

Toward New Metrics for Net-Enhanced Organizations

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Metrics are *sine qua non* for solid research, and scientific metrics have now been advanced with new approaches in the arena of Net-enablement (NE), otherwise known as e-commerce. Questions that likely require additional attention include: (1) Where/what is the real value in substituting information for physical processes?, (2) which NE systems effectively support end-to-end fulfillment?, and (3) when should a Net-enabled organization share information? With respect to extant studies in Net-enhancement, the field has been advanced in three methodological dimensions. Multiple methods have been used to validate measures. Approaches to metrics using archival/secondary data have also been initiated. Finally, strong external validity has been established through large scale data gathering.

(Metrics; Measurement; Research Constructs; e-Commerce; Net-Enablement; Net-Enhancement; Frameworks)

1. Introduction

The development of metrics to reveal the inner workings of Net-enablement and Net-enhancement (NE), a.k.a. e-commerce, is just beginning, as Straub et al. (2002) point out. The movement of firms toward using networks to enhance their businesses will likely take decades, an evolution that will see the development of metrics that suit emerging technologies and some that will endure over time. Both temporary and long-lasting metrics will be valuable for academics and practitioners trying to more fully comprehend this phenomenon.

What ground still needs to be covered? One way of evaluating progress is to compare extant metrics with the research questions that need to be addressed within the next few years. A number of frameworks

for research have been offered, and can be considered as a base of reference. In these works and in other literature, there are pressing matters for investigation that call for new or better instrumentation. The research questions we shall pursue briefly here are: What has already been covered in the metrics of Net-enablement and which measures still need to be developed?

2. Measurement in the Business Disciplines

Before examining this research question and assessing the contribution of articles in this issue, there is value in examining a few basic measurement issues from the perspective of the philosophy of science. This is especially

useful because the academic community apparently still needs to advance its knowledge a great deal further in this area. When Boudreau et al. (2001) studied how constructs were being measured in articles in 5 top journals over a previous 11 year period, they found only one area of validation—reliability—where more researchers were validating their instrumentation than not. Clearly there must still be a lack of understanding about basic measurement in the field for such a situation to persist at the turn of the millennium.

What exactly do measures gain for us, and why do we need to validate them? Scientists work with constructs, constructions of the mind that allow us to relate concepts to each other. These abstract constructs (or intellectual constructions) cannot be empirically tested, *per se*. They can be deduced from other theories, formulated into theoretical relationships, and logically and analytically tested, but testing them for use in the real world requires operationalization (Blalock 1969, 1979).

Thus, operationalizations, or measures, are the means by which we attempt to capture a moonbeam and hold it in our hands. There must be data that represents our abstractions well enough that we can conclude something about the intellectual phenomenon that we are actually interested in. Data is theory laden (Coombs 1976) in the sense that researchers make conscious or unconscious choices as to which operationalizations will be undertaken, and whether we recognize it or not, these do, *per force*, represent the underlying theoretical constructs in the researchers' minds.

How accurate are these measures in representing the underlying constructs? This is essentially a question of validation of the selected instrumentation. No form of empirical research is exempt from this challenge. Researchers often assume that certain objective measures, and frequently archival measures, are by definition good representations of underlying research constructs.¹ This is an assumption made even when the

¹This is an extremely common assumption in many disciplines, including pure economics research. One reason Boudreau et al. (2001) and Straub (1989) did not include articles based on archival data was that virtually none of these prior empirical studies validated their instrumentation. Had they included these studies, the overall picture of progress toward validation in the IS field would have been even more problematic.

data have obviously been gathered for other purposes. While secondary data may be the most difficult case to make, the effort needs to be undertaken.

What can researchers who rely on archival measures do to validate their constructs? Alternate measures of firm value can be acquired and considered along with stock price, for instance. This is the standard approach in measures gathered in primary data collection, and there is no reason why this cannot also be employed with secondary data (Jarvenpaa 1991, Venkatraman and Ramanujam 1986).

The clearest case for care in measurement and efforts toward validation is psychometrics. Gathering data from people is fraught with difficulties, and there need to be checks to be sure that the underlying construct is being well represented. This is especially true when researchers use surrogates for their measures instead of more direct measurements. A validation process tells us that the researcher has taken this scientific issue seriously and is concerned that the data being analyzed for theoretical relationships is at a threshold that will allow us to have some confidence in the main results.

