proceedings of the UNESCO Regional Seminar on

TECHNOLOGY FOR COMMUNITY DEVELOPMENT
IN AUSTRALIA, SOUTH-EAST ASIA AND
THE PACIFIC

Alice Springs, Australia
9-11 July, 1990

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Alice Springs College of TAFE
DATA BASE OF APPROPRIATE TECHNOLOGIES FOR REMOTE ABORIGINAL COMMUNITIES

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As the situation in remote Australian Aboriginal communities is unique it requires a special data base of information that is appropriate to their social, cultural and geographic setting. Such a data base has been developed employing a stand alone software package that uses a dBASE III Plus data base file structure and operates on IBM PC compatible computers. Four areas of information, Literature, Research, Available Products and Consultants, are listed. Within these areas information is presented in a form to enable end-users to discover the various resources available to them and who to approach for further detail. Most data is in brief set fields however a memo field of unrestricted length is available to enable variable comments such as the usefulness of the product and where it is being used or is on trial. Information is accessed by either a keyword or a menu search. Using either of these search routines the four areas mentioned above may be searched separately or consecutively. Information relevant to the user can be set aside for printing at the conclusion of the search. A detailed input system based on optional menus is included opening up the possibility for individual centres to define their own relevant data base of information. To date only limited data have have been keyed in to allow the system to be trialed. With feedback various changes could be made to the software including adaptation of the data categories used in the menu.

INTRODUCTION

Throughout the world numerous agencies collect information on appropriate technologies for application within a country or region (e.g. APACE1), for international usage or third world settings (e.g. SATIS2). However the situation in remote Australian Aboriginal communities is unique, requiring a selective data base of information that fits their circumstances. It is not known if a specific data base dedicated to appropriate technology for either Aboriginal communities, in general, or remote Aboriginal communities, in particular, exists elsewhere in Australia. To our knowledge there is no other.

The Remote Area Developments Group (RADG) has developed, in conjunction with the Department of Aboriginal Affairs (DAA, now known as the Aboriginal and Torres Strait Islanders Commission), such a computer formatted data base. The project was initiated because of DAA’s concern that their field officers should have ready access to the latest technologies appropriate to the needs of their area communities. The RADG was also interested in order to both deepen its knowledge and understanding of what technologies were and were not available as well as a desire that the communities have access to appropriate resources.

The development of the data base was seen to have four main stages:

i) Identifying the topics for data collection

ii) Development of user-friendly software on the existing IBM compatible machines used by the DAA.

iii) Collection and entry of data.

iv) Trial period to determine areas for improvement

1 APACE - The Appropriate Technology Development Group of W.A. (Inc.), Winter House, Johannah St., North Fremantle, W.A., 6159

2 SATIS - Socially Appropriate Technology Information System, P.O. Box 803, 3500 AV Utrecht, Netherlands
A fifth stage, very important in its own right, would involve defining who was to accept the responsibility of keeping the data base up to date and distributing the updated records.

At present the project has reached the fourth stage with the first version of the software developed and just over 100 entries keyed-in to create an initial sample size adequate for a field trial. In December 1989 the software together with the limited number of entries was handed over to DAA in Western Australia. A trial use of the data base was planned through one of DAA's regional offices. With the major changes underway, in response to the new orientation to ATSIC, there has been, understandably, a delay in obtaining feedback.

This paper explains basic aspects of the data base and raises issues relating to its usefulness.

INFORMATION

Four data bases of information, each with a different screen format, are able to be searched either separately or consecutively. These are:

1. Literature
   Detail of relevant books and articles.
2. Research
   Detail of research specifically orientated towards remote area issues.
3. Available Products
   Detail of off-the-shelf items or places where custom built items may be purchased.
4. Consultants
   Detail of people or firms available to help on a paid or voluntary basis.

For different end-users the appropriateness of these different data bases will be apparent. For the RADG with its research interest the first two categories 'Literature' and 'Research' have a higher significance. For ATSIC officers all four data bases could be useful. It is anticipated that the last two data bases, 'Available Products' and 'Consultants', would be more appropriate to end-users actually working in Aboriginal communities.

This division of interest leads into the subject of the appropriateness of a computer based information system for Aboriginal people and those that work with their communities. It hasn't been the focus of the RADG to assess this matter, however it ought not be assumed that computerised information is valid in all circumstances. One obvious drawback to computerisation would be that the more traditional Aboriginal people would have very limited direct access to the information. This would tend to accentuate dependency on advisors with the corollary that the advisors themselves may reinforce any existing belief that their role is indispensable. On the other hand the very remoteness of communities to normal information sources may override the negative aspects, especially with the use of computers becoming so widespread.

