International Scholars Journals

International Journal of Accounting, Auditing and Taxation ISSN: 2756-3634 Vol. 8 (1), pp. 001-013, January, 2021. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

Cause-effect relationships and the service quality evaluation criteria of portal sites

Ray Wang

Department of Hospitality Management, Hung Kuang University, Taiwan. E-mail: ketr501215@sunrise.hk.edu.tw. Tel: 886-4-26318652. Fax: 886-4-26310744.

Accepted 23 November, 2020

Evaluation of portal site service quality is relatively important for concurrent web services today. The practitioners and academicians are utilizing all kinds of tools to figure out what are the criteria presented as benchmark for portal website service quality. This study uses literature review to attribute the twenty-two portal site service quality evaluation criteria to compose the survey instrument. The hierarchical random sampling method is manipulated in this study. This study collected 1320 valid instruments from the large online population and university students. The decision making trial and evaluation laboratory method applied to compose a cause and effect model to examine the customer expectations of the portal site service quality. The results and managerial implications are discussed.

Key words: portal site, service quality, evaluation criteria, decision making trial and evaluation laboratory.

INTRODUCTION

In this age of technology and innovation, people rely on the Internet to look for information. A portal site is an intermediary for specific users to provide information services. The service items include news, search, communication and data collection as well as carry out auctions, loans and stock trading transactions through the sites (Kalakota and Robinson, 2001). A portal site is the type of site Internet users often comes in contact with. The site mainly operates from advertisement profits and the higher the number of browsers, the higher the profits the site can obtain (Spreng and Olshavsky, 1993). With the increase in the use of Internet services, there is a danger of having personal information being used by swindlers for defraud purposes. People become skeptical when they are requested to register their personal information on Internet sites. They need to ensure that the customers trust that these portal sites will ensure the protection of their personal information, in order to retain customer loyalty, thereby, portal site providers need to think of ways to ensure this safety. Therefore, site operators must understand the needs and user behaviors of customers, as well as provide the required services, so as to attract users to browse as well as increase customer loyalty.

In the past, scholars mostly focused on the overall user satisfaction of portal sites in the related researches of the influencing factors of user behavior or the degree of satisfaction of portal sites (Van Riel et al., 2001); or on the increased perception of the visual attraction and perceptual interests (Van der Heijden, 2003). To commit the satisfaction of using the portal sites, constant monitoring and feedback of integrated knowledge in the internal process in different departments with the ultimate goals of sustaining satisfaction and retaining the overall competitive advantage in the market (Tseng, 2009a, 2009b, 2009c; Tseng and Lin, 2009). The criteria and satisfaction provided by the portal sites must be unified as a system to improve the site performance (Tseng, 2009c, 2009d; 2010). Moreover, some scholars combined internal motivations and use perceptual usefulness and interests as the variables that affect the degree of satisfaction (Lin, Wu and Tsai, 2005). Yang, Cai, Zhou and Zhou (2005) used the perceived service quality of the portal sites by the users as the point of examination. Telang and Mukhopadhyay (2005) examined user influence through different types of service examinations. In other words, the entry point of portal site service quality of the above scholars is not consistent and the theoretical bases used are also different. For example, Van der Heijden (2003) used technology acceptance model as the research structure basis, whereas Lin et al. (2005) used expectations-verification theory as the basis to extend the

study of evaluation criteria. The inconsistency of the above scholars may cause complications in the applications and further study of follow-up researches. Few researchers in the past have discussed the cause-effect relationships of the service quality factors of portal sites and the Decision Making Trial and Evaluation Laboratory (DEMATEL) can make up for this deficiency. DEMATEL is mainly used to analyze the relevance of the various factors of social science problems and to study the cause-effect relationships among the various problems and factors. This method was first used by the Battelle Association in 1971 in Geneva for the study of the global problems in the United Nations. It was used to solve the relevance among problems like hunger, ethnicity, human rights, epidemic diseases, violence and terrorism. This method contains the intuitive method of non-linear system, which can use the quantitative method to calculate complex problems, so as to obtain the direct and indirect relationships among them (Lin and Wu, 2004). The main advantage of this method is its ability to integrate the indirect relationships into the cause-effect diagram and analyze the overall structure and is an efficient method used among the various evaluations or relationships between multiple cases in the system. At the same time, DEMATEL can sort the various operation relationships and effects of the criteria and based on these criteria, give larger weights to the operations of the criteria and is therefore, known as cause criteria, whereas the largely affected criteria are seen not to possess force and are known as effect criteria (Seyed-Hosseini et al., 2006). Based on the above advantages and limitations, this research uses the DEMATEL method to study the cause-effect relationships between the factors of the portal sites. The evaluation of the sites is a continuous processes involved with multiple aspects and criteria (Tseng, 2009a, 2009c, 2009d).

A portal site is a window into the world of knowledge and is also an advertisement tool used by many businesses. Along with an increase in the present number of Internet surfers, the portal site businesses have become more diversified. In addition to the wave of Internet and e-commerce, many industries have tried to use the sites to provide new and rapid product services. Due to the trend, there is increase in the usage of the portal sites to search for data, business marketing and product purchase; therefore, the contribution of this research can be divided into academic and business sections. The academic section can provide the cause-effect relationships between the service quality evaluation criteria of portal sites and clarify the evaluation criteria that affect users who use the portal sites. The business section can be used as references by the portal businesses to enhance service quality and set up, as well as references for successful operating models to develop the portal sites. The relative importance of all aspects and criteria associated with overall satisfaction of the sites are displayed to facilitate in identifying key drivers of satisfaction as well as formulate improvement priorities (Tseng, 2009b; c; Tseng and Lin, 2009). Specifically, the objectives of this research include:

(1) The study of the connotations of the service quality evaluation criteria of portal sites.
(2) The study of the direct influences and affected relationships between the various evaluation criteria.

LITERATURE REVIEW

The objective of this research is to study the cause-effect relationships between the service quality evaluation criteria of the portal sites. The study generalizes the meaning of the service quality and the various standards of the service quality criteria of the portal sites, as well as analyzes the related discussions of the analysts. The detailed explanations of the contents are as follows:

Definition of service quality

The quality of the service is determined by the customers. Products and services that receive customer value and satisfaction must be incorporated in the value system of the companies (United States Department of Commerce, 1993). Juran (1974) considered that service quality depends on whether a company can satisfy customer needs. Lewis and Booms (1983) pointed out that the service desired and known by customers cause the perception of service quality. Parasuraman, Zeithaml and Berry (1985) pointed out that the service quality is measured by using the difference between pre-purchase expectations and the actual experience after purchase. Followed by continuous improvement, service quality is then divided into five dimensions, and is referred to as SERVQUAL. These five dimensions include tangibles, reliability, responsiveness, assurance and empathy (Parasuraman, Zeithaml and Berry, 1988). Tangibles refer to actual facilities and personnel outer appearance. Reliability represents the ability to accurately and reliably execute the committed service. Responsiveness points at the desire to help customers and provide them with immediate services. Assurance points at the expertise knowledge and manners of internal personnel as well as the ability to gain the trust of customers. Empathy represents the care and individualized attention provided to customers (Parasuraman et al., 1988). Cornin and Taylor (1992) considered that service quality is measured by the difference of actual efficiency of service quality and the giving up of expected efficiency.