What is true in both the difficult archival case and the obvious psychometrics case is that the researcher walks down several avenues at the same time to show that the instrumentation is valid. If each measurement approach demonstrably contributes to the construct, then each has been validated. "Validation is symmetric and egalitarian" (Campbell 1960, p. 548). It is possible, of course, that none of the measures tested are truly representing the construct, and that the "true" construct is hidden from us and has yet to be discovered. Most philosophers of science feel that we can only use our best judgment to provide a greater level of comfort with the metrics (Cook and Campbell 1979).

3. A Framework for Mapping Progress to Date and Future Directions

In their research commentary on transformational issues in Net-enablement, Straub and Watson (2001) argue that there is a need for research in several areas, including B2C, B2B, NE (Net-enabled) strategy and virtual organizations, and the ICT function. Each of

these dimensions implies certain constructs and relationships. The article provides a framework to begin to evaluate the metrics development for NEOs (Net-enabled or Net-enhanced organizations), which has already been carried out.

Certainly, other frameworks could be added to extend this analysis. Watson and Straub (2002) extend Straub and Watson (2001) by introducing issues related to: (1) business to government exchanges (B2G), (2) investor and firm interactions (B2I), and (3) employees communicating with and being informed by their own organization (B2E). These interactions describe the dyads that go beyond the now traditional B2C and B2B dyads, which have been more heavily researched. Metrics that are implied in this broader scope include governmental performance metrics that measure higher levels of electronic services to citizens (B2G), measures for the health of investor relations (B2I), and metrics that capture Net-enabled internal activities (B2E). For B2E, for example, this implies measures for the performance of the firm's Intranet.

There can be little doubt that even if we combined a host of such future direction frameworks, we would still have an incomplete picture of the new and applied measures that will be required for insightful work in this entire area. The academic community has already been extremely inventive with regard to useful NE metrics and will, no doubt, continue to be so. Our mapping of extant research to issues (see Table 1) is not intended to offer a definitive view of what needs to be done. It is simply to argue that even if we map into a single framework, much work clearly remains. Table 1 shows the Straub and Watson research questions (2001), the implied metrics, and the extant research that has already developed ways of conceptualizing or measuring NE constructs.²

The mapping in Table 1 shows that researchers in this Special Issue have addressed many of these macro-level research questions and have advanced our knowledge of how to measure these key constructs. It also reveals that there is still ground to be covered,

even from the standpoint of this single framework. In particular, research questions 4, 5, and 6 in Table 1 deal with the advantages that come from richer and more pervasive information among firms. If, as predicted, these effects hold true, firms can forge stronger bonds with clients and create seamless information flows along the entire value chain. These issues lie at the heart of the e-commerce transformation. Networks create links between organizations through information. When they can replace or enhance physical processes, the productivity gains can be enormous. In the case of the Dutch Flower Auction (Kambil and Van Heck 1998), for example, networked systems replaced the physical movement of buyers and the physical movement of flowers. These are undoubtedly just two of the many different kinds of replacement activities taking place. What is the value of the information that replaces the physical processes? The economics of this exchange is critical to understanding how and where Net-enhancement makes the most sense. The development of metrics in this area are just beginning.

What is happening with EDI? Is Web-EDI replacing proprietary networks, and at what pace? What is the theoretical difference between these two forms of NE, and why do they have different effects on firms? There has been some research in this arena, including the Zhu and Kraemer article in this issue, but clearly much more can be done, especially measuring performance levels and impacts (see, however, Massetti and Zmud 1996).

When organizations share information with partners and customers across networks, they can presumably improve their internal processes and their strategic positioning. This is known as information visibility, and some level of visibility is a hallmark of the NE reformation. There may be a difference between strategic-level information and information about transactions and operations Klein (2001), but without further research, we will never learn exactly how this phenomenon works. Information sharing is dyadic, and measuring of both sides of this exchange can express the balance, or symmetry, between partners as well as independent measurement. What are the meaningful theoretical differences between these two forms of measurement? Much more research is obviously needed to uncover the inner workings of information visibility.

