

**Factors which influence
the successful implementation
of digital technology
in Aboriginal communities.**

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Abstract:

The success of digital library projects in Native American, Canadian Indian and Alaskan Villages has been characterised by broad based resource support, which is virtually non existent in remote locations in Australia. This paper identifies the opportunities that exist to improve the success of digital projects which will ensure that Australia's Indigenous peoples have the opportunity to collaborate with an emerging alliance of Indigenous Nations across the globe.

Preface

Increasingly, the “Digital Divide” in the Northern Territory is being recognised as a unique Aboriginal issue. Twenty nine percent of the Northern Territory population is Aboriginal, living in a handful of major regional centres, sparsely spread across 40 remote communities. Connectivity and access to the Internet is limited by a lack of telecommunications infrastructure and cultural factors.

Despite these apparent barriers, the use of multi-media has been identified as having a key role in the delivery of information services in the future. Over the past 3 years a number of feasibility studies for the establishment of integrated information centres at Galiwin’ku (Elcho Island), Kalkarindji/Dagaragu, Anmatjere and Alpurrurulum have been undertaken. Aboriginal information centres will include libraries, museums, keeping places, and rooms for community meetings and provide access to the Internet and other information.

In the Northern Territory cultural barriers and remoteness are key issues which limit Aboriginal participation in digital library projects. The model for traditional library services has generally not been accepted, as there is no print-based culture. In remote areas, home PC and Internet usage is very low and thus the concept of a digital library, which can be remotely accessed, has limited utility to the most remote communities. Libraries play a critically important role in relation to public access for Aboriginal peoples, and this has led to the development of more integrated approaches and the recognised need to utilise multi-media to deliver information services.

The Northern Territory’s integrated or hybrid approach to information delivery has resulted in the following models:

- Rural Transaction Centres (RTC), the federal government has provided \$70 million for establishment of combined information services with banking and mail.
- The Electronic Outback Project (EOP), in the Northern Territory will provide 14 remote communities with satellite communications. The approach uses up to date multi-media technology on a user pays system, and has created a technology rich environment.
- The Indigenous Knowledge Centre (IKC), Northern Territory Library and Information Service model developed by the people of Galiwin’ku is based on creating an interpretive centre, a safe keeping place and an information service using Yolgnu language.

These examples of integrated digital services and information services have not been implemented without difficulty. There are significant issues associated with culture and language, the lack of sustainable networks and support structures during project initiation, and the inherent unreliability and utility of hardware and software.

These difficulties are present in all three models: RTCs have not included training and skills development, hardware and software in relation to Internet services: EOP lacks support and training for communities in the use of technical equipment such as video conferencing facilities. The ongoing success of these projects is dependent upon a commercially viable market which is unlikely to exist in communities at this stage: IKC is an under developed concept which is limited by a lack of capital funding and skills development to implement the concept. In addition, like many Aboriginal languages, Yolgnu is yet to be comprehensively

recorded in audio or print format and translation to multi-media presents a significant challenge.

In June/July 2001, the Victorian Association for Library Automation granted a travel scholarship to undertake investigations into overseas experiences in implementing digital projects in aboriginal communities. The scholarship's aims were to investigate successful projects in Native American and Canadian Indians and Alaskan villagers and their applicability to the Australian Aboriginal experience.

There were three elements identified in the study communities, which could enhance the success of digital projects being implemented in Australian Aboriginal communities. These were:

- the development of co-operative networks which provided peer, inter-agency /inter-organisation and community support for projects
- the provision of reliable hardware and software
- the development of culturally relevant program delivery.

Digitisation was limited to Internet, digital technologies, and public access software provided in Library environments. The study concentrated upon leading projects which were characterised by their ability to elicit the support, participation and co-operation of the community by contributing to the learning and cultural wealth of the people.

The study projects were chosen for their ability to inform the Australian experience in the delivery of digital library services to Aboriginal peoples living in remote and rural locations. Those chosen included:

- projects originating from the Gates Foundation (Gates Foundation) funding for the provision of Public access to the Internet in the Pueblo Indian Communities of New Mexico, in the United States of America (USA) and communities in the North West Territories (NWT) of Canada
- Boston's "Linking Up Villages"
- Cambridge Bay's cultural centre located in the province of Nunavut, Canada
- New Mexico's Native Indian Telecommunications Institute (NITI).

Cultural and environmental context

Like Australian Aboriginal peoples, the Pueblo Indians, and Native Canadians continue to adapt and change their experiences to a foreign culture. Information services are a predominantly western concept, which is print-based and in the case of libraries, has a free information access philosophy. Conversely, native knowledge is based on oral traditions and has sacred components. The advantage of multi-media technology is that it has the potential to deliver traditional library services in an interactive medium, which accommodates some of these cultural differences.

An example is delivering audio and visual information using native language and concepts, with visual interactive content. Ensuring that cultural context is preserved, and control is

maintained over access is paramount to ensuring aboriginal peoples' engagement with the new technologies.

In Pueblo Indian communities and amongst the Inuit peoples of the NWT and Nunavut, cultural sensitivities affect perceptions about e-mail and website access. Many are reluctant to expose their culture, given their historical experiences of loss of language and genocidal acts by governments. The idea of the World Wide Web creating access to cultural materials can be threatening and is not easily embraced. Whilst most barriers are associated with ownership over cultural artefacts and do not differ significantly from the expectations of other peoples, there are particular issues related to sacred or protected materials in Aboriginal communities. There is a tension between protecting culturally sacred information and information access.

Moreover, the aboriginal oral tradition of knowledge transfer through story telling is not easily translatable into the new technologies, and in some cases low levels of English literacy hamper progress. The "Towa" language of Jemez Pueblo according to traditional law is not to be translated into writing in order to prevent exploitation by other cultures. The advantage of multi-media technologies is their potential to deliver access to cultural materials and provide information services to communities. In "Towa's" case the language can be recorded and explained using digital audio recordings.

One of the key environmental factors affecting implementation of digital technologies is the remoteness of Aboriginal communities. Remoteness means that generally the expertise to ensure connectivity is absent. Communities that clearly demonstrate the contrasting issues relating to remoteness are the Pueblo compared with NWT and Nunavut.

The Pueblo communities of New Mexico are remote by American standards. The farthest Pueblo Community is 140km from Santa Fe, compared with the NWT and Nunavut where some communities are 6000km from a major city.

Pueblo communities are in the main adjacent to highways leading to major centres and although public transport is sparse, access in a private vehicle is relatively easy. In contrast, the NWT has limited transportation of any kind during the cold dark winter months when temperatures can drop to -29C. Both these communities share a dearth of basic services such as adequate housing, health facilities and access to government services.

