e-Readiness and Trust:  
Macro and Micro Dualities for E-Commerce  
in a Global Environment

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**e-Readiness and Trust: Macro and Micro Dualities for E-Commerce in a Global Environment**

Research Paper

**Purpose**
To create a framework for national readiness and receptivity to e-commerce at both the business to business as well as business to consumer levels.

**Design/methodology/approach**
Relevant literature on e-readiness is discussed in light of research on corruption and national values. A model is formulated at the macro level in which e-readiness is predicted to be related to national culture values and corruption. Analysis at the micro level rests on existing literature related to trust and website usability.

**Findings**
At the macro level of analysis, levels of perceived corruption within a country, and overarching national values are identified as significant contributors to e-readiness especially in the business to business realm. At a more micro level, we propose that individual expectations regarding ability to trust an online vendor, and the suitability of usability characteristics of website design contribute to e-readiness at the business to consumer level. Taken together, macro and macro factors jointly contribute to a nation’s readiness and receptivity to e-commerce.

**Research limitations/implications**
The empirical work presented is based on aggregate level data from only one point in time. Results only provide generalized trends that may not be representative of all firms in a country or still applicable in the present time.

**Practical implications**
Practitioners are challenged to think beyond technological readiness and address factors such as corruption, national culture, and web design before entering new markets.

**Originality/value**
This paper identifies aspects of e-readiness beyond purely technical infrastructure and provides a fresh empirical model. This study uniquely considers both micro and macro level characteristics that contribute to e-readiness.

*Keywords: e-readiness, corruption, national culture, trust, website interface*
INTRODUCTION

The role of electronic networks has grown exponentially in recent years (Economist 2006). Trans-national exchanges have emerged including public exchanges such as Covisint (www.covisint.com), or closed and private exchanges such as those run by Wal-Mart and Dell. The result is a plethora of electronically managed trans-national supply chains (Brass, 2006).

Despite this, research into macro level or trans-national aspects of e-commerce has received little attention. Exceptions are the works of Samiee (1998), Avlonitis and Karayanni (2000), Porter (2001) and Karavdic and Gregory (2005). There has been some exploration into technical issues such as trans-national electronically enabled supply chains (Iyer et al., 2004), enterprise resource planning (Burn and Ash, 2005) and multi-lingual web sites (Tiessen, 2004). However, there is still a need to determine the factors that preclude firms at the national level from readiness for electronic relationships, with a focus on business to business (B2B) arrangements.

Perceived level of corruption has an effect on willingness to develop e-commerce relationships in a given nation state (Park, 2003). Based on publicly available data from Transparency International, we examine how the corruption rating ascribed to a country will be a component in e-readiness. Further, at the macro level of analysis, national cultural values are important. Employing the World Values Survey as proposed by Inglehart (1990; 1997; 2000; Inglehart and Long, 2002), two value dimensions (1) Traditional/Secular-rational and (2) Survival/Self-expression are included in a model for predicting e-readiness. It is expected that e-readiness at the macro level is a function of these two value dimensions with the national corruption index.
At a more micro level of business to consumer relationships (B2C) and based on research to date, it is expected that the relationship built between individual users and the vendor will result in variable levels of trust (Grabner-Krauter and Kaluscha, 2003; Jarvenpaa et al., 1999) which will in turn influence e-readiness. Further, usability characteristics of the interface between the user and the vendor must be effective if users are to return to a vendor site or use it in the future (Flavián et al., 2005).

In sum, we expect there is a multiplicative effect between the macro factors that influence e-commerce between countries, and those factors that are more micro in nature that influence individual readiness to participate in e-commerce. The focus of this paper is therefore on creating a framework for national readiness and receptivity to e-commerce on both business to business as well as business to consumer levels.

The paper begins with a general discussion of e-readiness, then outlines previous research on corruption and national values, followed by the results of a model in which e-readiness is predicted to be related to national culture values and corruption. Additional research is elaborated on trust and e-commerce at an individual level, as well as the impact of usability considerations in website design. The paper concludes with a discussion of these issues for e-readiness, and directions for future research.

E-READINESS AT THE TRANS-NATIONAL LEVEL

Researchers have begun exploration of barriers to trans-national e-commerce relationships (Eid et al., 2002). These barriers include objective technical issues such as network-infrastructure and computer literacy (Reddy and Iyer, 2002), as well as subjective factors such as culture (Yap et al., 2006)) and trust (Olson and Olsen, 2000; Aljifri et al., 2003). In particular,
when purchases are large in value as in B2B commerce, then trust building becomes important and is predicated on an absence of corruption. It is already documented that based on cultural norms corruption varies by country (Khatri et al., 2006; Sanyal, 2005; Park, 2003).