²IS community input was solicited to fill out this table with relevant articles. Responses to this ISWorld inquiry (i.e., ISWorld listserve of 2,500 participants) in the Spring of 2002 have been included in the table.

Table 1 Mapping Metrics to Key Research Questions

	Key Research Questions	Metrics Required	Work to Date [Special Issue in italics]
1. NE Systems for Reaching Consumers	Which network technologies effectuate which marketing goals?	<input type="checkbox"/> Usability <input type="checkbox"/> Download delay <input type="checkbox"/> Security features <input type="checkbox"/> NE trust <input type="checkbox"/> Perceived security <input type="checkbox"/> Perceived privacy	<ul style="list-style-type: none"> • <i>Palmer (2002)</i> • <i>Agarwal and Venkatesh (2002)</i> • <i>McKnight et al. (2002)</i> • Rose and Straub (2001)
2. Web Services	What are the most effective information processing techniques for personalizing, analyzing, and responding to customers' electronic behavior patterns?	<input type="checkbox"/> Personalization <input type="checkbox"/> Clickstream patterns <input type="checkbox"/> System outcomes such as further inquiry, purchase, Web satisfaction, info. quality, system quality <input type="checkbox"/> Customer service channels	<ul style="list-style-type: none"> • <i>Koufaris (2002)</i> • <i>Torkzadeh and Dhillon (2002)</i> • <i>McKinney et al. (2002)</i> • Dewan et al. (2000)
3. B2C Differentiation	How can NEOs use electronic networks to differentiate products and services?	<input type="checkbox"/> Information differentiation <input type="checkbox"/> Information asymmetry <input type="checkbox"/> Degree of customer info. gathering	<ul style="list-style-type: none"> • <i>Chen and Hitt (2002)</i> • Tapscott (1996) • Straub and Klein (2001)
4. Order of Magnitude Gains in B2B	Where is the real value in substituting information for physical processes?	<input type="checkbox"/> Information substitution <input type="checkbox"/> Types of physical processes replaced matched to types of information	<ul style="list-style-type: none"> • Roberts et al. (2001) • Kambil and Van Heck (1998)
5. Innovations in B2B Technologies	Which systems effectively support end-to-end fulfillment?	<input type="checkbox"/> Characteristics of NE technologies such as Web EDI, click to talk, Internet holograms <input type="checkbox"/> Degree of end-to-end fulfillment	<ul style="list-style-type: none"> • Hart and Saunders (1998) • Kumar and Zhao (2002) • Papazoglou et al. (2000)
6. Information Visibility	When should a NEO share information?	<input type="checkbox"/> Information sharing <input type="checkbox"/> Stages of the virtual/electronic value chain	<ul style="list-style-type: none"> • Klein (2001)
7. Strategy	What are the strategies, particularly IS strategies, that transform a firm into a successful NEO? And what are the inhibitors?	<input type="checkbox"/> Models of strategic planning <input type="checkbox"/> Types of NE strategy <input type="checkbox"/> NE atomic business models <input type="checkbox"/> NE corporate performance metrics	<ul style="list-style-type: none"> • <i>Wheeler (2002)</i> • <i>Zahra and George (2002)</i> • Straub and Klein (2001) • Chatfield and Yetton (2000) • Weill and Vitale (2001) • Subramani and Walden (2001)
8. Org. Design	Which virtual designs increase the effectiveness of information flows in B2B and B2C?	<input type="checkbox"/> Degrees of virtual org. design <input type="checkbox"/> Information flows	<ul style="list-style-type: none"> • <i>Kim et al. (2002)</i> • Eroglu et al. (2001) • Kraut et al. (1999)
9. Metrics	Which critical constructs and measures explain Net-enablement?	<input type="checkbox"/> Information substitution <input type="checkbox"/> Performance metrics such as efficiency, effectiveness, long term relations	<ul style="list-style-type: none"> • <i>Zhu and Kraemer (2002)</i> • <i>Devaraj et al. (2002)</i> • Hill (1997)
10. ICT Function	Which ICT infrastructure or development capability leads to favorable outcomes for NEOs?	<input type="checkbox"/> NE architectural designs <input type="checkbox"/> Infrastructure	<ul style="list-style-type: none"> • Earl and Khan (2001)

The redesigning of development processes for Net-enhanced systems has been frenetic, but there have been fewer studies in how the ICT function has changed to respond to these needs, as hinted at in research question 10 (Table 1). The altering of the infrastructure to accommodate NE is another fruitful area for research. Mapping metrics to this particular framework provides some evidence that the IS field is making progress. It also shows the sizable impact of this Special Issue on this set of questions. But, what is even clearer in this exercise is that the entire metrics process is at a very early stage and will take focused community effort to fully realize this goal.

