

The CPT Framework: Understanding the Roles of Culture, Policy and Technology in Promoting Ecommerce Readiness

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Abstract

Ecommerce has been readily adopted in more developed countries, but is still lagging in less developed nations. In this work, we synthesize lessons learned from economies that have already adopted ecommerce, and propose strategies that can be used to promote ecommerce adoption. We propose a comprehensive framework that simultaneously examines the importance of culture, policy and technology in promoting ecommerce within an economy. Our recommended strategies also utilize a 3-pronged approach that describes how changes in culture, policy and technology can be made to drive each other, so as to increase the readiness of the economy for ecommerce.

Key words: Ecommerce, international, culture, policy, technology.

1. Introduction

Over the last decade, the use of the Internet for commercial transactions has seen significant increases. Ecommerce is a segment of the economy that first developed in countries with sufficient economic and technical resources (Travica, 2002). Countries that are less developed follow at variable paces (Ein-Dor, Goodman, and Wolcott, 2000; Petrazzini and Kibati, 1999).

While the pace of adoption of ecommerce in developing countries has been slower, the benefits to doing so are well documented. The Group of Eight (G8) countries (comprised of Canada, France, Germany, Italy, Japan, Russia, the UK, and the USA) has released a statement that "IT (information technology) empowers, benefits and links people the world over.....access to digital opportunities must therefore be open to all"(Countries, 2000). It is widely accepted that ecommerce provides new efficiencies within an economy, and also allows developing countries to participate in the global economy (Mansell 2001; Gibbs, Kraemer, and Dedrick, 2003). Some researchers have argued that developing countries have even a greater incentive for adopting ecommerce than developed ones. For example, Panagriya (2000, p. 5), states:

"...Given that cost savings offered by Internet technology and the relative ease with which it can be provided, they (i.e., developing countries) can now skip several stages of technological development through which developed countries had to go. Stated differently, developing countries are much farther inside the technological frontier and, therefore, have larger potential benefits from moving to it."

While extensive earlier research has examined ecommerce diffusion in developed countries, much of this work is not applicable to developing countries that differ from developed countries along several dimensions. There is limited earlier work that specifically addresses how developing countries can enable the adoption of ecommerce within their economies (Travica, 2002; Gibbs, Kraemer, and Dedrick, 2003). Much of this work is in the form of specific case studies relating to adoption within a particular country. For example, Travica (2002) studied the adoption of ecommerce in Costa Rica. Chen and Ning (2002) examined constraints on ecommerce adoption in China. Gibbs, Kraemer, and Dedrick (2003) studied the adoption of ecommerce in ten countries (five of which would be classified as developed) and present lessons learned from these case studies. Palmer (2000) examined the diffusion of ecommerce in Bahrain, and described barriers to adoption.

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In this work we extend earlier work presenting a comprehensive framework that can enable economies to facilitate ecommerce adoption, by simultaneously addressing three dimensions: a) the culture of the players in the economy, b) the policies proposed and enacted by the government in the economy, and c) the state of technology within the economy. We term this the CPT (Culture-Policy-Technology) framework. The main advantage of our framework is that it considers the interplay between three important dimensions, all of which have been separately considered in earlier works and shown to be important in the facilitation of ecommerce.

The rest of this paper is organized as follows. In Section 2, we present the CPT framework and explain how it relates to other existing frameworks that study ecommerce adoption. In Section 3, we describe how factors in the CPT framework affect business to consumer (B2C), business to business (B2B) and consumer to consumer (C2C) ecommerce. Section 4 contains recommended strategies that economies can use to enable ecommerce. We conclude in Section 5 with contributions and limitations of this work, as well as opportunities for future work.

2. The CPT (Culture-Policy-Technology) Framework

We first develop the three dimensions of the framework, and then compare it with existing frameworks.

2.1. *Developing the Three Dimensions of the CPT Framework*

2.1.1. *Culture*

While numerous cultural differences exist between countries, and indeed within countries, we use the nation as the unit of study in this work. Further, we concentrate only on those cultural factors that prima facie, would come into play as a national economy moves towards ecommerce.