Several institutions have tried to capture country readiness for e-commerce, including the International Trade Forum and the Economist Intelligence Unit (Rao, 2003). Termed e-readiness, the construct is defined as a country’s ability to promote and support digital business and information and communication technology (ICT) services. A nation’s e-readiness is thus a measure of its e-business environment, and represents a collection of category indicators of how amenable a country is to Internet-based opportunities (Economist, 2006). Each year the Economist Intelligence Unit, in co-operation with IBM’s Institute for Business Value, publishes a white paper ranking e-readiness of the world’s nations which serves as a source of data for this research (Economist Intelligence Unit, 2006).

More specifically, e-readiness is defined in the Economist Intelligence Rankings (2006) as a weighted function of six categories: .25(Connectivity and technology infrastructure), .20(Business environment), .20(Consumer and business adoption), .15(Legal and policy environment), .15(Social and cultural environment), and .05(Supporting e-services). Connectivity and technology infrastructure include narrow, broadband, PC and mobile-phone penetration, as well as Internet affordability and security. The business environment comprises a series of indicators including strength of the economy, political stability, the regulatory environment, taxation, competition policy, the labor market, quality of infrastructure, and openness to trade and investment. Consumer and business adoption consists of national spending on information and communications technology as a proportion of GDP, the level of e-business development, degree of online commerce, quality of logistics and delivery systems, and
availability of corporate finance. The legal and policy environment comprises factors such as overall political environment, policy toward private property, government vision regarding digital-age advances, government financial support of Internet infrastructure projects, effectiveness of legal frameworks, laws covering the Internet, level of censorship, and ease of registering a new business. The social and cultural environment consists of education level, Internet/web literacy, degree of entrepreneurship, technical skills of the workforce, and degree of innovation. Finally, supporting e-services refers to availability of e-business consulting and technical support services, availability of back-office support, and industry-wide standards for platforms and programming languages (Economist, 2006). Table I provides a summary of e-readiness data for a sample of the top ten, middle ten and the bottom ten countries ranked according to e-readiness.

[TAKE IN TABLE I]

MACRO DIMENSIONS OF TRUST AND CORRUPTION

Trust has been defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer et al., 1995). Trust is a mutual perception of integrity on the part of social actors. Corruption, on the other hand, is the violation of trust and its core meaning is centered on injustice (Génaux, 2004). Social trust and corruption are often conceived as existing in an inverse relationship (Fukuyama, 1995).
To measure corruption, we draw from the work of Transparency International (2006) which has for a number of years published a “Corruption Perceptions Index” (CPI). The CPI is derived from multiple sources including the general public, resident and non-resident business people, and country experts. Countries are scored on a scale of zero to ten, and least corrupt countries have the highest scores while most corrupt score the lowest. Table II is a sample of the ratings list of Transparency International, showing the 10 least corrupt and the most corrupt countries for 2005.

[NATIONAL LEVEL CULTURE AND VALUES]

A definition of culture is complex. According to Matsumoto (1994), culture is characterized as the degree to which people share attributes, values, beliefs and behaviors. Hofstede defines culture as “the collective programming of the mind which distinguishes the members of one group from another” (1984, p. 21). Doney et al. (1998) note culture is “a system of values and norms that are shared among a group of people and that when taken together constitute a design for living” (1998, p. 67). Although one definition of culture is not possible, various researchers have used nation state as a loose categorization for culture (Doney et al., 1998).

Values are based on culture and guide personal conduct, interaction with others, and involvement. Similar to morals, values permit one to distinguish what is right from wrong. In this paper a perspective on values is derived from the work of Inglehart (1990; 1997; 2000; Inglehart and Long, 2002) who distinguishes two key value dimensions: (1) Traditional/Secular-rational
and (2) Survival/Self-expression. The traditional/secular-rational dichotomy reflects relative importance of religion in a society, as well as the importance of the family, deference to authority, absolute standards and traditional values. In contrast, secular-rational societies value secularism, and are more accepting of phenomena such as divorce, abortion, euthanasia, and suicide. Traditional societies tend to exhibit high levels of national pride while secular-rational societies tend to be weary of nationalistic fervor. Survival/self-expression corresponds to the transition from industrial societies to post-industrial societies. In the former, physical security and economic accumulation are emphasized and valued. In contrast, in post-industrial society physical and economic security tend to be taken for granted and are replaced with an emphasis on subjective well being, self-expression and quality of life (Inglehart and Baker, 2000). Figure I is a plot of nations on the two value axes. It is interesting to note that clear clusters emerge along regional and religious lines. The plot is reproduced from Inglehart and Long (2002).