Along with the generalization of the Internet and e-commerce, the success of site information system is not limited to the functional results of the site. Many researches also used the overall Internet system operation model as the focus of the successful evaluation of Internet systems (Liu and Arnett, 2000; Molla and Licker, 2001; Palmer, 2002). At the same time, Kettinger

and Lee (1995) considered that the efficiency and evaluation of information systems must be included into the information service quality, so as to truly enhance service quality. These evaluation standards and excellent system quality included in the information quality can bring values to customers and establish mutual trust and satisfaction (Pitt, Watson and Kavan, 1995; Watson, Pitt and Kavan, 1998).

Portal site service quality criteria

Purchasing through the portal sites is a new type of channel selection (Liang and Huang, 1998; Kiang et al., 2000). Hoffman and Novak (1996) considered that the characteristics of this type of interactive purchase emphasizes the excellent communication between the transactions of both sides, among which, the responding time is an important factor that affects customer perceptions of service quality. The researches of Van der Heijden (2003) also proved that the service quality of portal sites mainly attracts customer identification and the key to the attainment of this identification mainly reflects the responding speed and accuracy of site systems (DeLone and McLean, 2003). From the point of view of the customers, Lehtinen and Lehtinen (1991) divided the service quality of the sites into actual quality, company quality and interactive quality. From different consumer groups, Crane (1991) also examined the influencing factors of the service quality of the sites. Even though the contents of the service quality of the portal sites emphasized by the above scholars are inconsistent, they have confirmed to the requirement of portal sites to satisfy the needs of related dimensions, so as to enhance the service quality of the sites.

This study generalizes the discussions of the above scholars and divides the service quality evaluation criteria of the portal sites into system quality, information quality, technological quality and the interactive quality of the customers and the reliability of the sites. The system quality of the sites includes “A1 smooth system operation”, “A2 customized data search”, “A3 rapid access”, “A4 easy amendment of order contents”, “A5 complete service information”, “A6 correlation of product contents”, “A7 complete product information”, “A8 content quality of product information”, “A9 display quality of product information”, “A10 convenience and safety of account transactions”, “A11 accuracy of transactions”, “A12 trust”, “A13 transparency of transactional situations”, “A14 easy operation of transactions”, “A15 privacy”, and the interactive quality of customers customer includes “A16 rapid response to customer needs”, “A17 empathy to customers”, “A18 immediate service to customer needs”, “A19 post-purchase services”, “A20 interaction function with customers”. Moreover, the reliability of the sites includes “A21 rate of re-visits” and “A22 desire to introduce to friends and relatives”. This study generalizes the 22 items of evaluation criteria as the service quality evaluation criteria of portal sites and the various criteria and contents of related literatures are shown in Table 1.

Decision making trial and evaluation laboratory (DEMATEL)

DEMATEL method was first used by the Battelle Association in 1971 in Geneva for the study and handling of global complex and difficult problems such as ethnicity, hunger, environmental protection and energy resources (Fontela and Gabus, l976). In recent years, due to the ability of DEMATEL to effectively understand the complex structures of cause-effect relationships, it examines the degree of influence between two-two elements and uses matrix and related mathematical theories to calculate the cause-effect relationships and influencing strength of all the elements, therefore, it is widely accepted in Japan. Related applications include business planning and strategies, urban planning and design, estimation of geographical environment, analysis of global problem groups. For example, Yamazaki, Ishibe and Yamashita (1997) used DEMATEL method to analyze the hindering factors of social benefits. Hori and Shimizu (1999) used DEMATEL method to examine social safety factors. Hu (2003) examined the complexity of business problems. Lin (2005) studied the cause-effect relationships of management problems and established model analyses. Liou, Tzeng and Chang (2007) used DEMATEL method to analyze the safety measurement model of airline companies and finally obtain the cause-effect relationships model between the safety criteria. Wu and Lee (2007) also used DEMETAL method to analyze the adjustment capabilities of global managers and establish the cause-effect relationships model and group strategies of capability criteria. In short, DEMATEL method has received the identification of scholars on the aspect of social sciences and possesses research achievements. Therefore, this research uses DEMATEL method to examine the cause-effect relationship between the evaluation criteria of portal sites and understand the direct and indirect influencing relationships between the criteria and provide them as references for follow-up researchers. Generalizing the contents of the above literatures, this study uses the 22 evaluation criteria of smooth system operation, customized data search, rapid access, easy amendment of order contents, complete service informa-tion, correlation of product contents, complete product information, content quality of product information, display quality of product information, convenience and safety of account transactions, accuracy of transactions, trust, transparency of transactional situations, easy operation of transactions, privacy, rapid response to customer needs, empathy to customers, immediate service to custo-mer needs, post-purchase services, interaction function with customers, rate of re-visits and desire to introduce to

Table 1. Service quality evaluation criteria of portal sites.

Item	Evaluation criteria	Related literature
Service quality of portal sites	A1. smooth system operation A2. customized data search A3. rapid access A4. easy amendment of order contents	Belardo et al. (1982); Liu and Arnett (2000); Srinivasan (1985); Parasuraman et al.(1988)
	A5. complete service information A6. correlation of product contents A7. complete product information A8. content quality of product information A9. display quality of product information	Bailey and Pearson (1983); Parasuraman et al.(1988); Baty and Lee (1995); Laudon and Laudon (1994); Mahmood and Medewitz (1985); Mahmood (1987); Miller and Doyle (1987); Niederman, Brancheau, and Wetherbe (1991); Pitt et al. (1995)
	A10. convenience and safety of account transactions A11. accuracy of transactions A12. trust A13. transparency of transactional situations A14. easy operation of transactions A15.privacy	Liu and Arnett (2000); Teas (1994); Zeuthaml, Berryand Parasuraman (1996); Parasuraman et al.(1988)
	A16. rapid response to customer needs A17. empathy to customers A18.immediate service to customer needs A19.post-purchase services A20. interaction function with customers	Allen (1996); DeLone and McLean (2003); Liu and Arnett (2000) ; Lucas (1996); Parasuraman et al. (1988)
	A21. rate of re-visits A22. desire to introduce to friends and relatives	DeLone and McLean (2003)

friends and relatives as follow-up research basis.

METHODOLOGY

This study generalizes the contents of the above literature review and uses the 22 items of evaluation criteria for the smooth operation of the system and provides them as the basis for follow-up research. The main focus is to explain the development of the survey tools required in the DEMATEL method and design the following questionnaires.

Design questionnaires

The main tool of this research is the development of the required questionnaires of DEMATEL. The objective is to use the questionnaires to search for the direct/indirect influences of the service quality evaluation criteria of the portal sites and also use DEMATEL method to find the relevance of the standards. The development of the questionnaires is explained as follows. The study confirmed the validity of the contents of the service quality evaluation criteria of the portal sites through expertise meetings. The experts come from various domains and possess adequate knowledge, skills and practical experiences (Muralidharan et al., 2002). The process involves brainstorming or Nominal Group Technique (NGT) to determine the key evaluation criteria for the service quality of portal sites and defines the meanings of the various standards in details.

Table 2. DEMATEL questionnaires.