One experience that highlights the rapid adjustments to computers that an individual may undergo is apparent from the following account as detailed by an advisor to the Jigalong community (K. Lance, pers. comm., 1989). The accountant had just left the community without leaving detailed instructions about how the wages system was set out. One of the up and coming young leaders, who as a young lad had only been brought in from the desert in the mid 1960's, was able, together with the advisor, to help sort out the wages records on the community computer. An incredible change in technological appreciation in a matter of two decades!

The RADG also knows of the Turkey Creek community advisor using a visual overlaying map information system together with a dBASE data retrieval system to record, with community input, information to be stored for future use. The visual aspect of the data base, according to the advisor, can be related to by community members (D. McGrath, pers. comm., 1989).

Assuming then the appropriateness of a computerised data base further basic details of the RADG database will now be indicated.
SOFTWARE

Using an IBM compatible desktop computer a program has been developed using a program called "$dBXL" which is similar to the well known database program, frequently referred to as an industry standard, "$dBASE III plus". To make it run faster the program has been compiled using a software package called QUICKSILVER. Compiling it also permits stand-alone legal copies of the program to be distributed and information accessed without referral to any centralised storage system. Although one disadvantage for multi-users would be the lack of up-to-the-minute information this could be overcome by sending out upgraded data base files on a regular basis. This system was preferred to using a communication network or telephone link up and modems because of both the isolation of some communities and recurring costs for using Telecom services.

The program allows for any of the four data base areas of information to be searched in two ways:

- by entering a keyword such as 'water supply' or 'tanks' etc.
- by following a menu selection, as listed in the following table:

<table>
<thead>
<tr>
<th>Water Supply</th>
<th>Shelter</th>
<th>Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. General</td>
<td>a. General</td>
<td>a. Road vehicles</td>
</tr>
<tr>
<td>b. Pumps</td>
<td>b. Housing</td>
<td>b. Planes</td>
</tr>
<tr>
<td>c. Tanks</td>
<td>c. Materials</td>
<td>c. Radios</td>
</tr>
<tr>
<td>d. Distribution</td>
<td>d. Sheds</td>
<td>d. Telephone and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Associated Services</td>
</tr>
</tbody>
</table>

Energy

<table>
<thead>
<tr>
<th>Solar Energy</th>
<th>Waste Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. General</td>
<td>a. General</td>
</tr>
<tr>
<td>b. Diesel</td>
<td>b. Toilet Waste</td>
</tr>
<tr>
<td>c. Solar</td>
<td>c. Liquid Waste</td>
</tr>
<tr>
<td>d. Wind</td>
<td>d. Rubbish</td>
</tr>
<tr>
<td>e. Wood</td>
<td></td>
</tr>
<tr>
<td>f. Other</td>
<td></td>
</tr>
</tbody>
</table>

Land Use

<table>
<thead>
<tr>
<th>Society</th>
<th>General</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Traditional</td>
<td>a. Overview Material</td>
</tr>
<tr>
<td>b. Wind Breaks</td>
<td>b. Health</td>
</tr>
<tr>
<td>c. Cattle/Sheep</td>
<td>c. Community Development</td>
</tr>
<tr>
<td>d. Other Animals</td>
<td>d. Disabled</td>
</tr>
<tr>
<td>e. Gardening</td>
<td>e. Education &amp; Training</td>
</tr>
<tr>
<td>f. Trees/Shrubs</td>
<td>f. Finance</td>
</tr>
<tr>
<td>g. General</td>
<td>g. Other</td>
</tr>
</tbody>
</table>

Note: Due to the way the software is presently set up these menu categories are 'fixed'. However if the demand was great enough these could be adjusted either on a one-off basis, by modifications in the original software, or by developing flexible categories that could be changed or further refined within the input stage (discussed below) of the programme itself.

Whatever search method is chosen the information is displayed on the screen in a slightly different way for each of the four different data bases. A typical screen output would be similar to the following:
DETAIL OF CONSULTANT #C(ref.number)

Name: Position/Title:

Interests & Comments (further detail below):

Firm/Institute: Phone No:
Address: Postcode:

FURTHER DETAIL/EXPERIENCE

(this space is for a variable length memo field whereas other information is kept in fixed length fields)

Note: When viewing each entry a screen option is provided to SAVE the displayed data for PRINTING. All saved data is kept in a temporary file and reproduced, if requested, at the end of the search as a hard copy in the same format as the screen display.

One of the important aims for the data base as recommended by B. Walker and R. Hart (pers. comm., 1988) must be to record where various technologies have been used and to indicate lessons learned from their use. The memo field at the end of each screen display allows for virtually unlimited information of this nature to be recorded.