[TAKE IN FIGURE I]

RESULTS OF CORRUPTION AND NATIONAL VALUES

Based on the preceding, we suggest the choice of a country in which to do business will be determined at a macro level by three factors, (a) country e-readiness (b) level of corruption in the country, and (c) national level cultural values. A strong and significant causal relationship is hypothesized between a nation’s e-readiness with corruption and cultural values.

Data for the predictor values in this study consisted of the most recent data on world values by country from the World Values Survey, and the most recent data on corruption by country from the Transparency International Global Coalition Against Corruption. Data for the
criterion variable were 2006 e-readiness data from the Economist Intelligence Unit (2006). To test our hypotheses we analyzed the data using ordinary-least squares multiple regression. Results are summarized in Table III.

[TAKE IN TABLE III]

The model yielded an adjusted $R^2$ of .76, therefore explaining over three quarters of the variance in a country’s e-readiness by propensity toward corruption and nationalistic values. As predicted, e-readiness was impacted by perceived corruption ($t = 3.58$, $p < .05$), survival/self-expression values ($t = 2.33$, $p < .05$), and traditional/secular-rational values ($t = 2.58$, $p < .05$). From the standardized beta coefficients corruption has the greatest impact on e-readiness, followed by the survival/self-expression values dimension, and then traditional/secular-rational values. However taken together, the two national values dimensions have a greater combined impact on e-readiness than corruption. Predicted total e-readiness = (0.58 * Survival vs. Self-expression) + (0.46 * Traditional vs. Secular) + (0.433 * Corruption) 4.43. A visual plot of the regression model’s predicted e-readiness vs. actual e-readiness for each of the 62 countries that we included in our analysis is provided in Figure II.

[TAKE IN FIGURE II]

MICRO LEVEL TRUST

So far we have considered circumstances surrounding e-readiness as they apply at a national level between vendors. However, at the more micro level, transactions also occur
between a vendor within a country and an online consumer. This raises additional questions concerning online trust and legitimacy of the online vendor (Bhattacherjee, 2000; Gefen, 2000).

This sentiment is underscored by Chen and Dhillon (2003, p. 1) who write: “Since transactions on the Internet occur without personal contact, consumers are generally concerned with legitimacy of the vendor and authenticity of products or services”. As with macro level trust, trust at the micro level between vendor and consumer is focused on consumer confidence in the website as part of a buyer-seller transactional exchange, and consumer’s willingness to rely on the seller and take actions in circumstances where such action makes the consumer vulnerable to the seller (Jarvenpaa et al., 1999 p. 4). A “lack of trust is one of the most frequently cited reasons for consumers not purchasing from Internet vendors” (Grabner-Krauter and Kaluscha, 2003).

With reference to propensity to trust in online interactions across cultures, few studies focus on this topic, and those that do often have inconclusive results. However, in one study in which users from different cultures (Canada, the U.S., Germany, and Japan) viewed a local version of the Samsung website, statistically significant differences were determined between countries (author name removed for blind review, 2003). Questions probed whether the vendor is trusted, whether the website is credible, and whether the information on the website is trusted. For all three questions statistically significant cross-country differences emerged with Germans more trusting of the website, Japanese least trusting, and Americans and Canadians together in the middle.

As an element of trust, online credit card fraud is a major concern to online shoppers, often ameliorated by privacy policies or security signs on the vendor website. In a study of online consumer behavior in which American, Brazilian, and Latin American consumers are compared, Latin Americans and Brazilians indicate a presence of credit card symbols on
websites is more important than perceived by Americans (Cheskin, 2000). The authors conclude website companies and other organizations concerned with online security should tailor security efforts to specific regions or cultures. Further, information privacy is important and a lack of trust arises from cyber consumer’s perceived lack of control over the access others have to their personal information during the online navigation process (Hoffman et al., 1998).

