

Harvesting Community Knowledge

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Abstract

This paper addresses challenges system designers may face when building a community information system for a Latino community. Particularly it examines: How can social network analysis, Latino studies and computer supported cooperative work help in understanding the community's information needs? How can the design of an interface enhance access to its networked resources? What are the challenges faced when designing a tool whose goal is to harvest community knowledge from a diasporic community? A scenario is included in order to analyze issues related to the design of community information systems, including social capital strategies for harvesting community knowledge.

1. Introduction

Information infrastructure is a tricky thing to analyze. Good, usable systems disappear almost by definition. The easier they are to use, the harder they are to see. As well, most of the time, the bigger they are, the harder they are to see [7, p. 33].

A community information system has special characteristics. Similar to other information delivery systems, its networked capabilities may provide access to digital libraries, online public access catalogs, internet resources, collaboratories, distance education programs and local information resources. Yet, more often than their counterparts, the planning, managing and decision-making and visions for a community information system have strong ties to a *land*. Community information systems are territorial systems. Good farmers know the nature and composition of their land, make a significant effort in learning about the land's composition, nutrients, boundaries and its varied resources. At harvest, the combine is an especially useful tool because it can perform multiple tasks: cut plant stalks, thresh the cuttings, and separate the wheat from straw and wastes. Successful community information systems make significant efforts in learning about the community's needs, their goal is "to improve the lives of local

residents...with whom they physically interact everyday" [4].

This paper addresses some of the challenges system designers may face when building a community information system for a Latino community. Particularly it examines: How can social network analysis, Latino studies and computer supported cooperative work help in understanding the community's information needs? How can the design of interface features enhance access to networked resources? What are the challenges faced when designing a tool whose ultimate goal is to harvest community knowledge from a diasporic community?

A scenario takes us through the information needs and expectations of a Latino community as it strives to preserve a culture and a neighborhood that is experiencing de-territorialization. The represented community is a composite of actual Latino neighborhood situations. This paper uses a multidisciplinary approach to examine design strategies for harvesting community knowledge.

1.1 Scenario

Suppose that a city public library has been charged by an alliance of neighborhood-based industrial and community groups, businesses and nonprofit associations to design a community information system. The system would serve low and middle income Latino families in the northwest side of a large Midwestern city. This neighborhood, which years ago had been described as "blighted," with no hope for growth, has been undergoing massive urban renewal based on a plan from city government. However, as city dollars move in, Latino families are moving out. Suddenly dilapidated housing has a prime real estate value for outsiders, and housing sales are advancing the deterritorialization of the area. The alliance is concerned that Latinos stay in the neighborhood and reap full advantage of the urban renewal economic benefits for which so many Latino grassroots community groups have worked. The vision is for a community information system to be designed as an experimental "anti-deterritorialization" tool.

The alliance recognizes that people often learn about and acquire jobs and economic opportunities through informal channels of communications [17,18]. Consequently, this digital resource should be a means for expediently providing job training and placement information, including a collaboratory [46] system. The collaboratory is a component the alliance hopes will be used as a shared workspace for community meetings or for promoting community activities like musical concerts or live interviews with folklore artists, and provide critical and timely real estate and small business loan information. Unfortunately, the neighborhood public library is suffering from little community involvement: patrons rarely visit its physical facility or access its library networked resources.

Some key points to notice in this scenario are:

- (1) The relationships of community information systems and territories. It is expected that as the community is better informed about the city's urban renewal opportunities, this knowledge positively counteracts the process of de-territorialization. Offner has analyzed the myth of seeing a networked system "as an instrument of de-territorialization" [32, p. 167] and argues that it can instead strengthen territories. This scenario opens an interesting research issue on how community information systems interact with neighborhoods, localities, and geographic locations.
- (2) Relationship of key institutions and community information systems. The community alliance has asked the library to be the primary builder of the networked system. As Rogers [37] explains, adoption of innovations is an "information seeking activity." Consequently, libraries can be key partners to help communities adopt urban renewal programs [25] and to building community information systems [4,6]. For a study on adoption of internet use in low-income families, see [5].
- (3) Definition of community: The expectations about where and how the boundaries of the community to be served should be drawn will probably require considerable negotiation. Wellman [45] has defined this as the community question.