Content of standards	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22
A1	N																					

Based on the above stage of selecting the service quality evaluation criteria of the portal sites are selected to design the questionnaires. The questionnaire targets are the students of colleges in Taiwan. The prerequisites assume that the college students are familiar with the contents of the portal site services as well as the influences and directions of the quality evaluation criteria. In other words, in order to obtain the reliability of the questionnaires (Suwignjo, Bititci and Carrie, 2000), the targets of the questionnaire survey must understand the related processes and service items of portal sites, so as to assure the accuracy of the data and prevent the subjectivism of single opinions. The questionnaire explains the definition of the various standards and then requests the students to fill in the degree of the influence of some standards on other standards through the two-two comparison method (0-3). 0 represents “no influence”, 1 represents “slight influence”, 2 represents “influence” and 3 represents “large influence”. The questionnaires are shown in Table 2.

The results of the questionnaires are shown by matrix and use the numbers 0-3 filled in to show the degree of mutual influence of the standards.

Implementations of DEMATEL

According to the above research steps 1, 2, 3 and 4, a direct-relation matrix was first produced, followed by the achievement of standardized direct-relation matrix. Then the direct/indirect matrix was calculated and a casual diagram was plotted. The detail explanations of the various steps are as follows:

Step (1): Direct-relation matrix

The objective of step 1 is to collect related information and define the 22 items of evaluation criteria, so as to satisfy the customer needs of the service quality of the portal sites. The calculating method uses the total values filled in the various questionnaires divided by the number of people who filled in the surveys. For example, the values of the first row and second column is calculated as (1+3+2+2+3+3+.....3+3+2+3)/1320 = 2.222. The rest of the items are calculated in the same way. The calculated results are shown in Appendix 1.

Step (2): Calculating the standardized direct-relation matrix

The objective of step 2 is to calculate the standardized direct-relation matrix, so as to develop the evaluation criteria and tools. At this step when there is a complex mutual function between the criteria, the development of evaluation criteria and tools are increasingly important. As mentioned above, the surveying process has already aimed at the semantics of the various evaluation criteria to carry out detail explanations. The subjects aim at the degree of mutual influence between the various criteria and fill in the numbers 0-3 (0 represents “no influence”, 1 represents “slight influence”, 2 represents “influence” and 3 represents “large influence”). On the whole, Step 2 determines whether the survey results can be effectively used as the efficient tool for measuring the mutual relationship and influencing direction of the criteria. The results calculated from the standardized direct-relation matrix are shown in Appendix 2.

Step (3): Calculating the direct/indirect matrix

Calculate the above standardized direct-relation matrix and the calculated results are shown in Appendix 1.

Step (4): Plotting the casual diagram

The row and column values of the direct/indirect matrix (Table 4) are calculated and D + R, D - R, are used as the coordinates to plot the diagram. Let $t_{ij}(i, j = 1,2,\mathrm{L}, n)$ as the middle element of T and the total of row and column are represented as D_i and R_J and the element is used as the cause which affects the sum of the other elements, including direct and indirect influences (the calculated results are shown in Appendix 3). D_i and the element i is used as the cause which affects the sum of the other elements, including direct and indirect influences. R_J shows the element j and is used as the effect which is affected by the sum of the other elements. D + R is the prominence and is obtained from $D_k + R_k$, which shows the total degree of cause and effect through the elements. This can show the prominence of the problem groups in the elements. D - R is the relation and is obtained from $D_k - R_k$. If $D_k + R_k$ is positive, these elements deviate to the cause type. If $D_k + R_k$ is negative, these elements deviate to the effect type. The casual diagram is paired as ($D_k + R_k$, $D_k - R_k$) where (D + R) is in the horizontal axis and D - R is in the vertical axis. The casual diagram is shown in Figure 1.

RESULTS AND DISCUSSION

This research analyzes the data collected from the DEMATEL questionnaires and uses the original influencing evaluation of the various items to establish a direct-relation matrix as well as standardize the numerical relationships of the matrix, to obtain a total cause relationship matrix, and the statistics for the columns and rows, so as to obtain the related values of cause (D) and effect (R) of the various items. The experimental results are explained as follows by the degree of center and cause-effect relationships.

Description of research questions

During the entire commercialization process of the Internet, large numbers of people were affected and portal sites were made widely accessible

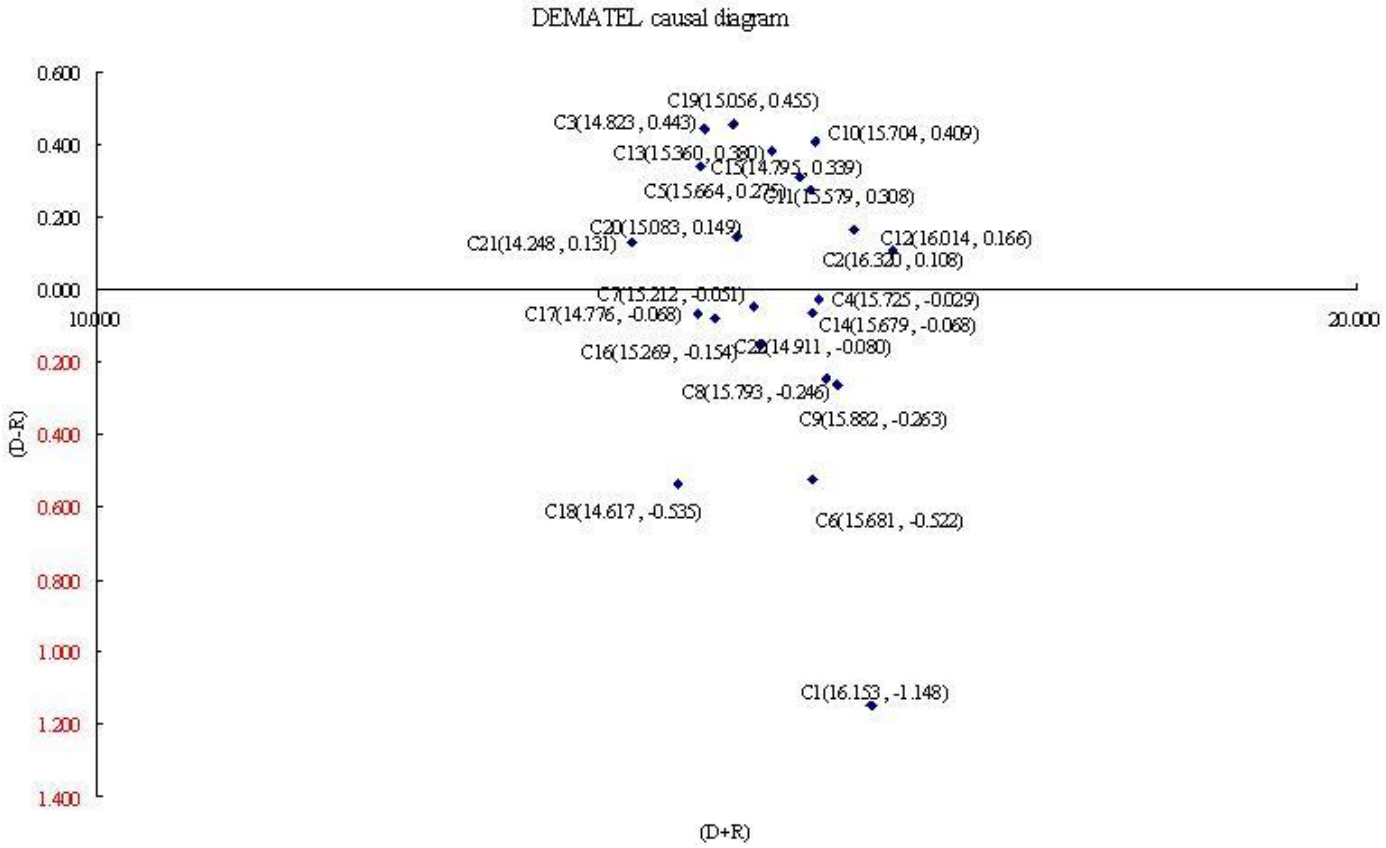

Figure 1. Casual diagram of the evaluation criteria of the service quality of the portal sites