Concerning website security, in the report by author removed for blind review (2003) cited above there are statistical differences in perception of online risk between Canadians, Americans, German and Japanese users. Japanese are most concerned with avoiding risks followed by the Germans. Canadians and Americans are least risk averse of the groups investigated, and most Canadian participants note they had previous experience with banking online, and are experienced Internet users. Canadians are aware of security problems when using the Internet, but do not feel risks outweigh the benefits. All groups are concerned with misuse of credit card information, and are very concerned with Internet security. The presence of security signs do much to console online visitors, although some Germans feel these signs could be faked. While Canadians and Americans seem relatively comfortable with credit card purchases, Japanese users express concern about online payments and instead opt for payment through the mail. Germans likewise mention alternate ways of making payments, including using invoicing or direct bank transfers. These cross-cultural differences related to trust and risk in online shopping are expected to result in differences in e-readiness, with most trusting users by culture more willing to embrace online interactions.

USABILITY CHARACTERISTICS OF VENDOR INTERFACES
Design and capabilities of an e-commerce website are important to online shoppers (Flavián et al., 2005; Mithas et al., 2003; Rosen and Purinton, 2004). Perceived website usability includes characteristics of the website such as (1) ease of understanding the structure of a system (including its functions, interface, contents), (2) simplicity of use, (3) speed and ease with which users can navigate the website to find an item or service, and (4) user control over the process (Flavián et al., 2005). Effective website design has been attributed to higher levels of technology acceptance (Koufaris, 2002; Pavlou, 2003; Venkatesh and Ramesh, 2006). Delivering value-added services, with easily accessible capabilities related to information design or navigation enables online vendors to build sustaining relationships with customers (de Ruyter et al., 2001). If online shoppers like the design and capabilities of a website, then they are more likely to revisit the website (Rosen and Purinton, 2004; Yoon, 2002).

Drawing on the literature from the design community, information design (ID), navigation design (ND), and visual design (VD) are central characteristics of effectively designed websites (Garrett, 2003). Information design refers to elements of the site that convey accurate or inaccurate information to a user. For instance, the location of an icon on the screen would be the domain of information architecture, but whether or not that icon conveys the right information to a user is the domain of information design. Clear and logical presentation of information about products or services is also a component of information design. In most research to date, information is considered an important prerequisite to trust (Flavián et al., 2005; McKnight et al., 2002) and satisfaction (Flavián et al., 2005; Syzmanski and Hise, 2000). As McKinney et al. (2002, p. 308) describe, “[C]ustomers dissatisfied with web site information contents will leave the site without making a purchase”.
Elements of visual design deal with balance, emotional appeal, aesthetics, and uniformity of the website overall graphical look. This includes colors, photographs, shapes, or font type (Garrett, 2003). Some research has established a relationship between the “aesthetic beauty” of a website and trust (Karvonen, 2000). In other work, aesthetics of website design were considered related to the “overall enjoyable user experience” (Tarasewich, 2003, p. 12). It is expected visual design of the website will result in both trust and satisfaction for the user. Navigation design refers to the navigational scheme used to help or hinder users as they access different sections of a website (Garrett, 2003). “No matter how thorough the information content of a site is, a customer who has difficulty in searching and getting the needed information is likely to leave the site” (McKinney et al., 2002, p. 308).

To summarize, there are a variety of characteristics that contribute to usability of a website. It is expected that effective website design results in greater trust and satisfaction by users, enabling greater e-readiness.

**DISCUSSION**

At the macro level of analysis a relationship was proposed between e-readiness to engage in trans-national B2B e-commerce with corruption and national cultural values. Using measures from the World Values Survey and Corruption Perception Index, 76 percent of the variance in a country’s e-readiness is explained by propensity toward corruption and cultural values. As might be expected an absence of inter-institutional trust manifested in corrupt acts has the potential to severely hamper willingness of nations to conduct e-business in a host country. Based on the criteria included in a formula for e-readiness it is expected that not only will technological
infrastructure requirements be met, but that ideologies are in place that support e-commerce initiatives.

While corruption has the single most important impact on e-readiness, when combined, the two national value dimensions of (1) Traditional/Secular-rational and (2) Survival/Self-expression are actually more influential. Looking more closely at this finding, we suggest the development of e-commerce is related to a country's progression from survival values to self-expression. This parallels the shift from early industrial society to post-industrial society and is related to economic development. Nations will focus first on economic and social development before proceeding to a level where consideration is given to infrastructure as needed for e-commerce. Further, the development of a nation’s readiness to engage in international e-commerce is related to an ability to move beyond traditional, nationalistic and relatively insular values. Alternately, secular–rational values are embraced where changes are welcome, perhaps including technological shifts.