2. Harvesting community knowledge

Social Capital. "Investment in social relations with expected returns" [26, p. 5]

The goal of the community alliance is to provide low and middle income Latino families with strategic information on jobs, housing counseling, real estate

development and finance, business opportunities, and cultural activities. One approach to the design of such a system would be to apply the notion of social capital (for representative authors, see Lin [26]; Burt [8]; Marsden and Hulbert [27]) within an urban renewal model of asset-based management [25]. Such an approach helps to achieve a community information system that captures social relations from a community and generates returns for an individual.

According to Kretzman and McKnight [25] there are two basic urban renewal solutions for rebuilding marginalized communities: (1) a conventional way that focuses on identifying a community's "needs, deficiencies, and problems;" (2) an alternative solution that insists on "discovering a community's capacities and assets". Briefly, the alternative solution is composed of three steps: recognizing, identifying and then mobilizing community assets, where assets are a community's individuals, informal associations and formal institutions. Kretzman and McKnight further argue that the first approach has been unsuccessful for rebuilding communities because it perpetuates a client-deficiency-welfare mentality in people, whereas the latter advocates a "producer" *mental map* and consequently fosters community involvement. The strategies for implementing such an asset-based model, and some success stories, have been detailed in their guide for rebuilding communities [25]. Their argument that systems and programs can impose a deficiency model on poor urban communities would seem to befit Latino diasporas too. For example, as comments from Latino teacher in California confirm,

In this country...You have to come in front of a group and explain that you don't speak English; then you get translation at the back of the room. You have to admit that you are an inappropriate provider for your family; then you get lunch service for your children. You have to declare first that you don't belong, to then gain a place...There is always the assumption that you are an inadequate person, that something is missing, that you don't belong, that as a person you have a disability [as cited in 40, p. 39].

This notion of social capital is important in the scenario because the alliance is particularly interested in expanding the Latino community's access and range to job information in the area via the community information system, based on the recognition that people often learn about and acquire jobs through social ties [17,18] and based in part on the premise that people may choose to live close to where they work. Lin's [26] definition of social capital helps here because it has three elements: "resources embedded in a social structure; accessibility to such social resources by individuals; and use or mobilization of such social

resources by individuals in purposive actions." According to Lin, the reasons why embedded resources in social networks generate expected returns are because they enhance the: *flow of information, influence on the agents, identify social credentials, and promote public reinforcements* [26]. Considering both the asset-based model of community rebuilding and the concept of social capital, the goal is to design a community information system that captures community assets (i.e., of the individuals, organizations, institutions, etc.) and social relationships.

Attending to social capital, the metaphor of harvesting community knowledge comes from applying the definition of harvesting as "result or consequence of any act, process or event: *a harvest of memories*," [35] to the social capital captured by a community information system. Social capital in this sense would be considered a collective good. It is not, however, a public good because it would not be possible to distribute it throughout the community in an automatic way. This also follows from the definition that benefits or returns derived from a public good, contrary to those derived from a private good, produce external effects of indivisible consumption in more than one individual. The best way to show that the social capital differs from a public good is by an example. Nothing is more vital to a country than its national defense (although some pacifists may disagree). Even if national defense could be considered as merchandise, it still differs substantially from the case of a private good like bread. A loaf of bread could be divided in various forms among the people of a group, but the national defense should be distributed in an indivisible way. This example is noted here because there is much debate in the literature concerning whether social capital is a collective or individual or public good [for an insightful review, see 26]. As Lin explains,

Most scholars agree that it is both collective and individual goods; that is, institutionalized social relations with embedded resources are expected to be beneficial to both the collective and the individuals in the collective. At the group level, social capital represents some aggregation of valued resources (such as economic, political, cultural, or social, as in social connections) of members interactive as a network of networks. The difficulty arises when social capital is discussed as collective or even public goods, along with trust, norms, and other "collective" or public goods. What has resulted in the literature is that the terms have become alternative or substitutable terms or measurements. Divorced from its roots in individual interactions and networking ... [26, p.9].