The level of trust between the players in an economy has been shown in numerous studies to affect the efficiencies of commerce (Burns and Brady, 1996; Palmer, 2000). In our context, we define trust along two sub-dimensions: a) the level of expected reliability that players place on each transaction within the economy, and b) the overall level of trust that players have in the institutions of the economy (such as banks, corporations and governmental institutions) in issues of redress of failed transactions.

Transactions in developed economies tend to perform more as expected by both parties (Endo, 2001). There is often also access to better redress, such as an efficient judiciary, efficient arbitration and reliable enforcement of redress decisions in the case of failed transactions.

A second aspect of culture is the level of corruption within a culture. Like trust, we define corruption along two sub-dimensions: a) petty corruption, which is illegal payoffs related to micro transactions within the economy, and b) institutional corruption, which is illegal payoffs and nepotism at the level of social networks within the economy.

It is widely accepted that petty corruption is much more rampant in developing countries. Singer (1991) asserts that, in developing countries, it is often an ordinary practice to hold out a hand for a bribe. Khera (2001) states that many developing countries deliberately pay their officials low wages, with the expectation that many micro transactions that these officials participate in will result in illegal payoffs for them. The question of institutional corruption being a differentiator between developed and developing economies is more open to debate. For example, Rosenthal (1997) asserted that Asian business leaders work in close groups to drive their national economies into chaos, and that nepotism is rampant in Asia. On the other hand, Khera (2001) highlights several examples of institutionalized corruption in developed countries: corruption at the corporate level, and in the influence of corporations on government policy. Carey and Simon (1992) highlight the commonality of insider trading and tax evasion in Germany, and also identify the corrupt methodology employed by Japanese firms when selecting developing countries for "foreign aid" and market domination.

A third aspect of culture in our framework is the patterns of communication that exist within the nation. The two sub-dimensions of patterns of communications that we isolate are: a)

the power distance (Hofstede, 2001) between members of an economy, and b) the richness of interpersonal communication usually accompanying each transaction.

We propose that cultures that have a greater power distance, *i.e.* greater hierarchy amongst members, will face greater difficulty when transacting on the Internet. For example, Asian and European cultures tend to be more hierarchical than the USA. Transactions on the Internet will be harder to complete in such cultures. In cultures with rich interpersonal communication (Lee, 2000), where face to face interaction consists of greater intensity of socializing, more verbal communication, more pronounced body language and greater time of communication, transactions on the Internet often lead to leaner communication, thereby creating barriers to adoption.

2.1.2. Policy

We divide the effects of policy into two sub-dimensions: a) the policies related to general trade and commerce in the economy, and b) the policies targeted specifically to enabling Internet usage and ecommerce. Examples in the first category include policies related to copyright protection of intellectual rights, taxation regulations across different parts of the economy and legislation for breach of contract in civil lawsuits. Examples in the second category include tax breaks for telecommunications equipment costs and state spending to promote Internet education and usage.

It is clear that economies with weak protection of intellectual copyright promote greater piracy and illicit sharing of copyrighted material such as music and films. An economy with lower taxes for commerce across different provinces, will be more likely to enable ecommerce (Geist, 2002). Stronger legislation for breach of contract in civil lawsuits also positively influences the level of comfort for ecommerce transactions. Investment by the government that promotes the purchase and usage of telecommunication equipment, as well as access to education to use the Internet all enable the adoption and usage of ecommerce in an economy (Mureithi, 2000).

2.1.3. Technology

As mentioned in Panagriya (2000), the Internet presents developing economies with the opportunity to leapfrog several generations of technology development, to gain equal access to world markets, as well as to increase the lifestyle of their citizens. We examine three sub-dimensions in technology that would critically influence the enablement of ecommerce: a) the level of hard wired telecommunications infrastructure that exists in an economy, b) the level of computer engineering expertise in an economy, and c) the level of wireless infrastructure within an economy.

While high levels of hard-wired infrastructure will clearly promote ecommerce, these are not usually found in developing economies. However, developments in the area of wireless networks now make it far cheaper to set up Internet networks, and to bypass the expensive setup of a hard-wired network. The availability of computer engineers clearly affects the robustness of the infrastructure, as well as the cost of access to the Internet, where higher availability would be clearly beneficial in both respects.

Figure 1 displays the three broad dimensions of the CPT framework, as well as the sub-dimensions. Having developed the CPT framework, we next compare it to existing frameworks.