(Tsai, 2000). The statistical data showed that 70% of the Internet surfers have used the functions and services provided by the portal sites (Chen, 2000). The portal sites are from the cycle links of innovation, simulation and competition, therefore, the portal site measures provide more services, so as to satisfy customer needs and enhance the service quality , which is the objective that many portal sites continue to endeavor (Tang, 2003; Zou, 2003; Lin, 2003). Among the targets of the portal site services, college students are the main service targets of portal sites (Lin, 2000; Vision Magazine, 1999; Hsiao, 2006). Therefore, understanding the students' needs on the service quality of the portal sites is extremely important.

Research targets

Based on the researches of Lin (2000) and Hsiao (2006), the study showed that college students are the main groups of the portal sites, thereby; they are used as the research targets. Moreover, according to the statistics of the Department of Education (2007), it was shown that 164 colleges from northern, central, southern and eastern areas of Taiwan were selected as the located ratio by the Random Sampling Method. 40 colleges were selected, with 15, 7, 9 and 2 colleges in the northern, central, southern and eastern areas (including offshore islands) were selected. 40 questionnaires were sent to each college, with a total of 1320 questionnaires sent out. The sampling distribution at the four areas is shown in Table 3.

Research findings

In this study, the total of the sum of the rows and columns is determined to calculate D+R (prominence). The larger the value of D+R (prominence), the more important is this item (factor) among the overall evaluation factors. The D+R values obtained from the various items are larger than the total mean (15.3791) (a total of 11 items). This shows the sorting of the importance of the key evaluation criteria of the service quality of portal sites, which is shown as: "A2. customized data search", "A1 smooth system operation", "A12 trust", "A9 display quality of product information", "A8 content quality of product information", "A4 easy amendment of order contents", "A10 convenience and safety of account transactions", "A6 correlation of product contents", "A14 easy operation of transactions", "A5 complete service information" (Table 4). In other words, the system quality of the portal sites is the service quality item that the customers are mostly

Table 3. Random sampling distribution of the various areas

Items	No. Colleges	Colleges/Nation-wide (%)	No. of schools based on ratio sampling	No. of questionnaires sent to the various schools (Total number of questionnaires)
Northern area	76	46.34	15	40(600)
Central area	34	20.73	7	40(280)
Southern area	43	26.22	9	40(360)
Eastern area	11	6.71	2	40 (80)
Total	164	100.00	24	160(1320)

Table 4. Total influence relationships between the service qualities of portal sites.

Columns and D		Rows and R		D+R		D-R	
Items	Value	Item	Value	Item	Value	Item	Value
A2	8.2141	A1	8.6502	A2	16.3201*	A19	0.4548
A12	8.0899	A2	8.1060	A1	16.1526*	A3	0.4432
A10	8.0568	A6	8.1012	A12	16.0140*	A10	0.4092
A5	7.9694	A9	8.0722	A9	15.8818*	A13	0.3801
A11	7.9435	A8	8.0190	A8	15.7925*	A15	0.3391
A13	7.8700	A12	7.9241	A4	15.7254*	A11	0.3080
A4	7.8482	A4	7.8772	A10	15.7044*	A5	0.2751
A9	7.8096	A14	7.8737	A6	15.6805*	A12	0.1658
A14	7.8053	A16	7.7114	A14	15.6789*	A20	0.1487
A8	7.7735	A5	7.6942	A5	15.6636*	A21	0.1312
A19	7.7553	A10	7.6476	A11	15.5789*	A2	0.1081
A3	7.6331	A11	7.6354	A13	15.3598	A4	-0.0290
A20	7.6158	A7	7.6316	A16	15.2689	A7	-0.0515
A7	7.5802	A18	7.5758	A7	15.2118	A17	-0.0677
A6	7.5793	A22	7.4954	A20	15.0829	A14	-0.0684
A15	7.5670	A13	7.4898	A19	15.0558	A22	-0.0801
A16	7.5575	A20	7.4671	A22	14.9108	A16	-0.1539
A1	7.5024	A17	7.4217	A3	14.8231	A8	-0.2455
A22	7.4154	A19	7.3005	A15	14.7950	A9	-0.2626
A17	7.3540	A15	7.2279	A17	14.7758	A6	-0.5220
A21	7.1896	A3	7.1900	A18	14.6166	A18	-0.5349
A18	7.0409	A21	7.0584	A21	14.2481	A1	-1.1478

* represents mean value greater than total mean value 15. 3791.

concerned about. Moreover, the information quality and technological quality of the sites are two of the important evaluation criteria.

Cause value (D - R)

The values of the D – R (cause) are calculated from the sum of the rows minus sum of the columns. The larger the positive value of D – R (cause), the easier is for the items to directly influence the other factors, whereas the larger the negative value of D – R (cause), the easier is for the item to be influenced by the other factors.

From the values of D – R, it is shown that “A19 post-purchase services”, “A3 rapid access”, “A10 convenience and safety of account transactions” are the important items that influence the other factors, whereas “A1 smooth system operation”, “A18 immediate service to customer needs” and “A6 correlation of product contents” are the important items influenced by the other factors (Table 4)

Center Value (D+R)

According to the relation place of the various items, the total cause-relation matrix of the service quality of the portal sites in Table 4 is used to plot the casual diagram

for the evaluation criteria of the service quality of the portal sites (Figure 1). The first three ranks of D+R (prominence) in the evaluation factor structure that influences the service quality of the portal sites are “A2 customized data search”, “A1 smooth system operation”, “A12 trust”, which shows that these are the important key criteria. Besides, from the casual diagram, it can be known that “A21 rate of re-visits”, “A18 immediate service to customer needs”, “A17 empathy to customers” are ranked as the last 3 (Table 4).

This shows that the three evaluation factors have a smaller influence on the other factors and from the individual problems or other factors, other strategies for enhancing the service quality can be obtained. Combining the cause and prominence data in Table 4, the casual diagram can be plotted (Figure 1), so as to understand the relationship among the various evaluation criteria. From the experimental results of the study, it can be known that the service quality evaluation criteria of the portal sites mainly include system operating quality and technological quality.

The number of theses issued by the teachers is the main cause factors and the outstanding performance of the graduates is the effect factors. Besides the experimental literature review contents and limitations of the resources, the above research results can effectively control the main key evaluation criteria, and also understand the direct and indirect functional relationship between the various factors.