This relates to the scenario because access to the community information system's job resources, for example, although vital for its users should not imply a guarantee that the social capital information captured and distributed through this system will convert into an economic surplus for everyone. The infrastructure here is a medium not a product [3].

3. Setting an observational space

Social power cannot any longer (if it ever could) be disconnected from the power and ability to move quickly over space [Swyngedouw 1993 as cited in 16, p. 183].

The community information system is an experiment in preventing and slowing deterritorialization. Once a system has been set up, a next step is to work with the neighborhood alliance in formulating and setting a research program. This paper proposes some areas of investigation for examining individual social relationships and/or group relationships within a Latino social network employing a community information system. Considering social capital and system use, this paper asks: Does research on the effect of networked systems on groups suggest that strong social ties will foster frequency of contact among community members, mobilize social capital as defined by contact resources, and enhance system use? More specifically, can a community information system foster the mobilization of social capital within a Latino community? The areas of investigation are framed by a definition provided by Lin on the measurement of social capital as "contact resources [as] mobilized resources in instrumental actions" [26, pp.16-17].

Table 1 presents the four dimensions on which to capture community assets in order to design a job placement and information database and the data to be collected to study the effects of social capital on social relationships and system adoption. This is a diasporic community in that many members are from other countries to which they continue to have ties, and also in that some of the original members of the community have moved away. The social capital, therefore, is likely to come from a *network of networks*. This community information system would provide the advantage of accumulating data at the group (e.g., size of social network) and at the individual (e.g., personal relationship) level.

Insert Table 1 here

This is a *social capital* database in that it includes not only jobs primarily in the local neighborhood (or even educational opportunities), but also identifies

businesses, organizations and institutions with available positions, individuals with advanced degrees, etc. Individuals who can exercise influence in the community may be government officials who are Latinos, community and business leaders, or even citizens with advanced degrees who can offer recommendations for universities and colleges.

Table 1
Capturing Community Assets
Contact Resources

| Social Capital | |
|--|--|
| Information Flow <ul style="list-style-type: none"> • Hierarchical positions • Job openings | Influence <ul style="list-style-type: none"> • Actors who can exercise influence over decision makers |
| Social Credentials <ul style="list-style-type: none"> • Occupations • Certifications • Curriculum Vitae | Recognition <ul style="list-style-type: none"> • Public Recognition • Promotions • Awards • Collaboratory data |

4. Providing user services

Keeping the scenario in mind, would it be best to delineate the boundaries of the community to be served as geographic, political, economic, cultural or emergent? If the boundaries are geographic, is the assumption that neighborhoods are communities? [45] Do users, therefore, need to live in the neighborhood in order to have full access to the system's resources? What if a Latino living in another US city is interested in taking advantage of the community information system's job placement resources because she is planning a move to this neighborhood?

If the boundaries are cultural, will the system privilege those Latinos speaking Spanish? Will the system be inclusive of Spanish-speaking users from Spain? How can a community information system negotiate what is so real for many Latinos, whose definition has eluded many scholars, and has been christened as *Latinidad*?

On the other hand, if the system successfully links Latinos throughout the globe but fails as a local retention mechanism, meaning that deterritorialization is not reversed, is the information system a failure? Who decides the system is a failure: would it be the system designers, managers or administrators? [15]. On what scale do we evaluate community information systems, locally, nationally or globally? If the system is judged as a *relationship marketing* [28] success because of its mastery in identifying and linking Latinos throughout

the world, who should ultimately be responsible for its funding? If portions of the funding come from a transnational alliance, how is the project's accountability managed?

