PARTICIPATIVE DEVELOPMENT OF AN INDIGENOUS COMMUNITY INFORMATION SYSTEM: THE IERAMUGADU CULTURAL PROJECT

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Abstract:
This paper describes progress on the participative development of the Ieramugadu Cultural Information System - an example of an indigenous community information system. The project is designed to develop and evaluate innovative procedures for elicitation, analysis, storage and communication of indigenous cultural heritage information. It is investigating culturally appropriate information systems design techniques; multimedia approaches; and ways to ensure protection of secret/sacred information. Effective procedures and products to facilitate the use of heritage information for education and negotiation are also being developed and evaluated. The paper summarises project progress to date and draws preliminary conclusions regarding key aspects of the research.

Introduction:
Although the development of any information system (IS) should be considered as a social as well as a technical process, this applies most strongly in the case of community information systems. This research project examines the ramifications of this perspective for development of indigenous information systems. Such systems are a specific sub-set of community information systems - they serve (primarily) an indigenous community and should reflect the needs and epistemology of that community. They must be culturally appropriate not only in terms of the design of the user interface but also in terms of their deep structure and the procedures for development and use of the system. This demands that a multidisciplinary, post-modern, post-colonial approach be adopted to the research.

The Community:
Ireamugadu (Roebourne) is a small town near the coast in the Pilbara region of Western Australia, with a population of approximately 1500 people, ninety five per cent of who are indigenous. It is the place where many Ngaluma, Injibandi and Banjima people live, although the traditional country of some of the people is up to 200 km inland. Health and living standards have been, and are still, poor. Most of the older indigenous people in Roebourne have little or no formal (non-traditional) schooling. However, children today attend primary and secondary schools and an increasing number go on to undertake trades courses or university degrees. In the 1990's strong indigenous leadership and a relatively united community has resulted in significant changes in the life of the community and a desire to investigate innovative ways of storing and using cultural heritage information.

Description of the ICIS Project:
Since 1996 the authors have been working with the indigenous community at Roebourne to develop a cultural heritage information system utilising multimedia, geographic information system (GIS) and database technology. This project provides a very demanding application domain for the investigation of highly participative approaches to the development of community information systems. Ethical issues are also foregrounded because of the culturally sensitive nature of the information.

The information system is for the storage of Injibandi, Banjima and Ngaluma peoples heritage information and is called the Ieramugadu Cultural Information System (ICIS). It is being developed with, rather than for, its users. Its development requires a significant conceptual advance in the way that complex cultural information may be identified, linked and represented.

The aim is to provide a flexible information bank capable of producing convincing products in a variety of circumstances (e.g. education or negotiation) in line with community needs and not infringing cultural constraints. Thus the project seeks to aid in empowerment of the indigenous community through highly participative, culturally appropriate information systems design and implementation. This will result in a system where data can be input, manipulated and output by members of the indigenous community themselves, hence appropriate training is also an important issue.

Indigenous cultural heritage information must express the integrated relationships between:

places - not just an arbitrary configuration of physical locations but an assemblage of places connected by meanings associated with traditional belief systems;

people - the specific group/s of people who possess the meaningful relationship with (and are responsible for) those particular places;

procedures - the laws and customs which link the people to the places and sustain their unique relationship to the land and each other;

presentations - the practices and physical manifestations by which the laws and customs and meaning relations between the people and places are expressed (and hence maintained), such as ceremonies and paintings.

ICIS is being developed on a large desktop computer fitted with an image scanner and high quality colour printer. The system involves an innovative integration of interactive multimedia, GIS and database software and will be accessed through an extremely user-friendly interface being designed for this purpose. Data sets include information about locations (overlaid on digital topographic map data); details of individuals, families, sub-tribal and tribal groups; and information relating to traditions, laws, ceremonies and cultural representations. The linking of these data sets in an effective way is a key facet of the development.

Ethical Overview of the ICIS Project:

This project addresses key ethical aspects in the context of post-colonial practice, critical ethnography, visual anthropology and GIS (Turk and Trees, 1998-c). Culturally appropriate technology developments must complement existing oral traditions. They must also engage with specific cultural practices such as naming taboo - the prohibition on using a person's name after death. With the use of photography, film and multimedia in indigenous communities the naming taboo has been redefined to take into account the use of images (Michaels, 1990). Relevant ethical issues include:

- Are IS and indigenous culture incompatible (in terms of ontology and epistemology)?
- Is IS technology a tool for epistemological assimilation?
- Can the richness of indigenous concepts be represented in a computer?
- Do indigenous IS take away indigenous knowledge?
- Do IS inscribe and fix knowledge inappropriately?
- Are IS incompatible with oral traditions?
- What (whose) authority does the information carry?
- Is there proper respect for gender specific aspects of information (mens' business / womens' business)?
- Is there appropriate use of information (including images) about people who have died?
- How does the project affect relationships between generations?
- Is community control a practical certainty?
- Can possible misuse of information be avoided?
- Is it legitimate for non-indigenous researchers to be involved?

It is impossible here to address in detail the ethical issues raised by this project. In general the ICIS project is being carried out in a manner which the authors believe reduces the opportunity for unintended outcomes, however, they do not claim that there is no room for improvement. The ethical principles being applied to the project include:

- The greatest possible project control by the indigenous community - they initiated the project (formal as well as informal consent was obtained) and can terminate it at any time;
- A highly participative, user-centred development methodology operationalises the ethical principles;
- Continual interaction with the community both for data collection, system design and critical review of project processes and products;
- A highly reflective mode of operation - at the individual and project group level;
- Conscious effort to involve personnel from cultural studies as well as technical backgrounds;
- Training of indigenous participants;
- An absolute bar on project information being used outside the community (except for web-site, cultural awareness and negotiation materials as authorised by the indigenous participants);
- An intricate system of security measures for different types of information being developed;
- Use of multimedia and innovative design approaches to minimise degradation of information concepts.