The relative proximity to major centres by the Pueblo Indian communities combined with the history of philanthropy in the USA, has led to external funding supporting infrastructure with the State government playing a limited role in the delivery of library services. The Pueblo's connectivity issues have been resolved through both private and limited Federal Government funding.

Direct grants to 15 Pueblo Tribal Libraries for collection development and program support range from \$2350 to US \$9000. Library skills training is provided in the form of specialised seminars. Recently the Gates Foundation provided US \$150,000, to automate the Tribal Libraries. In addition, the foundation has provided US \$270,000 annually to increase library development funding and to improve technology in Pueblo Tribal Libraries.

In New Mexico there are 48 tribal library sites, which have received computer equipment and Internet access via the Gates Foundation grants. Of the 48 sites, 31 are Navajo Chapter

Houses, 15 are Pueblo Tribal Libraries and 2 are Apache. There are 2 technical contractors providing training and technical trouble shooting.

The line connections and bandwidth is problematic when the Gates Foundation projects were initiated; however these have since been resolved. The Pueblo communities visited have invested heavily in T1, 2,3 lines which provide ample bandwidth, and private providers are now more willing to establish user pays services. Pueblo communities' wealth is increasing to some extent driven by the lucrative Casino trades and some of this is being redirected toward information services. Most still pay premium rates for Internet access and the cost of Internet services is at long distance rates. Internet establishment is often provided free of charge, and some Internet carriers have no charges for calls but charge an annual subscription rate. All Pueblo Tribal Libraries have their own servers, which are independent of the council. In some cases the library hosts the council's networks.

In contrast to the Pueblo Indian experience, some communities in the NWT have just received phone access in the last 12 months followed by the Internet. In Canada's far north, diversity, remoteness and population sparseness elevate the cost of providing Internet based services. Comparisons with the Northern Territory Library experience can be made as basic infrastructure and connectivity are only just being established, and there is limited public access to the Internet.

Solutions to the connectivity issue in the NWT have included partnerships between government agencies to share costs of infrastructure, and to ensure adequate bandwidth for the delivery of services translatable into text or voice recordings using the new technologies. The NWT Library service enlisted the support of the Department of Education, to provide technical and program support for the public access computers provided by the Gates Foundation.

NWT Library services has a \$CA 250,000 budget and a contribution to an agreement matched by council. Approximately \$CA 17,000 is spent operational issues associated with IT support by the provincial government. The Gates Foundation has just entered into an agreement with each Canadian province resulting in 45 Public access PCs being provided in the NWT. The deal included training and on site support.

In Nunavut, the Library service is just becoming established after the reformation of an all Inuit government. The Gates Foundation have just injected \$CA 500,000 to provide 27 computers at 11 library locations. So far the technology has not been translated into the information services but rather some basic delivery of Internet and computer literacy readiness.

Background

Three elements in the study communities were identified as factors which enhance the success of digital projects being implemented in Aboriginal communities. In particular the study identified:

- the types of co-operative networks which encourage participation by Aboriginal peoples in information technologies, including training and technical support,
- the most reliable and effective hardware and software for the delivery of digital services,
- the programs designed to integrate culture into the delivery of digital projects.

The types of co-operative networks which encourage participation

Co-operation maximises the limited resources available and in conjunction with peer support, coupled with mentoring, is critical to success. There were three types of co-operative networks observed in the study, resource partnerships, inter library or peer and library and community networks.

Co-operation between partners in implementation of digital projects had a significant effect upon success during the start up phase. In contrast to the Australian experience, philanthropy in the United States has delivered big investments in information technology to native communities across the USA. Co-operation in this form can be donations, and other resource assistance such as ideas and support for morale. The Gates Foundation has provided significant boost to the study communities, by providing generous federal negotiated donations matched by state initiatives.

Equally as important as the direct funding provided is the structure and level of support which if effective can significantly improve the success of digitisation projects. Recipients of the Gates Foundation funding, in addition to their state contributions towards establishing support networks, can expect to have people trained in Seattle at the Gates Foundation headquarters. Teams of technicians are also available to assist in set up and help desk support is provided via phone and e-mail. Support generally was observed to work best when it is a phone/e-mail away 24 hours a day.

In the study it was also observed that where community co-operation between library professionals was prevalent, there was a reduction in resource saturation points which in turn increased the likely hood of integrated program delivery. A good example of this was evident at Jemez Pueblo. The Public Librarian assisted the school library staff in integrating curriculum and supported community programs in the public library. The result was a range of Internet research projects conducted at the school and the public library to support a community festival. The programs have been so popular that there are now fifteen minute limits on the computer lab and the booking sheets are full every day.

In the NWT, the librarians who are responsible for providing the Gates Foundation training to regional areas have developed their own ad hoc approaches to peer support, and these are supported by the wealthier councils. Visits, phone calls and e-mails are sources of communication between professionals. Despite these networks, there was little uptake of the new technologies by the community, because the link between co-operation and program design was weak. Limited local support and few co-operative arrangements between communities and their members, coupled with programming linked closely to the school instead of special interests in the community such arts and crafts, reduced the effectiveness of the public Internet access projects.

Additional support could have been provided, by linking members via e-mail and providing some salary to support the arts and craft industry, thus increasing the public access. The Internet PC if located in the arts retail centre could have supported art research, marketing and later e-commerce. This approach has negligible cost to the host community, and provides demonstrable benefit, which can lead to increasing coverage and community flexibility.

In contrast the New Mexico inter library staff co-operation was so successful, it was further supplemented by a National Leadership Grant, under the State American Indian project. This funding has been provided to ensure technical assistance is available and to create regional networks of support and collaboration between the tribal libraries in New Mexico. There is a strong culture of Pueblo collaboration, which originates from the Spanish occupation. During the 1600's a series of strategic and collaborative efforts of the Pueblo Nations expelled the Spanish, during the Great Pueblo Revolt.

Co-operation was not limited to sharing of ideas on libraries but also participation in significant inter community events, and Library related programs. Within the Pueblos there is a high degree of mentoring provided by the librarian as a profession towards other peers and to the Library staff and the community. The number of trained community people who can run digital projects in the community has been significantly enhanced by co-operation. This has increased community flexibility leading to more advanced digitisation projects, such as those which use multi-media. Such projects included digitisation of historical photographs, language recordings, and a digital art design library.

In contrast to Australia's Northern Territory experience, the Pueblo librarians have developed a network amongst themselves. This has resulted from group training provided in the regions by the state government and encouraged by the Gates Foundation. In the Northern Territory distance and a lack of shared projects acts as a deterrent to co-operation. There are institutional arrangements which compound the issues, including the role and operations of councils.