4. Contribution of Papers in this Issue to e-Commerce Metrics

As in the previous number of the Special Issue (June, 2002), we asseverate that metrics are critically important and that we need to continue to hone our scientific measurement instruments. The best proof of this proposition, we believe, is contained within the published papers themselves. They represent some old and new ways of looking at NEOs, which, to a greater or lesser extent, have been validated for scientific use. They should serve as a sourcebook for future studies.

4.1. Article #1: Kim et al.'s "Businesses as Buildings: Metrics for Architectural Quality of Internet Businesses"

Kim et al. propose metrics for the architectural quality of Internet businesses based on three constructs that have been used to evaluate buildings in the real world. The structural construct indicates that Internet businesses need to be stable internally and secure externally. The functional construct implies that Internet businesses should provide convenient functions in the information gathering and order processing phases. Finally, the representational construct indicates that they need to provide a pleasant interface. Pretests and a pilot survey were conducted to enhance the content validity of the architectural metrics. Large-scale surveys in four different businesses were also conducted to test construct validity and reliability of the proposed metrics as well as to explore technical and managerial relevance to Internet business. Results indicate that the

metrics are valid and reliable across different business domains and contributory to customer loyalty and objective features. Metrics proposed and verified by Kim et al. are shown below in Table 2.

4.2. Article #2: Chen and Hitt's "Measuring Switching Costs and the Determinants of Customer Retention in Internet-Enabled Businesses: A Study of the Online Brokerage Industry"

The ability to retain and lock-in customers is a major concern for Net-enabled businesses. To effectively manage customer retention, it is important to have methods of measuring switching costs and to understand the effectiveness of different strategies for managing customer retention. In this paper, Chen and Hitt develop and implement an approach for measuring the magnitude of switching costs and brand loyalty for online service providers using archival Web-site traffic data. They also examine how different factors such as systems usage, service design, and other firm- and individual-level factors affect switching and retention in the context of the online brokerage industry. Overall, they find that there is considerable variation in customer retention across firms and identify some of the individual- and firm-specific factors that account for some of this variation. Metrics used by Chen and Hitt are shown below in Table 3.

4.3. Article #3: Zhu and Kraemer's "e-Commerce Metrics for Net-Enhanced Organizations: Assessing the Value of e-Commerce to Firm Performance in the Manufacturing Sector"

Through successive stages of testing and refinement, Zhu and Kraemer create a set of e-commerce metrics for capability in Net-enhanced organizations. The resulting capability metrics consist of four dimensions—information, transaction, customization, and supplier connection. These measures were empirically validated for reliability, construct validity, and overall model fit. These metrics are specific to the Internet and have no precedents in the IS literature. Based on a sample of 260 manufacturing companies divided into high IT-intensity and low IT-intensity sectors, the authors also examined the efficacy and nomological validity of these measures in terms of their relationships to firm

Table 2 Metrics in Kim et al.'s Article

Constructs		Measures	
Firmness	Internal Stability	Subjective	• Site provides fast loading speed in any environment.
		Objective	• Loading time of first page according to network lines (28kb, 56kb, ISDN line)
Convenience	External Security	Subjective	• Site provides a thorough protection preventing any invasion from intruders.
		Objective	• Whether site provides explicit policy for system security (y/n)
	Information Gathering	Subjective	• Information related to goods and services offered in this business is accurate.
		Objective	• Whether site provides information on item name, brand, price, item images (in the product info. page) (y/n)
Delight	Order Processing	Subjective	• Whether site provides tools to choose delivering package, delivery at the appointed date (y/n)
		Objective	• Processes of ordering goods and services are convenient.
	System Interface	Subjective	• The images and typographies used in the sites are stylish.
		Objective	• Whether site harmonizes well with the screen size and screen layout (y/n)
Communication Interface	Subjective	• Site offers various ways to communicate between the customer and the company.	
	Objective	• Whether it provides notice boards (y/n)	