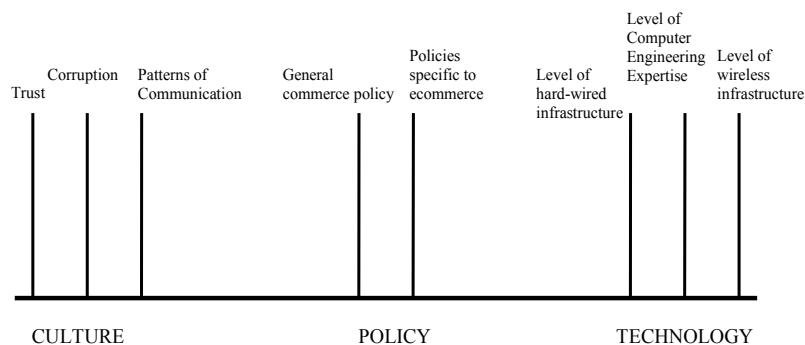


Fig. 1. Dimensions of the CPT Framework

2.2. Comparing CPT to Other Frameworks

As described in Section 1, most early work related to ecommerce enablement in developing countries has consisted of a case study based approach. However, a few frameworks have been proposed, and we make two illustrative comparisons here. First, Porter (1998) proposed a generic framework for sustained industrial development that consisted of factors of production such as labor and capital, demand conditions, supportive industries and an environment of competition. The CPT framework encompasses the production factors in the technology dimension. The culture and policy dimensions in CPT encompass factors not covered in Porter's framework, but are still established as important in earlier studies. The second comparison is with a framework recently proposed by (Gibbs, Kraemer, and Dedrick, 2003) that is more similar to CPT. At the national level, this framework examines two dimensions: environment, which includes factors like industry structure and consumer preferences, as well as national policy, that includes legislation and promotion of telecommunications. The CPT framework adds the cultural dimension, which is neglected in these other frameworks. The main contribution of the CPT framework is the consideration of culture, policy and technology simultaneously, and the qualitative interplay between these dimensions, when determining broad strategies for ecommerce enablement. Next, we describe how the CPT framework affects B2B, B2C and C2C ecommerce.

3. The CPT Framework's Affect on Ecommerce

3.1. B2B

Business-to-business (B2B) relationships using ecommerce are highly affected by the CPT framework. Different countries have diverse expectations, governmental policies and technological infrastructure to support their ecommerce endeavors. B2B ecommerce thrives on establishing sound relationships, which restricts developing countries without the infrastructure for such a relationship. From a cultural perspective, B2B ecommerce is limited by the trust that one business has for another business. Fewer business ties exist with developing nations than with developed ones. Therefore, electronic supply chain management is limited, as well as Extranet endeavors. Moodley (2003) found efficiency gains in B2B ecommerce to depend on confidence and trust that businesses create with suppliers and customers in South Africa. The feelings of deceitfulness of underdeveloped countries corrodes the relationships that could traditionally exist in a B2B setting. Also, due mainly to the lack of technological infrastructure and the cultural distance, effective communication is lacking between businesses. Developing countries' cultural preferences for personal communication or local language interfaces are barriers to B2B relationships (Palmer, 2000). Less communication between culturally diverse businesses leads to more distrust. Also, the cultural perception of the Internet can be limited. For example, Palmer (2000) found the Internet to be perceived as a managerial tool in Bahrain.

Commerce and ecommerce policies of countries also impact B2B interactions. Limitations can exist for transferring data/information across international boundaries, which makes it difficult to continue an effective business relationship. Tax laws as well as intellectual property laws differ within nation. Policies preventing the investment of funds in technology also reduce the capabilities of B2B ecommerce; developing nations could be prevented from participating in B2B ecommerce because of the lack of technological infrastructure. Also, in some nations copying software is more acceptable than in others. The lack of education about existing policies, as well as the lack of appropriate policies, limits businesses interacting electronically.

