

# An Integrated Model of Negative Critical Incidents and Quality Attributes Satisfaction

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## ABSTRACT

*This study proposed an integration of the frequency of negative criteria incidents (FNCIs) and quality attributes satisfaction (QASAT) model based on theory guided. To accomplish this objective, criteria incidents related to the measurement model have been developed. An empirical study of online bookstores was illustrated. The results of this study developed a set of critical incidents and indicated that FNCIs affected overall satisfaction indirectly by QASAT was 44% on the Internet shopping environment.*

## 1. INTRODUCTION

The increase in business-to-customer (B2C) channels has made several firms look for new strategies to understand online shopping behavior in order to attract, retain and satisfy customers' needs (Ranganathan and Ganapathy, 2002). In fact, many researchers have considered that customer satisfaction leading to higher levels of customer retention would depend on the success of critical factors, such as quality design (Liu and Arnett, 2000; Rose et al., 1999; Huizingh, 2000), security concerns (Bhimani, 1996; Denning, 1997), and other factors for electronic commerce. However, Waterhouse and Morgan (1994) reported an interesting finding that just one factor of dissatisfaction and defection would be enough to cause customers to become disenchanted with Internet shopping. This finding is consistent with Firman et al. (2001), who found that negative critical incidents (NCIs) play an important role for users' cumulative satisfaction with public transport services. A critical incident is an encounter that is particularly satisfying or dissatisfying (Bitner et al., 1990). NCIs are customer encounters that do not proceed normally but create friction, irritation, and dissatisfaction (Edvardsson, 1992).

Occasionally, due to loss aversion (Kahneman and Tversky, 1979) or distinctiveness in memory (Bower, 1981; Oliver, 1997), customers treated negative critical incidents more silently and are unlikely to remember specific critical incidents for a long time. However, they may accurately judge the frequency of the critical incidents, in particular since such events stand out (Fisk and Schneider, 1984; Greene, 1984; Woodley and Ellis, 1989).

Given the literature review above, although many researchers have identified critical incidents from different perspectives, little has been reported in the literature with regard to the influence of negative critical incidents for Internet shopping from the viewpoint of customer satisfaction. Therefore, this study pursued better measures and models for use in predicting and explaining online bookstores as an example of customer Internet shopping satisfaction. The purpose of this study was twofold. First, it heeded the call for theoretically based empirical work on Internet shopping. Second, it examined the frequency of NCIs in combination with quality attributes satisfaction (QASAT), in an attempt to understand their combined effects on the overall satisfaction of Internet shoppers.

The remainder of this study is arranged as follows. First, section 2 describes the proposed model and summarizes the hypotheses. Section 3

outlines the method and sampling procedure. Section 4 presents the analytical results and discussion of this study. Finally, section 5 concludes the related contribution on academic and marketer practitioners of online bookstores.

## 2. PROPOSED MODEL

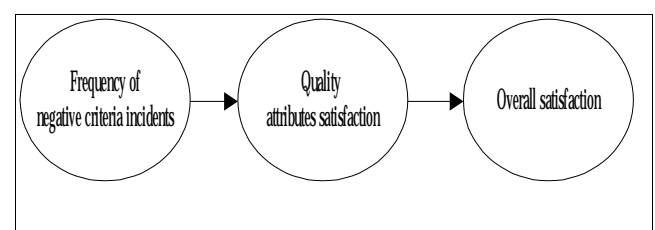
Customer satisfaction has been an important theme in many separate studies and is scattered across many fields. To develop and evaluate an integrated model, frequency of NCIs and QASA, affected overall satisfaction for customers of Internet shopping, it is imperative that satisfaction be distinguished from cumulative satisfaction (Firman et al., 2001) and in both cases satisfaction be either defined as an overall judgment of satisfaction or quality attributes (Anderson and Sullivan, 1993; Cronin and Taylor, 1992; Gotlieb et al., 1994).

We referred to Firman et al.'s (2001) study in public transport services to propose a model (Fig. 1) consisting of three sets of latent variables: (1) frequency of negative critical incidents (FNCIs), (2) quality attributes satisfaction (QASAT), and (3) overall satisfaction.

