impact* (R^2=.601 in both models) and *user satisfaction* (R^2=.600 in model 1 and R^2=.591 in model 2) is explained, which is substantial. The variance of the remaining endogenous variable *use* (R^2=.366 in model 1 and R^2=.383 in model 2) is explained to a lesser extent, but is nevertheless moderate (Chin 1998).

The two control variables, *knowledge-intensity of tasks* and *process standardization*, had no significant influence on our results. However, the third control variable, *management support*, significantly influences both *use* and *user satisfaction*.



*significant at p<.050; **significant at p<.010; ***significant at p<.001

Figure 1. Analytical results

Unexpectedly, the results support only half of the relations derived from the D&M IS Success Model. The paths from *system quality* to *user satisfaction*, between *use* and *user satisfaction*, from *use* to *individual impact*, as well as from *user satisfaction* to *individual impact* emerged as hypothesized by the original model. However, the paths from *system* and *information quality* to *use*, from *information quality* to *user satisfaction*, as well as from *service quality* to *use* and *user satisfaction* were not significant. Instead, our results support most of the hypothesized relationships of the two newly added success dimensions. The paths from *collaboration quality* to *use* and *user satisfaction* as well as from *process quality* to *user satisfaction* are supported. Only the path from *process quality* to *use* is not significant. Furthermore, the control variable *management support* has a significant impact on *use* and *user satisfaction*.

6 RESULTS OF THE PERFORMANCE-BASED MODEL ANALYSIS

In addition to the causal analysis, we further investigated the empirical results by analyzing the index values of the latent constructs and the single items. Thus, we achieve additional insights into how to improve the success of EPs, both from a strategic and action-oriented perspective.

6.1 Results from a strategic perspective

We analyzed the index values of the latent constructs and the exogenous latent variables' impact on the endogenous latent variables to identifying fields of action to improve EP success from a strategic perspective. This performance-based model assessment (Fornell et al. 1996, Martensen & Gronholdt 2003) can be applied for a further analysis and interpretation of PLS results. Additional insights and highly relevant fields of action can be identified by employing this approach. It builds on the structural model's causal relationships and expands the analysis with a further dimension that captures the latent

variables' performance indexes. Each exogenous latent variable's specific index value is related to its effect on the associated endogenous latent variable (Höck & Ringle 2007).

Table 2 shows the average mean of each exogenous latent variable's performance indexes across the different participating companies and their total effect on the endogenous latent variables. All values have been calculated for model 1 and 2. A latent variable's performance index was estimated by means of the weighted average of the scores from the corresponding measurement variables (questions). The values of the original seven-point scale have been transformed to a 0-to-100-point scale. A latent variable's impact on the construct to be analyzed is based on the total effect, which is the exogenous latent variable's direct and indirect effect on the endogenous latent variable. Of the six exogenous latent variables, *information* and *service quality* have the highest performance index. However, neither of these variables shows a significant effect on the endogenous latent variables, which may be explained by a habituation effect, which assumes that the quality has already been rather high for quite some time and, consequently, no longer influences the users' perception.

Success dimension	Performance index	Total effect on use	Total effect on user satisfaction	Total effect on individual impact
System quality	60.651	--- / ---	.370 / .370	.213 / .213
Information quality	71.588	--- / ----	--- / ---	--- / ---
Process quality	58.970	--- / ----	.104 / .104	.073 / .073
Collaboration quality	50.562	.444 / .461	.211 / .210	.250 / .254
Service quality	65.949	--- / ---	--- / ---	--- / ---
Management support	63.756	.283 / .281	.172 / .170	.182 / .182