Finally, technology availability and computer professional experience may be the most obvious restrictions to B2B ecommerce. The slow pace of the telecommunications sector, problems with consolidation of technical standards, high cost of broadband connectivity, and inadequate ecommerce infrastructure and skills are constraints to B2B ecommerce (Mansell, 2001; Moodley, 2003). For example, Darley (2003) found Internet access to be largely confined to capital cities in sub-Saharan Africa. Developing nations have underdeveloped computer infrastructure as compared to developed nations. Wireless infrastructure is becoming common in developed countries. In order to conduct business with these nations, developing countries need to have at a

minimum hard-wired infrastructure, if not also wireless infrastructure. Without computer engineering experience to develop this infrastructure, the developing countries could fall even further behind. The developing countries do have the benefit of learning from the mistakes of developed nations. However, B2B ecommerce will not wait for the infrastructure to be established. Those businesses that cannot interact will be left in the dark. Application and access to the Internet and World Wide Web (WWW) will not sufficiently reduce the overall transaction costs in order for developing countries to enter global markets (Pare, 2003). Therefore, resources are needed to ensure that skilled individuals are available to promote evolving ecommerce in response to social and economic goals of developing countries (Mansell, 2001).

3.2. B2C

Business-to-consumer (B2C) relationships using ecommerce have to consider all aspects of the CPT framework. Consumers have high expectations when interacting electronically with businesses. Many individuals distrust less developed nations' businesses (*i.e.* differing cultures) when buying online and using credit cards. Therefore, an effective relationship may not be established between businesses and consumers because of cultural differences. Not only it is difficult to transfer products internationally, many businesses are unwilling to take the risk of distributing a product to a less developed nation's population because of the possibility that payment will not be made. The cultural and physical distance (*i.e.*, distribution systems) between consumers and businesses creates this distrust (Gibbs, Kraemer, and Dedrick, 2003). Also, consumer characteristics can impact B2C ecommerce. For example, Tigre (2003) found the future of ecommerce in Brazil to be limited by social and economic factors, such as income level and education.

The policies affecting ecommerce, and commerce in general, have not specifically addressed the B2C needs. Tax laws lag when it comes to all ecommerce transactions, but in particular are lacking when funds must travel across international boundaries. Many of the same issues that exist for B2B interactions also exist for B2C interactions. For example, the lack of investment in infrastructure, the notion of copying software as being legal, etc., all affect B2C relationships. Also, policies regarding acceptance of products and acceptance of payments have not been fully addressed and have therefore limited the interaction between businesses and consumers when both developed and developing nations are involved. Enabling policies on telecommunications will have a huge impact on B2C ecommerce (Gibbs, Kraemer, and Dedrick, 2003).

The lack of technological infrastructure prevents developing nations' businesses from selling to consumers (in both developed and developing nations), and prevents developing nations' consumers from buying from developed and developing nations' businesses. In B2C relationships, the lack of infrastructure is seen as a last-mile problem, actually completing the intended transaction. The lack of education regarding technology in developing countries contributes to the lack of B2C interactions.

3.3. C2C

Consumer-to-consumer (C2C) ecommerce is also affected by the CPT framework. In particular, the use of online exchanges (*i.e.* auctions) dramatically impacts the number of possible relationships that can exist. Culturally, consumers can be leery of unknown consumers, especially when those unknowns have international contact information. The level of fraud is significantly higher in developing nations than in developed ones (Chen and Ning, 2002). In general, distrust exists between cultures. This distrust grows with the lack of proper communication mechanisms in developing countries. The lack of technology can inhibit consumers from fulfilling requirements for selling products to other consumers, such as adequate images of the product, adequate feedback on the seller, etc. Also, the technology itself plays a role culturally. Shim and Shim (2003) found mobile commerce (m-commerce) to be used in developing countries to show social status. Therefore, not everyone has the same opportunity for access.

Policies regarding arbitration mechanisms are yet to be established regarding selling transactions in C2C ecommerce. Also, many of the same issues from B2B and B2C interactions exist in C2C relationships. In particular, the transfer of products, information, etc. across international boundaries must be considered, as well as the tax laws of differing nations. C2C interactions are a growing means of income for many consumers. Therefore, policies are needed to

eliminate many consumer fears, therefore allowing all consumers to be a part of the mix. For example, piracy of software in China is widespread (Chen and Ning, 2002); it is difficult to enforce Internet and ecommerce regulations by governments in developing nations.

Finally, technology has to exist to allow the C2C exchanges to occur. The lack of technological infrastructure prevents developing nations' consumers from transacting with developed nations' consumers, and developing nations' consumers from interacting with other developing nations' consumers. The Digital Divide is truly limiting the relationships that can be established in this case.