Table 3 Metrics in Chen and Hitt's Article

Construct	Measures
Customer Retention	Fraction of customers who stay with the same service provider
Switching Cost	Comparison of product choice behavior between new and existing customers
Drivers of Customer Switching	Attributes of current service provider —Ease of Use, Personalization, Price, Product Line Breadth, Web Site Quality Attributes of Customers —Usage, Changes in Usage, Adoption of Multiple Service Providers
Customer Attrition	Fraction of customers who terminate a service relationship without initiating a relationship with a competitor
Drivers of Customer Attrition	Same as drivers of customer switching (above)

Table 4 Metrics in Zhu and Kraemer's Article

Construct	Measures	Construct	Measures
Information	• Product Information Online	Interaction and Customization	• Configuration Capability
	• Search Capability		• Customer Registration
	• Product Review		• Online Recommendation
	• Product Information Update		• Content Personalization
Transaction	• Buy Capability	Supplier Connection	• Real-time Support
	• Account Management		• Online Procurement
	• Online Order Tracking		• EDI Links
	• Return		• Supplier Virtual Community
	• Security		• Integration to Backend Info. Systems
			• Fulfillment and Logistics
	• Inventory Data Sharing		

Table 5 Metrics in McKinney et al.'s Article

Construct	Measures	Construct	Measures
Relevance	<ul style="list-style-type: none"> • Applicable • Related • Pertinent 	Access	<ul style="list-style-type: none"> • Responsive • Quick loads
Understandability	<ul style="list-style-type: none"> • Clear in meaning • Easy to understand • Easy to read 	Usability	<ul style="list-style-type: none"> • Simple layout • Easy to use • Well organized • Clear design
Reliability	<ul style="list-style-type: none"> • Trustworthy • Accurate • Credible 	Entertainment	<ul style="list-style-type: none"> • Visually attractive • Fun • Interesting
Adequacy	<ul style="list-style-type: none"> • Sufficient • Complete • Necessary topics 	Hyperlinks	<ul style="list-style-type: none"> • Adequate # of links • Clear descriptions for links
Scope	<ul style="list-style-type: none"> • Wide range • Wide variety of topics • # of different subjects 	Navigation	<ul style="list-style-type: none"> • Easy to go back and forth • A few clicks
Usefulness	<ul style="list-style-type: none"> • Informative • Valuable 	Interactivity	<ul style="list-style-type: none"> • Create a list of items • Change list of items • Create a customized product • Select different features of the product
Web-information quality	<ul style="list-style-type: none"> • Understandability • Reliability • Usefulness 	Web-system quality	<ul style="list-style-type: none"> • Access • Usability • Navigation
Web-information satisfaction	<ul style="list-style-type: none"> • Dissatisfied/satisfied • Displeased/pleased • Frustrated/contented • Disappointed/delighted 	Web-system satisfaction	<ul style="list-style-type: none"> • Dissatisfied/satisfied • Displeased/pleased • Frustrated/contented • Disappointed/delighted
Overall satisfaction with the Web site	<ul style="list-style-type: none"> • Dissatisfied/satisfied • Displeased/pleased • Frustrated/contented • Disappointed/delighted • Recommend/not recommend to friends • Use/not use again 		

performance. As demonstrated in the article, these metrics can be used to investigate the value of e-commerce to firm performance and other aspects of e-commerce in Net-enabled organizations. Metrics articulated by Zhu and Kraemer are shown in Table 4.