The proliferation of corporate sponsors and federally supported programs has led to a level of co-operation and success across many of the study communities. In Nunavut however, where there is no library support provided by the state, an alliance between The Kitikmeot Heritage Society and the school at Cambridge Bay has encouraged the creation of a multi-media cultural centre. The effect of this co-operation has been dramatic, resulting in powerful alliances, leading to the lobbying of the provincial government for improvements to support services.

In the NWT public access to the Internet is limited to a number of school-based locations and is available in some public libraries. Despite the heavily resource investment of the Gates Foundations, public access has not penetrated the community to the extent observed in the Pueblo's of New Mexico. One benefit of the partnership between the Gates Foundation and NWT government has been the establishment of the basic connectivity requirements to launch any digitisation projects.

Major Australian initiatives such as ODN, NTN and RTCs are remarkably un-coordinated in their approach, which limits effective co-operation. Projects tend to be stand-alone and lack a strategy for communities to make linkages with one another, which could assist in promoting improved implementation. There is a level of skill that has been assumed to exist and rather than providing support structures to enhance performance, communities are often left to fend for themselves.

The reliability and effectiveness of hardware and software

By far the most reliable hardware and software observed in the study was that provided by the Bill and Melinda Gates Foundation. Many of the library staff commented that success was directly related to the comprehensive information technology support and reliability of hardware and software. The Gates Foundation's philosophy towards the implementation of hardware and the selection of software is that Librarians are not hardware or software experts and they shouldn't have to be.

Support materials provided are extremely comprehensive, logical and tailored to each site. They include information about server issues, ISP setup addresses and have a 24-hour help desk facility. The written materials use visual flags and little text. The hardware was almost universally PC based, with some libraries finding a use for 386 machines in addition to more powerful Pentium machines.

Interestingly, the Gates Foundation chooses middle of the price range hardware for installation, due to increased reliability compared with the cheaper end of the PC hardware market. The slower machines superseded by the Gates Foundation projects were made more attractive to younger patrons by using catchy names. At Jamez Pueblo, New Mexico, the younger children often overbooked a 386 called "dinosaur", leaving other faster machines for the adults.

The NWT programs were delivered at Chief Julius School, in Fort McPherson via a large touch screen. The response from the community to Internet searching training was well received, as the large visual display appealed to the families who participated in the Internet training day. The hosts plan to use a touch screen for the next demonstration, and hoped to attract a broader cross section of the community to the Internet familiarisation program.

The examples above can be contrasted with the Australian, and in particular the Northern Territory, experience, where there is a lack of hardware and software support in remote communities, limiting the effectiveness of digital programs. Despite broad-based attempts through federal government initiatives such as Networking the Nation, to address this issue, the importance of ongoing support to keep the technology functioning has been overlooked. There are no help desk supports, or online guides for these initiatives.

The study found that software applications are most useful when they are diverse in content but tailored towards target groups. The study communities had access to 47 different software applications under limited licensing fees for a set period of time, ensuring that Library staff are able to assess the relevance and useability of applications with patrons.

In the Pueblo communities where the technology has been implemented for the past 2 years, there was high usage of the full range of software applications and the community was only just starting to exhaust the full suite of applications on offer. In contrast the NWT libraries were only just engaging school-aged children using "Arthur's Brain Teasers" and "Barney's Circus". The choice of commercially available software was made on the basis that patrons were interested in gaining skills in information literacy, increasing their English literacy or numeracy. "Barney", "Encarta", "Power Point" and "Creative Writer" are used for this purpose. The software applications are grouped into desktops according to the applications

functionality, for example supporting research, children and adults. The desktop can be changed during the day to be attractive to the major patron groups, children and schools during the 9-3pm time slot, teens after 3:30pm and adults after 5pm (Attachment 1).

The web based curriculum modules produced by the Native Indian Telecommunications Institute (NITI) based in Santa Fe, were developed during web design workshops conducted by the Institute. The Institute has purchased licences for “NetScape” and “Front Page”, and conducted training for Native American teachers, building on traditional knowledge concepts and using native languages. The training and web site construction was achieved mostly remotely on web sites such as www.herenowalways.org. There is also funding for a virtual museum and Star Schools to assist and support parents teachers and the public, in gaining confidence in using the technology.

The teaching modules have been build based on a national standard template and include the need for a cultural component with evaluative elements. Core concepts include maths, science and geography. NITI hope to have all 150 Navajo languages represented over the next two years.

In Australia, licensing fees could range in the thousands of per annum - for a full suite of software as supplied by the Gates Foundation, and would be out of reach to most library services in Australia. Establishing which application would be most utilised and of interest, through experimentation, could be an expensive exercise.

The effect of culture on program design and delivery

Cultural specificity, understanding and tailoring of programs is essential to good program design, and the success of any digital project. Library programs, technology and community interests must be integrated and supported by local content. Local content is the combination of people, materials and topics used in a program. Program integration is the only way to attract and maintain interest in the digital technology. Program design is arguably more potent when local people are working in the Library. Locally trained people were able to tap into community interests such as the economic development of art based products and provide materials and historical information to support projects.

The cultural centre at Cambridge Bay is designed to ensure that community members are able to build their own tool kits to explore and add value to the information within the centre. It is more than interactive, as content and interpretation are created on site and can change daily. The Kitikmeot Heritage Society Director, Kim Crockatt developed the project, in conjunction with Cambridge Bay Aboriginal peoples. Kim was the librarian, who established the Kitikmeot Heritage Society, to assist in collecting information about the history of Cambridge Bay and to give Aboriginal elders a voice in the interpretation of archaeological discoveries being made in the local area.

The cultural centre, with interactive multi-media components which have been dramatically interpreted to provide archival storage, interpretive components and multi-media displays with interactive components (Attachment 2). The local language “Inuktitut” has been recorded and translated to explain life on the tundra, and to re-interpret Inuit experiences with European contact. This requires significant community ownership over the physical access, training and interpretive elements to be successful.

The structure has been designed to accommodate community needs, and is located in the Centre of Cambridge Bay. Appropriate technology to meet specific needs has also been sourced. For example specialist archival and interactive software will be used to develop local content using language and partitioning of information which it is not for general public consumption.

Pueblo digital library programs engaged the community using specific art history visual databases created from local input and captured on CD-Rom. Good programming assisted in extending the relevance of the applications and therefore the life of the software (Attachment 3). Some examples of integrated programming include searches using “Encarta” to promote art design, such as those taking place at Jemez, Santa Clara and Acoma Pueblo. Logging in, sending email and surfing the web are talked about in the same breath as the Navajo sentence for the concept of a computer, which is prominently displayed on the library walls at Acoma Pueblo. Similarly, at Santa Fe’s Indian School, “PowerPoint” is used by students to create presentations on tribal government issues. The students acquire skills in conducting empirical research, presenting and public speaking, all critical communication skills conducive to the success of Native American societies.

