

Touch and see (and hear):

Touchscreen technology and Indigenous health

**An evaluation of the pilot introduction of health touchscreens
into remote and urban Indigenous communities in Queensland**

Did you find it easy or hard to use this touchscreen?

Choose an answer and touch CONTINUE.



easy



a little hard



quite hard



very hard



Ernest Hunter and Helen Travers



**THE UNIVERSITY
OF QUEENSLAND**



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Inala General Practice

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Centre for Online Health

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Centre for Online Health

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Activation – the activation of the kiosk by touching the screen.

Attractor – the series of screen savers that play when the kiosks are not in use displaying key messages.

Batch file – a set of instructions grouped together that calls other programs in turn as they are needed without the requirement of the user to do this separately for each one. Often used for installation or when a number of updates need to be applied to a program all together.

'Black box flight recorder' – a term sometimes given to the mechanism that collects the trace information. Black box traces will be in coded form and need interpretation for use in reports.

CHARM – a change request mechanism/form for logging requested changes.

Code – the program that enables navigation of the content and makes the kiosk work.

Content – everything that is seen or heard on the kiosk and can be changed. This does not include buttons and system messages like 'bye', 'continue' etc.

Content change – a change to the content that does not involve any coding.

Content components – groups of content that all have a similar set of attributes. For example, attractor slots.

Content rich sequence – a sequence that exposes the user to information.

Commission – an engineering process undertaken for anything new, car, boat or computer, to check all the parts are working prior to handing over to the customer.

Credits – the credits at the end of a MediBook that will be shown when the 'bye' or any other finish button is touched.

Crib-sheet – a set of abbreviated user instructions used as an aide memoir for updates or communications; sometimes for setting up machines.

Functional change – a change to the program code.

Installation and commissioning – the process of physically installing and commissioning hardware, in this case kiosks.

Mag-stripe card (magnetic stripe card) – an everyday card with a magnetic stripe with limited data tracks that can be used. Useful in health for identification and carrying very limited data like blood group, medications, height, etc.

PAT – public access terminal; usually with a keyboard and trackball rarely touchscreen (touchscreen units tend to be called kiosks).

PCAnywhere – a software utility used for remote control of a kiosk or other computer so problems can be fixed or support given.

'Play list' – the list which gives the order that the slots are played from in the 'attractor'.

Proximity sensor (or motion sensor) – a device on a kiosk that detects, usually by light sensitivity although it can be heat, someone approaching it. Software can use this to come to life or give a message.

Sequence – an audiovisual presentation that is initiated by touching a button on the screen.

Session – an activation where at least one button is pressed subsequent to activation.

Showstopper – a fault or bug that causes the program to fail catastrophically. This type of problem will not go on the wish list in most cases but be corrected as soon as possible.

'Slot' – the project term used for the 'posters' and pictures or messages that are 'played' within the attractor. 'Slots' are customisable to the location and usually updated locally although some may be reserved for user help with the system.

SMS (Short Message Service) – for example, text messaging on mobile phones.

Source code – the actual computer language instructions that are initially written by a programmer and will be compiled into machine instructions by a software tool.

Staging – a confusing term used in a variety of ways. Staging is normally the process prior to delivery when software and hardware are put together and tested but it can equally be a step in a content process between creation and publishing. A 'staging server' is a server that a new application is released on to but not made widely available until acceptance testing has taken place.

Strapline – a concise, consumer message, or brief description going with an illustration or image.

Test plan – a plan of tests used for checking code or changes. These are written against the requirements of the system and will always be carried out consistently each time a functional change is made before it is released for citizen use.

Timeout – if nobody uses the kiosk or someone walks away a time is set for it, assuming nothing is happening,

when it will return to showing the 'attractor'. This programmable length of time is called 'Timeout'.

Traces – the collection of information based on 'touches', time used, order of answers, etc.

Training and initiation – the process of taking staff through the content on the kiosk. As MediBooks are intuitive this may mainly involve sharing the vision for the project more than just using it.

Update tool (supervisor) – the update tool or supervisor is the separate program that enables the database of content to be viewed and altered without having to change the MediBook systems code. This can be called an update tool or a 'supervisor'.

Upload – the process of 'uploading' information or software to the kiosk.

VOIP (Voice over IP) – the transmission of voice using the Internet protocol. Its use allows the integration of voice and data over the Internet and other networks. It also provides a potentially cheaper alternative to conventional telephony, though at present with a lower quality of service.

'Wish list' – a list of changes that have been suggested. This will be organised in a formal template for each change so that information like date of suggestion, suggestor, likely priority of the change, what it is and the status / review date is kept with some comments on feedback or actions.

Acronyms used in this report

ACC	Aboriginal Coordinating Council
AUDIT	Alcohol Use Disorders Identification Test
CYDNP	Cape York Digital Network Project
DETIR	Department of Education, Training and Industrial Relations
EQ	Education Queensland
GSK	Glaxo SmithKline
HCHA	Hunter Centre for Health Advancement
ILC	Independent Living Centre
IT	Information technology
JSC	Julia Schofield Consulting
KHL	Kids' Help Line
MSR	Magnetic Stripe Reader
NCR	NCR Australia Pty Limited
NQHEPU	North Queensland Health Equalities Promotion Unit
OATSIH	Office for Aboriginal and Torres Strait Islander Health
PAT	Public Access Terminal
QH	Queensland Health
QHIN	Queensland Health Information Network
RHTU	Rural Health Training Unit
SKB	SmithKline Beecham
SPSS	Statistical Package for the Social Sciences
TAFE	College of Technical and Further Education
TPHU	Tropical Public Health Unit
UPS	Uninterrupted power supply
UQ	University of Queensland.

This report is the evaluation of the pilot implementation of a health promotion initiative utilising touchscreen technology in Indigenous settings. It has been prepared in parallel with the report by Julia Schofield Consulting (JSC) which deals with the technical issues involved. The pilot implementation has primarily been at the level of 'proof of concept'. This evaluation gives particular attention to considering how the context of Indigenous service/community settings influences implementation, use, support and maintenance, and thus, sustainability. It provides a description and commentary on the human and institutional processes involved in implementation, and the patterns of use in two Indigenous settings. While it has not been possible to provide definitive answers to questions of effectiveness and efficiency, the process-focused findings of this evaluation will enable these questions to be addressed. It can at least be said at this point that, given the salience of contextual issues that have emerged from this work, the answer to such questions must necessarily be prefaced by 'it depends...':

The evaluation demonstrates that this is a technology that will be used by Indigenous people. This use will be influenced by aspects of the program itself that relate to cultural appropriateness, specifically content, graphics and sound. Beyond program design there are critical implementation factors that will support use in Aboriginal settings. Use will be influenced by location, both in terms of the total number of potential users but also in terms of health-motivated potential users. In this regard primary care settings appear to be appropriate sites both because a high volume of potential consumers pass through this setting (exposure), and because this population is more likely to be concerned about health (receptivity) and, thus, open to acting on health-relevant recommendations (intentionality).

Many Indigenous people in urban settings are already familiar with touchscreen technology from other services and institutions. Regardless, and certainly for non-urban settings, facilitating first use is important through appropriate signage and permission-giving introductions. Indigenous users may initiate use in an exploratory manner, gauging ease of use and content interest, returning to engage in more purposeful use at a later time. Technical concerns regarding privacy, speed of program response and navigation issues have all been noted which are potentially solvable and will increase perceptions of ease of use and personal control. While voiceover in this application sought to provide access for users with limited literacy, introduction remains particularly important for this group whose previous experience of similar technology may lead them to believe that this is another text-based application.

Users were found to come from all age-groups but there

is a greater willingness for younger Indigenous people, particularly males, to explore kiosk use. Providing content that engages and maintains interest is critical and thus consideration of needs across the age range is necessary with particular attention to encouraging and facilitating use by older potential users. However, the appeal of this technology to younger Indigenous people provides opportunities to access a population with particular needs that have been difficult to reach through conventional approaches to health promotion.

Of all users who activate the kiosk a consistent proportion do so purposefully and this group appears willing to provide information on-screen. Some of these users also function as vehicles for further dissemination of information about subject matter (and kiosk use) either as proxy users (providing information to others, for instance family members) or to bystanders in the vicinity (vicarious use). In relation to proxy use the availability of printouts of relevant material may act as a reinforcer. Printout impact was not evaluated but comments and observation suggest that this capability increases perceptions of personal relevance and reinforces messages. The existent literature supports this and also emphasises the importance of ensuring that material is complemented by other sources (such as pamphlets) and is consistent with health service messages and approaches. Localising is clearly identified as being a key issue in terms of engaging users and critical in this regard is that information is interesting, relevant and up to date. The ability to generate and include material locally is essential.

Implementation and support of this technology is complex and demands clear identification of roles, responsibilities and procedures, and coordination across those involved. This is particularly important in settings which do not have substantial service and infrastructure support, and where the service or activity focus is not health (the intervention thus being perceived as less relevant to core functions). Choice of setting may well be a balance of competing factors. Regardless, a comprehensive support structure is essential including content and updating, technical, hardware, and ancillary requirements (power, telephone access, insurance...).

In addition to relevance and technical aspects of program use, the literature and feedback from informants suggests that use and impact of this technology will be improved by provision of choice through increasing the range of topics and by incorporating interactive and personalised responses. Such use of this technology also provides an additional means of collecting information that may be useful in local health planning. This project has demonstrated that relevant information can be gathered through this

technology. It has also demonstrated that other means of obtaining information regarding kiosk use and program content are feasible, particularly face-to-face interviews with users and key informants, and that certain other approaches, specifically requesting written feedback, is unrewarding. Ultimately a thoughtful mix of trace observation and structured interviews appears most useful, complemented by observation of process and kiosk use.

Laptop versions of the current information modules are available but have been used primarily for demonstration purposes. However, there has been positive feedback regarding the use of laptops as an educational resource for Indigenous health workers. Such mediated use has not been evaluated but appears a logical extension and a means of accessing targeted populations.