Table 2. Index values and total effects

The performance indexes and the estimated total effect scores can be combined by categorizing them into an effect-performance map. Such a data presentation is also called a priority map, since it is appealing from a management perspective and can be useful in priority setting and strategy development (Martensen & Gronholdt 2003). Figure 2 shows a priority map for increasing individual impact. Each of the influential variables is placed in one of the four cells in the map. The lines separating the cells represent the average effects and performance indexes. The four cells can be interpreted in managerially useful ways and used to prioritize the fields of action with regard to improving the individual impact of using EPs. The performance of variables in the upper-left cell is relatively strong, but the effect is weak. In this case, the status quo should be preferably maintained. If necessary, however, resources can be transferred from this area to those with a higher potential. Variables in the upper-right cell demonstrate strong performance and have a strong effect. Since this area presents strengths, the good work should be maintained. The performance of variables in the lower-left cell is not very strong compared to the other variables. However, since the effect is also relatively weak, action in this area should have low priority. Finally, the lower-right cell is the area with the greatest opportunity. The effect of these variables is relatively strong and the performance leaves sufficient room for improvement (Martensen & Gronholdt 2003).

The priority map in figure 2 shows that primarily the greatest potential for increasing the *individual impact* of the EPs we studied – assuming the implementation costs are the same for all the determinants – lies in the *collaboration quality*. The quality of the EPs' enabling of collaboration between users has the lowest performance index and, at the same time, the strongest effect on the individual impact. It can therefore be inferred that the companies in our sample should invest in collaborative features to improve their EPs. *System quality* as well as *management support* are an area of strength for the participating companies with regard to creating a highly individual benefit. The quality of the EP as a system, as well as the leadership team's encouraging of EP use seems to be important for users and should therefore be maintained or improved. The *process quality* is relatively high in the organizations investigated, but its effect on *individual impact* is relatively weak. Further improvements in this area are not essential.

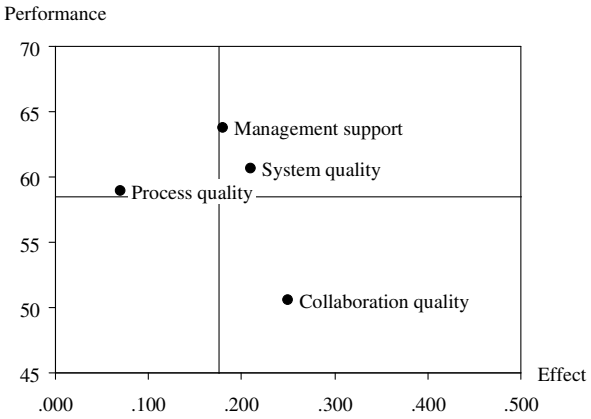
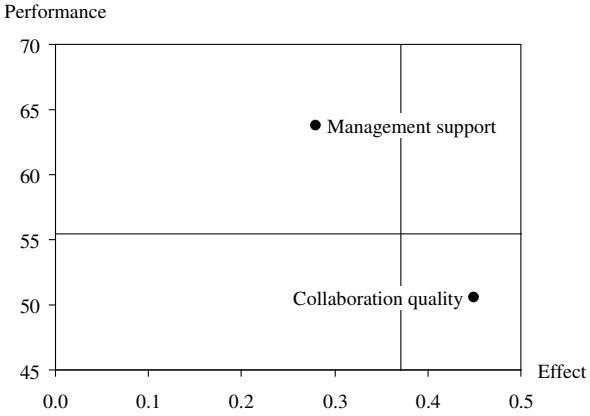
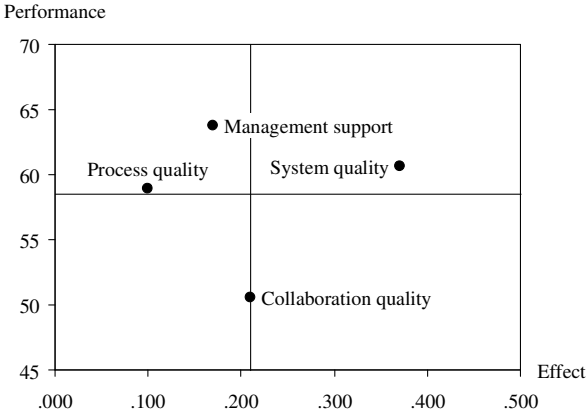


Figure 2. Priority map for individual impact

Figure 3 shows the priority map for increasing portal *use*. As shown by the results of the causal analysis, only *management support* and *collaboration quality* have a significant effect on *use*. *Collaboration quality* in particular has a very strong effect on EPs' diversified *use*. However, the performance index is low and should therefore be improved. The effect of *management support* on portal *use* is moderate, but the performance is high. The status quo should be maintained; improving the status quo to increase use is not essential.