Four factors have been categorized into quality e-store, information content, security concerns and consumers' experience from aspects of web quality attributes for measuring Internet shopping were specified to construct a set of critical incidents for encounter satisfaction. The four factors consisted of 34 items from previous literature described as follows:

- (1) Quality e-store (10 items): fast web page download, store size, promotions, ease of use and so on (Liu and Arnett, 2000; Rose et al., 1999; Huizingh, 2000).
- (2) Information content (8 items): availability of information to compare across alternatives, completeness of information provided about a firm, product and service and so on (Scharl and Bauer, 1999; Huizingh, 2000; Ranganathan and Ganapathy, 2002).

Fig. 1: Causal relationships among frequency of negative critical incidents, quality attributes satisfaction and overall satisfaction.



- (3) Security concerns (5 items): availability of secure modes for transmitting information, provisions made for alternatives, overall concern about security of transactions over the Internet, gathering of personal information and so on (Bhimani, 1996; Denning, 1997; Ranganathan and Ganapathy, 2002; Kiely, 1997; Mannix, 1999; Mardesich, 1999; Salisbury et al. 1998).
- (4) Consumer experience (11 items): increased customization, convenience in purchasing, responsiveness in product delivery and so on (Jarvenpaa and Todd, 1996; Elliot and Fowell, 2000).

These items were initially assessed using a Delphi method. Three E-commerce scholars were asked to evaluate the items and make changes to eliminate repetitive items. After two evaluation rounds, there remained 22 critical incidents of web quality attributes for further study.

Two questions were used to measure overall satisfaction. One is "What is the degree of satisfaction for online bookstores?" The other question is "Will you recommend using online bookstores to a friend?"

Furthermore, in this model, the causal relationships among the frequency of NCIs, QASAT, and overall satisfaction may be summarized as the following hypotheses we will subject to testing.

H1: Frequency of NCIs affected overall satisfaction and were indirectly mediated by QASAT.

### 3. METHODOLOGY

#### 3.1 Measurement

A questionnaire was designed to measure satisfaction of service quality, frequency of negative critical incidents, overall satisfaction, demographic variables, and experience of online purchasing. A measurement of quality attributes satisfaction and the former question of overall satisfaction included a five-point Likert-scale from "strongly agree (5)" to "strongly disagree (1)." A measurement of the second question of overall satisfaction, "Will you recommend using online bookstores to a friend?" included a five-point Likert-scale from "strongly willing (5)" to "strongly unwilling (1)." A measurement of frequency of NCIs also included a five-point Likert-scale from "never experienced (5)" to "always experienced (1)."

#### 3.2 Data collection

In this study, two pilot tests were conducted. In order to remove the bias from inexperienced customers, 30 customers who have at least online purchase were asked to respond to the second draft of the instrument. Seven infrequently experienced negative indices, including price, promotion activities, discounts, variety of payments, personalized service, variety categories and search engine, were dropped. There remained 15 critical incidents for further analysis. Once again, the number of measuring variables, 15 critical incidents, were the same for measuring the constructs of FNCIs and QASAT.

An online survey was performed for collecting the data. The instrument was posted from July 1, to July 15, 2002. We simply eliminated an additional 5 respondents who replied with essentially the same scale value to all items on the survey. This produced a final analysis sample of 318 respondents, with no missing data. The sample of the respondents consisted of 144 (45.3%) males and 174 (54.7%) females, all of whom had made purchases online, with 79% having had at least one or two experiences in online book purchasing per month, spending varying amounts.

#### 3.3 Research design

The aim of this study was to examine the causal relationship among FNCIs, QASAT constructs, and overall satisfaction about which we proposed a series of assumptions in Section 2. Therefore, a structural equation model (SEM) was used to fit a calibrated sample. The Lisrel 8.3 package (Joreskog and Sorbom, 1993) was selected for all model fitting. A matrix of correlation between the variables was input to Lisrel 8.3 using the maximum likelihood estimated.