Both mediated (laptop) and kiosk use are context dependent. This context critically includes the wider health system within which these resources are located, and which provides technical and human support. The extent to which this resource is used and the degree to which it is efficacious will be determined by the level of encouragement of use, and the resonance in terms of content messages with those provided within the service. Implementation and evaluation of this technology should be informed by, and integrated into local service planning.

While the developmental and startup costs associated with this technology and its use are considerable, there will be efficiencies with replication and extension. However, a significant contributor to overall costs relates to what is the substance of this report, that is, to the range of what has been referred to as contextual factors. These need to be considered diligently and comprehensively. Less easy to address are those factors that support sustained alterations to users' knowledge,

attitude and, in particular, behaviour, where the contextual issues in question are far broader and more complex. They are, however, also modifiable and will best be achieved by integrating the intervention into well-functioning service settings characterised by clear communication, cooperation and coordination of health-related activities, and which are involved in production and implementation, and take ownership of the intervention.

This project has functioned as a 'proof of concept' for health touchscreen use in Indigenous settings. It has shown that this technology will be used (and by whom and in what situations) and has provided circumstantial evidence that this changes attitudes and intentions. It was not possible to assess behavioural or health status change or to ascertain sustainability (which needs to be considered broadly to include both technical and content issues). These remain priorities for future work.

At the conclusion of this report issues for further consideration are presented that derive from the results of the evaluation and from project participation more broadly. These fall into three groups. The first set relates directly to this project and consists of issues for consideration in replication or extension. We believe that this is worthwhile but demands careful attention to issues of ownership, copyright, detailed economic analysis and the development of collaborative partnerships. The second set relates to process, the importance of which has been highlighted by the participation of the evaluation team in the project. Local and institutional process factors enable this intervention and must be thoughtfully considered and systematically addressed. The final set is a range of opportunities that this intervention signals for Indigenous health and wellbeing more generally.

The health sector in Australia has embraced Information Technology (IT). IT developments have offered means by which to address a range of problems and to address the needs of particular disadvantaged groups – for instance people from non-English speaking backgrounds or with compromised literacy and those living in remote settings. These new technologies have been rapidly taken up by services and organisations involved in Indigenous health with many obvious benefits. However, as Swanson (1999) notes: “IT and telecommunications technologies are proceeding at an extremely rapid pace. The likely social effects are ‘location independence’ of a range of activities and widening gaps between the ‘information rich’ and ‘information poor’. Most of the currently underserved groups will fit into the latter category” (p. S209).

This caveat is particularly salient in relation to IT innovations in health promotion and health education. Indigenous Australians generally and those living in remote Australia in particular not only have the worst health status in Australia, but are compromised in their capacity to be advantaged by technological innovations in information dissemination by the critical determinants of cultural exclusion (Brody, 1966) disadvantage – exposure, education, language and literacy. In the face of an increasing burden of chronic diseases informed by lifestyle the importance of upstream interventions is manifest. To date the gains have been limited and health services remain preoccupied with the tragic consequences and complications of diabetes, respiratory disease, heart disease and renal disease.

To meet these challenges the Commonwealth has sought to improve access and effectiveness of mainstream services, and to provide complementary Indigenous-specific programs to ensure both high quality primary care and effective population health programs. Commonwealth policy in relation to Aboriginal and Torres Strait Islander health is informed by principles of community empowerment, participation in development and delivery, and partnership across key stakeholders. To these ends the following strategic approaches have been developed to improve Indigenous health status:

- Achieving comprehensive and effective health care for Aboriginal and Torres Strait Islander peoples through the development of infrastructure and resources;
- Addressing key health issues and risk factors impacting on health;

- Improving the evidence base through effective data systems and evaluation and promoting the use of effective policy; and
- Improving communication with service providers and the general population (*Commonwealth of Australia, 2002*, p. 161)

These broad objectives across disease management and prevention will necessarily demand increasing the capacity of individuals and groups to make informed choices which will, in turn, require significantly improved health literacy. While many of the major drivers of change in this area are at social and economic development levels, such activities are likely to take time to be consequential for health. As Leonard Syme (1997) notes:

insisting only on fundamental and revolutionary social change is dooming us to programs that will take years and generations to take effect. Since it is difficult to implement such major social change, it is easy to ignore inequalities because, they say, nothing can realistically be done about them. Moral outrage about inequalities is appropriate but may be self-indulgent. If we really want to change the world we may have to begin in more modest but practical ways. (p. 9)

Such ‘modest but practical ways’ include exploring the utility of innovative IT approaches to improving Indigenous individual and community health literacy and capacity. This evaluation addresses one such initiative which has already been demonstrated to have benefits in other settings – touchscreen health information kiosks.

This evaluation proceeds from several premises. First, it is accepted that IT will continue to be an increasing feature of Indigenous health practice. Second, the circumstances of Indigenous settings will affect the acceptance, uptake and successful utilisation of IT approaches (as of health initiatives generally) differentially. Consequently local factors will be important in determining the outcome of particular interventions in particular places. Third, regardless of nature or location such approaches cannot operate in vacuo but must, critically, have functional links to relevant health service providers.

2 BACKGROUND

This project came about because of two distinct sets of activities linked by independent relationships to the pharmaceutical company Glaxo SmithKline (GSK) (previously SmithKline Beecham (SKB)). In the early 1990s Julia Schofield Consulting (JSC) undertook health-related work in the United Kingdom for SKB Community Partnerships, the corporate philanthropic division of SKB. In 1996 Australian representatives of SKB contacted the University of Queensland in Cairns requesting information regarding Indigenous health and potential areas of corporate philanthropic activity. One year later further contact was made and a visit followed by directors who visited Yarrabah and Thursday Island.

Ultimately SKB Community Partnerships funded two three-year north Queensland projects (Yarrabah and the Torres Strait). The Yarrabah project was initially auspiced by UQ with responsibility passing in 2000 to Gurriny Yealamucka. The objectives of the project, as defined in September 1998, were:

- 1 to build local community health capacity and
- 2 To move within three years towards a primary health care oriented health service for Yarrabah that has the following features:
 - Community directed – progressing to community control
 - Financially sustainable
 - Integrates socio-cultural and spiritual well-being with a biomedical perspective
 - Coordinated with mainstream services

The project at Yarrabah commenced in early 1999. As part of the initial negotiations with SKB the possibility of a website was discussed and later expanded to include a

touchscreen kiosk pilot. In mid-1999 JSC were engaged for this by SKB and after a series of visits to Cairns a tentative proposal was put to SKB. Soon thereafter initial contact was made with the Office for Aboriginal and Torres Strait Islander Health (OATSIH) regarding a pilot implementation and evaluation.

During these preliminary negotiations number of disparate sites were considered (Central Australia, Yarrabah and the Torres Strait) to provide a means of assessing the utility of this initiative in different populations. It was subsequently felt that the costs of such an initiative would be prohibitive and a set of different community types within the north Queensland area was suggested – Yarrabah (a discrete Indigenous community), Mareeba (a rural town) and Wu Chopperen (an Aboriginal Medical Service in an urban centre). Later still a set of different service settings was discussed, specifically, Yarrabah (mainstream services in a discrete community), Wu Chopperen (community controlled services in an urban setting) and Inala Community Health Centre (a mainstream primary care setting in Brisbane with a substantial Indigenous patient population). Ultimately this third option – different service settings – was selected with two sites chosen: Yarrabah and Inala. While both of these sites have mainstream services, they represent quite different approaches to addressing the needs of their respective communities – Inala being a mainstream service with a majority of non-Indigenous patients but containing a well-utilised Indigenous primary care program; Yarrabah being a mainstream service for a majority Indigenous population with the beginnings of a transition towards community control.

As outlined in the introduction, structuring the evaluation of this project proceeded apace with project planning and implementation. This has necessarily meant that aspects of the objectives of this evaluation have evolved. In what follows the initial evaluation objectives as conceived during the planning stages is presented (sections 3.1 to 3.1.5 with future tense retained as per original documentation), followed by a brief comment on adaptations to the objectives of the evaluation during the course of the project.

3.1 Initial objectives

The following sections outline the objectives for the project and evaluation as conceptualised prior to commencement. As per the work plan generated in May 2001, we sought to address the following objectives:

- How easy is it to develop and incorporate new content material?
- How easy is it to extend the initiative to new sites?
- How effective is this approach for improved health outcomes and what are the contextual features supporting effectiveness?

These questions were framed in the proposal around three related evaluation goals:

- Evaluation of the Yarrabah touch screen kiosk initiative
- Evaluation of the process of developing new content material (diabetes)
- Evaluation of effectiveness at the two sites

As outlined at the Content Workshop (23 April, 2001), these evaluation goals may be further separated out. The evaluation will address five areas relevant to the interests of the funding organisation:

- Customisation of existing content material,
- Production of new content (diabetes),
- Extension of the project to a new site (customised and new material),
- Implementation (in two sites),
- Effectiveness.

While extension is identified as a separate area, in practice implementation across the two sites (Yarrabah and Inala) will proceed together. However, in order to address the applicability of this initiative in other sites, to the extent that it is possible the implementation in Inala will be considered as if it were a separate venture.

3.1.1 Customisation

This section will focus on the process of adapting existing MediBooks material (non-Indigenous) – specifically, reducing and minimally adapting an existing

module on connective tissue problems (arthritis). Because implementation of customised and new material will probably occur simultaneously, the examination of customisation will focus primarily on the process of customisation, with consideration of effectiveness subsumed within effectiveness of the project overall.

Relevant questions are thus:

- What is the process of adapting existing material (what does it entail, what does it cost, what supports are necessary, what scope is there for adaptation of further material)?
- Is the product used (how, by whom, where, when...)?
- Can it be demonstrated to make a difference?
- What are the factors that influence differences in use and effectiveness between customised and new material?

3.1.2 Production of new material

This section will be a description in depth of the process of choosing, scripting, producing and revising new material (the subject of diabetes having been chosen earlier). The purpose of this section is to document this process in detail in order that cost-effectiveness and replicability may be considered.