4.4. Article #4: McKinney et al.'s "The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach"

McKinney et al. integrate the expectation-disconfirmation theory so prevalent in marketing on user sat-

isfaction with MIS theories. They identify key constructs influencing Web-customer satisfaction at the information-search stage of Web shopping and differentiate between a Web site's information quality (IQ) and system quality (SQ). They also posit that Web-customer expectations, perceived performance, and disconfirmation regarding Web site IQ and SQ influence satisfaction with Web-IQ and Web-SQ, which in turn influences their overall satisfaction. In a two-phase study, the authors identify the salient dimensions of Web site IQ and SQ, propose measures for Web-IQ and Web-SQ as second order factors, and

Table 6 Metrics in Devaraj et al.'s Article

Reference Framework	Construct	Measures
Technology Acceptance Model (TAM)	Perceived Ease of Use	<ul style="list-style-type: none"> • Easy to shop • Shopping interaction clear and understandable
	Perceived Usefulness	<ul style="list-style-type: none"> • Easy to navigate • Greater control over shopping • Effective way to shop • Improves quality of shopping decisions
Transaction Cost Analysis (TCA)	Uncertainty	<ul style="list-style-type: none"> • Website provides adequate information • Availability of price, taxes etc. information • Possible to evaluate shopping alternatives
	Asset Specificity	<ul style="list-style-type: none"> • Alternative sites for product • Wider range of site choices • Wider product choices
	Time Efficiency	<ul style="list-style-type: none"> • Time spent in shopping • Speed to accomplish shopping • Effort to accomplish shopping
Service Quality (SERVQUAL)	Reliability	<ul style="list-style-type: none"> • Get product asked • Performs service expected • Trust online shopping service
	Responsiveness	<ul style="list-style-type: none"> • Responsiveness to needs • Prompt service in case of problem • Address shopping concerns
	Empathy	<ul style="list-style-type: none"> • Store remembers/recognizes customer • Address specific customer needs • Accept various payment options
	Assurance	<ul style="list-style-type: none"> • Confidence in shopping • Feel safe in on-line transactions • Store answers customer questions

extensively validate the proposed constructs. The results of this study provide a blueprint for companies interested in measuring Web-customer satisfaction and the perceptions of expectation, perceived performance, and disconfirmation that could impact customer satisfaction when acquiring product information on the Web. The metrics articulated by McKinney et al. are shown in Table 5.

4.5. Article #5: Devaraj et al.'s "Antecedents of B2C Channel Satisfaction and Preference: Validating e-Commerce Metrics"

Devaraj et al. examine consumers' electronic channel satisfaction and preference through an integrated framework based upon three established frameworks in information systems, economics, and marketing, viz., the Technology Acceptance Model (TAM) (Davis

1989), Transaction Cost Analysis (Williamson 1987) and Service Quality (Parasuraman et al. 1988). Their key findings are that ease of use and usefulness are only the first steps in achieving e-consumer satisfaction and preference. For consumers to keep coming back, the electronic channel should be secure and offer competitive prices, highly usable information, and superior customer service. Metrics articulated by Devaraj et al. are shown in Table 6.

4.6. Article #6: McKnight et al.'s "Developing and Validating Trust Measures for e-Commerce: An Integrative Typology"

Trust is critical in e-commerce. Trust helps consumers overcome perceptions of risk and insecurity in interacting with often unknown, socially distant vendors over a new medium. However, trust in the domain of