For explanation, the total coefficient of determination (TCD)  $R^2$  for structural equations was shown herein. Then, five recommended fit

Table 1: Principal component analysis with varimax rotation

Quality attributes	Variable (Coded)	Factor1	Factor2	Factor3	Factor4
Acceptable service charge	Sat4	0.65	0.16	-0.08	0.17
Diversity shipping	Sat5	0.82	0.14	0.11	-0.03
Diversity ordering	Sat6	0.78	0.10	0.19	0.10
Diversity receiving	Sat7	0.81	0.10	0.05	0.14
Speedy product delivery	Sat8	0.24	0.56	0.35	0.12
Simple transaction process	Sat9	0.46	0.42	0.14	0.28
Variety of communicates	Sat10	0.21	0.70	0.12	0.20
Quick response	Sat11	0.09	0.83	0.15	0.14
Convenience to exchange product	Sat12	0.10	0.77	0.11	0.13
Book preview service	Sat13	0.10	0.41	0.50	-0.09
Infrequent books	Sat18	0.05	0.01	0.82	-0.01
Complete introduction of books	Sat19	0.08	0.23	0.81	0.21
Accurate book reviews	Sat20	0.08	0.24	0.66	0.32
Security of transactions	Sat21	0.25	0.17	0.22	0.81
Privacy of personal details	Sat22	0.12	0.23	0.06	0.85

indices were used to measure the overall model fit. These are normed Chi-square (Hair et al., 1995), Goodness-of-fit index (GFI, Hair et al., 1995), Root-mean-square error of approximation (RMSEA, Steiger, 1990), Relative fit index (RFI, Hair et al., 1995), and Adjusted goodness-of-fit index (AGF, Hair et al., 1995).

### 4. RESULTS

#### 4.1 Measurement model

##### 4.1.1 Quality attributes satisfaction (QASAT)

Principal component analysis (PCA) is a useful strategy for recovering an underlying model that can then be evaluated with CFA (Gerbing and Hamilton, 1996). Therefore, this study used PCA to identify items belonging to the different hypothesized latent variables first. We decided to use a cutoff point of 0.7 for item loadings and the factor analysis revealed four factors with an eigenvalue of greater than one (as shown in Table 1).

The following changes were made. Since three item scales (sat8, sat9 and sat13) did not load on any factors were removed. Sat4 and sat20 factor loading less than 0.7 were removed. Finally, 10 measured variables onto the four latent factors of positive emotions were constructed. Furthermore, quality e-store, customer experience, and information content were renamed into "ease of use, quick response, complete information, and trustworthy."

It was found that ease of use consisted of three items and dealt with such attributes as diversity shipping, diversity ordering, and diversity receiving. "Quick response" reflects concerns related to finding specific details about supporting multiple channels of communication with organizations and response quickly. "Complete information" consisted of two items: support of infrequent books and complete introduction of books. "Trustworthy" contains two items: security of transactions and privacy of personal details. The standardized Cronbach's alpha coefficients with 0.81, 0.79, 0.70, and 0.78 for ease of use, quick response, complete information and trustworthy were all exceeding the generally accepted guideline 0.7 and above (Hair et al., 1998).

##### 4.1.2 Frequency of negative critical incidents (FNCIs)

As described above, FNCI measures were the same as the construct of quality attributes satisfaction and thus FNCIs were mapped into four factors, useless, careless, incomplete information, and untrustworthy, directly. In addition, the results of a principal analysis extracting four factors suggested that 6 critical incidents (Unsat1, Unsat5, Unsat7, Unsat9, Unsat10 and Unsat13) were removed, since item loadings were less than 0.7 (as shown in Table 2). Standardized Cronbach's alpha coef-

Table 2: Principal component analysis with varimax rotation

Critical incidents	Variable (Coded)	Factor1	Factor2	Factor3	Factor4
Need more service charge	Unsat1	0.55	0.20	-0.16	0.40
Less diversity shipping	Unsat2	0.30	0.79	0.03	0.24
Less diversity ordering	Unsat3	0.22	0.87	0.10	0.18
Less diversity receiving	Unsat4	0.21	0.77	0.18	0.12
Slow product delivery	Unsat5	0.66	0.18	0.41	-0.02
Complicated transaction process	Unsat6	0.71	0.17	0.10	0.27
Lack of variety of communications	Unsat7	0.61	0.46	0.26	0.09
Slow response	Unsat8	0.73	0.38	0.18	0.19
Inconvenience to exchange product	Unsat9	0.58	0.20	0.20	0.41
Don't provide book preview service	Unsat10	0.37	0.18	0.63	-0.08
Less variety of products	Unsat11	-0.05	0.12	0.80	0.05
Incomplete introduction	Unsat12	0.11	0.04	0.85	0.26
Mislead books review	Unsat13	0.32	0.06	0.60	0.26
Pool security of transactions	Unsat14	0.20	0.27	0.13	0.84
Pool privacy of personal details	Unsat15	0.23	0.17	0.23	0.83

ficients for useless, careless, incomplete information and untrustworthy were 0.85, 0.81, 0.68, and 0.85, respectively.