In our scenario, the goal for such a system is that it will provide pertinent job, housing and cultural information to serve as a retention mechanism that among other things limits deterritorialization. In other words, designers not only develop an information delivery system but fulfill a vision for what is imagined as the demarcation of this community. Thus, designers should approach the community system design without pre-conceived ideas of where Latino community boundaries should be drawn, in the hope of building an information system which the Latino community actually uses. Boundaries are likely to be an issue for ongoing negotiation within this community alliance. Some tensions in advancing a stakeholder's interpretation of a common vision for this community information system are likely in need of resolution, especially since research has shown that collaboration and "strategic organizational partnerships" are key ingredients for successful implementation of a community information system [6]. In a literal sense this would mean, for example, that providing a user interface only in Spanish would disenfranchise all those Latino adults and youths who only speak English. Heterogeneity within a Latino community goes well beyond issues of Spanish and English language literacy and proficiency, and system designers need to be aware of the many variables that define a community.

The complexity in user diversity relates to what social network analysis defines as *boundedness*, which is "the proportion of network members' ties that stay within the boundaries of the network" [44]; *range*, the variety and number of resources a person has access to [43, 44]; and *density*, the extent to which members of a community are connected to all other members [43, 44]. The constructs are easily separated in formal definitions. But in fieldwork, the words often lose their distinctions when described in less bounded terms:

Culture gives us a sense of unity, of connectedness, a vision of our identity...The difficulty is trying to pinpoint what we mean by culture. It isn't simply language, community, the arts, religion, history...It is a little of each, and all at the same time. We all know what it is, but can't explain it. It makes us closer to our brothers and sisters; it makes us disregard the differences when it comes to the tough things of life; it's like a unity within the difference [as cited in 40, p. 43].

This is one of the utilities of social network analysis for system design; it helps in teasing out and analyzing

the community situation that was previously described as the *unity within difference*.

4.1 Community issues and interface design

In usability studies, Shneiderman's [39] Principle 1 is *Recognize the Diversity*. As Shneiderman admits, "It is a simple idea, but a difficult and, unfortunately, often undervalued goal. No one would argue against this principle, but many designers assume that they understand the users and users' tasks" [39, p. 67].

In designing this community information system, it is readily apparent that it is important to have knowledge about both the individual user and the community. At this point it is necessary to turn to scholars in Latino Studies. Flores [13] says, "Latinos may now be more accurately described as a diasporic community or, more suggestively, a *world tribe* (italics added)." (For some comprehensive works on Latino Studies see, Flores and Benmayor [14] and Aparicio and Chavez-Silverman[2]; related to diasporic communities, see Chatterjee [10].) The Latino community places a high value on communication connectivity. Even before the internet's popularity, Mueller and Schement [29] found that low-income Latino families allocated a considerable amount of economic resources to staying connected, maintaining long-distance relationships and being informed by way of phones, wireless technologies, cable TV, VCRs etc.

The importance the community places on connectivity is exhibited by the number of Latino online journals, listservs, and websites currently available. Vega Garcia [42] has provided a review of some recommended Latino sites. A community information system for Latinos should be a portal, a network of networks that provides access to resources and people on a local, national, international and global scale. Given that this is a community that engages in conversations in English and/or Spanish, this portal should be a multilingual retrieval system [24] that allows users to enter queries in one language and retrieve information in another. The cross database in Spanish and English databases could be implemented via query augmentation, neural networks, or AI algorithms, and provide relevant feedback based on users' selections of relevant items. This would enhance access to information and avoid limiting users' searching capabilities based on lack of knowledge about which descriptors or keywords to use in a search.

Another important design feature to consider is the possible interaction between choice of communication media and ethnic group [1, 38]. Rosaldo and Flores [38] explained this interaction between communication media and ethnicity as follows:

In his seminal work on national communities, Benedict Anderson ...found that ethnic groups in Eastern Europe often used the print media to find one another, to form alliances and to begin building their communities. He termed such groups imagined communities because they constructed their collective identities as if they were members of face-to-face communities (which given their numbers, they obviously were not). In contrast [our] research project found that Latino imagined communities derive less from print and other media than from such events as public celebrations and protest rallies [38, p. 73].