Boston City’s challenge, in a project named “Linking Up Villages”, was to create community platforms to encourage Internet and PC access in socio-economically disadvantaged areas. The locally recruited project team looked to community issues to get people hooked on using the technology. Free training was then provided, in exchange for a take home PC. The training in Internet searching and basic PC familiarity used purpose built software and created public bulletin boards, which were tailored toward community interest.

The project’s effect has been an increase in access and skills across the community estimated at 70%. Surprisingly there has been an improvement in school attendance rates attributed to the program and information literacy skills, measured during annual exams, have increased. Many adults have been successful in job promotion or change, and there has been slow increase in mobility amongst the population to seek employment outside their home area.

In contrast to the tailor made software developed by Boston, in Santa Fe the National Telecommunications Institute used commercially available web based products such as “FrontPage” to develop multi lingual interfaces. Funded primarily via a National Science Foundation grant, connectivity and training of Native Americans is the institute’s goal. The program design hook to engage aboriginal people is the use of native languages to describe native knowledge concepts, which has ensured that language and culture are not barriers to entry into the web information service.

Technical skills can be learned and taught much more easily than program skills, which require relational ability and the capability to target issues which are relevant to the community. Program integration also assists in ensuring that the community is getting something relevant, which will increase commitment. Universally local employment was the key to ensuring such integration in the study communities.

Local people and language have been utilised throughout the study projects, in much the same way that the Northern Territories IKC concept integrates culture and information into a specific design framework. It also explains the relative difficulty that is experienced by the RTC model in integrating information services with relevant community programs.

Monetary and other transactions are not conducive to encouraging community engagement with information services.

Whilst there has been localised success in the Northern Territory with the employment of Aboriginal liaison officers in some libraries, finding an Aboriginal person in a remote area with digital skills is difficult. The person also needs to be paid for that expertise: that is also a challenge in remote areas, where the average salary for such work is well below the equivalent being paid in the study communities.

The cumulative effect of co-operative networks, reliable hardware and software and culturally relevant program delivery

Once there is a degree of community organisational and peer co-operation, skills in digital library development progress. In conjunction with reliable hardware and software applications, increases in community participation and “coverage” are observed. Implementation of accessible buildings is possible through co-operation with like service delivery agencies or the development of resource donors.

Community flexibility to accommodate the new digital technologies is enhanced by establishing the intrinsic worth and relevance to the community. As more people become interested, and trained they assist other community members.

A successful digital project will penetrate the whole community. The depth of engagement with a broad cross-section of the community, and the resultant degree to which digital technology is utilised, are critical factors in determining the project’s success. Coverage is affected by the degree of program design, which is dependent upon the individual skills in packaging and delivery. There is little benefit in providing digital access to a very small proportion of the population; the impact will be negligible and the cost relatively high compared with other library programs.

There were three cases in the NWT where the teachers responsible for projects were not local and very traditional in their approach to implementation of the technology. This did not lead to good public access or community coverage. In contrast the Cambridge Bay integrated multi-media centre has relevance to a broad cross section of the community, and includes interpretive local images and audio delivery in the local language.

Coverage for digital projects in the Northern Territory is an issue. There are isolated examples of successful projects, however most do not achieve the depth of coverage observed in the study communities. In part this is due to the readiness of communities to engage, and little work has been done towards ensuring there is a familiarity with the technology prior to connectivity being established. In contrast the Pueblo communities such as Santa Clara were skilling up their community with PC skills well before connectivity was an issue. They used donated hardware from businesses to run the programs.

Providing digital technologies with a building structure or public access space is critical in Aboriginal communities, because the home ownership of PCs is low. Low ownership rates were a feature of Pueblo communities where an estimate of 10 PCs per 3000 people was quoted. The utility of a fully digital library (online access to resources) is limited in this

environment and the need for building accessibility is elevated. There is no point in having the technology if not one will access the building to use it.

Public access has to complement different client needs and remain accessible to ensure good coverage. A key challenge is a suitable public space from which to deliver digital services. Since program design is an important lever in increasing or decreasing community flexibility, physical building access can be critical to achieving full flexibility and movement to the next stage of library development.

Special purpose buildings were rarely observed during the study, the exception being Cambridge Bay's Cultural Centre which cost \$CA 1,000,000. The design of the new building has been achieved through Inuit consultation, using symbols, which reflect the Inuit culture. It is a circular design incorporating many symbols of Inuit language.

This development is a good example of the effect that co-operation can have on implementation. The Cambridge Bay experience would not have been possible without The Kitikmeot Heritage Society who partnered with the local school and the library staff to establish an integrated service at the front of the new high school. Another example of co-operation assisting in building accessibility was evidenced at Acoma, Pueblo New Mexico. The local police department too utilises the public access PCs, because the machines are faster and the software is considered better than that provided by the council.

In Australia there are limited examples of this type of inter-agency co-operation leading to integrated digital library services. In the Northern Territory there are no purpose built areas to deliver such services and most buildings are grossly inadequate. Many are not dust proof, which affects the longevity of the hardware, but more importantly, they do not provide broad community accessibility. In areas where cultural practices such as avoidance are common, European designs are not adequate.

The stresses and strains placed upon and within communities can lead to less flexibility. Unless a way is found to either prioritise up the list the digitisation project or provide a sufficient level of flexibility, the project is likely to be less successful. In Australia, and in particular within the Northern Territory, development of a broad skills base to implement digital projects and provide adequate remuneration for that work is essential to ensuring successful outcomes.

Lessons for Australian projects

Australian digitisation projects do not differ significantly from those observed in the study. Aboriginal people lack basic access to hardware and connectivity is problematic – particularly in the Northern Territory (NT), and both Northern Queensland and Western Australia. Libraries play a key role in ensuring that communities get access to digital technology.

Co-operation

Networks are effective in promoting co-operation, which reduces individual and community stress, thus boosting community capacity.

Fostering co-operation could include visual links with staff involved in programming or the development of e-mail networks. In communities where co-operation between staff is high, it was observed that there was an increased saturation point for new initiatives, and greater coverage across the community. Problems were resolved more quickly, new ideas fostered and the quality of programming through integration increased.

In Australia there are many Aboriginal people working in library services, but there is currently no identifiable way to link them organisationally or on a project basis. The development of a digital network of Aboriginal people would be a significant step in promoting co-operation. Tapping into existing projects such as RTCs ODN and specific library based projects could be a first step in such a strategy.

Formal and informal networks could be improved by the placement of “library networking champions” throughout Australia. The library champion’s role could be to encourage Aboriginal works participation in training and libraries, as well as to extend the information networks across the country and internationally. The establishment of a National register of Aboriginal workers in libraries would be an important step.