Relevant questions are thus:

- Why and how are content-topics chosen?
- What is the process of developing specific Indigenous-oriented material?
- How is this material 'validated'?
- What costs/resources are required to develop specific content?
- What is required to produce further specific content material (including issues of access to software resources, costs of same, copyright...)?
- What are the constraints on producing this material (what/who are the critical elements)?

3.1.3 Implementation (in two sites)

The evaluation will document the processes of initiation and maintenance of the technology across both study sites. This will necessarily incorporate elements of 'extension'. This section will consider what is entailed in setup and operation, and what relevant constraining contextual factors operate.

Relevant questions are thus:

- What is entailed in implementation (staff preparation and training, support, hardware and software requirements...)?

- What is entailed in maintenance?
- What are the responses and reactions of relevant service and other stakeholders?
- How do consumers/users react to the kiosk presence?
- What are the patterns of use and how do these relate to relevant contextual factors?

3.1.4 Extension of the project to a new site

As noted earlier, the Inala arm of the project will be considered as an 'second' site to which the project has been 'extended'. This section of the evaluation will also be descriptive and will focus on issues relevant to the possibility of utilising this technology in other Indigenous settings. To this extent the second site (Inala) represents a very different service delivery setting (mainstream primary care) compared to the 'primary' site, Yarrabah (discrete Indigenous community). While these by no means exhaust the range of potential settings (for instance, community controlled primary care service), reflection on this section will attempt to consider the contextual characteristics of wider service settings.

Relevant questions are thus:

- What is entailed in extension (technology plus content) to a separate/distant site?
- What is entailed in maintenance in a second/distant site?
- Are there differences in contextual factors influencing the process of implementation or of use/uptake in a second site?
- What are the critical issues that emerge for extension elsewhere (technical support, human resources, hardware considerations, institutional politics/dynamics regarding process and content, cost...)?

3.1.5 Outcomes

This project explores two related issues – the use of a specific technology to health ends, and the effectiveness of that technology in addressing a specific health issue – diabetes. Outcomes in terms of changing health status clearly will not be ascertainable within the timeframe of the project. Outcomes are thus considered here in terms of the acceptance and use of the technology by relevant users, and the impact of the use of this technology in terms of health-relevant behaviour.

Relevant questions in relation to acceptance and use are thus:

- Who are the users?
- Who are the users of interest?
- What are the patterns of use of the latter and what are relevant influential contextual factors?
- What do these users think of the technology/content?
- What do health service providers think of the technology/content?
- What do health service providers think of the use of

the technology/content?

- How do health service providers themselves use the technology/content?
- What do other relevant stakeholders think (Council, other relevant services)?

Relevant questions in relation to health-relevant behaviour are thus:

- Are there proximal or more distant indices of health behaviour change (change in service utilisation – volume or quality – by those with the condition or of those concerned about having the condition or about the welfare of others with/at risk of the condition, change in other behavioural indices such as exercise or food choices, increased attention to the issue in public settings/discourse...)?
- Are there potential longer term indices of improved outcomes (changes in patterns of compliance with treatment regimes, changing patterns of screening requests, changes in rates of acute and longer-term complications)?
- What are the service benefits of these changes, if any?
- Are there collateral or unanticipated health-relevant outcomes?

3.2 Adaptations during the course of the project

From first consideration of the project to the production of this report spanned a period of three years – a long time given the pace of change in Indigenous health policy and service planning. This has also been a period of rapid and dramatic social change across Indigenous communities, particularly in north Queensland where the Cape York Justice Study has initiated fundamental reconsideration and reform of a range of 'rights', responsibilities and relationships. It should not be surprising, then, that the project has evolved to accommodate changing circumstances. Nor should it surprise that this is more evident in Yarrabah, a discrete Indigenous community with fragmented health service structures undergoing fundamental realignment and subject to the social consequences of a range of local political transformations, than in Inala, an established and stable mainstream service that, by contrast to health services in Yarrabah, is relatively insulated from local, sectoral and intersectoral forces.

The most fundamental adaptation across both sites stemmed from acknowledgment, as noted earlier, that useful measurement of behaviour change in relation to chronic health conditions due to this intervention was not feasible within the timeframe of this implementation and evaluation – less than one year. The circumstances of the project in Yarrabah were particularly critical in this shift as it had appeared, earlier, that Yarrabah presented the best opportunities to evaluate health behaviour change. As a discrete community with limited service points the opinions of health care providers and other

informed observers were, theoretically, more easily canvassed. Furthermore, the planned opening of a new supermarket at Yarrabah in early 2001 (where, it was initially intended, the kiosk would be located) presented opportunities not only to locate the intervention proximate to where important day-to-day food choice decisions were made (and thus, potentially, to influence those decisions), but also to obtain quantitative and qualitative information regarding the same. However, as it turned out, neither of these were easier or, indeed, possible in Yarrabah due to changing responsibilities and turnover of staff, and delays in opening the supermarket. The focus of the evaluation thus consolidated around "acceptance and use of the technology by relevant users".

As initially planned the kiosk at Inala was sited in the waiting room for the Aboriginal health clinic. As the supermarket was not an option, the Yarrabah kiosk was initially sited initially at the Centrelink office within the Yarrabah Council building complex. This office closed in early 2002 and, after taking into account the continuing delays in opening the supermarket and after consideration of a number of options, the kiosk was relocated in April of that year to the pharmacy adjoining the (then yet to be opened) supermarket adjacent to the Gurriny Yealamucka offices and some two hundred metres from the Queensland Health primary care facility. While these sites and the change were not planned, they did present the opportunity of examining differences in use by site within Yarrabah. By the end of the project, transfer of the kiosk to the originally intended supermarket site was finally underway. Unfortunately, while the Pharmacist provided space for the kiosk, on site support was lacking, the telephone link conveying trace data was inconsistently maintained, the kiosk was often switched off, and in June 2002 the pharmacy had closed due to bankruptcy. Consequently, negotiations with the Council, Gurriny Yealamucka and the

Supermarket Committee were accelerated with Gurriny accepting responsibility for future ownership, human support and costs. This has resulted in the Yarrabah kiosk being off line pending relocation to the supermarket at the time of writing.

Because most activities in Yarrabah and Inala proceeded in parallel (indeed in advance in Inala in many respects) the discrete process of 'extension of the project to a new site' could not be assessed and the focus, as noted above, shifted to utilising the differences across these two sites to identify relevant local contextual factors informing use.

One of the issues that had been planned to be examined was the use and impact of providing heat-sensitive printouts of particular touchscreen content-rich sequences (of information appearing on the screen). While the printout capacity was activated during the course of the project, delays in producing content to be incorporated, problems in including printout use in trace recordings and other, unforeseen issues, have significantly constrained what can usefully be said about the effects of printout availability on kiosk use and behaviour change.

A final development which informed the evaluation process was the production of a new proposal for the extension of this technology to remote communities, building on current content material and including an interactive component (the Alcohol Use Disorder Identification Test – AUDIT). The proposal was structured to address issues raised later in this report regarding appropriate study design to identify behavioural and health status outcomes. The process of proposal development significantly enhanced understandings of technical and human factors necessary for wider implementation and, consequently, influenced this evaluation. At the time of writing this proposal has been short-listed for consideration.

Telecommunications and information technology are transforming the ways in which health and related activities are planned, coordinated, delivered and evaluated. In some areas, such as telemedicine, Australia has taken a lead role although there remain obvious underserved areas, particularly rural and remote residents, the aged, non-English speaking people and Indigenous Australians – groups that are at risk of remaining, relative to the rest of Australian society, “information poor” (Swanson, 1999). Against the rapidly expanding literature on the health application of information technologies, and the dearth of such information as relates to Indigenous Australians, this review will focus on those non-Indigenous applications that are relevant because of use of specific technologies (touchscreen kiosks) or due to similarities in conditions (chronic diseases, especially diabetes). There is also included a section on ‘relevant projects’ that contains information provided directly by workers and others involved in a range of IT initiatives that are relevant to the current project or opportunities that may arise from it.

4.1 Existent literature

The literature on IT-based health interventions is enormous and far wider than the province of this project. This review will focus on patient education and, where possible, touch-screen approaches. Much of the experimental literature is derived from research utilising non-clinical samples and thus must be interpreted with some caution. However, there are a number of important points that emerge from such work. For instance, Alemi and Higley (1995), in a study of computerised telephone interviewing for assessing callers’ health risk status among 96 randomly selected university employees, found that recipient responses were very positive but that there was: “no impact on subjects’ behaviour or intent to change behaviour”. Thus, while a particular intervention may be technically viable and well received, it may not have any impact on behaviour. It is also important to recognise that this is a rapidly changing field which has shifted in the last decade from computer-assisted instruction (information provision) to computerised health risk appraisals which are interactive and personalised. Given the rapidly expanding array of programs, Skinner et al (1993) suggest three basic criteria for program selection:

- 1 programs should be easy to use;
- 2 programs should provide printed feedback to the user; and
- 3 programs should be developed not only by computer experts but also by reputable health professionals who are acquainted with health education and behaviour change principles.

A review of 22 randomised controlled trials of educational computer-patient interactions was undertaken by Krishna and colleagues (1997) which included thirteen studies of instructional programs, although none being touchscreen-based. The authors noted that the results of some of the studies: “such as those involving diabetes, asthma, arthritis, indicate that computers may be the preferred educational method for patients with chronic disease that require a high degree of self-management” (p. 32). The authors went on to note that: “Although computers cannot be substitutes for physicians, dovetailing their face-to-face time with computerized patient education may be an approach with optimum benefit to all those involved in providing health care” (p. 33).

These findings are similar to those of Lewis (1999) who reviewed 66 articles, including 21 research-based reports between 1971 and 1998 related to computer use in patient education. Over one-quarter of these studies related to diabetes education or management with three utilising touchscreens. Although long-term information is not provided the authors noted that the findings: “suggest that the use of technology to improve patients’ knowledge and to involve them in health care decisions leads to better health outcomes” (p. 273). Lewis comments on the wider effects of this technology, providing patients: “with opportunities for enhanced social interaction, diminished feelings of isolation and improved self-esteem. In these studies, most patients were able to use these virtual learning environments to acquire knowledge and skills that could be transferred to the wider world”, adding that “patients with low literacy skills appeared to benefit from the individualized pace of instruction and the non-threatening learning that occur with computer-based learning program” (p. 275).