Table 1 summarizes the impact of the CPT factors on ecommerce. Next, we propose specific recommendations that emerge from the CPT framework to promote ecommerce within an economy.

Table 1

The impact of CPT factors on B2B, B2C and C2C ecommerce

CPT Dimensions	Ecommerce Type		
	B2B	B2C	C2C
Culture			
Trust	Fewer relationships; Distrust of govt. involvement	Distrust developing countries' businesses by developed countries' consumers; Cannot establish relationships	Distrust selling to developing countries' consumers
Corruption	Feelings of deceitfulness and distrust lead to few relationships	Consumers of developing countries distrust by developed countries' businesses	Level of fraud in developing countries
Patterns of Communication	Poor communication between developing countries and developed countries; Cultural distance; Developed countries distrust certain other cultures	Cultural and physical distance promotes distrust; Lack of infrastructure may prevent relationships all together	Not able to properly communicate needs of selling relationship to developing countries
Policy			
General Commerce	Differing policies from different countries; Different tax laws, intellectual property, and trans-border information sharing	Differing policies from different countries; Different tax laws, intellectual property, and trans-border information sharing	Transferring money and products across international borders; Different tax laws
Specific to E-Commerce	Lack of funds available for infrastructure development; Country policies on copying/stealing; Lack of education on policies	Concerns regarding receiving payment or products; Lack of funds available for infrastructure development; Country policies on copying/stealing	Concerns regarding arbitration mechanisms; Policies on relationships
Technology			
Level of Hard-Wired Infrastructure	Lacking infrastructure; Less sophisticated connections;	Prevent developing countries' businesses from selling to consumers; Prevent developing countries' consumers from buying from developed countries and developing countries businesses; Ability to complete the transaction	Prevent selling to developing countries' consumers; Prevent developing countries' consumers from selling to developed countries' consumers; Digital Divide limitations
Level of Computer Engineering Expertise	Ability to deal with down networks; Ability to create needed exchanges; Ability to promote evolving ecommerce	Ability to create needed exchanges; Educating businesses on how to use the technology infrastructure	Ability to create exchange mechanism
Level of Wireless Infrastructure	Ability to offer wireless opportunities	Ability to offer wireless opportunities	Ability to offer wireless opportunities

4. Recommendations Utilizing the CPT Framework

We structure our recommendations along the three dimensions of CPT. For each dimension, we describe the drivers that can be used to favorably affect the adoption and usage of e-commerce within that economy. For ease of exposition, we also classify the drivers along the CPT dimensions. Thus, our work recommends a three-pronged approach (utilizing cultural, policy and technological drivers) to favorably affect the culture, policy and technology of the economy.

4.1. Drivers Impacting Culture

As shown in Figure 1, the culture dimension consists of the trust, corruption and patterns of communications sub-dimensions.

4.1.1. Cultural Drivers Affecting Culture

From a cultural standpoint, an economy should raise the awareness amongst the general populace on how trust affects their overall well-being and lifestyle. Courses on trust and ethics can be offered in educational programs in business schools, as well as at all levels of society. Advertising can be undertaken at the national level on trust being important, not only for economic well-being within the economy, but also because of its impact on outside perceptions, and hence foreign investment. Similarly, education and advertising should be undertaken to highlight the adverse impacts of corruption, not just to the intelligentsia but amongst the populace as a whole. Finally, education involving the use of chat-rooms and lean communication methods such as e-mail and instant messaging should be offered at all levels of the economy.

4.1.2. Policy Drivers Affecting Culture

Several policies can be undertaken to favorably impact culture. The trust level in the economy can be increased if consumer protection laws are passed and strictly enforced. For example, in the USA, protection from credit card fraud has emboldened several users to adopt online payments without fear (Caswell, 2000). Another example is legislation that would require all merchants to utilize safe technologies such as SSL (Secure Sockets Layer) and/or escrow payments for transactions (e.g., Paypal at www.paypal.com). This legislation should also be strenuously enforced, with visible punishment for wrong-doers. Similarly, corruption can be reduced if the government passes strong legislation against it, and also strenuously and publicly punishes the wrong-doers in this regard. Finally, patterns of communication can be affected if tax or other financial incentives are offered to businesses that offer data communication networks to consumers (wired or wireless), and firms that offer instant messaging and e-mail services.