Table 7 Metrics in McKnight et al.'s Article

CONSTRUCT—Disposition to Trust		CONSTRUCT—Trusting Beliefs	
Subconstruct	Measures	Subconstruct	Measures
Faith in Humanity—Competence	<ul style="list-style-type: none"> • People do a good job at work. • People are knowledgeable. • People are skillful in their area of expertise. 	Competence Belief	<ul style="list-style-type: none"> • Web vendor is effective in its role. • Web vendor performs its role well. • Web vendor is proficient. • Web vendor is knowledgeable.
Faith in Humanity—Benevolence	<ul style="list-style-type: none"> • People care about others. • People are concerned about others' problems. • People try to be helpful. 	Benevolence Belief	<ul style="list-style-type: none"> • Web vendor acts in my best interest. • Web vendor would try to help me. • Web vendor is interested in my well-being.
Faith in Humanity—Integrity	<ul style="list-style-type: none"> • People keep promises. • People back up their words. • People are honest. 	Integrity Belief	<ul style="list-style-type: none"> • Web vendor is truthful with me. • Web vendor is honest. • Web vendor keeps commitments. • Web vendor is sincere and genuine.
Trusting Stance	<ul style="list-style-type: none"> • Tend to trust people until given reason not to trust • Give people the benefit of the doubt • Tend to trust people at first 		
CONSTRUCT—Institution-Based Trust		CONSTRUCT—Trusting Intentions	
Subconstruct	Measures	Subconstruct	Measures
Situational Normality—General	<ul style="list-style-type: none"> • Feel good about Web activities • Comfortable purchasing on the Web 	Willingness to Depend—General	<ul style="list-style-type: none"> • Feel comfortable depending on Web vendor's advice • Would rely on Web vendor in tough call • Want to use the site again • Count on the Web vendor • Want to use the Web vendor's advice
Situational Normality—Competence	<ul style="list-style-type: none"> • Web vendors do a capable job. • Web vendors are competent at serving customers. • Web vendors are good at what they do. 	Subjective Probability of Depending—Follow Advice	<ul style="list-style-type: none"> • Act upon Web vendor's advice • Not hesitate to use information • Confidently act on Web vendor's advice • Feel secure using information • Serve notice as Web vendor advised
Situational Normality—Benevolence	<ul style="list-style-type: none"> • Web vendors act in our best interest. • Web vendors would try to help. • Web vendors are interested in customers well-being, not their own. 	Subjective Probability of Depending—Give Personal Information	<ul style="list-style-type: none"> • Provide name, address, and phone to Web vendor • Provide social security number to Web vendor • Share specifics of legal issue with Web vendor
Situational Normality—Integrity	<ul style="list-style-type: none"> • Can rely on Web vendors to do their part • Web vendors meet obligations. • Web vendors fulfill agreements. 	Subjective Probability of Depending—Make Purchases	<ul style="list-style-type: none"> • Would pay to access site info • Would provide credit card information to purchase on the site • Would pay for a legal consultation
Structural Assurance	<ul style="list-style-type: none"> • Internet has enough safeguards • Legal and technical structures protect. • Encryption and other advances make the Internet safe. • The Internet is a robust environment. 		

Table 8 Unique Methodological Contributions

Domain	Article	Methodological Contribution
Multiple Methods	Palmer	Palmer uses three maximally different methods to validate his measures, which is highly unusual in the literature.
	Kim et al.	Kim et al. cross-check their subjective with objective measures.
Archival or Secondary Data	Palmer	Palmer validates his archival data via two other methods; one rarely sees true multimethod approaches in the literature, let alone validation of archival data.
	Zhu and Kraemer	Zhu and Kraemer supplement secondary data with subjective measures and Web site codings to test their model, indicating that theory, and not the mere availability of archival data, was driving their research design.
	Chen and Hitt	While not validating their measures, Chen and Hitt develop an elaborate logic for their measures; future work can further validate their metrics, for which they have provided the conceptual groundwork.
Content Validity	Torkzadeh and Dhillon	Contains elaborate justification of the content of the instrumentation; this is seldom seen in empirical research.
Nomological Validity	Koufaris	Of the many authors in the Special Issue who examine nomological validity, Koufaris relies heavily on this form of validity.
External Validity	Agarwal and Venkatesh	Agarwal and Venkatesh collected large scale data in mall settings ($N = 1475$) to examine the usability of Web sites.
	McKnight et al.	McKnight et al. conducted a large scale data gathering with 1,400 respondents to validate their psychometric constructs; the extensiveness of such data collection is not often seen for psychometrics.
	Kim et al.	Survey responses from 14,594 persons were used in validating the metrics.

e-commerce is a complex, multidimensional concept. McKnight et al. propose and test an integrated model of trust concepts that encompass several dimensions of trust found in the extant literature: trust in the e-vendor (trusting beliefs/intentions), trust in the Internet itself (institution-based trust), and trust as a personal trait (disposition to trust). They decompose these second order trust concepts into measurable constructs and develop and validate metrics for each construct. Trust concepts are related within the broad framework of the Theory of Reasoned Action. The authors also relate trust concepts in the model to three concepts already important to e-commerce: perceived site quality, Web experience, and personal innovativeness. Metrics articulated by McKnight et al. are shown in Table 7.