The Internet Assistance Program currently provides online help and technical support for small business users. Such a program, if expanded, could assist initiatives such as those above achieve their aims, and provide assistance to the growing group of relatively inexperienced Aboriginal workers in public access environments, in remote areas. In the Northern Territory and across rural and remote areas of Australia, the development of guides and technical support to each community would be beneficial in supporting initiatives.

Hardware and Software

Consortia arrangements in Australia could lead to better value for software purchases in the area of public library services. Under normal licensing conditions, having access to the diversity of software provided by the Gates Foundation may not be possible, and thus the judgement of librarians using co-operative networks will be important. Other like communities may provide added insights into the most appropriate software and again reduce the resource burden upon the participating communities.

More research into which software works and what doesn’t and the associated costs could benefit implementation in Australia, as well as an audit of existing packages and the specific functionality as platform for Aboriginal content

Improving the utility of software applications through program design is the most efficient way to maximise the usefulness of a small number of software programs and ensure good program coverage. Generally this is achieved on an individual library or program basis, however some of the most powerful outcomes observed were achieved through co-operation. This usually led to sharing of templates, programs and people.

In Australia the Australian Public Libraries Network (APLN) could be instrumental in negotiating the purchase of such software licences at discount rates for national projects. In addition the Australian Government could legislate to ensure that as part of a community service obligation by companies or developers, funds are made available to promote software development specifically for Australian Public Libraries interested in integrating Aboriginal content themes.

Program design

There are relatively sparse examples of Aboriginal content integration and community integration in Australian public libraries. Greater engagement with communities may boost this content, in addition to comprehensive action, which highlights and promotes digital projects in libraries as tools for Aboriginal people. This is best achieved through the employment of local Aboriginal people.

The issue for Australian libraries is what role can Aboriginal people have in libraries and in relation to information professionals. In New Mexico, the library qualification required to be employed as a manager of a Tribal Library was at the certificate level. Significantly, in Australia's remote communities the level of English literacy to gain such a certificate may not exist, even if this type of training was on offer. The Northern Territory experience is a direct contrast to overseas counter parts such as the Pueblo communities, where the level of general library skill is as much as three times higher. Increasing the skills base of Australian Aboriginal people in information service provision has to be a priority if progress is to be made in digital library projects.

Specific initiatives to improve the relevance of program design may include:

- targeted programs community based on accessing and creating community heritage
- development of national templates for program delivery targeted toward Aboriginal peoples
- cross cultural training for Library staff and information managers.

Coverage

In Australia, Aboriginal people's engagement with the digital technologies is far lower than other community groups. Lack of cultural specificity coupled with the paucity of hardware and connectivity, severely limits Aboriginal peoples ability to engage. Issues of connectivity, whilst important, don't prevent the development of programs and the training of community members and staff. Training to ensure Internet and computer readiness would benefit many communities who do not currently have access.

In the USA a number of companies that were upgrading hardware donated good quality hardware for this purpose, installing and providing some basic training to library staff. In Australia such co-operative projects could provide additional hardware at limited costs.

Mainstream approaches to the RTCs, EOP and NTN projects need to be re-engineered to cater for Aboriginal needs in remote and rural locations. In addition, coverage could be increased by implementing the Boston style projects on a federal level with specific reference to Aboriginal communities. In addition incentives to provide integrated approach to information management that recognises the commercial value of local history would increase community coverage. The provision of incentives to design software that supports these initiatives could boost these developments.

Implementation

In Australia, cultural accessibility is an issue for Aboriginal people who are less comfortable in formal institutions. The design of any structure and space is more effective if there is adequate and appropriate access for all community members. Integrated services are more likely to generate interest and if in a central location within the community and this will lead to greater accessibility.

Frequently schools are chosen as locations for digital library projects because there is some level of information technology support, and an experienced trainer. In Australia, schools do not generally encourage the type of community participation, which will lead to a successful digitisation project. There are significant culture issues and the types of software and hardware which schools generally utilise mean that the general community is unlikely to find them useful.

Macintosh computers are the hardware choice of many schools, are not generally used in the workplace and therefore training using them is of limited value. The utility of creating public access spaces within schools is increasingly difficult. With few exceptions major structural modification are necessary to make schools an effective public space.

Cambridge Bay did provide a good contrast to the Australian situation in relation school and community libraries, but again reinforced the need for special purpose built facilities to ensure effective implementation.

The cultural centre provides a good example of how a building designed with community input can create a tangible sense of pride about the location, style and structure. Inuit symbols are used throughout, and elders and younger people have ownership over the design concept.

In Australia, the design of community spaces needs to take account of Aboriginal symbols and embrace the cultural signage which punctuates each community. Significant investment in capital works funding is required to re-create libraries as integrated cultural centres which incorporate museum libraries and safe keeping places for sacred objects.

Community Flexibility

In Australia's remote communities, access to expertise to develop digital technology is particularly difficult. This leads to an increase in pressure upon those who are skilled. Generally there is one or two people who are responsible for program delivery and who have basic skills to implement digital library programs. As a result, they become over worked and the burn out rate is high. There is low flexibility in these communities, and unless community capacity can be increased accommodating new technologies will continue to be slow.

Schools both overseas and in Australia regularly participate in the integration of technologies and saturation tends to be higher in younger, more experimental, children. In the NWT locating PCs in schools was the most efficient way of ensuring on site support, however community members were significantly less engaged. There was little recognisable community support and program design was almost non-existent.

In terms of increasing community flexibility, the Pueblo provided a better model for Australia. They are autonomous and are responsible to the local council, which increases their flexibility, in terms of programming, while reducing their reliance upon the state government for support and funding. These arrangements are possible because there is a number of people within the Pueblo communities who have information management skills. The Councils value the access and in return have provided significant levels of funding to support the library facilities.

There is a real and increasing need in Australia to target Aboriginal people for training in the use of information management and digital library tools. Several initiatives could assist in the creation of flexibility in Australia include:

- programs designed specifically for Aboriginal peoples in information management streams
- scholarships and incentives to encourage Aboriginal people to undertake information management professions
- re-engineering of Librarianship studies to focus on Indigenous knowledge transfer and the use of technology.

Increasing community skill is the only way to ensure flexibility.

Conclusion

In 1992 the Australian government signalled the need to lift performance in relation to outcomes from the delivery of programs and services to Aboriginal and Torres Strait Islander peoples (COAG 1992). In statements by the Council of Australian Governments (COAG) the message is clear, programs work best when local needs are identified, when there is collaboration and when there is accountability. There is no doubt that these strategies will lead to more effective programs. In Australia's remote libraries, in contrast with the USA and Canada to a lesser extent, the success of digital projects is limited by a lack of broad-based resource support.

