



# Evaluation of E-Commerce in Continental Native American Nations

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## ABSTRACT

This paper presents an evaluation of seven Native American e-commerce portals in order to identify their problems which can be addressed by decision and policy makers. The evaluation methodology used was developed by Van der Merwe and Bekker (2003). From the results of this study, some of the problems that Native American e-commerce businesses confront are technical, organizational, and access to credit and infrastructure.

## LITERATURE REVIEW

E-commerce has created exceptional and significant opportunities for companies in countless business environments to interact with their customers (Kim et al., 2003). Native American Nations have foreseen the opportunities that technology could provide them. With the Web as primary infrastructure, e-commerce offers several tangible and intangible benefits. For Native American Nations, an online presence is the forum used to communicate with customers; to facilitate business transactions; to preserve their cultural heritage; native organizations; to supply resources on genealogy and demographics, educative opportunities, culture, literature, history, spiritual practices, sovereignty, and contemporary life (Taylor, 2002).

The Internet has sites that respectfully present Native Americans with truthful information, quality merchandise to sell, and as normal human beings with authentic existence. However, the Internet has also sites that present incorrect information, and represent Native Americans through lens that distort their image (Cubbins, 2000).

At present, Native Americans perceive e-commerce presence as an alternative for economic development. Some of them sell products and services. Also, they are proprietors of casinos (Evans and Topoleski, 2002; Kearney, 2005). The strategies Native American nations are using for generating economic development and have the objective of paying for education and healthcare (Wood, 2003). Also, there are e-commerce sites that belong to individuals or groups that are for profit, but keeping strong links with their cultural background.

Well-designed portals can help create loyal clientele and increase profits, poorly designed ones may lead to frustrated consumers and subsequent losses (Cunliffe, 2000). In spite of the importance of this topic, research and literature focusing on e-commerce evaluation are limited and our review has found little research of this nature for e-commerce portals. Some of them include the following:

- Schubert and Selz (1999) described a web assessment model created by the Competence Center for Electronic Markets;
- Liu et al. (2000) proposed criteria for the design of e-commerce sites derived from a survey of web masters working for Fortune 1000 companies;
- DeLone and McLean (2004) proposed six dimensions — system quality, information quality, service quality, use, user satisfaction, and net benefits;

- Phippen et al. (2004) considered customer lifecycle analysis and customer behavior analysis in their research in web analytics;
- Kim and Lee (2003) conducted research on e-catalogs evaluation;
- Mao et al. (2005) proposed measures of effectiveness for web sites; and
- Van der Merwe and Bekker (2003) proposed a comprehensive set of evaluation criteria for e-commerce sites.

The evaluation criteria proposed by Van der Merwe and Bekker (2003) was adopted in this study as it is broader than the other frameworks reviewed.

## STATEMENT OF PURPOSE

The objective of this paper is to evaluate seven randomly selected Native American e-commerce portals in order to identify their problems. The significance of the study is based on two factors: a) little research has been done in this area, and our literature review has found little research of this kind has been developed for minorities and specifically for Native Americans, and b) the instrument used and the results obtained by this research could help Native American businesses enhance their e-commerce sites.

## METHODOLOGY

Seven Native American's e-commerce sites were evaluated. A gateway to the presence of Native American Nations is the Lisa A. Mitten's website "NATIVE AMERICAN SITES and home of the American Indian Library Association Web Page" (<http://www.nativeculturelinks.com/indians.html>). This site provides a category called Native businesses, which provides access to ninety nine Native American business sites. Not all the sites in this category can be considered e-commerce sites; there are companies, Native American business associations, et cetera. Those that are not e-commerce site were skipped, and finally seven sites were chosen randomly. Each of these portals evaluated belongs to a Native American nation or is developed by individuals belonging to that Nation.

The evaluation instrument used was developed by Van der Merwe and Bekker (2003). These evaluation criteria incorporate five distinct categories: interface, navigation, content, reliability, and technical infrastructure.

In order to guarantee objectivity, three different individuals did the evaluation. The evaluation procedure has two steps, as follows:

- a) Gather data - Values were assigned using an interval scale zero to ten. Zero represents the non-existence of the attribute. After the evaluations were completed, common agreement was achieved in the way the evaluation criteria were used. The e-commerce sites were retrieved from 13 to 15 of December.