Conclusions

The service quality evaluation criteria of the portal sites include the 11 items of customized data search, smooth system operation and trust

Through the results of data analysis, this study selected 11 items that influence the service quality evaluation criteria of the portal sites. The contents include “A2 customized data search”, “A1 smooth system operation”, “A12 trust”, “A9 display quality of product information”, “A8 content quality of product information”, “A4 easy amendment of order contents”, “A10 convenience and safety of account transactions”, “A6 correlation of product contents”, “A14 easy operation of transactions” and “A5 complete service information”. The contents of these 11 items are mainly distributed as system quality and technological quality. This shows that the site consumers considered that the most important key strategic factors include rapid offer of data content that is accurate and meet the needs, as well as the convenience and safety during the operating process, so as to achieve customer trust. Moreover, from the service quality evaluation criteria of the portal sites, it can be known that the influence of “A21 rate of re-visits”, “A18 immediate service to customer needs”, “A17 empathy to customers” on the other factors is relatively small, thereby do not possess much influence on the enhancement of the service quality of the portal sites. It is suggested that related measures that can effectively enhance the service quality should be obtained from other items.

The cause factors of the service quality evaluation criteria of the portal sites include post-purchase services, whereas the effect factors include smooth system operation.

The study found out that the first three important and direct influence of the items of the service quality of the portal sites include “A19 post-purchase services”, “A3 rapid access”, “A10 convenience and safety of account transactions”; whereas the main items that were influenced by the other factors include: “A1 smooth system operation”, “A18 immediate service to customer needs”, “A6 correlation of product contents”. In other words, the main evaluation criteria of site consumers are still safety and convenience; whereas smooth system operation can provide immediate service and belongs to the main item that is influenced by other factors.

Management implications

The research results can be used for making profound decisions. For example, if the research wants to obtain higher customer satisfaction in terms of the effect group factors, it would be necessary to control and pay attention to the cause group criteria beforehand because the cause group implies the influencing criteria and the effect group represents the influenced criteria (Fontela and Gabus, 1976). In other words, the cause group is difficult to move, whereas the effect group can be easily moved. The management implications of the research results proved that the operation of the portal sites must give special importance to the stability and information quality of the system operation. Stable system quality points at the ability to rapidly send the data required by the customers, adequately satisfying the customers’ unwillingness to wait, and seize the mentality that “customers lack patience”, so as to enhance the positive perceptions of customers regarding the service quality of the portal sites. At the same time, when the customers feel that the system operation and data display possess quality, their feeling of trust will be increased. Besides experimental speed, the research results have a positive influence on the service quality of the portal sites. The experiments also show the accuracy of the data searched at the portal sites, which will influence the service quality of the portal sites. In other words, the searching speed, data display of the products and accuracy of the portal sites will directly influence the service quality of these sites. Besides being used as references for related industries to satisfy consumers during the construction of the portal sites, the cause-effect relationships can provide references for follow-up researchers to conduct further studies of the portal sites.

On the aspect of future studies, it is suggested that different research methods, such as fuzzy theories should be used in the DEMATEL method, so as to improve the

uncertainty of data resources (Lin and Wu, 2008). It is also one of the factors that must be considered in social sciences. At the same time, future researches can use different research methods to carry out the experiment, and compare the differences among them. Moreover, on the aspect of the research targets, it is suggested that other targets besides students should be used, so as to understand the differences in the perceptions of the evaluation criteria of the portal sites by different targets.

Limitations

The research targets of this research include students only and they are assumed to have adequate knowledge about the portal sites and the influences of the quality evaluation criteria. Different students have different needs and they may have differences in their views about the quality criteria and since the questionnaires are more of a linguistic nature, chances of biases may happen, thereby, causing uncertainty and limitations of data resources. It is, therefore, suggested that future studies can include other social groups, so as to understand the differences in the perception of the evaluation criteria of the portal sites.

REFERENCES

Allen LE (1996). Electronic Commerce. Mortgage Bank., 56(10): 101-102.

Bailey JE, Pearson SW (1983). Development of a Tool for Measuring and Analyzing Computer User Satisfaction. Manag. Sci., 29(5): 530-545.

Baty JB, Lee RM (1995). Intershop: Enhancing the Vendor/Customer Dialectic in Electronic Shopping. J. Manag. Info. Syst., 11(4): 9-31.

Belardo S, Karwan KR, Wallace WA (1982). DSS Component Design through Field Experimentation: An Application to Emergency Management. Proceedings of the Third International Conference on Information Systems, Dec., 93-108.

Chen SY (2000). Analysis on the Development Trend and Operational Model of Portal Sites. Account. Today, 79: 72-84.

Cornin JJJr, Taylor SA (1992). Measuring Service Quality: A Reexamination and Extension. J. Mark., 56(2): .55-68.

Crane FG (1991). Consumer Satisfaction/ Dissatisfaction with Professional Services. J. Prof. Serv. Mark., 7 (2): 19- 25.

DeLone WH, McLean ER (2003). The DeLone and McLean of Information Systems Success: A Ten-Year Update. J. Manag. Info. Syst., 19(4): 9-30.

Fontela E, Gabus A (1976). The DEMATEL Observer, DEMATEL 1976 Report. Switzerland, Geneva, Battelle Geneva Research Center.

Hoffman DL, Novak TP (1996). Marketing in Hypermedia Computer-Mediated Environments: Conceptual Foundations. J. Mark., 50- 68.

Hori S, Shimizu Y (1999). Designing Methods of Human Interface for Supervisory Control Systems. Control Eng. Pract., 7 (11): 1413-1419.

Hsiao JL (2006). Study on the Motivations and Behaviors of College Students Surfing the Internet. 2006 E-Commerce and Digital Life Seminar. 2006. 2. 13-14. San Xia Campus of National Taipei University.

Hu HC (2003). Examination and Weighted Research of Complexity of Business Problems—Using DEMATEL Method as the Analysis Tool. Master Thesis of the Department of Business Administration of Chung Yuan University.

Juran JM (1974). Quality Control Handbook, 3rd ed., Mcgraw-Hill, New York.

Kalakota R, Robinson M (2001). E-Business 2.0: Roadmap for Success, Addison-Wesley, New York.

Kettinger WJ, Lee CC (1995). Perceived Service Quality and User Satisfaction with the Information Services Function. Dec. Sci., 25: 737- 765.

Kiang MY, Raghu TS, Shang KH (2000). Marketing on the Internet – Who Can Benefit from an Online Marketing Approach? Dec. Support Syst., 27: 383-393.

Laudon KC, Laudon JP (1994). Management Information Systems, NY: Macmillan New York.

Lehtinen U, Lehtinen JR (1991). Two Approaches to Service Quality Dimensions. Serv. Ind. J., 25: 737-766.

Lewis RC, Booms BH (1983). The Marketing Aspects of Service Quality in Emerging Perspectives on Services Marketing, L. Berry et al. (eds.), American Marketing Association, Chicago, IL. pp. 99- 107.

Li EY (1997). Perceived Importance of Information System Success Factors: A Meta Analysis of Group Differences. Info. Manage., 32(1): 15-28.

Liang TP, Huang JS (1998). An Empirical Study on Consumers Acceptance of Products in Electronic Markets: A Transaction Model. Dec. Support Syst., 24: 29-43.

Lin CJ, Wu WW (2004). A fuzzy extension of the DEMATEL method for group decision making, the proceeding of 1st operation research, Taipei Technological University, Taiwan.

Lin CM (2005). Study on the Establishment of the Complex Analysis Model on the Cause-Effect of Management Problems-DEMATEL Method. Master Thesis of the Department of Business Administration of Chung Yuan University.