Specifically, resources are required to train and develop local skills, to invest and trial appropriate software and to provide appropriate levels of remuneration for locally trained peoples to implement the new technology.

Several models could be pursued to attract resources, including:

- A state based imperative to provide 2% of library budgets to directly fund integrated digital Library projects for aboriginal peoples or,
- The creation of state/territory based coalition of organisations and individual donors who promote projects which are aimed at integrating digital library services for Aboriginal peoples.

The types of activities which the resources could be directed to include:

- The consortia purchase of software to be rolled out to all community libraries servicing Aboriginal people
- The establishment of a hotline, networking and email support services for hardware and software problems associated with the rollouts
- Establishment of an Aboriginal digital library training centre, which offers National study scholarships to encourage participation of Aboriginal people in the delivery of services
- Establishing national and international support networks with other tribal library professionals
- Establishment of career and training structures which promote library skills development for Aboriginal people
- Establishment of a National framework to properly remunerate where Aboriginal people are or could be employed to deliver services
- Establishment of an evaluative framework which identifies and measures the level of community coverage and flexibility
- Establish the national and international program of promotion to attract continued funding

Aboriginal communities span the globe, and now represent hundreds of distinct, independently sovereign nations. Indigenous networks form powerful alliances, which could be used to promote the proliferation of digital technology. The Navajo Nation in the USA is working on building a database of Nation information, with the vision that a computer network can be established which will link communities spanning three states. The tribe also sees the network being utilised for local governance. Navajo tribes could submit documents via email and use video conferencing to meet with government officials. The network will save time and money and open up a whole new way of doing business.

This vision, once proliferated nationally and internationally, would provide Indigenous communities in Australia with an opportunity to collaborate with a powerful alliance of Indigenous Nations across the globe.

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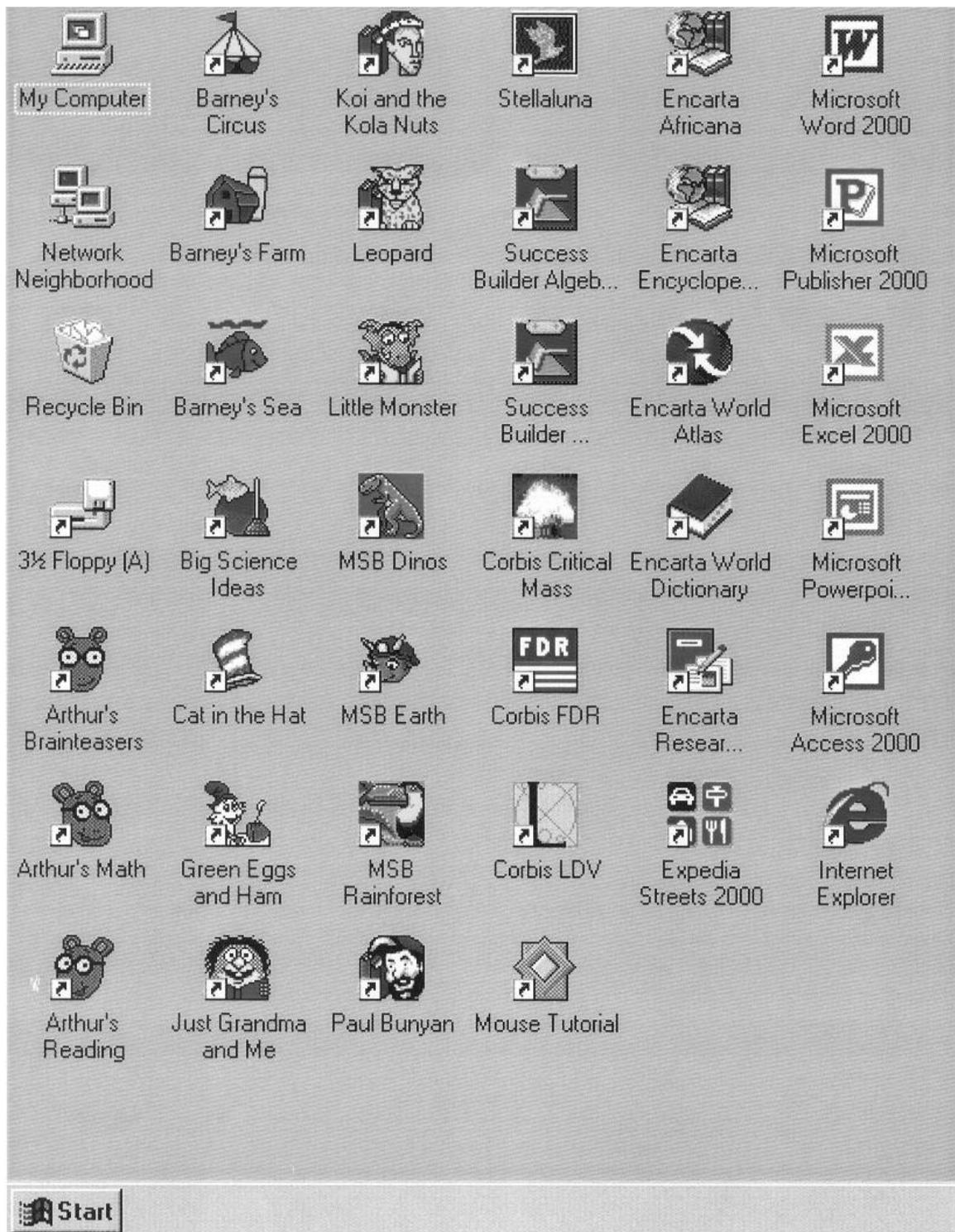
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Attachment 1