Figures 3 & 4. Priority maps for use and user satisfaction

The priority map for creating *user satisfaction* is shown in figure 4. The placement of variables is very similar to the priority map for individual impact. However, the importance of *system quality* for *user satisfaction* is even higher. The effect of *collaboration quality* on *user satisfaction* is slightly weaker. Overall, the prioritization of fields of action to improve *user satisfaction* is similar to that of increasing the *individual impact*. This is supported by the high path coefficient between the latent variables *user satisfaction* and *individual impact* in the causal model (see figure 1).

6.2 Results from an action-oriented perspective

In order to elaborate on the strategic areas about which we want to acquire more detailed information, we expanded our analysis by directly evaluating the respondents' answers. Since *collaboration quality* demonstrates the greatest potential for improving *use*, *user satisfaction*, and *individual impact*, we investigated this area in more detail. Consequently, we followed an approach similar to the one applied by Martensen and Gronholdt (2003), examining the answers to the eight questions that we used to formatively operationalize *collaboration quality*. The relative importance of every item was determined by taking the outer weights of the PLS analysis, which were calculated by means of a

regression analysis. We rescaled these scores, so that the sum of all the relative importance scores is one. The performance values of these items were calculated as the average mean of all the participating companies' average means of all answers transformed from the original 7-point scale to a 0-to-100-point one. The questions and the calculated scores are presented in table 3.

Item	"Our employee portal…	Importance	Performance
Communication	… enables an easy and comfortable communication with my colleagues."	.168	49.465
Information sharing	… supports an effective and efficient sharing of information with my colleagues."	.101	50.563
Document sharing	… enables a comfortable storing and sharing of documents with my colleagues."	.194	47.746
Contact management	… allows me to easily and quickly locate my colleagues' contact information."	.196	68.862
Competence management	… allows me to enter my competence profile easily and in a structured way."	.086	50.532
Expert directory	… enables me to identify experts within my organization easily and quickly."	.084	49.140
Social networking	… supports an effective networking between the members of my organization."	.173	49.503

Table 3. Importance and performance scores for collaboration quality

The relative importance scores and performance levels are combined in a priority map, which is depicted in figure 5. Again, the lower-right cell is the area with the greatest opportunity. *Ease and comfort of communication*, *comfort of storing and sharing documents*, as well as *effective networking* are important factors in the users' perception of collaboration quality. Since the performance values of these aspects are also low, they can be considered areas for improvement. The *ease of locating colleagues' contact information* is placed in the upper-right cell. Both the performance score and the relative importance are high. Consequently, contact management is clearly a strength of the investigated EPs. *Ease of entering competence profiles*, *ease and efficiency of finding experts*, as well as the *effectiveness and efficiency of information sharing* seem to be relatively unimportant to users. Although, the companies do not seem to be making much effort in these areas, further work should not be more prioritized than other activities.