Lin CS, Wu S, Tsai RJ (2005). Integrating Perceived Playfulness into Expectation- Confirmation Model for Web Portal Context. Info. Manage., 42: 683-693.

Lin CJ, Wu WW (2008). A causal analytical method for group decision-making under fuzzy environment. Expert Syst. Appl., 34: 205-213.

Lin LH (2000). 6 students of Cheng Kung University Cannot Do without Internet. Ming Sheng Daily, 2005/05/15.

Lin MT (2003). Outlook of Portal Site Service Quality and Customer Satisfaction. Masters Thesis of the Department of Business Administration of Chung Shan University.

Liou JJH, Tzeng GH, Chang, HC (2007) Airline safety measurement using a hybrid model, J. Air Transp. Manage., 13: 243- 249.

Liu C, Arnett KP (2000). Exploring the Factors Associated with Web Site Success in the Context of Electronic Commerce. Info. Manage., 38(1): 23-33.

Lucas A (1996). What in the World Is Electronic Commerce. Sales Mark. Manage., 148(6): 24-29.

Mahmood MA, Medewitz JN (1985). Impact of Design Methods on Decision Support System Success: An Empirical Assessment. Info. Manage., 2(3): 37-64.

Mahmood MA (1987). System Development Methods -- A Comparative Investigation. MIS Quart., 11(3): 293-311.

Miller J, Doyle BA (1987). Measuring the Effectiveness of Computer-Based Information Systems in the Financial Services Sector. MIS Quart., 11(1): 107-124.

Molla A, Licker PS (2001). E-Commerce Systems Success: An Attempt to Extend and Respecify the DeLone and McLean Model of IS Success. J. Elect.Com. Success, 2(4): 1-11.

Muralidharan C, Anantharaman N, Deshmukh SG (2002). A multi-criteria group decision making model for supplier rating. J. Supply Chain Manage., 38(4): 22-33.

Niederman F, Brancheau JC, Wetherbe JC (1991). Information Systems Management Issues for the 1990s. MIS Quart., 15(4): 475-500.

Palmer JW (2002). Web Site Usability, Design, and Performance Metrics. Info. Syst. Res., 13(2):151-167.

Parasuraman A, Zeithaml VA, Berry LL (1985). A Conceptual Model of Service Quality and its Implications for Future Research. J. Mark., 49: 41-50.

Parasuraman A, Zeithaml VA, Berry LL (1988). SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. J. Retail., 64(1): 12-40.

Pitt LF, Watson RT, Kavan CB (1995). Service Quality: A Measure of Information Systems Effectiveness, MIS Quart., 19(2): 173-187.

Seyed-Hosseini SM, Safaei N, Asgharpour MJ (2006). Reprioritization of failures in a system failure mode and effects analysis by decision

making trial and evaluation laboratory technique. Reliability Eng. Syst. Safety, 91(8): 872-881.

Spreng RA, Olshavsky RW (1993). A Desires Congruency Model of Consumer Satisfaction. J. Acad. Mark. Sci., 21(3): 169-177.

Srinivasan A (1985). Alternative Measures of System Effectiveness: Associations and Implications. MIS Q., 9(3): 243-253.

Statistical Department of the Department of Education (2007). Statistical Numbers of the Various Schools in the Cities and Counties of Taiwan in 1997. 2008. 05.01; http://www.edu.tw/files/site_content/b0013/location.xls

Suwignjo P, Bititci US, Carrie AS (2000). Quantitative models for performance measurement system. Int. J. Prod. Econ., 64: 231- 241.

Tang CR (2003). Study on the Marketing Communication Strategies and Customer Satisfaction of Mobile Value Added Services—Mobile Portal Sites. Master Thesis of the Department of Information Communication of Yuan Zhi University.

Teas RK (1994). Expectations as a Comparison Standard in Measuring Service Quality: An Assessment of Reassessment. J. Mark., 58: 132-139.

Telang R, Mukhopadhyay T (2005). Drivers of Web Portal Use. Elect. Com. Res. Appl., 4: 49-65.

Tsai MC (2000). Looking at the Internet Surfing Rate from the Ambitions of CMGI. Internet Pioneer, 42-45.

Tseng ML (2009a). A causal and effect decision-making model of service quality expectation using grey-fuzzy DEMATEL approach. Expert Syst. Appl., 36(4): 7738-7748.

Tseng ML (2009b). Application of ANP and DEMATEL to evaluate the decision-making of municipal solid waste management in Metro Manila. Environ. Monitor. Assess., 156(1-4):181-197.

Tseng ML (2009c). Evaluation of firm's green performance: A novel approach. Environmental Monitoring and Assessment, in press.

Tseng ML (2009d). Using extension of DEMATEL to integrate hotel service quality perceptions into a cause-effect model in uncertainty. Expert Syst. Appl., 36(5): 9015-9023.

Tseng ML (2010). Evaluating firm's green supply chain management in linguistic preferences. J. Cleaner Prod., in press.

Tseng ML, Lin YH (2009). Application of Fuzzy DEMATEL to develop a cause and effect model of municipal solid waste management in Metro Manila. Environ. Monitor. Assess., 158: 519–533.

United States Department of Commerce (1993). The Malcolm Baldridge National Quality Award: 1993 Award Criteria, National Institute of Standards and Technology, Gaithersburg, MD20899.

Van der heijden H (2003). Factors influencing the usage of websites: the case of a generic portal in the Netherlands. Info. Manage., 40: 541-539.

Van Riel ACR, Liljander V, Jurriens P (2001). Exploring Consumer Evaluations of E-Services: A Portal Site. Int. J. Serv. Ind. Manage., 12(4): 359-377.

Watson RT, Pitt LF, Kavan CB (1998). Measuring Information Systems Service Quality: Lessons from Two Longitudinal Case Studies. MIS Quart., 22(1): 61-79.

Wu WW, Lee YT (2007). Developing global manager's competencies using the fuzzy EDEMATEL method. Expert Sys. Appl., 32: 499- 507.

Yamazaki M, Ishibe K, Yamashita S (1997). An analysis of obstructive factors to welfare service using DEMATEL method. Reports of the Faculty of Engineering, Yamanashi University, 48: 25-30.

Yang Z, Cai S, Zhou Z, Zhou N (2005). Development and Validation of an Instrument to Measure User Perceived Service Quality of Information Presenting Web Portal, Info. Manage., 42: 575-589.

Zeithaml VA, Berry LL, Parasuraman A (1996). The Behavioral Consequences of Service Quality. J. Mark., 60(2): 31-46.

Zou JD (2003). Exploratory Study on the Individualized Service of Portal Site Member—Yahoo! Master Thesis of the Department of Information of Fo Guang University.