There are many studies that have examined computer-assisted management of diabetes, including that of Tsang et al (2001) who undertook a six-month prospective interventional crossover study investigating a hand-held electronic diary to monitor diet and provide instantaneous feedback. Improvements in clinical control and high user acceptance were demonstrated. Day et al (1997) describe the use of a CD-ROM multi-media program for carers or and patients with insulin and non-insulin dependent diabetes and comment on the ease of adaptation to different socio-cultural needs and other languages.

Touchscreen technology has been utilised to support a range of health initiatives. Pearson et al (1999) utilised a touchscreen information system and screen printout with 345 radiotherapy patients in Glasgow. While found to be generally acceptable and helpful, the authors comment on different responses and needs by age and

literacy and the need to tailor products to identified end-user needs. This group also compared touchscreens providing information only, with a similar system providing personalised information (linked to their medical records), and with standard booklet information. While no major differences were noted between these three conditions in terms of doctors' perceptions, the personalised computer-based system was preferred by patients, and both electronic approaches were, in the long term, cheaper than relying on paper based approaches (Jones et al, 1999). These authors noted that cancer patients were keen to access condition-specific information. The importance of interactivity was also demonstrated in a study using a non-patient (university student) sample comparing interactive and non-interactive computer programs, and paper based information focusing on nutrition in relation to cancer prevention (Kumar et al, 1993). Also examining this area, Fieler and Borch (1996) describe six months use of two kiosks, one located in an oncology service and the other in the patient library of the University of Rochester. Utilising information collected during use, the authors report that this system ("CancerHelp") was well used and received by patients and by relatives.

Comparison of the effectiveness of touchscreen versus leaflet provision of information regarding prenatal testing was also undertaken through a randomized controlled trial involving 875 pregnant women in Aberdeen (Graham et al, 2000). These authors report that women in the intervention group did not show greater understanding of the purpose of the tests than control women, but that the uptake of scans was higher among those using touchscreens. The authors concluded that: "The touch screen intervention group seemed to convey no benefit over well prepared leaflets in improving understanding of prenatal tests among pregnant women. It did, however, seem to reduce levels of anxiety and may be most effective for providing information to selected women who have a relevant adverse history or abnormal results in their current pregnancy" (p.155). An earlier study from the United States using touch-screen technology specifically addressed the risks of alcohol to pregnancy with low-income women and utilising on-screen pre and post-test to determine intentionality. This was well accepted and appeared to have potential to influence choices regarding alcohol consumption. These authors also indicated three concepts essential for the development of successful educational programs: personal control, self-efficacy, and the stimulation of curiosity (Kinzie et al, 1993).

Also addressing prenatal care, Lapham et co-workers (1991) examined prenatal risk screening of 201 women by computer in a health maintenance organisation in the United States including substance use which was then compared with urine drug screening and chart review. These authors report that none of the sample were intimidated by the technology (which was keyboard-based) and that 95% preferred the computer to a written format. Furthermore, urine screening supported the honesty of

computer reported substance use, with significantly larger amounts of alcohol and drug use being admitted on computer. The efficacy of computer interviewing in screening for drug and alcohol use has been commented on by numerous authors (for instance Bernadt et al, 1989; Erdman et al, 1983; Waterton & Duffy, 1984).

Focusing specifically on diabetes management, Glasgow and colleagues (1997) in Eugene, Oregon, explored the cost-effectiveness of a touchscreen-based brief behavioural dietary intervention versus usual care for 206 patients followed over one year. Against modest cost there were positive outcomes in terms of multiple measures of change in dietary behaviour, patient satisfaction and serum cholesterol, although not in BMI or HbA1C levels. Cost-effectiveness was also the focus of a study comparing touchscreen versus paper-based administration of the SF-36 as a routine part of clinical practice (Lofland et al, 2000). An economy of scale was evident with cost savings for touchscreen administration with larger throughput. For this usage the touchscreen also offered other advantages including speed of results and a reduction in skipped questions by using forced-choice answers, thus reducing the burden of incomplete and consequently unusable surveys.

A further advantage of IT based approaches is the ability to network sites to facilitate timely modification. A system of internet-based health kiosks in shopping malls, supermarkets, medical centres, libraries and community centres is described by Strecher (nd), these linked to a central data-collection system at the University of Michigan. Jones et al (1993) report on thirteen "Healthpoints" – touchscreen kiosks with a range of different health subjects – located across a similar set of health and other sites in Glasgow. Internal traces and community surveys were utilised, demonstrating that approximately 20% of respondents in the kiosk areas had used them with no difference by sex, but slightly more youth noted. The authors commented on the capacity to quickly integrate and feed back information and to undertake routine monitoring of changing concerns in the community.

Hughes (1995), the consultant who provided the content for the first MediBooks module at St Thomas Hospital, London, reports on the first 20 weeks of use involving 396 patients (this study is further described in the methodology section). Three salient issues were raised: 1) the subject material needed to be relevant, non-patronising and easy to understand; 2) in spite of being a computer system, it should be much more akin to the familiar TV, being easy to use and acceptable; and 3) the system must not be perceived as a 'self-diagnosis' tool. In relation to this study (Julia Schofield, personal communication) while the amount of time patients and/or relatives spent with the consultant did not change, the consultant reported an increase in the level, complexity and sophistication of information sought and discussed.

Of most relevance to this project is a series of studies

undertaken by the City University in London to evaluate different aspects of a national touchscreen health information initiative undertaken in collaboration between health services and a commercial health informatics provider, Intouch with Health (see section 4.2.9). As noted in the methodology section, this work includes the development of appropriate metrics for evaluation (Nicholas, Huntington & Williams, 2001). These authors combined a range of evaluation tools including intensive observation of one kiosk in the waiting room of a walk-in centre in a general hospital and interviews with relevant staff (Williams, Nicholas & Huntington, 2001). From this approach the authors conclude that the kiosk was seen as an information point, not simply as something to do while waiting, which in turn added to the use and relevance of the centre itself. They also commented on the additive importance of providing written information, and as was the case with the personal communication regarding the earlier noted Hughes (1995) article, a higher quality of knowledge of patients entering consultation was noted.

In another article these authors examined the impact of location on the use of health information kiosks (Nicholas, Huntington & Williams, 2002, in press). This study involved 21 kiosks in four groups (pharmacy, hospital, information centre and doctors' surgeries) as well as a case study of a kiosk in a supermarket. Details are reported from the transactional logs of 90,000 users and some 750,000 page views. The researchers found that kiosks in information centres were used most and hospitals also performed well. By contrast, surgeries performed less well and pharmacies poorly – the last possibly as the kiosk was located close to the prescription counter. In terms of the doctors' surgeries: "Preliminary fieldwork with patients has established reasons why people are reluctant to use a kiosk in this environment. Firstly, people may be uncomfortable in the relative intimate company of strangers, and might be disinclined to do anything that sets them apart from others. They are also very conscious of time" (p. 3). These authors also speculated that: "searching for information may be perceived to be something that is not really acceptable behaviour when they are about to ask their doctor for answers to their questions (p. 3). In terms of the supermarket, the authors report such sites: "may offer particular advantages, most notably visibility and large numbers of potential users" (p. 16) with this site attracting higher numbers of men and young people. The impact of site was also considered in an Oregon-based non-random pre/post study of interactive multimedia utilising touchscreen health risk appraisal in a clinic waiting room, a workplace and a senior citizens centre. Only in the clinic setting was the number of subjects significant, however the authors reported significant changes in terms of stage of change, risk perception, behavioural intention and self-efficacy (Irvine et al, 1998).

The abovementioned University of London group also report on the views of health professionals in

organisations where health information kiosks are operating (Nicholas, Williams & Huntington, 2001). The researchers interviewed doctors, nurses and practice managers across ten sites using postal surveys and semi-structured interviews as well as using kiosk trace material. The researchers record: "Nurses tended to be far more pro-active than doctors, and saw many health related benefits in referring patients to the kiosk. By contrast, doctors saw the system in very practical ways – praising its space saving potential, for example, not enthusing about its possible value to patients in health terms. Practice managers and others with responsibility for the maintenance of the system were dissatisfied with the extra work they were required to undertake, and complained about children 'playing' and about printer and other problems" (p. 313). Finally, acknowledging the potential of computers in patient education, and with a focus on medical practitioners, Gillispie and Ellis (1993) identified six barriers to uptake: 1) lack of familiarity with the technology on the part of practitioners; 2) technical difficulties; 3) problems of integration into service routine; 4) spacial location; 5) lack of quality material, and; 6) concerns about effectiveness. From experience in a range of settings, these authors comment that: "age is not necessarily a limiting factor in the use of computer-based instruction," a finding supported by Rippey et al (1987) in a late 1980s study of older patients with osteoarthritis utilising a keyboard-based instruction program which would be considered primitive by today's standards.

4.2 Relevant Projects

In the following sections a selection of projects are described that are relevant to considering the circumstances and issues of this project, or offer insights into wider opportunities for information technology approaches in Indigenous health. The latter will be considered in a later section on 'opportunities'.

4.2.1 Cape York Digital Network Project (CYDN)

The CYDN project is a key regional initiative having direct relevance to this project, and one that could help to inform the project's wider context and future potential. The Network was funded by the Commonwealth Government in 2001-2002 (\$5.2m), to 'roll out' the network of infrastructure required to service 16 Cape communities with business computing facilities, a Thin Client System, the ability to carry data at no cost (Telstra, QUIN, videoconferencing, internet, police data etc), and telemedicine facilities. Each of these community facilities will be able to operate at very low cost, and generate income through use of their videoconferencing facilities by government departments such as Corrective Services, Education and Health. Each community will be provided with two seconded positions to manage and maintain the technology, which will be supported by the CYDN Centre in Cairns. It is envisaged that through the provision of this suite of technologies and training, communities will prioritise and customise their use, and

that future asset management of all government department equipment will occur locally.