4.1.3. Technological Drivers Affecting Culture

From a technology perspective, the nation should aim to provide a secure infrastructure by utilizing technologies such as SSL at the application level. Instead of fragmented feedback information that is hard to find, websites that provide feedback on merchants and products should be setup at the *national* level and promoted heavily in order to garner a critical mass of users. To lower corruption levels, information and processes within institutions and large corporations should be made as transparent as possible. For example, providing easy access to information on the sponsors for a politician as well as who gets access to which government projects will lower the level of institutional corruption within the economy (www.opensecrets.org is an example of this in the USA's economy). Patterns of communication can be favorably affected by providing free and easy to use chat-rooms as well as offering consumers discounted access to e-mail and instant messaging.

4.2. Drivers Impacting Policy

As shown in Figure 1, the policy dimension consists of general policy favorable to commerce as well as policies that specifically favor e-commerce.

4.2.1. Cultural Drivers Affecting Policy

Policy can be impacted favorably if there is a grass-roots' effort to educate people at all levels on business issues, as well as entrepreneurship education on setting up business. As the

number of people who are aware of business and entrepreneurial methods increases, we believe that this can act as a bottom-up driver and put pressure on policy makers to enact policies favorable to business and to ecommerce. For example, the Information Technology Act 2000 passed in India aims partly to alleviate the disproportionate share of profits enjoyed by a few middlemen in the traditionally rural and agrarian economy (Basu and Jones, 2003).

4.2.2. Policy Drivers Affecting Policy

Policy can build on itself, in that once the fruits of a beneficial policy are realized by the policy makers, more can follow. For example, India started liberalizing its closed economy from the early 1980s (Menezes, 1999) by inviting car manufacturers such as Suzuki to manufacture cars. This caused a dramatic increase in the quality of cars, and led to policies that further opened the economy, so that by the mid 1990s, most consumer goods could be imported easily. In the 2000s, India shows every sign of emerging as an economic powerhouse in its own right, with policies that enable foreign investment as well as promote ecommerce by recognizing digital signatures and secure network infrastructures. The lesson learned here is that, even if policy makers are not ready to enact sweeping legislation, starting small with policies that will likely have maximum beneficial impact can serve as a catalyst for further policies.

4.2.3. Technology Drivers Affecting Policy

Exposing policy makers to technology gives them familiarity with the problems they need to alleviate through legislation. Thus, the policy makers need to be exposed to emerging technologies and modes of communication, such as shopping online, chat-rooms, instant messaging, email and downloading of digital content. In several developed countries where e-commerce developed first, politicians for many years were caught off-guard and are only now preparing to deal with the issues raised by ecommerce. For example, the issue of taxation of inter-state commerce was ignored in the pre-Internet age, when these were a small percentage of overall transactions. The early adoption of ecommerce in the USA means that consumers have been able to buy instantly from anyone, anywhere for several years. There was a definite lag between this phenomenon and the consideration of taxation of inter-state transactions (Freeman, 1999): a policy issue that has still not been resolved. If policy makers had been exposed to online shopping earlier, and done a significant percentage of their own shopping online, this issue may have been considered earlier. Developing countries have an advantage in that ecommerce is now fairly ubiquitous, and policy makers are likely to have been exposed to it in some form.

4.3. Drivers Impacting Technology

Figure 1 shows the three sub-dimensions of technology in the CPT framework: the level of hard-wired infrastructure, the level of wireless infrastructure and the level of expertise in computer engineering available in the economy.

4.3.1. Cultural Drivers Affecting Technology

The goal is to create a positive image of technology and ecommerce within the national psyche. Schools should offer classes on technology and its use, so that people are exposed at a young age to technology. Colleges should be given incentives to offer degrees in computer engineering to increase the overall technical competence of the population. We also recommend advertising in the media that promotes high-tech jobs as glamorous and appealing. All of these measures will raise the cultural awareness of the entire population regarding technical issues.