- b) Analyze the results - the results were tabulated and drawn using radar graphics. Each specific evaluation criteria will be compared for each e-commerce portal to describe the degree of maturity of each Web site.

### Instrument

The researchers adapted the evaluation criteria, and the modified instrument containing 110 items to assess in five categories and twenty subcategories. The interface category assess: graphic design principles, the value of the graphics and multimedia, style and text, and flexibility and compatibility. The navigation category assess: logical structure, user friendly, search engine service, and navigational necessities. The content category assess: product or service related information, company and contact information, information quality, and interactivity. The reliability category assess: customer profile, order process, after-order follow up, and customer service. Finally, the technical category assess: speed, security, use of software and database, and system design.

### Limitations

Four sub-categories were difficult to assess: after-order follow up, customer service, speed, and security.

## RESULTS

The degree of technical sophistication found in e-commerce sites has a wide spectrum of sophistication, going from static one page sites to sites making use of database catalogs, and credit card payments using pay pal services.

In the interface design, the subcategories – Graphic design, graphics and multimedia, style and text, and flexibility and compatibility have the following averages: 6.8, 6.4, 7.5, and zero. The following issues are not addressed in any one of those seven sites: printable versions for pages available, text-only versions, special consideration for disable individuals, and the page size to fit the browser window. The best issue addressed is style and text. The graphic design and the use of graphics are good in two sites, fair in another, and the rest of them have room for improvement. In fig. 1, each one of the vertices represents a site, and the sub-categories are measured from zero to ten.

The navigation category sub-categories averages are the following: logical structure – 5.6, user friendly – 7.5, search engine – 4.5, and navigational necessities, which includes “no broken links” – 6.4. In navigation, two sites do a good job, one a fair, and the rest of them have space for improvement. For more details, see figure 2.

The average assessment values for the sub-categories of content are the following: product or service related information – 5.8, company and contact information – 6.4, information quality – 6.8, and interactivity – 1.5. In this category, two sites do a fair job, one acceptable, and the rest have opportunity to improve. The content category is the one least

Figure 2. Navigation

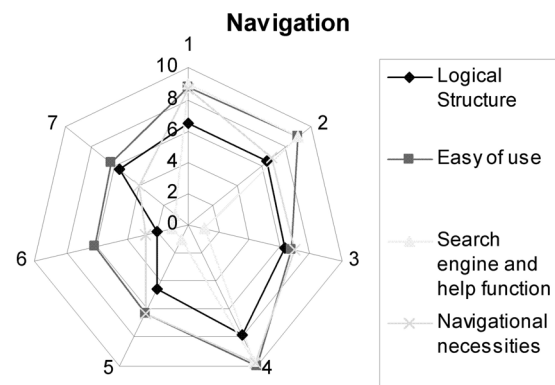


Figure 3 Content

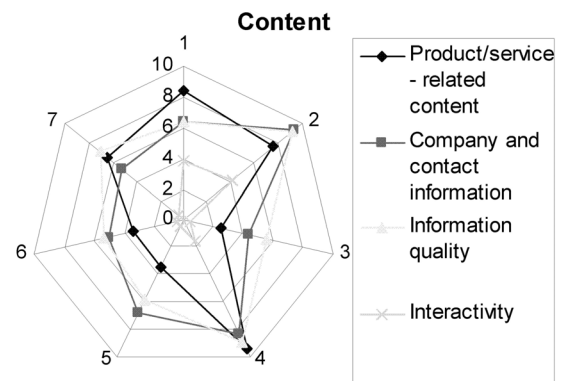
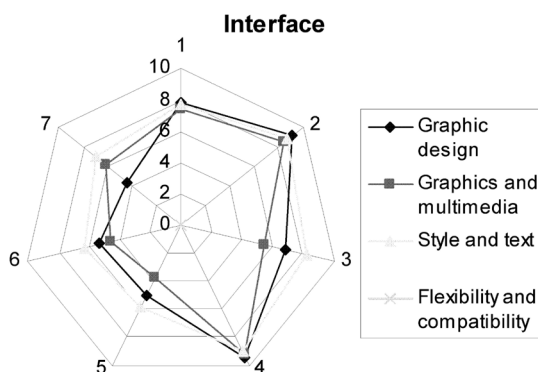


Figure 1. Interface



related to content, but the values are the lowest. This category is related to the description of product or services, contact information from the e-commerce site. The sub-category that requires more technology is least developed and includes issues like customization and personalization of content for the user, and the creation of an interactive community of buyers (fig. 3).