Since Anderson [1] and Rosaldo and Flores [38] observed that media use varies by ethnic groups, the design of systems for diasporas should not assume that multimedia plugins provided by interfaces may have equal affinity in different social networks (e.g., Mexicans, Puerto Ricans, Cubans and so on, and in comparison to non-Latinos). It might be interesting to study how selection patterns emerge within Latino networks. Consequently, community information systems designed for diasporas should give attention to how various social networks are communicating, what media are most frequently employed. This is not an easy task and places a burden on the interface design team to look for

Social relationships that transcend groups or localities. A group is only a special type of social network, one that is *densely-knit* (most people are directly connected) and *tightly-bounded* (most relations stay within the same set of people). To be sure, there are densely-knit and tightly-bounded groups and community groups. Yet there are other kinds of work and community networks whose relationships are sparsely-knit with only a minority of members of the workplace or community directly connected with each other. These relationships usually ramify out in many directions like an expanding spider's web rather than curling back on themselves into a densely-knit tangle [45].

Diasporas and online communities are analogous in certain aspects but for dissimilar motivations and with different consequences. Members of diasporas have departed from homelands to live in strange hostlands while online communities visit hostlands in search of "homelands." The shared perspective relates to the passages the communities must travel, which are characterized by mobility, constant exchanges of resources, and the management of social relationships that are spread out throughout several hosts. Both groups are constantly seeking a space that helps them situate themselves to manage a social network of *close* or *weak ties* that may span several states or countries

and requires significant economic resources for sustenance.

The endurance needed to survive in both physical and virtual spaces perhaps comes from a person's social capital. Since this argument relates to diasporas and/or distributed communities, then social capital must be coupled with a "mental model" [9, 22] which particularly reinscribes a person's sense of belonging to an *imagined* place.

4.2 Applying inherited views to interface design and system adoption

The analogy between diasporas and distributed communities is presented here for several reasons. First, from a tool designer's perspective, there has been considerable work on the utility of mental models for interface design [31,34]. Thus, which are the appropriate mental models to apply in interface design for diasporas may be an interesting research issue. For example, Pfaffenberger [33] found that the metaphor of the computer as a brain, widely accepted in Western culture, was considered absurd and laughable among a diasporic community of Sri Lanka Tamil immigrants living in London, U.K. Second, it would be interesting to observe within a diasporic community what role social capital plays in whether and how its users embrace a community information system.

4.3 Activating the network

Following the thread of system adoption, this section presents some thoughts on how social network analysis can assist in activating a social network of dynamic users. Briefly, social networks are studied by measuring the strength of social relationships distinguished as *strong* or *weak* ties. Haythornthwaite [20] defines the measurement dimension,

Relationships indicate a connection between two or more people or things. Pairs of actors who maintain a particular relationship are said to be *linked* by that relationship, for instance, pairs who work together are linked in a working relationship. Pairs can be linked by one or more relationships, for example, pairs may work together, and they may associate after work. Pairs are said to be *tied* by all the relationships they maintain. Thus, a tie describes the aggregate connection between relationships that form and maintain those ties. [20, p.326].

Yet, in social relationships there are other ties, which represent unobservable behavior, a potential for a social relationship to develop or rekindle, to convert from nothing into a weak link, and these are what Haythornthwaite [21] has so clearly identified as *latent*

ties. Diasporas are familiar with latent ties; it is an advantage (or disadvantage) of mobility. The passages diasporic communities must travel are constantly bringing them into new relationships that may convert from latent into weak and perhaps into strong ties. A networked information system offers the same prospect. As Haythornthwaite explains,

latent ties -- ties for which the connection is available technically, but not yet activated ...can be formed by the presence of a computer network connection, e.g., by enrollment in an organization's internal email system. They may also be formed by non-computer means, e.g., by invitation to a departmental or unit meetings. Whether computerized or not, such weak tie connection mechanisms depend on structures that are established organizationally, not by individuals. [21]