## 4.2 Structural model

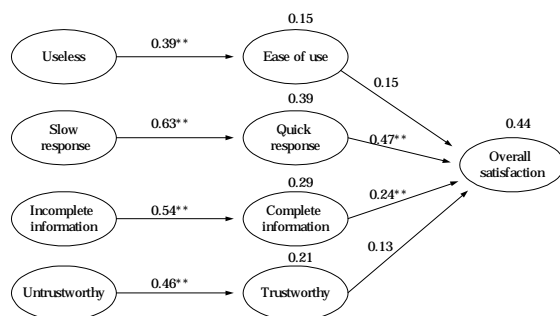
### 4.2.1 Integration of FNCIs and the QASAT fit model

The maximum likelihood estimated was also used to fit this model. Convergence was achieved in 26 iterations, and no estimation problems were encountered for the calibration sample of 210 respondents. A path analysis of the integrated model shows acceptable fit to the data (norm Chi-square = 1.38, RFI = 0.88, GFI = 0.90, AGFI = 0.87 and RMSEA = 0.039). The amount of variance in the dependent variable, overall satisfaction, explained by this integral model was 44%, which is higher than the variance of FNCIs alone (23%). There are eight paths (causal relationship) between the FNCIs, QASAT constructs and overall satisfaction (Fig. 2). Six of these eight links have path coefficients not significant, in which, all of the remembered frequency of negative critical incidents are directly related to quality attributes satisfaction. Just two exceptions are the links between ease of use, trustworthy, and cumulative overall satisfaction.

## 5. DISCUSSION AND CONCLUSIONS

Through the overall satisfaction variance and path coefficients, positive vs. negative emotions, happiness vs. unhappiness really has separate and disparate effects between the bipolar emotional dimensions (Babin et al., 1998; Gardner, 1985; Thomas and Diener, 1990).

Fig. 2: Integrated model with NCIs and QASAT path analysis (\*\*: = 0.01, \*: = 0.05).



In conclusion, these results have implications for research and practice. For research, there was little prior research that discussed whether cumulative overall and quality attributes satisfaction with online shopping service are related to the remembered frequency of negative critical incidents. Our results suggest that the effect of slow response and incomplete information on overall satisfaction was mediated by quality attributes satisfaction.

In practice, market practitioners of online bookstores need to be aware that cumulative overall satisfaction depends not only on positive emotions, but also on negative emotions. This idea is similar to an example that Babin (1998) proposed – if a customer were to fill out a “satisfaction” survey to indicate some satisfaction on the scale rating, the customer would never return because of the high levels of negative emotion also experienced but unassessed. From the commercial viewpoint, online shopping has become more and more essential and is broadly well-known. How to build, maintain, and enhance customer relationships is an important issue in a fiercely competitive environment. Therefore, the results of this study indicate that it would be a valuable strategy for marketers to rethink how they can find out and reduce the frequency of NCIs that customers may encounter.