DESKTOP VIEW OF A
VIRTUAL LIBRARY
WORKSTATION

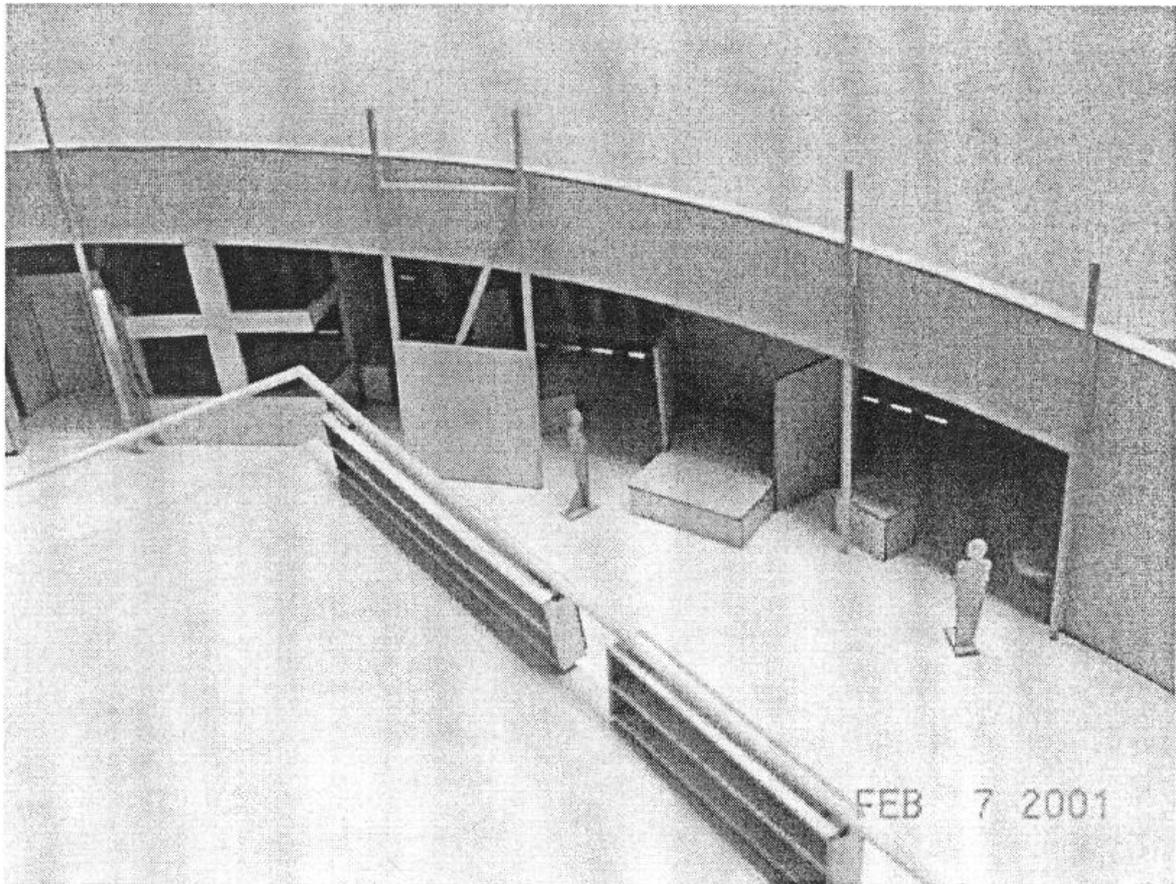
Attachment 2

CAMBRIDGE BAY CULTURAL CENTRE



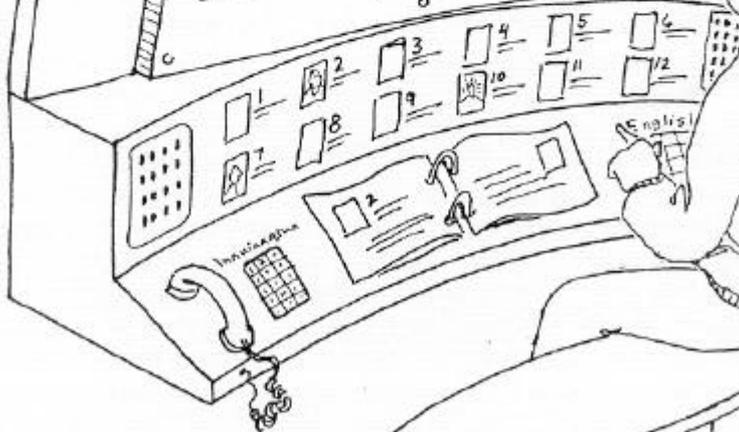
community libr
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new complex