Because this paper argues that diasporas and virtual communities are analogous in certain ways, it would be useful to look at research on how online communities have successfully activated and maintained their social networks [11,12, 19]. An important ingredient for the adoption of the community information system would be personal interest, which Constant, Sproull and Kiesler [11] found was enhanced by online users observing others using a networked system. An IT-enabled place where users could easily observe each other interacting would be a collaboratory, the shared workspace the alliance hopes will be used to promote Latino culture. The collaboratory could also be used to capture the social capital element of public recognition. For instance, Robins [36] has proposed designing collaboratories as innovative recognition mechanisms which promote development of shared understandings and common goals by way of matching people with similar interests, featuring exemplary work products, and "promoting the rise of local heroes" [36, p. 10]. Interestingly, Smoliar and Baker [41] found that an IT-enabled place for "hanging out" with others was an important system feature for enabling the process of knowledge creation. "Knowledge creation can only come from a passionate desire for involvement with the content. Sometimes the desire can come solely from exposure to the content; but, more often than not, it arises from the 'hanging out' with others who are already infected with the desire" [41, p. 6].

How can social network analysis, Latino studies and computer supported cooperative work help in understanding the community's information needs? How can the design of interface features enhance access to networked resources? What are the challenges faced when designing a tool whose ultimate goal is to harvest community knowledge from a diasporic community?

With respect to designing a community information system, the questions may be addressed by including strategies that expand a user's access to information and to social resources. In view of,

- (1) *Social capital and system use.* Granovetter [17,18] showed that acquaintances and relationships outside of a person's intimate network (i.e. a "weak tie" relationship) could provide a bridge to greater access to employment opportunities and valued goods in a society. Considering the scenario then social capital strategies for system design would be to include a social status directory (e.g., job information, promotions, educational opportunities, etc.) on the Latino community and a neighborhood map on community assets [25]. Availability of this information through a community networked system offers a potential for access to embedded resources in social networks and a potential to generate economic, social and cultural opportunities at a wider range.
- (2) *Multimedia information retrieval system.* The success in searching and retrieving information from online resources is in many respects conditional upon the user being able to submit the appropriate keyword, descriptor, query, in addition to being able to understand the instructions of the searching tool. Searching assistance would be implemented through a multilingual IR system [24]. The multilingual interface would provide greater access to information by allowing users to enter queries in a language of choice and retrieve documents in a target language. This system enhancement would provide a multilingual community with a wider range of access to diverse online resources, people, and cultures, in addition to also serving as an educational tool.
- (3) *Infrastructures and latent ties.* Haythornthwaite [21] has shown that the presence of a communication infrastructure establishes a possibility for an inactive connection (i.e., a "latent tie") to transform into a weak or strong relationship. The design and implementation of the system is a first step, but the activation of the social network is a most complex task because some infrastructures will work well in some communities but not at all in others [7]. Bishop et al., provide a model for the diffusion process of a community information system that highlights: the need to establish a "community-wide approach" which includes strategic partnerships and collaborative relationships, recruitment and training of local residents as peer mentors,

provision of "contextualized and open training programs," and the establishment of "public access sites at neighborhood locations that represent convenient and congenial settings [6].

5. Final thoughts on harvesting community knowledge

Given the system request posited at the beginning of this paper, in this case an acceptable community information system would be one that mobilized social capital and harvested community knowledge by offering job training and placement information, housing counseling, real estate & financing information, by promoting the maintenance of the culture and of the neighborhood and more. Yet in reality, the creation and mobilization of knowledge has many unknowns [23, 30]. Current research efforts from the US National Science Foundation program on Knowledge and Distributed Intelligence are focusing on ways to uncover the processes of embedded and mobile knowledge (e.g., see <http://www.dkrc.org>). The design of a community information system for diasporas not only represents an important effort in serving a dispersed community, it also offers another setting in which to continue examining the creation and mobilization of social capital and the diffusion of knowledge over distributed networks.