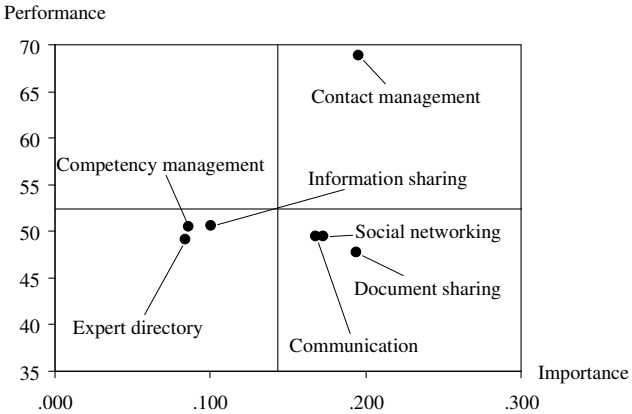


Figure 5. Priority map for collaboration quality

7 CONCLUSIONS

The results of our causal analysis indicate that collaboration quality is the only quality dimension that significantly influences both use and user satisfaction. Thus, the quality of an EP's collaborative features seems to be an important success factor. If available, these features are utilized by the users

and lead to a higher overall satisfaction with the portal. Accordingly, providing additional collaborative features and/or improving existing ones may directly increase use and user satisfaction and, consequently, the individual impact gained from using EPs. In addition, our performance-based model analysis shows that – from a strategic perspective – the great potential for increasing use, user satisfaction, and individual impact of using an EP is also primarily related to collaboration quality. Analyzing collaboration quality from an action-oriented perspective, certain aspects such as document sharing, communication, and social networking are identified as significant levers for improvement.

Furthermore, our results confirm that system and process quality, as well as management support have a significant impact on user satisfaction and/or use, and can therefore be considered as further success factors. However, the performance scores of these variables are already relatively high. Accordingly, companies should try to maintain this status if they have high impact values. In contrast, information and service quality does not significantly influence user satisfaction. Since these success dimensions show the highest performance index of all the variables (see table 2), we believe our findings are due to a habituation effect. The performance has already been on a high level for quite some time and, thus, no longer influences the impact level.

Our research is limited in that our results are based on empirical data collected in only twelve companies. The results are therefore at least valid for these companies. The generalizability of these results is not implausible, but cannot be assured. Our research is further limited in that we used a convenience sample of companies for the data collection. A random sample from a pool of companies would have increased the generalizability of the results, but was not possible due to the relatively small number of companies participating in the benchmarking study.

Keeping the limitations of the study in mind, our results contribute to both theory and practice. From a practical point of view, our model offers a means for organizations to evaluate and predict the success of EPs. EP success – like the success of any other IS – is multidimensional and interdependent. Owing to our results, practitioners now know more about the levers that help to improve their EPs and can prioritize their investments accordingly. Our contribution to theory is the extension and further empirical testing of the D&M IS Success Model in a different setting and system context than in previous studies, as recommended by various authors (e.g., DeLone & McLean 2003, Iivari 2005). Furthermore, we apply a performance-based analysis to further elaborate on our causal analysis findings. Our results advance theoretical development in the area of EPs, serving as a basis for future research in this field.

References

Ahn, T., Ryu, S. and Han, I. (2004). The impact of the online and offline features on the user acceptance of Internet shopping malls. Electronic Commerce Research and Applications, 3, 405-420.

Almutairi, H. and Subramanian, G. H. (2005). An Empirical Application of the DeLone and McLean Model in the Kuwaiti Private Sector. Journal of Computer Information Systems, 45 (3), 113-122.

Azzone, G. and Bianchi, R. (2000). Intranet: different configurations and their effects on the performance of corporate value chain's activities. In Proceedings of the 2000 IEEE Engineering Management Society, August 13-15, Albuquerque, NM, USA.

Benbya, H., Passiante, G. and Belbaly, N. A. (2004). Corporate portal: a tool for knowledge management synchronization. International Journal of Information Management, 24 (3), 201-220.

bin Masrek, M. N. (2007). Measuring Campus Portal Effectiveness and the Contributing Factors. Campus-Wide Information Systems, 24 (5).

Brown, M., Mines, C., Moore, C. and Barnett, J. (2007). Companies Adopt Employee Portals, Not Portal Best Practices. Forrester Research, Inc, Cambridge.

Chan, E. H. W. and Liu, C. (2007). Corporate Portals as Extranet Support for the Construction Industry in Hong Kong and Nearby Regions of China. ITCon, 12, 181-192.