4.3.2. Policy Drivers Affecting Technology

From a policy perspective, technology can be affected positively in several ways. The bypassing of government telecommunication providers in Haiti with four private Internet Service Providers (ISP) was enabled by legislation that had a beneficial effect on the costs of Internet access (Travica, 2002). Policy makers can pass tax incentives or even provide direct financial aid to develop either a hard-wired or a wireless infrastructure. As pointed out by Panagriya (2000, p. 5), developing countries do not need to invest heavily in a wired network, since wireless infrastructures are usually so much cheaper. Apart from legislation affecting the infrastructure, policy mak-

ers can also provide incentives for schools and colleges to offer computer training, and for students to take these courses (*e.g.*, scholarships, forgiveness of student loans, etc).

4.3.3. Technology Drivers Affecting Technology

Advances in technology standards, the lower costs of hardware, and the increased ease of use of software all impact the technology within a nation. Thus, it is clear that it is becoming increasingly less expensive to create ecommerce infrastructure within a nation, as well as to provide access to ecommerce to the general population. For example, the XML standard (eXtensible Markup Language) (Glavinic, 2002) provides a much cheaper method of providing B2B data interchange than traditional proprietary electronic data interchange (EDI) systems used in developed countries before ecommerce. Developing nations can capitalize on these trends to catch up with more developed countries that have in the past invested significantly more to develop infrastructures and provide access.

Table 2 summarizes the three-pronged approach described in this section.

Table 2

A 3-Pronged Approach to Enabling Ecommerce along the CPT Dimensions

CPT Dimensions	Drivers		
	Culture	Policy	Technology
Culture			
Trust	Offer courses on the importance of trust in an economy, advertising on the beneficial effects of trust.	Pass and strictly enforce consumer protection laws Require all merchants to utilize minimum security standards.	Provide cheap access to technologies like SSL and set up national feedback sites on merchants and products.
Corruption	Offer courses on the negative effects of corruption, as well as advertise on how corruption affects perception within and outside the economy.	Pass strong legislation against corruption, and visibly enforce sentencing for guilty parties.	Utilize web access to make information and processes in large firms and government agencies as transparent as possible.
Patterns of Communication	Easy access to education on how to use chat rooms and lean communication methods such as e-mail and instant messaging.	Offer tax and other incentives to consumers that use and firms that offer instant messaging and e-mail services.	Provide easy to use e-mail, chat-rooms and instant messaging to a large number of consumers in the economy.
Policy			
General Commerce	Grass roots effort to educate people at all levels on entrepreneurship and put pressure on policy makers to enact favorable policy as the culture of the economy changes.	Start with small pro-business policies, and then as the fruits are realized, enact more policies in that direction	Expose policy makers to the technology that is used by consumers, so they have a better understanding of what issues need to be legislated.
Specific to E-Commerce	Grass roots effort to educate people on specific benefits of ecommerce and raise awareness of the issues such as digital signatures, that policy makers should be looking at.	Start with small ecommerce policies, such as requiring security, etc. and then build on this, as the benefits are realized.	
Technology			
Level of Hard-Wired Infrastructure	Educate the population on the importance of technology, and make technology professions more appealing and glamorous.	Pass tax incentives to promote hard-wired infrastructure, or offer other financial aid.	Utilize new technology that makes it easier and cheaper to create an infrastructure and utilize emerging standards like XML to promote application development.
Level of Computer Engineering Expertise		Provide incentives for schools and universities to offer computer engineering courses and degrees and incentives such as financial aid for students to enroll in these.	
Level of Wireless Infrastructure		Pass tax incentives to promote wireless infrastructure, or offer other financial aid.	

Next, we conclude along with limitations and opportunities for future work.

5. Conclusion

It is widely understood that the problem of promoting ecommerce in a lesser developed economy cannot be solved by simply adding more technology, without simultaneously changing the culture and the policies in the economy. In this work, we address this issue, by presenting the comprehensive CPT framework, which helps in a) the analysis of what needs to be done to promote ecommerce readiness, and b) provides a structured strategy that shows how all three aspects (culture, policy and technology) can be used to simultaneously drive each other. The CPT framework presented here is the result of the synthesis of factors shown to be important in earlier studies.

One potential limitation of this work is that there may be other dimensions that are important, and may be included in future versions of the framework. A useful extension of our work here will be to empirically test the CPT framework by examining activities that led to the successful adoption of ecommerce in economies, and studying the extent to which these activities map to the recommendations that flow out of the CPT framework.

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