## REFERENCE

1. Anderson, E.W., and Sullivan, M. (1993), The antecedents and consequences of customer satisfaction for firms, *Marketing Science*, 12(2), pp. 125-143.
2. Babin, B.J., Darden, W.R. and Babin, L.A. (1998), Negative emotions in marketing research: affect or artifact? *Journal of Business Research*, 42, pp. 271-285.
3. Bhimani, A. (1996), Securing the commercial Internet, *Communications of the ACM*, vol. 39 (6), pp. 29-35.
4. Bitner, M.J., and Booms, B.H. (1990), and Tetreault, M.S., The service encounter: diagnosing favorable and unfavorable incidents, *Journal of Marketing*, 54, pp. 71-84.
5. Bower, G.H. (1981), Mood and memory, *American Psychologist*, 36, pp. 129-148.
6. Cronin, J.J., and Taylor, S.A. (1992), Measuring service quality: a reexamination and extension. *Journal of Marketing*, 58, pp. 53-66.
7. Denning, D.E. (1997), International encryption policy, in: R. Kalakota, A.B. Whinston (Eds.), *Readings in Electronic Commerce*, Addison-Wesley, Reading, MA, pp. 105-118.
8. Edvardsson, B. (1992), Service breakdowns: a study of critical incidents in an airline, *International Journal of Service Industry Management*, 3 (4), pp.17-29.
9. Elliot, S., and Fowell, S. (2000), Expectations versus reality: a snapshot of consumer experiences with Internet shopping, *The International Journal of Information Management*, 20, pp. 323-336.
10. Fisk, A.D., and Schneider, W. (1984), Memory as a function of attention, level of processing, and automatization, *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 10, pp. 181-197.
11. Friman, M., Edvardsson, B., and Garling, T. (2001), Frequency of negative critical incidents and satisfaction with public transport services I, *Journal of Retailing and Consumer Services*, 8, pp. 93-104.
12. Gardner, Mery P. (1985), Mood states and consumer behavior, a critical review, *Journal of consumer research*, 12, December, pp. 281-300.
13. Gerbing, D.W., Hamilton, J.G.. (1996), Viability of exploratory factor analysis as a precursor to confirmatory factor analysis, *Structural Equation Modeling*, 3, pp. 62-72.
14. Gotlieb, J.B., Grewal, D., and Brown, S.W. (1994), Consumer satisfaction and perceived quality: complementary or divergent constructs? *Journal of Applied Psychology*, 79, pp. 875-885.
15. Green, R.L. (1984), Incidental learning of event frequency, *Memory and Cognition*, 12, pp. 90-95.
16. Hair, J.F., Andersen, R.E., Tatham, R.L., and Black, W.C. (1998), *Multivariate Data Analysis*. Prentice Hall, New Jersey, USA.

17. Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1995), *Multivariate Data Analysis*. Englewood Cliffs, NJ: Prentice-Hall.
18. Huizingh, E.K. (2000), The content and design of web sites: an empirical study, *Information and Management*, 37(3), pp.123-134.
19. Jarvenpaa, S.L., and Todd, P.A. (1996), Consumer reactions to electronic shopping on the World Wide Web, *International Journal of Electronic Commerce*, Vol. 1 (2), pp. 59-88.
20. Joreskog, K.G., and Sorbom, D. (1993), *LISREL 8: structural equations modeling with the SIMPLIS command language*, Chicago, IL: Scientific Software, International.
21. Kahneman, D., and Tversky, A. (1979), Prospect theory: an analysis of decision under risk, *Econometrica*, 47(2), pp. 263-291.
22. Kiely, T. (1997), The Internet: fear and shopping in cyberspace, *Harvard Business Review*, 75(4), pp.200-213.
23. Liu, C., and Arnett, K.P. (2000), Exploring the factors associated with web sites success in the context of electronic commerce, *Information and Management*, 38(1), pp. 2333.
24. Mannix, M. (1999), Watch for web hazards and you'll shop hitch free, *US News and World Report*, 13, December, pp. 76.
25. Mardesich, J. (1999), The web is no shopper's paradise, *Fortune*, 140(9), pp. 188-198.
26. Oliver, R.L. (1997), *Satisfaction, A Behavioral Perspective on the Consumer*, McGraw-Hill, New York.
27. Ranganathan, C., and Ganapathy, S. (2002), Key dimensions of business-to-consumer web sites, *Information and Management*, 39, pp. 457-465.
28. Rose, G., Khoo, H., and Straub, D.W. (1999), Current technological impediments to business-to-consumer e-commerce, *Communications of the Association for Information Systems*, 1(16), <http://cais.aisnet.org/articles>.
29. Scharl, A. and Bauer, C. (1999), Explorative analysis and evaluation of commercial web information systems, in: *Proceedings of the Twentieth International Conference on Information Systems (ICIS)*, Charlotte, North Carolina, December, pp. 534-539.
30. Steiger, J. (1990), Structural model evaluation and modification: an interval estimation approach, *Multivariate Behavioral Research*, 25, pp. 173-180.
31. Thomas, D.L., and Diener, E. (1990), Memory accuracy in the recall of emotions, *Journal of personality and social psychology*, 59, January, pp. 291-297.
32. Waterhouse, K., and Morgan, A. (1994), Using research to help to keep good customers: understanding the process of customer defection and developing a strategy for customer retention, *Marketing and Research Today*, 22(3), pp. 181-191.
33. Woodly, Z.P., and Ellis, N.R. (1989), Memory for frequency occurrence: intelligence levels and retrieval cues, *Intelligence*, 13, pp. 53-61.

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