CYDN's original project proposal included the use of touchscreens as interactive community billboards posting community events and to gather relevant planning information. It was anticipated that each government department could purchase a touchscreen page or website, and CYDN would provide marketing and maintenance, thereby generating income from the kiosk. A project business plan for this aspect was to be developed by Westpac, which has made a commitment to supporting indigenous business initiatives in the Cape by seconding business consultants to the region for the next two years. The idea was eventually excluded because it lay outside the core technology that government was willing to fund. However, CYDN still believe it is one of the better technologies for communities with low levels of literacy and computer skills. There is interest in strengthening future touchscreen projects by providing the human resources required to provide data input and conduct research on community views and local ownership of content.

CYDN believe that touchscreens pitched at the whole community fit well with the new approach to enhanced Primary Health Care that sees health professionals being encouraged to reorient their practice towards community. Health workers (or other professional facilitators) could use touchscreens as a tool to teach community members, who would in turn come back to show their family and friends in a manner referred to as 'virulent technology' due to its potential to replicate quickly.

CYDN states the most exciting thing about this technology is that, as an informant noted: "if you can list the functionalities you require – the absolute ideal – then IT engineers will rise to it. They love problem solving. They love to be able to test their technologies in new ways. Give them an idea, give them time, and they will do it".

4.2.2 North Queensland Rural Health Training Unit (RHTU)

The RHTU, based in Cairns and Townsville, works to promote the health of rural and remote communities through the provision of training, education and support to health care providers. It specialises in the provision of interactive digital training for indigenous Health Workers in remote settings, via computer and telephone hookup. Its Development, Education and Multimedia Services Unit has an extensive library of digital Indigenous health images across areas such as diabetes, sexual health, alcohol and drugs, and men's and women's health. A graphic version of Queensland Health's **Primary Clinical Care Manual for Rural and Isolated Practice** has recently been completed by the unit. The RHTU sees itself as a potential provider of graphic images for Indigenous health-related topics should health touchscreen projects 'roll out' on a larger scale in future.

The Gulf Connect Project is a venture funded by Networking the Nation, that involves collaboration between Education Queensland (EQ), the RHTU and either the Shire or Aboriginal Councils of the Gulf. It aims to equip all schools and health clinics in seven communities in the region with computers, video-conference and internet facilities, and to establish long term IT trainee positions which are connected to EQ but trained by the RHTU, to support and maintain the technology. These positions would be well placed to support a roll-out of touchscreens in the Gulf region in the same way that the Cape York Digital Network project could in the Cape. Two-year funding is currently being sought for the project.

The Department of Education, Training and Industrial Relations (DETIR) has recently completed an audit of all training funded by them, conducted across sectors (including health) and implemented in Cape York communities. The principal outcome of the audit report is that DETIR will require community-based training plans for funding for Cape communities in the future. These plans to identify training priorities will be developed by the North Queensland College of TAFE. It will be important to target the information used to determine these priorities on information generated by the Chronic Disease Strategy (through the partnership between Apunipima and QH). It will thus be important to give current, relevant and updatable health information back to communities to inform these decisions about priorities. RHTU suggest that touchscreens are a useful way to facilitate the independent transfer of this information. (Yarrabah community has already requested this).

In addition, if communities are to use this information well to develop their own capacity to address health issues, infrastructure needs to be in place to enable 'self help' strategies. The creation of family health profiles, for example, could facilitate the development of a self help program for families to take steps to improve their health. Touchscreens could be the first step for people to register their interest in the idea, and to point the way for them to access such programs.

4.2.3 Independent Living Centre (ILC)

The Mobile Independent Living Centre (ILC) in Brisbane provides statewide outreach to rural, regional and remote communities. It supports people in their own communities, people living and working with disability, injury or age-related difficulties. As a non-profit, non government service, it welcomes requests to visit communities, or provides consultations and training through video conferencing and online services. Their occupational therapists are specialists in advising on home modification and equipment solutions for everyday living, including information on supplier and funding contacts.

The ILC's Indigenous Outreach Service is currently undertaking an online documentary project which focuses on education and training for Indigenous Health

Workers. The pilot for the project, funded by Networking the Nation, commenced in October 2001 in Lockhart River, Doomadgee, Horn Island and Aurukun communities. An ILC website has been developed in Goondoowindi and three other communities have also engaged.

The service can provide evaluation reports on current health promotion initiatives in remote Indigenous communities that are introducing digital media, including a list of recommendations for the successful introduction of new media in communities. They found through ongoing evaluation of outcomes achieved through the development of community websites, that community people are not interested in engaging with new technology that is purely health related. They are more interested in interactive community noticeboards that tell them 'What's happening' in their area. They also found fundamental differences in the way that Aboriginal and Torres Strait Islander people utilised the provision of independent information through technology. Once Aboriginal people accessed the website, they did not want further personal help or information. They preferred to access further information by typing in questions for themselves (it was found that as long as text is broken up by images, and is concise, people are happy to use it). The Torres Strait Islanders however, preferred to maintain personal contact while utilising the website. These findings were backed up by the Cairns Rural Health Training Unit's experience in delivering audiographic training to both the Cape and the Torres.

4.2.4 Centre for Online Health

The Centre for Online Health is a research, teaching, education and service provider within the University of Queensland's Faculty of Health Sciences. The Centre's mission is to pursue improvements in health care through the application of information technology. It has four areas of activity: a focus on research in the area of online health; teaching about online health; commercialisation of research outcomes; and delivery of services in online health. The Centre is also active in developing web-based health promotion utilising a series of virtual network education templates, under the name of V-Net. The projects aim to develop and deliver highly interactive on-line health education materials for young people that are innovative in both the technologies and methodologies employed. As a starting project the group has decided to use the topic of 'bullying' in primary schools, having consulted with a range of teachers.

Other projects include developing websites for communities to enhance the social health and wellbeing of that community. Some of the headings used on websites indicate ways in which an indigenous community might put a touchscreen to use: for instance, a buy & sell section, toy library, tool library, interest groups in the community, history section, arts & crafts section, links section (to government sectors available),

food shed (place where cheap food is available). The Centre suggests that ideally, telemedicine initiatives in areas such as diabetes and IT based health promotion projects such as the touchscreen project, could be coordinated.

4.2.5 Kids Help Line (KHL)

KHL is a national, 24-hour, free telephone counselling service for children and young people aged between 5 and 18. The demand for the service is very high as evidenced by the 30,000 calls made to Kids Help Line every week. The 80 professionally trained, paid counsellors who staff the service respond to less than half of these calls weekly. Of the 100,000 counselling calls answered in the year 2000, 5% were from Indigenous callers, despite being only 2% of the population. This proportion is steadily increasing with time.

Towards a Talking Circle is a review of concerns of callers from Aboriginal & Torres Strait Island backgrounds over the six years that resulted from a wider review conducted by University of Queensland (Litchfield & Reid, 1999). This unique, recently updated data confirms that children and young people from indigenous backgrounds are calling about more severe issues than their Anglo-Australian counterparts. Issues include major family conflict and disruption, violence, child abuse and bullying, homelessness and grief. They are also more likely to call with drug and alcohol concerns, legal issues, and employment and financial concerns than their Anglo-Australian counterparts. This data may help to inform content aimed at young people for future health touchscreen projects.

Email and website counselling have also been initiated. Older kids with more severe problems, for example sexual abuse, seem to access the site. KHL are currently developing interactive web-based counselling tools using graphics, text and sound, and self-directed online activities that allow kids to problem-solve, with topics including bullying and loneliness. Counselling resources on touchscreens are something that KHL would be very interested in providing for future projects.

4.2.6 Computer Assessment of Alcohol-Related Brain Damage

In the late 1980s researcher, Trevor Cox, undertook a study of alcohol related brain damage among 21 Aboriginal patients in Alice Springs Hospital, of whom 81% were of "full aboriginal descent" and all of whom led "relatively traditional Aboriginal lifestyles." One aspect of this study involved a computer-based (Apple Macintosh) maze test utilising a mouse to navigate, the maze itself embedded in a broader narrative that allowed for testing of speed, understanding, memory and other functions. Neuropsychological assessment also included a computer-based card game. Despite this being a group of remote Indigenous residents with limited or no education (and probably little to no exposure to computers), who were hospitalised at the time and with

some having a history of heavy substance use, and while the technology used was relatively unsophisticated by comparison to that available a decade later, the subjects were generally able to be engaged and to interact with the program.

4.2.7 The Mass Media Tools Project

The Mass Media Tools Project aims to target Indigenous community people and service providers in North Queensland to develop community-specific suicide prevention resources. In response to focus testing and the prevalence of low literacy rates, the project primarily produces 'life promotion' videos, for their ability to successfully capture people's attention and promote health and esteem.

The process of developing resources is based on principles of community cultural development – utilising creative expertise at the direction of community to identify local issues and themes, inform content of scripts, casting, language, music, etc. The project now has a large video and image archive – strong, positive cultural imagery covering dance, art and craft, sport and culture in general. The touchscreen kiosk ideally provides a new venue in communities to make these quality health promotion resources accessible to a wider range of people. The combination of touchscreens and digital video are a powerful education tool, well suited to addressing social as well as other determinants of health. Themes addressed by the project so far include bullying, family violence, gambling, relationships and grog.

4.2.8 Indigenous HealthInfoNet

The Australian Indigenous HealthInfoNet's mission is to contribute to improving the health of Australian indigenous people by making relevant, high quality information easily accessible. They address their mission by:

- Undertaking research
- Disseminating relevant information
- Facilitating information exchange
- Providing Internet and related training to indigenous health workers and others
- Internet site development

The HealthInfoNet has an Australia-wide reference group of about 80 consultants who help to ensure the quality control aspects of health information sourced and used. This network may be of value to future touchscreen projects, for instance by coordinating both projects – the touchscreen project reaches consumers within the health information matrix, whereas the HealthInfoNet accesses the health workforce. Health consumer information being created by the touchscreen project, if it was to be included on the HealthInfoNet, would save duplication and time, and would see the information available on the net.