5. Conclusion

All of the articles in the two parts of the Special Issue survived an extremely rigorous review process. This has resulted in metrics that the scholarly community can depend on for testing theories about e-commerce

and Net-enhanced systems. It is useful to note in closing that progress has also been made in the Special Issue in methods. Table 8 highlights some (but not all, by any means) of these unique contributions by our authors.

Research that contributes to the field not only by validating measures and testing theoretical linkages but also by introducing new methods of measurement and extending usual methods is especially commendable. The field can only advance beyond "normal" science through those who are willing to take such risks. Hopefully, reviewers and editors at the best of our journals will reward innovation like this. Without taking risks in our research, progress in our science will stultify. We need this innovation to grow and learn.

Appendix A. The Special Issue Process (by Senior Editor Detmar W. Straub)

Because this is the second and final assemblage of the two full issues of the "Special Issue on Measuring e-Commerce in Net-Enabled Organizations," a brief description and chronology of the events that led up this endeavor might be in order. We also need to acknowledge the contributions of many of our colleagues who helped to bring this

effort to fruition. For background information, the CFP is at: (www.cis.gsu.edu/~dstraub/ISR/CFP.htm).

Dr. Izak Benbasat, former *ISR* Editor-in-Chief, approved the concept behind the Special Issue in the Fall of 2000. In our discussions, he also collaborated on the selection of the Special Issue Editors. The goal was to represent diverse contingents of the e-commerce academic community. Dr. Donna Hoffman was asked to join because of her ground-breaking work in e-marketing. Dr. Bruce Weber was selected because of his strong background in the economics of the e-commerce transformation. Coming from the organizational communications and telecommunications fields, Dr. Charles Steinfield has widely published on the impacts of computer-mediated communications. With the final formulation of the team, the call for papers was prepared and the ground rules for reviewing manuscripts laid out.

Consistent with the experience of most special issues, we anticipated about 20–30 papers. A selection of the best five or so papers would be in keeping with the high standards of *ISR* and other "A" level journals, and this was roughly where we stood when the initial deadline for submissions of December 31, 2000 (eventually delayed to January 15, 2001, to accommodate the holidays) arrived.

Given this setting, it came as a major surprise when by the middle of January 2001, over 70 papers had already been received by the *ISR* office for processing. By the end of the entire review process, this number, for a host of reasons, had swelled into the mid-80s. Even with four Special Issue Editors, this extraordinary response put tremendous pressure on the reviewing systems, human and computerized.

How was this volume of papers handled? First, each of the Special Issue Editors was assigned papers in his/her research domain, to the greatest extent possible. Editor-in-Chief Benbasat also made the regular *ISR* AEs available to assist with the extensive overflow. In this way we were able to find a well-qualified Editor responsible for each paper. My responsibility in this, besides serving as AE for a set of papers, was to be the single, final point of contact between the authors and the journal. The role of Senior Editor was to independently evaluate the papers, provide additional feedback, and work with papers that were accepted to make them as strong as they could possibly be before publication.

The intention was to utilize the normal reviewing procedures of the journal in the main and to try to process the papers fairly and impartially. The *ISR* staff worked valiantly to this end and, in my view, succeeded in these goals. Our academic community needs to realize that there were no additional funds allocated to handle this excess of papers, and the time allocated to *ISR* by the sponsoring agencies was unchanged. Much of the extra work was carried out due simply to the professionalism of the doctoral student staff in Vancouver. Although all of us associated with the Special Issue tried to be responsive to authors, the volume of papers was daunting, and any unintentional lag in responsiveness can be attributed to these pressing circumstances in nearly all cases.

With this volume of papers, it became clear to Dr. Benbasat that, assuming that the usual *ISR* standards were applied, two full issues would be required for roughly 10–12 accepted research papers. This

plan was put into motion and two issues were targeted for publication in the year 2002.

Beyond what has already been said, the exacting details of the review process are likely of little interest to the community, but this moment cannot pass without a special word of thanks to the over 240 reviewers who evaluated papers. On the whole, they were a dedicated group who provided invaluable feedback to the authors, even when papers did not progress to acceptance. I also would like to thank the *ISR* AEs and the special AEs who contributed their services. Finally, a word of gratitude is due to my Co-Special Issue Editors, Donna Hoffman, Bruce Weber, and Chip Steinfield, who worked tirelessly to make the Special Issue successful.

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