Appendix 1. Producing Direct-Relation Matrix

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22
A1	0.000	2.222	2.111	2.444	2.667	1.556	2.556	2.444	2.333	2.000	2.444	2.333	2.333	2.111	2.444	2.222	2.222	2.111	2.222	2.000	1.667	1.667
A2	2.111	0.000	2.000	2.222	2.667	2.222	2.111	2.333	2.444	2.444	2.111	1.889	2.000	2.333	2.000	1.444	1.889	1.889	1.556	2.000	1.778	1.556
A3	1.889	1.778	0.000	2.222	2.111	1.889	1.556	1.556	1.778	1.444	2.222	2.111	2.000	2.111	1.889	1.667	1.667	1.556	1.667	1.667	1.667	1.556
A4	2.111	2.111	2.111	0.000	2.222	2.222	1.667	2.000	1.667	2.111	1.556	2.444	2.667	2.222	2.000	1.778	1.667	1.889	1.778	2.222	1.556	1.778
A5	2.222	2.222	2.222	1.889	0.000	1.667	1.889	2.000	2.222	1.889	2.222	2.222	2.333	1.667	1.889	1.778	1.667	1.111	1.667	2.111	1.889	2.000
A6	1.556	2.333	2.667	2.111	2.111	0.000	2.222	2.333	1.889	2.444	2.111	2.111	2.000	1.667	1.444	2.444	1.889	1.778	2.222	2.222	1.778	1.778
A7	2.111	2.222	2.222	2.000	2.111	1.778	0.000	2.222	1.889	2.111	1.556	1.889	2.111	1.667	1.889	1.444	1.556	1.889	2.000	2.111	1.556	2.111
A8	1.889	2.222	2.111	2.333	2.333	2.333	1.889	0.000	2.222	2.111	2.222	2.000	2.111	1.889	1.778	2.222	1.889	1.444	2.333	1.778	1.444	2.000
A9	1.667	2.444	1.556	2.222	2.222	2.556	1.889	1.778	0.000	2.222	1.778	2.222	2.000	2.222	2.222	1.778	2.111	2.000	2.000	2.000	1.889	2.111
A10	1.444	2.000	2.111	1.778	1.889	2.111	1.667	1.889	1.889	0.000	1.778	2.000	2.000	2.111	2.111	1.889	2.000	1.889	2.000	2.000	2.333	1.778
A11	1.667	2.222	1.889	1.889	1.889	1.667	1.667	1.667	1.778	2.111	0.000	2.222	2.000	2.000	2.111	2.111	1.667	2.000	2.111	2.000	2.000	1.889
A12	1.778	1.889	2.000	2.444	1.778	2.333	2.333	2.000	2.000	2.000	2.333	0.000	1.889	1.556	1.889	2.000	2.333	2.000	1.667	1.889	2.111	1.889
A13	1.667	2.444	1.556	2.000	1.667	1.778	1.889	1.556	1.889	1.889	1.667	2.111	0.000	2.111	1.778	2.444	2.222	1.556	1.778	2.111	1.667	1.889
A14	2.333	2.444	2.222	2.556	2.111	2.000	1.889	2.222	2.333	2.444	2.000	1.778	1.333	0.000	1.556	1.667	2.111	1.667	2.000	1.889	1.556	1.556
A15	2.111	2.111	1.778	2.000	1.333	1.556	1.778	1.778	1.444	1.444	1.667	2.333	1.889	2.000	0.000	2.222	2.000	1.667	2.000	1.333	1.889	1.889
A16	2.000	2.000	1.778	1.889	1.778	1.889	1.444	2.111	2.111	2.667	2.000	1.889	1.222	1.778	1.556	0.000	2.111	2.444	2.111	2.222	1.889	2.000
A17	1.333	1.889	1.444	1.889	2.222	2.333	2.444	2.111	2.000	1.667	2.111	1.444	1.889	2.000	1.667	1.667	0.000	1.667	2.000	1.667	2.000	1.889
A18	2.000	1.778	1.778	1.444	2.444	1.889	2.000	1.444	2.444	2.000	2.111	2.333	2.000	2.222	2.222	2.000	1.444	0.000	1.778	1.444	1.556	1.778
A19	1.778	1.444	1.667	1.667	1.667	1.778	1.889	2.333	2.111	1.889	2.111	2.111	2.222	1.778	1.889	1.556	1.444	1.556	0.000	1.667	2.222	1.889
A20	2.222	2.000	1.556	1.889	1.889	1.333	1.667	2.000	1.556	2.111	2.222	1.889	1.778	2.111	2.222	1.667	1.778	2.000	2.111	0.000	1.667	1.889
A21	2.111	2.000	1.778	1.222	1.333	1.444	1.889	1.778	1.556	1.556	2.000	1.778	1.889	1.778	1.556	2.000	1.889	1.556	2.000	1.778	0.000	2.444
A22	1.778	1.889	1.889	1.444	1.889	1.778	1.889	1.667	1.889	2.222	2.000	1.889	2.111	2.111	2.000	2.111	1.333	1.556	2.222	2.222	1.889	0.000

Appendix 2. Standardized direct-relation matrix

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22
A1	0.000	0.048	0.046	0.053	0.058	0.034	0.055	0.053	0.051	0.043	0.053	0.051	0.051	0.046	0.053	0.048	0.048	0.046	0.048	0.043	0.036	0.036
A2	0.046	0.000	0.043	0.048	0.058	0.048	0.046	0.051	0.053	0.053	0.046	0.041	0.043	0.051	0.043	0.031	0.041	0.041	0.034	0.043	0.039	0.034
A3	0.041	0.039	0.000	0.048	0.046	0.041	0.034	0.034	0.039	0.031	0.048	0.046	0.043	0.046	0.041	0.036	0.036	0.034	0.036	0.036	0.036	0.034
A4	0.046	0.046	0.046	0.000	0.048	0.048	0.036	0.043	0.036	0.046	0.034	0.053	0.058	0.048	0.043	0.039	0.036	0.041	0.039	0.048	0.034	0.039
A5	0.048	0.048	0.048	0.041	0.000	0.036	0.041	0.043	0.048	0.041	0.048	0.048	0.051	0.036	0.041	0.039	0.036	0.024	0.036	0.046	0.041	0.043
A6	0.034	0.051	0.058	0.046	0.046	0.000	0.048	0.051	0.041	0.053	0.046	0.046	0.043	0.036	0.031	0.053	0.041	0.039	0.048	0.048	0.039	0.039
A7	0.046	0.048	0.048	0.043	0.046	0.039	0.000	0.048	0.041	0.046	0.034	0.041	0.046	0.036	0.041	0.031	0.034	0.041	0.043	0.046	0.034	0.046
A8	0.041	0.048	0.046	0.051	0.051	0.051	0.041	0.000	0.048	0.046	0.048	0.043	0.046	0.041	0.039	0.048	0.041	0.031	0.051	0.039	0.031	0.043
A9	0.036	0.053	0.034	0.048	0.048	0.055	0.041	0.039	0.000	0.048	0.039	0.048	0.043	0.048	0.048	0.039	0.046	0.043	0.043	0.043	0.041	0.046
A10	0.031	0.043	0.046	0.039	0.041	0.046	0.036	0.041	0.041	0.000	0.039	0.043	0.043	0.046	0.046	0.041	0.043	0.041	0.043	0.043	0.051	0.039
A11	0.036	0.048	0.041	0.041	0.041	0.036	0.036	0.036	0.039	0.046	0.000	0.048	0.043	0.043	0.046	0.046	0.036	0.043	0.046	0.043	0.043	0.041
A12	0.039	0.041	0.043	0.053	0.039	0.051	0.051	0.043	0.043	0.043	0.051	0.000	0.041	0.034	0.041	0.043	0.051	0.043	0.036	0.041	0.046	0.041
A13	0.036	0.053	0.034	0.043	0.036	0.039	0.041	0.034	0.041	0.041	0.036	0.046	0.000	0.046	0.039	0.053	0.048	0.034	0.039	0.046	0.036	0.041
A14	0.051	0.053	0.048	0.055	0.046	0.043	0.041	0.048	0.051	0.053	0.043	0.039	0.029	0.000	0.034	0.036	0.046	0.036	0.043	0.041	0.034	0.034
A15	0.046	0.046	0.039	0.043	0.029	0.034	0.039	0.039	0.031	0.031	0.036	0.051	0.041	0.043	0.000	0.048	0.043	0.036	0.043	0.029	0.041	0.041
A16	0.043	0.043	0.039	0.041	0.039	0.041	0.031	0.046	0.046	0.058	0.043	0.041	0.027	0.039	0.034	0.000	0.046	0.053	0.046	0.048	0.041	0.043
A17	0.029	0.041	0.031	0.041	0.048	0.051	0.053	0.046	0.043	0.036	0.046	0.031	0.041	0.043	0.036	0.036	0.000	0.036	0.043	0.036	0.043	0.041
A18	0.043	0.039	0.039	0.031	0.053	0.041	0.043	0.031	0.053	0.043	0.046	0.051	0.043	0.048	0.048	0.043	0.031	0.000	0.039	0.031	0.034	0.039
A19	0.039	0.031	0.036	0.036	0.036	0.039	0.041	0.051	0.046	0.041	0.046	0.046	0.048	0.039	0.041	0.034	0.031	0.034	0.000	0.036	0.048	0.041
A20	0.048	0.043	0.034	0.041	0.041	0.029	0.036	0.043	0.034	0.046	0.048	0.041	0.039	0.046	0.048	0.036	0.039	0.043	0.046	0.000	0.036	0.041
A21	0.046	0.043	0.039	0.027	0.029	0.031	0.041	0.039	0.034	0.034	0.043	0.039	0.041	0.039	0.034	0.043	0.041	0.034	0.043	0.039	0.000	0.053
A22	0.039	0.041	0.041	0.031	0.041	0.039	0.041	0.036	0.041	0.048	0.043	0.041	0.046	0.046	0.043	0.046	0.029	0.034	0.048	0.048	0.041	0.000