4.2.9 Intouch with Health

Intouch with Health is a commercial company producing health related touchscreen products in the United Kingdom. A national evaluation has been undertaken by the City University in London (see section 4.1). They have also collaborated with three health action zones in Sheffield, Nottingham and Leicester to produce health information in minority languages to be accessed by touchscreen. Bengali, written Urdu and verbal Punjabi, Gujerati and Chinese versions were produced. The project aimed for simplicity, to provide information to people who could not read English or their mother tongue, and which would enable users to print out information. Production involved extensive consultation with materials produced addressing diabetes, tuberculosis, cardiovascular disease prevention and cervical screening. To support privacy in audio feedback a telephone handset was provided on the side of the computer. Evaluation is being undertaken by Sheffield School of Health and Related Research (personal communication, Margot Jackson – Margot.Jackson@sheffield-ha.nhs.uk). Intouch with Health "2-in-1 web kiosks with touchscreen" can be accessed through the Intouch with Health homepage on <http://www.intouchwithhealth.co.uk>.

4.2.10 Australian touchscreen kiosk companies

There are a number of Australian companies producing touchscreen kiosks for commercial and public interest purposes. One such company is Sydney-based Abuzz technologies, which has manufactured and customised kiosks for use in Aboriginal settings including the Wobbigal Aboriginal Medical Service in Newcastle, the NSW Department of State and Regional Development, and the Abtrade exhibition in Milan (Italy), where it was used to demonstrate and promote aspects of Aboriginal culture (<http://www.abtrade.com.au>). Abuzz has the ability to work with clients from the conceptual stage of a project, to combine software development, hardware design, in-house manufacturing and complete installation. Its in-house design capabilities span industrial design, engineering, graphic design, multimedia and interactive software production.

Abuzz cites the following reasons for using interactive touchscreens:

- Touchscreens are the most intuitive user interface
- Touchscreens have a long record of proven reliability
- Touch-enabled software creates flexible applications with greater functionality
- Touchscreens can be used to save space
- Touchscreens can eliminate the need for a mouse or keyboard input.

Examples of the Aboriginal kiosk design can be found at http://www.abuzz.com.au/aboriginal_sparc.jpg and http://www.abuzz.com.au/aboriginal_blue.jpg and are reproduced as Appendix 1.

4.2.11 Hunter Centre for Health Advancement

The Hunter Centre for Health Advancement (HCHA) is a unit of the Hunter Area Health Service, with collaborative ties with the University of Newcastle's School of Medical Practice and Population Health. It employs a wide range of health promotion activities which include the use of touchscreen computers and computer-assisted telephone interviews. Deborah Radvan is a Projects Manager with the HCHA. She has a Masters of Medical Sciences (Health Promotion) with a minor thesis describing the opportunistic community use of computerised health information programs.

The HCHA started experimenting with touchscreens in mainstream health almost ten years ago addressing topics such as asthma and smoking, and utilising kiosks in shopping centres, hospitals and other public places. The project is now called HealthCHIPS (Computerised Health Information Programs) and comprises thirty kiosks containing diagrams, pictures, text and animation, but no sound. Pretesting suggested that potential users may be put off by sound as a result of sensitivities regarding privacy. Current kiosks are located in various settings – public hospitals, supermarkets, clubs and a cinema.

Deborah Radvan considers that touchscreens contribute to building personal skills and the empowerment of individuals to make decisions conducive to good health, broadly consistent with the Ottawa Charter. However, as they remain an educative tool she believes it is essential that other health promotion strategies are also in place. Walkabout Learning is an indigenous project that evolved from these principles. It contains modules on Family Violence and Alcohol and Drugs. New modules on Smoking, Nutrition, Physical Activity and Heart Health Tests (diabetes, cholesterol and blood pressure) are currently being developed. They employ three styles of information provision – flat information, quizzes and risk assessments (such as the alcohol AUDIT, the Alcohol Use Disorders Identification Test). The latter are used to personalise and raise people's sense of awareness. Once such awareness is raised, the focus is on the health service. Staff at the AMS where the kiosk is situated are trained in 'detection and brief advice' – interventions which they offer opportunistically. There is a Guidebook for Health Workers comprising brief interventions and checklists to enhance the impact of the touchscreens.

Past research conducted by Deborah Radvan demonstrated the acceptability of touchscreens and supported high levels of information comprehension. The evaluation of Walkabout Learning was limited by the small number of users, but programs and delivery strategies are evidence-based, drawing from previous work. Content development for modules occurs in several steps over one year, with different modules being developed concurrently and a review planned for three years. Cultural representation in development is integrated from the outset. Indeed, Marilyn Wilson, the Aboriginal Health Coordinator for the region, stated that:

"the name Walkabout Learning came about from the notion that when going walkabout, you go for a reason, and on the way you learn lessons from the journey. It is not an aimless wander." This is a good analogy for the way people navigate their way around information provided on the touchscreen. Information is provided in Aboriginal English and the most frequent users are in the 16–30 year age bracket. Training in brief interventions for service providers will occur in July 2002, to correlate with the four new topics on the touchscreen.

Schools and ASSPA committees contribute to content development for the kiosk and brief intervention handbooks, using language appropriate to the area. The touchscreens provide skills to service providers and cultural competency in communicating with Aboriginal clients. The idea of improving cultural communication between client and service provider is preferred to the concept of increasing cultural awareness, as this concept does not change attitudes or behaviour.

4.2.12 Other activities

There are various other corporate groups with expertise in Indigenous design. For instance, Learning Curve Pty Ltd, a subsidiary of the Swish Group, are developing an Aboriginal Art CD-ROM – Patterns of Power – with the National Gallery of Australia (canberra@swish.com.au).

European Commission EUREKA Project, European Health Education (Eurohealth) is a consortium of three hospitals (in the United Kingdom, Germany, Spain) and an interactive multimedia developer which have produced the Managing Your Health series, four CD-ROM for PC or touchscreen use, current topics being asthma, health hearts, insulin dependent diabetes and non-insulin dependent diabetes (www.interactiveeurohealth.com/index.html).

In the early 1990s each of the Aboriginal Medical Services in Victoria were provided with touchscreen kiosks that displayed an interactive alcohol and drug screen (the former adapted from the AUDIT), sexual health and HIV information and QUIT smoking material (Craig Edwards, personal communication). In Geelong this was sited in the foyer of the AMS. Content materials for the kiosks were generated by collaboration between the Addiction Research Program and Drug and Alcohol workers in Victoria. Funding was initially obtained through the Commonwealth and subsequently maintenance funding came through VicHealth. Audio content volume was adjustable locally and there was Aboriginal music and photos of well known local identities. However, ongoing maintenance subsequently became a problem and there was no capacity for updating. There was also no ability to retrieve trace data regarding use. None of the units are now functioning. An informant from Koori Human Services (previously the Koori Health Unit) related that because of the sensitive nature of topics covered, some Aboriginal Medical Services received but did not display or activate the kiosks. No evaluation of this initiative was undertaken.

4.3 Commentary

From this review of the literature and a sampling of relevant activities within Australia it is clear that the potential of touchscreen technology within health is expanding in the wake of the rapid uptake of IT generally. In relation to patient (and other health user) interactive systems there has been a shift over the last two decades from instruction or information provision, to systems that engage by personalising responses and providing feedback. Touchscreens have been proven to be effective communications means in wider non-health applications and have particular benefits for users with limited literacy levels. While particularly attractive to youth, given appropriate content and design, older age has not been shown to preclude use.

However, in addition to technological sophistication, health application success also requires content, health promotion and social (cultural) expertise. It also demands consideration of location and institutional setting, both in terms of the acceptance and integration within a broader set of goals and activities, and in terms of system and content support, and making available appropriate interventions triggered by touchscreen use.

Effective use of this technology provides for a number of collateral outcomes, including the feedback of information in a timely manner to the wider interested public, and the ability to gather data. In this respect there is some evidence that particular types of information, for instance

in relation to substance use, may be more accurately gathered through computer-based approaches than through conventional survey techniques.

Given the above, it is clear that evaluation must be attuned to far more than use. Indeed, it is also clear that such technologies may be user-friendly and widely accepted without influencing the health outcomes in question. Evaluation must thus consider how use of touchscreen technology translates into behavioural (and thus health) change. It must also take into account collateral patient and community/system benefits. The former includes the impact of proxy use (wider health impacts mediated by primary users), and increasing the familiarity of users with (and thus capacity to benefit from use of) computer technology. Community/system benefits include the ability to quickly gather, analyse and present information to users. The reliability of such data may be enhanced by program design, for instance by incorporation of forced answer approaches in particular instances. Having taken into account all of the above, this technology cannot be assessed in isolation and must be understood in the system context in which it is operating.

Finally, it is abundantly clear that IT-based interventions in Indigenous health have been embraced within the mainstream and community controlled sector. There is expertise in Australia in hardware, software and kiosk design and awareness across related activities of the potential benefits of cooperation and collaboration.

5 EVALUATION DESCRIPTION

Evaluation of Information Technology applications in Indigenous health is constrained at various levels. It must be consistent with broad objectives of evaluation in public health in terms of adequacy (of expected change), plausibility (in relation to purported mechanism) and probability (that outcomes are not due to other factors). This demands that evaluation planning should parallel program planning and that the evaluation results should be timely and should address decision makers' questions (Habicht et al, 1999). It should also be informed by evaluation in the specific area of innovative IT interventions. The Australian and New Zealand Telehealth Committee (1999), while focusing on IT facilitation of clinical practice, make certain points in relation to evaluation that are relevant to this project:

In summary, there were three different approaches to evaluation. The first was descriptive in nature and sought to describe how a particular telehealth application performed. It might almost be thought of as a 'proof of concept' approach. There was no comparative element and this approach tended to be used with a class of less mature applications. As such, often it included some form of evaluation of the technology itself, as well as a component of clinical effectiveness.

The second approach sought to determine the comparative cost of telehealth, relative to some alternative, and used direct measurement of performance data for both forms of service delivery.

The third type of evaluation also was concerned with comparative analysis of telehealth performance, relative to some alternative, but this time performance data for one of the forms of service delivery was simulated or estimated using data from external sources.