Research Progress and Plans:
Work on the development of ICIS and the methodology is progressing very well (Turk and Trees, 1998 - a; b; c). There were five field trips to Roebourne during each of 1996 and 1997 and there have been five field trips so far in 1998. Data collection and system design is progressing and two versions of an initial (requirements animation) prototype have been evaluated by the indigenous participants. Their initial responses were extremely encouraging and there is expanding community interest in the project. The researchers assisted in the establishment of Ngurra Wangkamagayi (the cultural training group) and made a major contribution to the development of cultural awareness courses and training of the indigenous presenters. More cultural information (e.g. family trees) is being collected and converted into digital form. The first prototype of a purpose-built database program for family information was tested early in 1998.

In 1999 the researchers will continue with the development of the multimedia cultural heritage information system (ICIS) in close collaboration with the indigenous community at Roebourne, through Minurmarghali Mia and Ngurra Wangkamagayi. Research aspects include investigation of:

- multimedia scenarios which reflect traditional narrative structures;
- the utility of different types of interface metaphors;
- effective utilisation of video and audio materials;
- ways to deal with restrictions on the use of names and images of people who have died;
- collection and storage of meta-data, such as who a particular story belongs to;
- ethical issues in the context of the highly participatory system development methodology.

The research project at Roebourne will be extended to incorporate on-line computer mediated communication (CMC). Trials of some approaches are already under way, however, the particular forms of WWW-based communication will be determined in consultation with the community to ensure that it reflects their needs and does not infringe cultural constraints. Possible scenarios include:

- a rich web site describing the activities of Ngurra Wangkamagayi;
- negotiations with organisations wishing to arrange cultural awareness courses;
- transactions with potential cultural tourists (probably simulated in the first instance).

Some Observations and Conclusions:
Although this project has a long way to go, it is possible to discuss some preliminary observations and conclusions, as follows:

Approaches to data gathering and the impact of worldview:
Progress to date on the development of ICIS has clearly demonstrated the need for an ethnographic style and a hermeneutic approach to data gathering. The inappropriateness of formal, inflexible interviewing techniques has been clearly demonstrated. In addition there have been questions of which people can legitimately (from a cultural perspective) talk about what things? What questions may be asked by a man of a woman (and vice versa)? What questions infringe upon secret/sacred information? What subjects will people want to avoid in order to save embarrassment to themselves or others? An overall understanding of the worldviews of the different segments of the community must be developed (Trees and Turk, in press - a). The building of an intimate personal relationship between the researchers and at least some community members has been a practical necessity.

The utility of requirements animation prototyping:
Requirements animation prototyping is being used because there is a need for the authors to understand what system functionality is required and what form of user interface will be most effective. More importantly, the community participants need to know what sort of things a computer system could do for them, and what its impact may be, so that they can decide how the system should be designed and give informed consent for every phase of the project. Use of initial multimedia interface prototypes has proved very effective (Trees and Turk, in press - b). This approach has been extended to the design of specific system output materials to support cultural awareness training courses and a proposed web site for Ngurra Wangkamagayi.

The role of GIS in the development of multimedia narrative:
Because the most fundamental thing in indigenous culture is land (a person's "country"), ICIS must incorporate spatial aspects (Turk and Mackaness, 1995). This is being achieved through the linking of GIS software to

multimedia and database elements. Using the government topographic mapping as a spatial base, new maps are being created which use the traditional names and show places of cultural significance. Multimedia elements (such as images, sounds and video sequences) can then be associated with particular locations to help convey the connection between place and traditional law.

Genealogical database development:
ICIS needs to incorporate a representation of the complex set of relationships between people in the community. This involves not just formal family trees but also provision for recording informal relationships at a personal and group level. A key aspect of the conceptual design of the genealogical database is the incorporation of reference to sub-tribal ("skin") groupings. The skin system is used to: regulate marriage; organise law meetings, talu (sacred) site operation and natural resource use; classify strangers; ascribe character to individuals; and forge alliances between groups (Rijavec and Harrison, 1992). It will take considerably more work to adequately understand the complex web of interpersonal relationships and to develop a database which faithfully represents them. This is only possible if a special database is developed for the purpose and if the development process involves a very high level of participation by the community.

Web Site Development:
To date there has been no on-line access to information involved in the ICIS project, although several possible scenarios have been examined. For instance, the Ngurra Wangkamagayi culture group could maintain a web site with example heritage information to encourage organisations seeking cultural awareness courses (or potential cultural tourists) to contact the group and make a booking, possibly interactively. A prototype of such a system has recently been trialled in Perth and Roebourne. This process has assisted the indigenous participants to meaningfully debate the relevant issues and decide what they want to do and the best way to achieve it. This is as much about the relationships between people and social procedures as about the confidentiality of specific information. Adjustments to the web site design are currently being made. It will be implemented late in 1998 and its use monitored to provide feedback regarding its utility and usability.

The five issues discussed above clearly illustrate the importance of using a highly participative methodology for the development of indigenous community information systems such as ICIS. The strong cultural and ethical aspects of the project make it easy to understand that such an approach is mandatory if a suitable system is to result. Although the importance of participation may be less starkly apparent for the development of other types of information systems, we contend that all users have unique cultures and that ethical considerations are no less critical for being subtle and difficult to discern. All information systems development practice can learn from research such as this.

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