Architect's model of the display area in the Cultural Centre



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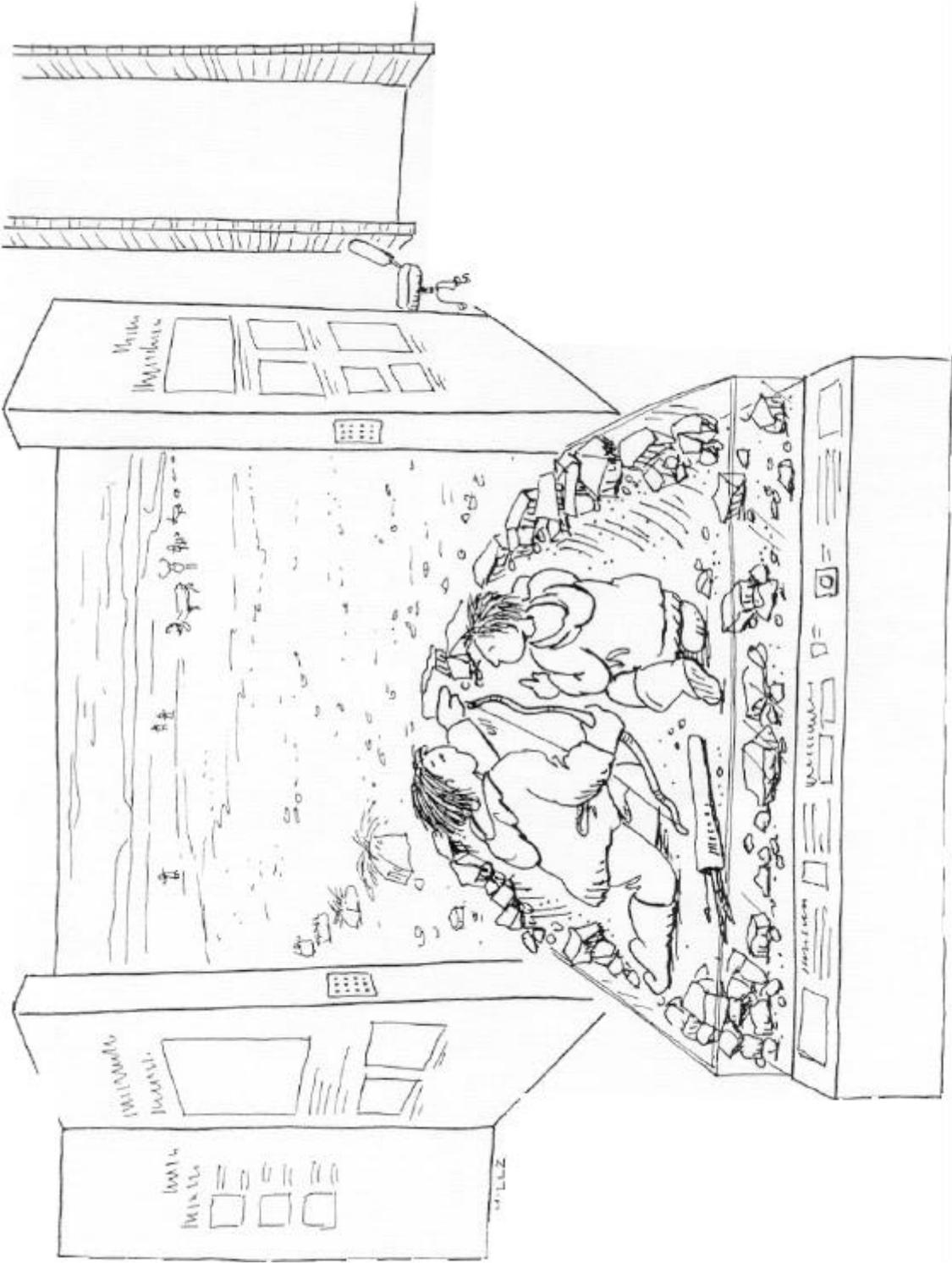
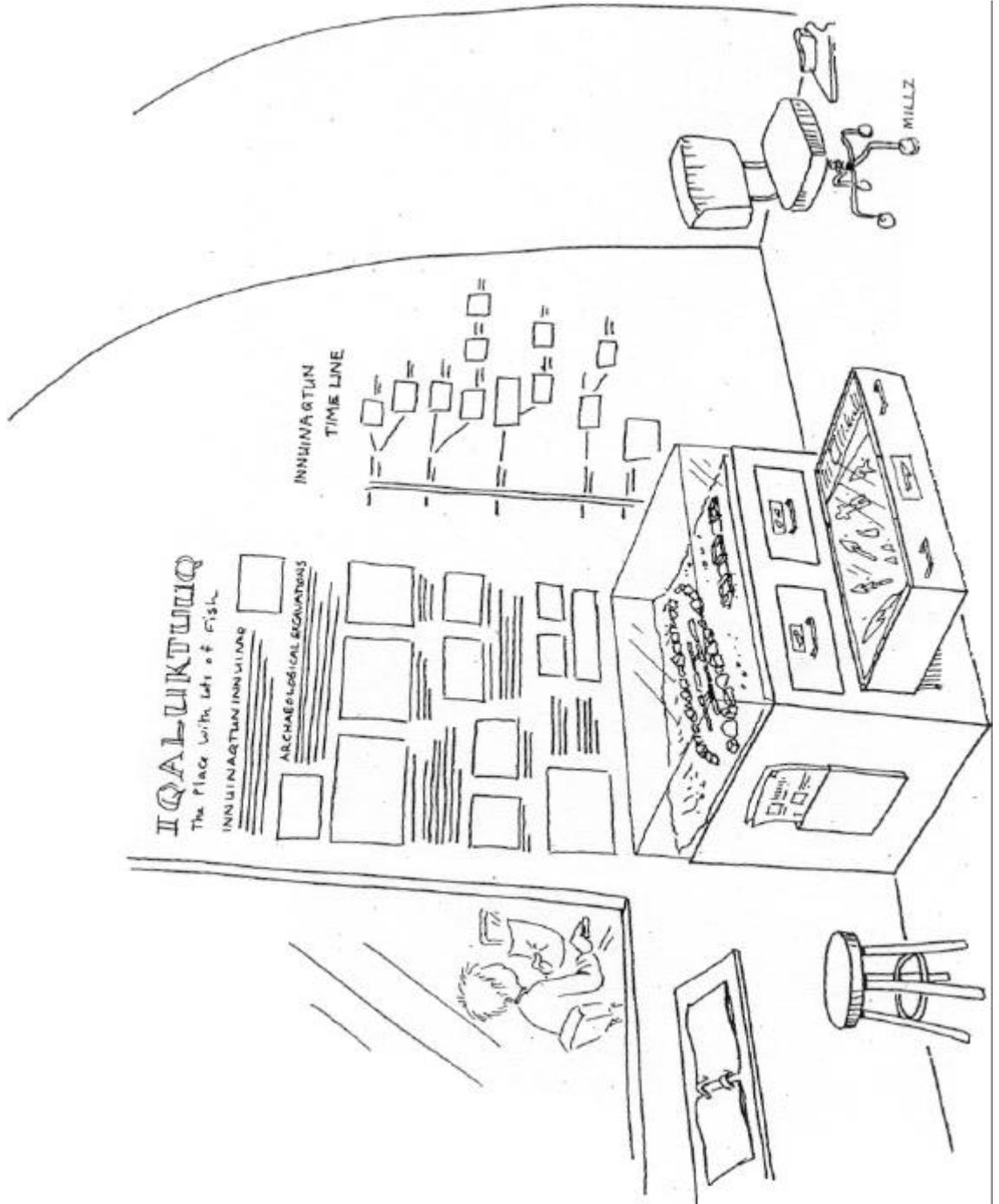


Fig. 1 Iktung has a calendar



Attachment 3

Attention

Artists



New Mexico Culture Net and the Jemez Pueblo Department of Tourism will be at the Jemez Pueblo Community Library on July 14, 2000. 10:00 am-12:00 pm. They will **help you** put your artwork **on** the inter-net.

The Internet can bring more business and collectors People from all over the world can see your artwork and contact you. If you have any questions please contact the Jemez Pueblo Community Library at 834-9171. we look forward to seeing you.

Free E-mail Accounts

The library staff will be here to assist you in **getting a free email account.**

Please Bring:

- *Artwork
Pottery, painting, Jewelry, etc. Or a photograph of your artwork.
- * Information about yourself and your artwork.
(Please bring at least one of the following resume, artist statement, brochure, business cards or general information about you.)

Note: There will be a \$20.00 fee to put a picture of your artwork on the Culture Notes site on the Internet. There is no charge if you do not wish to put a photograph on the Internet. A picture of your artwork can be taken with a digital camera for free.

Computers . and Classes

Computers are available for word

more. There is a minimal fee for
copies, faxes, and print outs. processing resumes, - flyers

Computer usage is available during
regular library hours.

We offer computer classes during
the year. Look for advertisements
for upcoming classes or call the
library for more information.

Internet is also available for use
by patrons 13 years and older.



Reading To Success !



Additional Programs Available:

Books for Babies

Interlibrary Loan

Interlibrary Loan Research

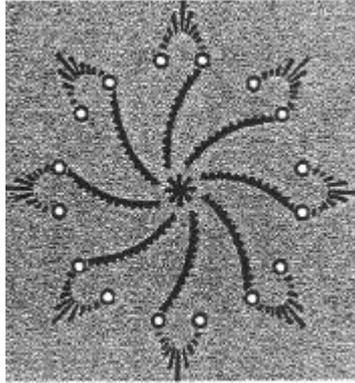
Employment

- Jobs Information
- Resume Software

Fax Service: \$1.00 per page

Copy Service: \$.10 per page

Jemez Pueblo Community Library



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505 834-9171
Fax: **505 834-9173**

We are committed to serve, *assist*, and educate the community through books, computers and information of all kinds.