6. References

- [1] Anderson, B., *Imagined Communities: Reflections on the Origins and Spread of Nationalism*, Verso Editions, London, 1983.
- [2] Aparicio, F.R. and Susana Chavez-Silverman (Eds.), *Tropicalizations: Transcultural Representations of Latinidad*, University Press of New England, Hanover, NH 1997.
- [3] Armour, P.G., "The case for a new business model: Is software a product or a medium?", *Communications of the ACM*, vol. 43 (8), August 2000, pp. 19-22.
- [4] Bajjaly, S.T., *The Community Networking Handbook*, American Library Association, Chicago, 1999.
- [5] Bier, M., Gallo, M., Nuklos, E., Sherblom, S. and M. Pennick, "Personal empowerment in the study of home internet use by low-income families", *Journal of Research on Computing in Education*, vol. 30 (22), 1996, pp. 106-119.
- [6] Bishop, A.P., Tidline, T., Shoemaker, S. and P. Salela, "Public libraries and networked information services in low-income communities", *Library and Information Science Research*, vol. 21(3), 1999, pp. 361-390.

- [7] Bowker, G. & L. Star, *Sorting Things Out: Classification and Its Consequences*, MIT Press, Cambridge, MA, 1999.
- [8] Burt, R., *Structural Holes: The Social Structure of Competition*, Harvard University Press, Cambridge, MA, 1992.
- [9] Carroll, J.M., Mack, R.L. and W.A. Kellog, "Interface metaphors and user interface design", *Handbook of Human-Computer Interaction* (Helander, M., Ed.), North-Holland, Amsterdam, 1988, pp. 67-85.
- [10] Chatterjee, P., *The Nation and Its Fragments: Colonial and Postcolonial Histories*, Princeton University Press, Princeton, New Jersey, 1993.
- [11] Constant, D., Sproull, L. and S. Kiesler, "The kindness of strangers: On the usefulness of electronic weak ties for technical advice", *Culture of the internet* (Kiesler, S., Ed.), Lawrence Erlbaum Associates, New Jersey, 1997, pp. 303-322.
- [12] Feldman, M. "Electronic mail and weak ties in organizations", *Office: Technology and People*, vol. 3, 1987, pp. 83-101.
- [13] Flores, J. "The Latino imaginary: Dimensions of community and identity", *Tropicalizations: Transcultural Representations of Latinidad* (Aparicio, F.R. and Susana Chavez-Silverman, Eds.), University Press of New England, Hanover, NH, 1997, pp. 183-193.
- [14] Flores, W. V. and Rina Benmayor (Eds.), *Latino Cultural Citizenship: Claiming Identity, Space and Rights*, Beacon Press, Boston, MA, 1997.
- [15] Glass, R.L. "Evolving a new theory of project success", *Communications of the ACM*, vol. 42 (11), November 1999, pp. 17-19.
- [16] Graham, S. "Constructing premium networked spaces: Reflections on infrastructure, networks and contemporary urban development", *International Journal of Urban and Regional Research*, vol. 24(1), March 2000, pp. 183-200.
- [17] Granovetter, M.S., "The strength of weak ties", *American Journal of Sociology*, 78, 1973, pp. 1360-1380.
- [18] Granovetter, M.S., "The strength of weak ties: A network theory revisited", *Social Structure and Network Analysis* (Marsden, P.V. and N. Lin, Eds.), Sage, Beverly Hills CA, 1982, pp. 105-130.
- [19] Haythornthwaite, C. "Online personal networks: Size, composition and media use among distance learners", *New Media & Society*, vol. 2 (2), 2000, pp. 195-226.
- [20] Haythornthwaite, C. "Social network analysis: An approach and technique for the study of information exchange", *LISR*, vol. 18, 1996, pp. 323-342.
- [21] Haythornthwaite, C. "Tie strength and the impact of new media", *Proceedings of the 34th Hawaii International Conference on System Sciences*, Los Alamitos CA, IEEE Computer Society, 2001.
- [22] Johnson-Laird, P.N., "Mental models", *Foundations of Cognitive Science* (Posner, M.I., Ed.), MIT Press, Cambridge, MA, 1989, pp. 469-493.
- [23] Kanfer, A., Bruce, B.C., Haythornthwaite, C., Burbules, N., Wade, J., Bowker, G. and Joe Porac, "Modeling distributed knowledge processes in next generation multidisciplinary alliances", *Conference Proceedings of Next Generation Enterprises: Virtual Organizations and Mobile/Pervasive Technologies* (April 27-29), Academic-Industry Working Conference on Research Challenges (AIWoRC'00), NY, 2000.
- [24] Korfhage, R.R., *Information Storage and Retrieval*, Wiley Computer Publishing, New York, 1997.
- [25] Kretzman, J. P. and J.L. McKnight, *Building Communities From The Inside Out: A Path Toward Finding and Mobilizing A Community Assets*, ACTA Publications, Chicago, Il., 1993.
- [26] Lin, N., "Building a network theory of social capital", *An updated version of a paper presented at the XIX International Sunbelt Social Network Conference* (February 18-21), Charleston, S. Carolina, 1999.
- [27] Marsden, P. and Jeanne S. Hulbert, "Social resources and mobility outcomes: A replication and extension", *Social Forces*, vol. 66 (4), 1988, pp. 1038-59.
- [28] McKenna, R., *Relationship Marketing*, Addison-Wesley Publishing Co., England, 1991.
- [29] Mueller, M. L. and J. R. Schement, "Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey", *The Information Society*, vol. 12, 1996, pp. 273-292.
- [30] Nonaka, I. and H. Takeuchi, *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, 1995.
- [31] Norman, D., *The Design of Everyday Things*, Doubleday Dell Publishing, Inc., New York, 1988.
- [32] Offner, J., "Territorial deregulation: Local authorities at risk from technical networks", *International Journal of Urban and Regional Research*, vol. 24 (1), March 2000, pp. 165-182.
- [33] Pfaffenberger, B., "The second self in a third world immigrant community", *ETHNOS*, vol. 60 (1-2), 1995, pp. 59-80.
- [34] Preece, J., *Human-Computer Interaction*, Addison-Wesley Publishing Co., England, 1994.
- [35] Random House Webster's College Dictionary, Random House, New York, 1998.
- [36] Robins, J., "K-12 Collaboratories", *Bulletin of the American Society for Information Science*, vol. 26(3), February/March 2000, pp. 8-10.
- [37] Rogers, E.M., *Diffusion of Innovations* (Third Edition), The Free Press, New York, 1983.