It is noteworthy that often only one variable is affected by the e-readiness equation. For example, South Africa (with a total score of 5.74/10 in Table I) suffers from one key problem of connectedness (with a very low score of 2.70/10). Despite scoring well on factors such as legal policy or supporting services, the country’s poor connectedness (which is highly weighted) drags e-readiness levels down to place South Africa in the middle of the group. The Economist Intelligence Unit white paper (2006) places blame for lack of connectedness on ineffective liberalization of telecoms, resulting from the current government’s political agenda and its alliance with trade unions. This sequence of events has affected e-business within the country, as well as the decisions of B2B marketers in other parts of the world related to the potential development of future e-relationships.
For the macro level analysis there are limitations to the empirical work. The data used in the research is aggregate-level and generalized country data. B2B marketers will find that some of their country partners will be exceptions to these broad rules. The data is taken at one point in time and while care was taken to use recent data, a country situation can change rapidly with respect to e-readiness criteria. Data were not collected for our specific purpose, with no control over its collection although we believe the collection procedures to be reliable.

At the micro level of analysis we have relied on prior literature regarding individual trust in e-commerce as well as usability considerations for a vendor’s website. However, we believe these considerations to be important as they impact e-readiness. As noted at the outset, it is expected that taken together macro level requirements along with micro level requirements for e-commerce will collectively inform which countries are most receptive to e-business. If we take Canada as an example, it scores 8.37/10 for e-readiness based on data from the economist intelligence unit rankings for 2006 and is relatively uncorrupt. It is therefore well positioned for e-readiness. Further on the Inglehart Values map, Canada is high on self-expression, and moderate on the traditional/secular-rational value dimension. This would indicate moderately high receptivity at the national level to e-readiness. In addition, if we consider the more micro level of analysis, and based on the report by author removed for blind review (2003), Canada is relatively trusting of relationships with Internet vendors, is not high on risk aversion, and generally has experienced users. As a result, in B2C e-commerce Canadians are open to using the Internet for online shopping and other purposes. Further, appropriate usability characteristics and vendor interfaces are generally in place to support online activities.

From a practical perspective this work offers insights to managers, strategists, and online vendors. First, when considering B2B relationships, level of country technology is not the only
primary consideration, but level of corruption likewise has a large impact on viability of host
country entry. Second, national culture has a significant impact on a country’s ability to engage
in international e-commerce. Since culture changes more slowly than technology, societal values
may be a better predictor than infrastructure of e-readiness. Third, the development of trust is
important for online vendors, and results in return visits to a website. As such, it is important for
Web designers to consider the conditions for users that enable them to feel comfortable visiting a
website. This may include the presence of security symbols or a clear elaboration of ethics
related to purchasing. Since Japan is a highly risk adverse culture, these would seem central
considerations for vendors wishing to establish e-relationships in that country. However, in
practice many online vendors have neither the expertise nor budget to customize their site for
consumers. However, to gain the maximum multiplicative effect based on macro level and micro
level characteristics that serve to enhance e-readiness, then this should likewise be a
consideration.

New directions for research flow from this work at the macro level. This work
underscores that numerous analytical opportunities exist to explore publicly available data. Using
data from various credible and independent sources and seeking new combinations as in the
current study provides opportunities for further B2B country level analysis. These data can also
provide background to a more detailed case analysis in a particular country. For example, if our
regression equation were used to calculate e-readiness of a particular country then the impact of
changing values and corruption levels could be further used to predict future changes in e-
readiness. This type of research is amenable to longitudinal extension to track changes in key
variables over time.
At the user-vendor level of analysis, research into website usability resulting in satisfied or loyal online customers is relatively new. Although some studies have investigated technology acceptance (Flavián et al., 2005; Koufaris, 2002), few studies examine more micro characteristics factored with macro level characteristics in a determination of e-readiness. There is scope for additional research in this area. Further, it is of interest to determine how design elements resulting in user loyalty may be applied beyond PC-based electronic commerce. With the rapid evolution to mobile commerce and ubiquitous computing it is expected that notions of e-readiness will find applications in emerging user interfaces and with new technologies.
REFERENCES