Appendix 3. Direct/Indirect Matrix

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16	A17	A18	A19	A20	A21	A22
A1	0.341	0.420	0.391	0.408	0.417	0.378	0.397	0.404	0.404	0.408	0.412	0.416	0.406	0.399	0.395	0.390	0.381	0.364	0.399	0.388	0.362	0.372
A2	0.364	0.351	0.367	0.381	0.395	0.369	0.367	0.380	0.383	0.394	0.382	0.384	0.377	0.381	0.364	0.353	0.353	0.339	0.363	0.366	0.343	0.349
A3	0.323	0.348	0.289	0.343	0.345	0.326	0.319	0.327	0.332	0.335	0.346	0.350	0.339	0.339	0.325	0.321	0.313	0.299	0.328	0.323	0.307	0.313
A4	0.355	0.384	0.360	0.326	0.376	0.360	0.349	0.364	0.359	0.378	0.362	0.386	0.381	0.369	0.355	0.350	0.340	0.331	0.358	0.362	0.330	0.344
A5	0.350	0.379	0.355	0.357	0.322	0.342	0.346	0.356	0.362	0.365	0.367	0.373	0.367	0.351	0.346	0.343	0.333	0.309	0.349	0.352	0.330	0.342
A6	0.352	0.398	0.380	0.378	0.383	0.323	0.369	0.379	0.372	0.394	0.382	0.388	0.377	0.367	0.353	0.372	0.353	0.337	0.376	0.371	0.343	0.353
A7	0.345	0.376	0.352	0.357	0.364	0.341	0.304	0.358	0.353	0.367	0.352	0.364	0.360	0.348	0.343	0.334	0.328	0.322	0.353	0.349	0.321	0.341
A8	0.356	0.392	0.366	0.379	0.384	0.368	0.359	0.328	0.375	0.384	0.381	0.383	0.376	0.368	0.356	0.365	0.349	0.327	0.375	0.359	0.334	0.354
A9	0.353	0.399	0.357	0.379	0.384	0.375	0.361	0.367	0.332	0.388	0.374	0.389	0.376	0.377	0.367	0.358	0.356	0.340	0.371	0.365	0.345	0.358
A10	0.332	0.372	0.351	0.353	0.360	0.349	0.340	0.352	0.353	0.324	0.357	0.367	0.358	0.358	0.348	0.343	0.337	0.322	0.353	0.348	0.337	0.335
A11	0.336	0.376	0.346	0.354	0.359	0.339	0.339	0.347	0.351	0.367	0.319	0.371	0.357	0.355	0.348	0.347	0.330	0.324	0.355	0.347	0.330	0.337
A12	0.350	0.382	0.360	0.377	0.369	0.364	0.364	0.365	0.367	0.377	0.379	0.337	0.367	0.358	0.355	0.357	0.355	0.335	0.358	0.357	0.343	0.348
A13	0.330	0.374	0.333	0.351	0.349	0.336	0.338	0.339	0.347	0.357	0.348	0.362	0.310	0.351	0.335	0.348	0.336	0.310	0.342	0.344	0.318	0.331
A14	0.359	0.391	0.362	0.378	0.374	0.356	0.353	0.368	0.372	0.384	0.371	0.372	0.355	0.323	0.346	0.347	0.348	0.326	0.363	0.355	0.330	0.339
A15	0.329	0.356	0.327	0.340	0.331	0.321	0.325	0.333	0.327	0.337	0.337	0.356	0.338	0.338	0.287	0.333	0.321	0.303	0.336	0.318	0.313	0.321
A16	0.346	0.374	0.347	0.357	0.361	0.347	0.338	0.359	0.361	0.382	0.364	0.367	0.345	0.354	0.340	0.306	0.342	0.336	0.358	0.355	0.331	0.342
A17	0.321	0.360	0.329	0.346	0.357	0.344	0.346	0.347	0.346	0.350	0.354	0.346	0.347	0.346	0.330	0.330	0.287	0.309	0.344	0.332	0.322	0.329
A18	0.340	0.365	0.341	0.343	0.368	0.341	0.344	0.340	0.362	0.363	0.360	0.371	0.355	0.357	0.348	0.343	0.324	0.281	0.346	0.334	0.319	0.333
A19	0.325	0.346	0.328	0.336	0.341	0.328	0.330	0.346	0.343	0.349	0.349	0.354	0.348	0.337	0.330	0.323	0.313	0.303	0.298	0.327	0.322	0.324
A20	0.341	0.364	0.332	0.348	0.352	0.326	0.333	0.347	0.339	0.360	0.358	0.357	0.346	0.350	0.343	0.332	0.326	0.318	0.348	0.299	0.317	0.330
A21	0.322	0.346	0.320	0.317	0.324	0.312	0.321	0.326	0.323	0.332	0.337	0.337	0.331	0.327	0.314	0.322	0.312	0.294	0.330	0.320	0.267	0.326
A22	0.333	0.363	0.340	0.340	0.353	0.336	0.338	0.341	0.347	0.364	0.355	0.358	0.354	0.351	0.340	0.342	0.318	0.310	0.352	0.346	0.323	0.292