Chan, M. F. S. and Chung, W. W. C. (2002). A framework to develop an enterprise information portal for contract manufacturing. International Journal of Production Economics, 75 (1-2), 113-126.

Chang, J. C.-J. and King, W. R. (2005). Measuring the Performance of Information Systems: A Functional Scorecard. Journal of Management Information Systems, 22 (1), 85-115.

Chin, W. W. (1998). The Partial Least Squares Approach to Structural Equation Modeling. In Modern Methods for Business Research (Ed, Marcoulides, G. A.) Lawrence Erlbaum Associates, Mahwah, 295-336.

Chin, W. W. and Newsted, P. R. (1999). Structural Equation Modeling Analysis with Small Samples Using Partial Least Squares. In Statistical Strategies for Small Sample Research (Ed, Hoyle, R.) Sage Publications, Thousand Oaks, CA, 307-341.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13 (3), 318-340.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science, 35 (8), 982-1003.

de Carvalho, R. B., Ferreira, M. A. T., Choo, C. W., da Silva, R. V. and Joia, L. A. (2008). Analysis of the Effects of Technological and Organizational Features on Intranet and Portal Usage. In Proceedings of the 14th Americas Conference on Information Systems (AMCIS 2008), August 14-17, Toronto, Ontario, Canada.

DeLone, W. H. and McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. Information Systems Research, 3 (1), 60-95.

DeLone, W. H. and McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. Journal of Management Information Systems, 19 (4), 9-30.

Detlor, B. (2000). The corporate portal as information infrastructure: towards a framework for portal design. International Journal of Information Management, 20 (2), 91-101.

Doll, W. J. and Torkzadeh, G. (1988). The Measurement of End-User Computing Satisfaction. MIS Quarterly, 12 (2), 258-274.

Eppler, M. J., Seifried, P. and Röpnack, A. (1999). Improving Knowledge Intensive Processes through an Enterprise Knowledge Medium. In Proceedings of the ACM SIGCPR Conference on Computer Personnel Research, April 8, New Orleans, LA, USA.

Fornell, C., Johnson, M. D., Anderson, E. W., Jaesung, C. and Bryant, B. E. (1996). The American Customer Satisfaction Index: Nature, Purpose, and Findings. Journal of Marketing, 60 (4), 7-18.

Forrester (2006). Employee Benefit News/Forrester Research 2006 Benefits Strategy And Technology Study. Forrester Research, Inc., Cambridge.

Goodhue, D. L. and Thompson, R. L. (1995). Task-technology fit and individual performance. MIS Quarterly, 19 (2), 213.

Höck, C. and Ringle, C. M. (2007). Analyse der Zufriedenheit von Besuchern moderner Multifunktionsarenen: Eine kausalanalytische Untersuchung und indexwertorientierte Ergebnisbeurteilung. Marketing Zfp, 29 (3), 181-193.

Hussein, R., Masrek, M. N. and Karim, N. S. A. (2008). The Utilization and Effectiveness of Intranet: A Case Study at Selected Malaysian Organizations. Communications of the IBIMA, 4, 200-206.

Iivari, J. (2005). An Empirical Test of the DeLone-McLean Model of Information System Success. The DATA BASE for Advances in Information Systems, 26 (2), 8-27.

Kankanhalli, A., Tan, B. C. Y. and Wei, K.-K. (2005). Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation. MIS Quarterly, 29 (1), 113-143.

Lin, H.-F. and Lee, G.-G. (2006). Determinants of Success for Online Communities: An Empirical Study. Behaviour & Information Technology, 25 (6), 479-488.

Martensen, A. and Gronholdt, L. (2003). Improving Library Users' Perceived Quality, Satisfaction and Loyalty: An Integrated Measurement and Management System. The Journal of Academic Librarianship, 29 (3), 140-147.