Both the second and the third forms of evaluation tended to be used with more mature applications and the focus was often on comparing the efficiencies of the two (or more) alternatives. (p.3)

This project is, indeed, of a 'less mature' application in a population for which there is limited baseline data for either IT or conventional preventive and health promotion initiatives. Consequently it emphasises the descriptive element in analysis, both of the technology and its application.

The evaluation is also constrained by the particular type of IT application. Hughes (1995) describes four sources of information in evaluation of the MediBooks touchscreen module 'So you have rheumatism':

- 1 observation;
- 2 traces within the touchscreen module program (at

times referred to as the 'log');

- 3 self-administered on-screen questions; and,
- 4 pen and paper questionnaire.

These, in turn, are constrained by the nature of the target population and the circumstances of the IT intervention. In relation to this evaluation it was felt that in terms of both, but particularly because of sensitivities to pen and paper questionnaires on the part of many Aboriginal people, that this approach would not be utilised. Instead, semi-structured interviews were utilised with a range of informants.

There are two key advantages of program-based (either through the web or stand-alone kiosks) applications. First, this allows for gathering information from users at point of use (self-administered on-screen questions) which is, necessarily, contingent on user understanding, motivation and cooperation. Second, these programs allow for non-contingent monitoring of unit use by all users. This provides valuable information which must be sorted from 'non-purposive' use (for instance, random touches by passers-by to see what happens). In the British evaluation of the Intouch with Health touchscreens (see literature review and section 4.2.9) Nicholas, Huntington and Williams (2001) comment on a set of key metrics, these being: user numbers, pages viewed, number of search sessions undertaken, session time, page view time, number of prints made and kiosk capacity utilised. They emphasise that simply reporting on aggregate use patterns misses important underlying dimensions. The above metrics tap into different qualities of the product: the number of pages printed provides a sense of user engagement; the number of pages viewed provides information regarding the thoroughness of use of the program; session time length provides an index of the capacity of the program to hold attention.

In a separate publication these authors emphasise the importance of "site/system penetration" which is: "an important factor in measuring use – in many menu-based kiosk information systems the user has to navigate through a number of menu screens to arrive at what can be termed an information page. Clearly what constitutes positive use must imply that the information seeker navigates beyond the collection of initial menu screens to information pages" (Nicholas, Huntington & Williams, 2000, in press).

The above literature-derived considerations have been incorporated into this evaluation. Before describing the resultant methodology the broader evaluation frame that is informed by the particular circumstances and goals of this project will be presented.

5.1 Evaluation frame

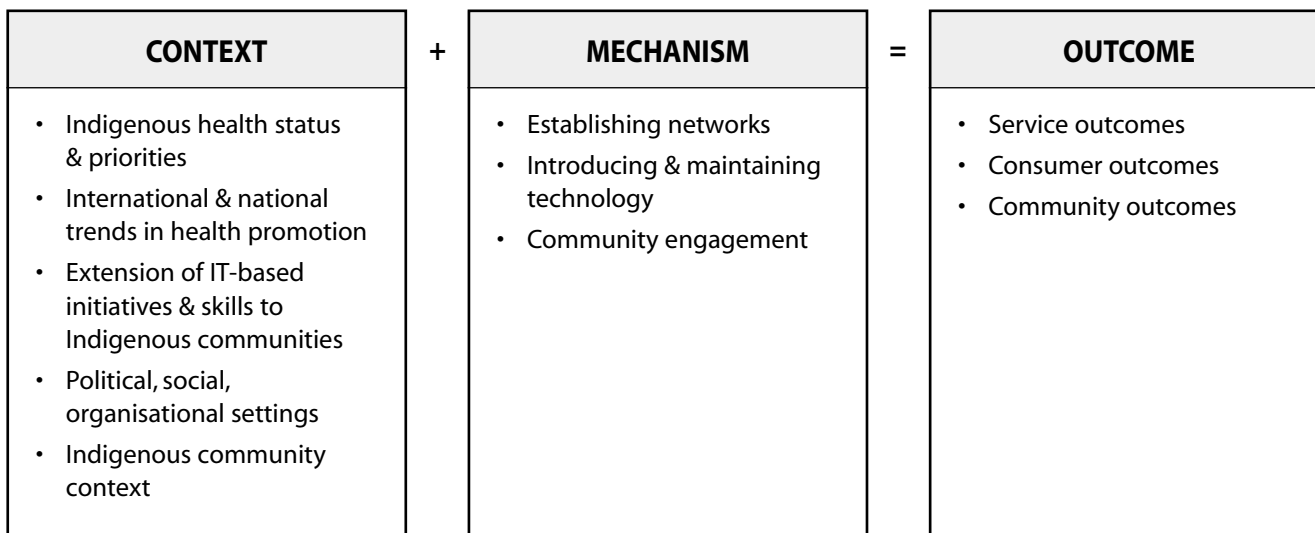
There are several important limitations to this evaluation. These include that health change can only be discernible only in the long term, the small number and particular features of the two project sites, and the limited health topics available (diabetes and arthritis). There are also pragmatic considerations given that the two project sites are widely separated (Far North Queensland and Brisbane) and various parts of the project have proceeded in parallel – adaptation and development of new material, and the implementation across two sites at the same time.

As with any health intervention, this project does not occur in a vacuum; it will have influences that more broadly affect the way in which activities occur – through training, reflection, stimulating interactions and providing information. As this evaluation will demonstrate, these processes have been quite different

in the two sites. Rather than attempting to minimise or control this variability, the evaluation utilises diversity to more fully understand not only the process, but the potential of this intervention. To this extent the overarching framework of ‘realistic evaluation’ as outlined by Pawson and Tilley (1997) is utilised. The basis of this approach is that the outcome of a program is contingent on the applied mechanism and the context in which this occurs, or, simply put:

CONTEXT + MECHANISM = OUTCOME

For the purposes of this project the (relatively) constant variable is ‘mechanism’ (although, as will be obvious, this is not strictly the case). This evaluation seeks to examine both context and outcomes in order to identify what benefits (and problems) of this intervention emerge for who (stakeholders) under which contextual circumstances. **Context + mechanism = outcome** may be expanded as below:



5.2 Methodology

The evaluation process undertaken will be described in terms of general considerations, the incorporation of experiences derived from participation in the process, and the management of quantitative and qualitative data.

5.2.1 General considerations

Being an evaluation of a ‘less mature’ application (touchscreen health information) in an altogether novel population (Aboriginal Australia) this evaluation is purposefully descriptive and relies primarily on qualitative data supplemented by quantitative information obtained primarily through the analysis of program traces. The development of the evaluation strategy began in parallel to the planning for the project implementation with project and evaluation contracts linked. The close association between the project and evaluation team has allowed for a tight feedback and learning loop and facilitated participant observation in various phases of the project. This, in turn, has added depth to the qualitative analysis.

This evaluation has drawn on an iterative process of information collection throughout the project. Initial broad-ranging scoping interviews were used to generate information for subsequent semi-structured interviews. These, in turn, informed targeted interviews and focus groups in each site later in the project. In addition to interviews the primary sources of information are observation and systematic documentation (records and logs). Triangulation of information (across informants and approaches) is utilised to clarify particular issues both in the course of the project and in summative analysis. To these ends approaches utilised include:

- Project officer diary
- Participation in subject development process
- Participation in project review and adaptation process
- Trace review and analysis
- On-screen questionnaire
- Regular teleconferences with implementation team
- Review of documentation relevant to development, installation, maintenance

- Weekly log – service providers, maintenance personnel
- Scoping interviews – service providers, service users, others
- Semi-structured interviews – service providers, service users, others
- Comments box for kiosk users
- Review of service provider service utilisation data
- Focus groups – service providers, service users, others
- Targeted key informant interviews
- Interviews with hardware consultants
- Interviews with software consultants
- Interviews with OATSIH/QH/Community Controlled sector/Diabetes Australia...(future context)

The following formal interviews (which do not include a large number of opportunistic interviews) were undertaken across both sites and with other informants during the course of the project (table 5.1).

Table 5.1: Interviews undertaken during the course of the project

	Inala	Yarrabah	Other	TOTAL
Content workshop			1 (group)	1
Theoretical scoping			14	14
Key informant 1	2	4		6
Key informant 2	2			2
Exit	14			14
Patient (user)	4			4
Patient (outcome)	2			2
Community support		2		2
Key informant (outcome, providers)	4	2 (includes one group)	4 (includes two groups)	10
TOTAL	28	8	18	55

5.2.2 Feedback loop – the ‘wishlist’

The wishlist is a mechanism devised by the software consultants for keeping and disseminating suggested changes to the kiosk which were raised during the life of the project. A template organises relevant information such as date, author (of the request), nature and priority of the proposed change, and a review date, with some comments on feedback or actions taken. This was reviewed at project meetings for importance and subsequent action. Through the life of the project this list was disseminated regularly so that project members knew who was proposing what.

As a result of this process, changes which were marked urgent and found to be within budget were made during the project (eg. the recording of local Yarrabah voices and music for an introduction to the Yarrabah touchscreen to enhance local engagement with it), while important suggestions which were not within budget

have been noted for consideration of future projects. Examples include: the ability to add pictures and artwork to the attractor locally; the use of colour or icons as a means of identifying menu options for those who are poor readers; putting the Indigenous AUDIT (for alcohol use) on the kiosk and printing out a customised report for each individual, and; graphically presenting data from Adult Health Checks as community information.

5.2.3 Data management

Both quantitative and qualitative information was collected through the course of the project. The management of this data is outlined briefly below.

5.2.3.1 Quantitative data

The major quantitative data management relates to that information gathered through program use (including both user traces and the on-screen questionnaire), with reviews and analyses conducted throughout the project. The tab delimited data files from the kiosk, whose format has been determined, were imported into a Microsoft Access database where subsequent data received could be readily appended. Data was allocated to a “site” based on the site specified in the name of the datafile received. Once data receipt was complete this data was checked and cleaned in MS Access and exported to SPSS.