- [38] Rosaldo, R. and W. Flores, "Identity, conflict, and evolving Latino communities: Cultural citizenship in San Jose, California", *Latino Cultural Citizenship: Claiming Identity, Space and Rights* (Flores, W.V. and Rina Benmayor, Eds.), Beacon Press, Boston, MA, 1997, pp. 57-96.
- [39] Shneiderman, B., *Designing The User Interface: Strategies For Effective Human-Computer Interaction* (Third Ed.), Addison-Wesley Publishing Co., Reading, MA, 1997.
- [40] Silvestrini, B.G., "The world we enter when claiming rights: Latinos and their quest for culture", *Latino Cultural Citizenship: Claiming Identity, Space and Rights* (Flores, W. V. and Rina Benmayor, Eds.), Beacon Press, Boston, MA, 1997, pp. 39-53.
- [41] Smoliar, S.W. and J.D. Baker, "Storytelling, jamming, and all that jazz: Knowledge creation in the world of new media", *Proceedings of the 32nd Hawaii International Conference on System Science*, 1999.
- [42] Vega Garcia, S., *Recommended Latino Websites: Diversity and Ethnic Studies*
http://www1.iastate.edu/~savega/us_latin.htm
- [43] Wasserman, S. and Katherine Faust, *Social Network Analysis: Methods and Applications*, Cambridge University Press, New York, NY, 1994.
- [44] Wellman, B., "An electronic group is virtually a social network", *Culture of the Internet* (Kiesler, S., Ed.), Lawrence Erlbaum, NY, 1997, pp. 179-205.
- [45] Wellman, B., *Networks in the Global Village*, Westview Press, Boulder, CO, 1998.
- [46] Wulf, W.A., "The collaboratory opportunity", *Science*, vol. 261, August 13, 1993, pp. 854-855.