Martini, A., Corsob, M. and Pellegrini, L. (2009). An empirical roadmap for intranet evolution. International Journal of Information Management, 29, 295-308.

McKinney, V., Kanghyun, Y. and Zahedi, F. M. (2002). The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach. Information Systems Research, 13 (3), 296-315.

Pitt, L. F., Watson, R. T. and Kavan, C. B. (1995). Service quality: A measure of information systems effectiveness. MIS Quarterly, 19 (2), 173-187.

Puschmann, T. and Alt, R. (2005). Developing an integration architecture for process portals. European Journal of Information Systems, (14), 121-134.

Raghavan, P. (2002). Social Networks: From the Web to the Enterprise. IEEE Internet Computing, 6 (1), 91-94.

Rai, A., Lang, S. S. and Welker, R. B. (2002). Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis. Information Systems Research, 13 (1), 50-69.

Remus, U. (2006). Critical Success Factors of Implementing Enterprise Portals. In Proceedings of the 39th Hawaii International Conference on System Sciences (HICSS 06), January 4-7, Kauai, Hawaii.

Ringle, C. M., Wende, S. and Will, A. (2005). SmartPLS 2.0 (M3) Beta. University of Hamburg, Hamburg, Germany.

Schelp, J. and Winter, R. (2002). Enterprise Portals und Enterprise Application Integration. HMD - Praxis der Wirtschaftsinformatik, (225), 6-20.

Seddon, P. B. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. Information Systems Research, 8 (3), 240-253.

Seddon, P. B. and Kiew, M.-Y. (1994). A Partial Test and Development of the DeLone and McLean Model of IS Success. In Proceedings of the 15th International Conference on Information Systems (ICIS 94), December 14-17, Vancouver, Canada.

Sharma, R. and Yetton, P. (2003). The Contingent Effects of Management Support and Task Interdependence on Successful Information Systems Implementation. MIS Quarterly, 27 (4), 533-555.

Shilakes, C. C. and Tylman, J. (1998). Enterprise Information Portal - Industry Overview. Merrill Lynch, Inc., New York City, New York.

Straub, D., Boudreau, M.-C. and Gefen, D. (2004). Validation Guidelines for IS Positivist Research Communications of the AIS, 13, 380-427.

Sugianto, L.-F. and Tojib, D. R. (2006). Modeling User Satisfaction With an Employee Portal. International Journal of Business and Information, 1 (2), 239-255.

Sugianto, L.-F., Tojib, D. R. and Burstein, F. (2007). A Practical Measure of Employee Satisfaction with B2E Portals. In Proceedings of the 28th International Conference on Information Systems (ICIS 2007), December 9-12, Montreal, Quebec, Canada.

Tojib, D. R., Sugianto, L.-F. and Sendjaya, S. (2006). A Conceptual Model for B2E Portal User Satisfaction. In Proceedings of the International Conference on Business and Information, July 12-14, Singapore.

Tojib, D. R., Sugianto, L.-F. and Sendjaya, S. (2008). User satisfaction with business-to-employee portals: conceptualization and scale development. European Journal of Information Systems, 17 (6), 649–667.

Urbach, N., Smolnik, S. and Riempp, G. (2009a). A Conceptual Model for Measuring the Effectiveness of Employee Portals. In Proceedings of the 15th Americas Conference on Information Systems (AMCIS 2009), August 6-9, San Francisco, California, USA.

Urbach, N., Smolnik, S. and Riempp, G. (2009b). The State of Research on Information Systems Success – A Review of Existing Multidimensional Approaches. Business & Information Systems Engineering (BISE), 1 (4), 315-325.

Wüllenweber, K., Beimborn, D., Weitzel, T. and König, W. (2008). The impact of process standardization on business process outsourcing success. Information Systems Frontiers, 10, 211-224.

Yang, Z., Cai, S., Zhou, Z. and Zhou, N. (2005). Development and validation of an instrument to measure user perceived service quality of information presenting Web portals. Information & Management, 42 (4), 575-589.