Before moving on to discuss the input of data it must be made clear that the data-base is meant to assist communities discover the various resources available to them and where to go or to whom to go for further detail. It is not intended to be an information storehouse detailing the nuts and bolts of every option. For this reason, as well as costs, the database doesn't contain graphics. In terms of usefulness to non technical persons, however, a graphically based information system may be more useful. With the emergence of database systems like the 'HyperCard' used with Apple Macintosh this graphical form of information access could become very useful.

ENTRY OF DATA

Although not an issue for end-users who are primarily interested in the information itself, nevertheless entry of data is a complex and important task. Most of the programming of this data base is directed towards making the entry of data relatively easy, although of course it requires some technical ability to determine the relevance of the subject material. An understanding of the instructions of dBXL or dBase III plus is not necessary. However should anyone have access to one of these commercially available software programs they could access the data base files because they are compatible with either of the above applications. This would not be significant for any other reason other than incorporation of data in other data base files or manipulation of the data in ways not anticipated by the original software.

Some limitations that still exist in the input of data stage are:

1. The ease of transfer of information from one of the four data bases to the other. For example an entry into the 'literature' data base may contain relevant information for the 'available products' data base. A means of transferring that information is not available - separate entries would need to be made.
2. An easy system to check on whether or not an entry has been previously made hasn't been incorporated. The only means of checking is by searching the records in the same way as an end-user.

3. When entering data in the variable length memo field associated with each data base a text editor or word processor is required. An editor called WEDIT (provided with the QUICKSILVER compiler) comes with the software package, however it has a limitation in that it doesn’t have automatic word wrap (i.e. at the end of each line the “return” key has to be pushed). Provision is made in the software package to overcome this minor limitation with an option to incorporate any existing ASCII word processor or editor already installed on the hard disk.

Initially it was considered that entries would only be made at one central base, either by the RADG, at Murdoch University, or by DAA. Such a decision has never been made although it is clear that there is no obligation on either party. However whatever eventuates between DAA (ATSIC) and Murdoch is in some ways irrelevant. The potential exists for different organisations to add their own information to their copies of the data base. If sharing of information is desirable the database software could be enlarged with special appending options to allow an integration of data transferred between centres, groups or communities.

In the original proposal it was planned to incorporate relevant data from an overseas international database. Despite many attempts to make contact and firm up the arrangement nothing eventuated. So the minimal data so far collected has come through the efforts of the RADG members. This has obvious drawbacks due to the group’s bias towards research, its present limited overseas experience and contact with grassroots Aboriginal communities. For the data base to become increasingly more valuable it will need considerably more input from individuals and communities experienced in remote area activities. This may be possible if communities become aware of the potential for the data base and perhaps use it for their own records. It is also apparent that many advisors to Aboriginal communities possess huge amounts of unwritten information gathered from years of activity within communities. Collection of this material could become a task associated with a research cum employment position. Certainly there is scope for this form of data collection.

Another source of information suggested by Dr Bruce Walker (personal communication, 1988) could be through the development of a specialised data base of existing equipment held by different communities. The task of collection of this data would be immense yet it could serve a vital role by extending its brief to include detail on where spare parts and servicing could be obtained for the equipment kept on record. It is the latter service aspect that may also be the key to communities being willing to receive an occasional visit to enable records to be created and updated.

HARDWARE REQUIREMENTS

An IBM compatible computer is required to run the database program. The following basic specifications are recommended:

1. Minimum 512K RAM.
2. Hard disk with minimum 20MB capacity. As the database size increases a fairly fast average access time for the hard disk of about 28 ms would be helpful but not at all necessary.
3. Although not necessary the program is designed to run in colour, therefore an EGA or VGA card and monitor would be helpful.
4. At least one 5.25 inch floppy disk with ability to read 360KB formatted disks. A 1.2 MB drive ought to handle this requirement.
5. Printer: Any compatible printer run from the parallel port would be acceptable. A 9 pin dot matrix printer would be adequate. There would be some advantage in having a printer with an option for printing 12 or more characters per inch. This would be particularly handy if entry of data was undertaken where hard copies of new entries are required (because the information fits onto the page in a neater format.)
CONCLUSIONS

The RADG has developed a software data base that has relevance to the ongoing need for remote communities and their advisors to record and access information on appropriate technologies for their development. Although still in its infancy it theoretically holds a potential for record keeping and information accessing for large organisations (e.g. ATSIC) and small individual communities with low budgets. No doubt further development work could be undertaken to make the software more appropriate to users, however the main concern is how to access the wealth of information that already exists in the experience of communities and advisors, for without adequate entries within the data base its value is limited. Nevertheless the data base is a stand alone unit and can be used by other organisations for their own record keeping.

ACKNOWLEDGEMENTS

RADG would like to express its appreciation to ATSIC (formerly DAA) in Western Australia for its support in developing this data base.