The fourth category reliability was not assessed completely because the researchers could not assess the customer service and the after-order follow up. Storing customer profile and the order process were assessed, but only one site do a fair job in these two categories.

In the technology category, some aspects were not possible to measure such as speed, adequacy of software and database. It was possible to review security and the overall system design. Security is one of the areas in which these e-commerce sites require help.

## CONCLUSIONS

Bregendahl and Flora (2002) found in their research specific opportunities and challenges to develop e-commerce in Native American nations. Some of the opportunities and challenges are the following: a) credit and finance, b) making the most of cultural capital, c) enhancing tribal assets, d) social and cultural obstacles, e) lack of infrastructure, and f) the necessity of technical assistance and training. From the results of this study, some of the problems that Native American e-commerce businesses confront are technical, organizational, and access to credit and infrastructure. This reflects that digital divide may still be a reality for minority groups. As Prieger pointed out before, this situation has



evolved over the time, and today for Native American nations, it means to have restricted access to broadband internet access (Prieger, 2003).

Criticism can be done to this type of research – the instrument is not adequate, the researchers do not understand the complexity of Native American reality, and/or it represents the point of view of outsiders. This research should not be understood as a critic to the Native American e-commerce sites evaluated, but as information that can be used in the policy making or decision-making processes.

## REFERENCES

- Bregendahl, C., Flora, C. (2002). *Native American Business Participation in E-commerce: An assessment of technical Assistance and Training needs*, North Central Regional Center for Rural Development.
- Cubbins, E. (2000). Techniques for Evaluating American Indian Web Sites, retrieved Oct. 1, 2005, from <http://www.u.arizona.edu/~ecubbins/webcrit.html>
- Cunliffe, D. (2000). Developing usable web sites: A review and model. *Internet Research: Electronic Networking Applications and Policy*, 10(4), 295-307.
- D'Angelo, J. & Little, S.K. (1998). Successful web pages: What are they and do they exist? *Information Technology and Libraries*, 17(2), 71-81.
- DeLone, W. H., & McLean, E. R. (2004). Measuring E-commerce Success: Applying the DeLone and McLean information system success model. *International Journal of Electronic Commerce*, 9(1), 31-47.
- Evans, W. N., Topoleski, J. H. (2002), The social and economic impact of Native American Casinos, National Bureau of Economic Research, *Working Paper 9198*.
- Kearney, M. S. (2005). The Economic Winners and Losers of Legalized Gambling, *National Tax Journal*, Vol. 58 (2), 281-302.
- Kim, S.-E., Shaw, T. and Schneider, H. (2003). Web site design benchmarking within industry groups", *Internet Research: Electronic Networking Applications and Policy*, 13 (1), pp. 17-26.
- Liu, C., Arnett, K.P., & Litecky, C. (2000). Design quality of web sites for electronic commerce: Fortune 1000 webmasters' evaluations. *Electronic Markets*, 10(2), 120-129.
- Mao, J., Vrendenburg, K., Smith, P. W., & Carey, T. (2005). The state of user-centered design practice. *Communications of the ACM*, 48(3), 105-109.
- Phippen, A., Sheppard, L., & Furnell, S. (2004). A Practical Evaluation of Web Analytics. *Internet Research*, 14(4), 284-293.
- Prieger, J. E. (2003). The supply side of the digital divide: is there equal availability in the broadband internet access market?, *Economic Inquiry*, 41 (2), 346-363.
- Schubert, P., & Selz, D. (1999). Web assessment - measuring the effectiveness of electronic commerce sites going beyond traditional marketing paradigms. *Proceedings of the 32nd Hawaii International Conference on System Sciences*, vol 5. Retrieved October 18, 2005, from <http://csdl2.computer.org/comp/proceedings/hicss/1999/0001/05/00015040.PDF>
- Taylor, R. H. (2003). Focusing on Native Americans: basic Web resources pathfinder, *Collection Building*, 21(2), 60-70.
- Van der Merwe, R., & Bekker, J. (2003). A framework and methodology for evaluating e-commerce web sites. *Internet Research*, 13(5), 330-341.
- Wood, F. B. (2003). Tribal connections health information outreach: results, evaluation, and challenges, *Journal of Medical Libraries Association*, 91(1), 57-66.



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