Descriptive and analytic statistics were produced in SPSS. Using the negotiated data format, analysis of associations between items within kiosk sessions could be tested. This allows such questions as *Do sessions where the user chose to view information on diabetes receive feedback that is different to the feedback received from sessions where this information was not requested?* to be tested. As an index of ‘site/system penetration’, those uses in which a content rich sequence was accessed during one session were selected to indicate purposive use.

5.2.3.2 Qualitative data

Qualitative data was gathered throughout planning and implementation. Descriptive data gathered by the Project Officer through participation and observation was recorded and reviewed, forming the basis of the process description presented in the next section (6.1). Sets of questions arising from initial scoping interviews, experience in the project and the literature review formed the basis of the key informant interviews which were transcribed using a standard template (an example is provided as Appendix 2). Following transcription these interviews were returned to the relevant informants to check for accuracy and to add as necessary. The resulting records were reviewed and relevant issues incorporated into the report. Structured interviews were undertaken during the project with a range of informants including clinicians early in the life of the project (Appendix 3), exiting kiosk users and diabetic patients (Appendix 4), and providers and diabetic patients later in the project with a view to outcomes (Appendix 5). The results of these interviews were transcribed, amalgamated by

question across each of the groups and subjected to content analysis to identify key issues and common themes. In addition to these formal interviews there were a large number of contacts which were used as opportunistic interviews and are not included in Table 5.1. Many of these arose from wide consultation undertaken through the last half of this project to explore options for a wider application of this technology and approach. While much of this is peripheral to the results of this project, some relevant issues are touched on in the concluding sections of the report.

Where possible triangulation of data was undertaken across different modes of investigation – observation, participation, elicitation; different sources of information – key informants, health service providers, health service consumers, and potential and actual users of the technology; and by comparison of quantitative and qualitative material. The resulting narrative condensing these findings was compiled by the first author of this report and reviewed by the Project Officer whose participation provided a means for checking accuracy and interpretation.

As an evaluation of an application of recently developed technology to influence health outcomes in a specific cultural context this report is concerned as much with the processes of the application as with the outcomes. These are considered separately in sections 6.1 and 6.2 respectively.

6.1 Process description

This section will be a description in depth of the six steps involved in the process of developing, building, implementing and maintaining health touchscreens and their specified content material, in particular settings. The purpose of the section is to document this process in detail. The six steps to be evaluated include:

- **Customisation** – the process of adapting existing material (in this case the MediBooks module on arthritis which became *Joint Pains, Sprains and Feet*).
- **Production of new material** – the process of choosing, scripting, producing and revising new material (the subject of diabetes having been chosen earlier).
- **Development and build** – the process of developing software from customised and new material, integrating it into the software environment to be used as the kiosk operating system, and building it onto the hardware of the kiosk to create the finished product ready for installation.
- **Implementation (in two sites)** – the processes of community negotiation, setup and installation, and training and support. This section also includes material that would, in the original submission, have been included under ‘Extension to a new site’. As detailed earlier the circumstances of the project were such that there was no formal ‘extension’ process. However, the set of differences across the two sites provides an opportunity to consider contextual factors influencing implementation, use, maintenance etc. One such difference was that kiosk location was not assured in Yarrabah leading to relocation, which is considered in its own right.
- **Relocation of the kiosk (Yarrabah)** – between sites in the same community.
- **Participatory evaluation** – the process by which the participation of the Project Officer for this evaluation engaged in as well as observed the above activities, providing particular insights for this report and, in turn, strengthening development and implementation.

6.1.1 Customisation of content material

Set out below is a chronology of steps involved in customising existing content material for use in this touchscreen project. This approach was used both to add another content area for this project, and to gain feedback from the software consultants and script developers. It was felt that information regarding this technical process was relevant both in terms of future adaptations of other non-Indigenous material and in relation to adaptation of Indigenous-specific material from one Indigenous context to another. Through discussion with clinicians and other Indigenous health experts it was decided that of the existing MediBooks modules, the most appropriate for adaptation was that related to joints problems. This topic was chosen as these problems are common and the existent material was both relevant and simple. Photographs and images used in MediBooks were retained and only the written material was adapted. The resulting customised script was titled *Joint Pains, Sprains and Feet*.

6.1.1.1 Customisation of written material

Audio scripts of the existing module (*Pains and Sprains, Osteoarthritis, Rheumatoid Arthritis and Lupus*) were reviewed by Dr Hayman and later Dr Yelland, a sports doctor, who undertook the adaptation to a final script which was as short as possible, conversational in style, and included terms that Indigenous patients would be likely to hear in the clinic. Feedback on script content was obtained before being finalised and sent to JSC prior to recording, which was undertaken locally (see Appendix 6, Customisation, for text of original and customised scripts for comparison). This process was repeated on a smaller scale later in the project to adapt an introductory script for Yarrabah following requests for the inclusion of a local person’s voice.

6.1.1.2 Recording of customised scripts

While the major recording site was Inala, recording occurred in both sites. Zip files containing the completed scripts were sent from the UK ready for recording. As with the *Diabetes* module, the scripts were split into two parts, one for a male voice and one for a female voice. The recording process was basically the same for customised as for new material.

6.1.1.3 Commentary

Technically, customisation presented no difficulties and, as will be demonstrated later, the adapted module, *Joint Pains, Sprains and Feet*, proved to be the more accessed of the two subject modules. While a non-customised module was not available for comparison, it appears likely from comments that will be presented in the following sections that the use of a recognisably

Indigenous voice (and, it might be added, voices that were recognised) was deemed important by users. While in this instance customisation was undertaken from a module produced for a British target population, the ease with which this was done suggests that a similar process of adaptation of material produced for one Indigenous population for use in another (for instance to settings in which traditional language or creole are the vernacular) should not present difficulties.

6.1.2 Production of New Material

Through a similar consultation process used in relation to choosing a topic for customisation, diabetes was identified as the clinical condition for which a new module would be developed specifically for Indigenous users. Diabetes was selected as it is a common, chronic condition, which is seriously consequential when there is not consistent and careful attention to diet, behaviour and clinical care. Type 2 diabetes has become epidemic in a number of countries experiencing rapid social change, with Indigenous Australians having one of the highest prevalence rates (approximately 25% of adults) in the Asia-Pacific region (Asian-Pacific Type 2 Diabetes Policy group, 2002).

To produce a touchscreen module on diabetes involved both content related (generating ideas, and developing and recording appropriate scripts and graphics) and technical activities. In the following sections the content related activities will be described.

6.1.2.1 Content workshop

The new material for the *Diabetes* module was generated through a process used previously to produce earlier MediBooks modules. This involved:

- identification of a working group consisting of content and context (Indigenous community lifestyle) expertise;
- completion by content and context experts of a pre-workshop questionnaire; and,
- a one-day workshop following a specified format.

The workshop was held in Cairns on April 23, 2001 with the following individuals identified for their technical, content and contextual knowledge (and including members of the evaluation team and funding body):

Queensland Health:

- | | |
|----------------------|--|
| • Dr Noel Hayman | Inala General Practice Program |
| • Dr Sharon O'Rourke | Diabetes Centre, Cairns District Health Service. |
| • Ms Sophia Dunn | Nutrition Program, Tropical Public Health Unit |
| • Ms Michelle Elwell | Nutrition Program, Tropical Public Health Unit |

Gurriny Yealamucka Health Service

Mr Les Baird

Also present were:

- | | |
|----------------------|--|
| • Prof Ernest Hunter | University of Queensland – evaluation team |
| • Ms Helen Travers | University of Queensland – evaluation team |
| • Mr Alan Thorpe | OATSIH |
| • Julia Schofield | JSC |
| • David Schofield | JSC |
| • Marianne Markowski | JSC |

Invited but unable to attend:

(but with subsequent active input)

- | | |
|---------------------|---|
| • Ms Marlene Norman | Diabetes Centre, Cairns District Health Service |
|---------------------|---|

The preworkshop introduction to MediBooks and questionnaires are included as Appendix 7. These had been collected and collated by JSC and were presented in summary form by JSC. The workshop itself was directed by Julia and David Schofield and tightly followed the timetable outlined in Appendix 8). In summary, after introductions and an outline of the history and process of the project, information was fed back that had been collected from pre-workshop questionnaires sent to attendees, the findings aggregated into three categories – key health points, key diabetes points, and questions arising (Appendix 9). The participants then worked in teams to develop a preliminary script around each of these subjects, ensuring coverage of the range of identified issues. Thus, for the section on lifestyle management (What can I do for myself?), the following issues were incorporated: diet, activity, weight management, alcohol, smoking, and stress (an example of a preliminary script from the workshop is included as Appendix 10). Following completion of the preliminary scripts, these were presented back to the group and this opportunity taken to identify connections between subject areas that could, at a later stage, be linked within the program itself. Technical details were kept to a minimum through the workshop. Those raised included:

- the need to develop a hierarchy of questions and appropriate links between subject areas;
- the information appropriate to the rotating attractor 'slots' when the unit is not in use; and,
- the incorporation of information-gathering capacity within the program, including – user characteristics, probably collected at the outset,
- use descriptors (duration, track...), and
- specific questions for the user.

Ethical implications of collecting this material were considered and agreement reached regarding the need for a statement at the outset, clarifying that this information was being collected, that its collection would be anonymous, and regarding its use (on the day following the workshops a further meeting was held at which the need for ethics committee approval was

discussed by members of this group. Dr Robyn McDermott was asked for her opinion from the perspective of someone who works closely with the Cairns Base Hospital Ethics Committee. It was felt that a formal application was not required for this project).

At the conclusion of the workshop various roles and tasks were allocated to participants. Noel Hayman and Les Baird were identified as primary site contacts. A mechanism for distributing scripts through the workshop participants was agreed to, with Noel Hayman undertaking final liaison with JSC. It was agreed that Noel Hayman's voice would be used for the voice over. Following the workshop a preliminary list of first level questions and question clusters was produced by JSC (Appendix 11) and interim trace questions developed by members of the group from the University of Queensland.

6.1.2.2 Development of final scripts

Following the workshop a series of scripts were developed. In addition to the core subject topic (*Diabetes*) scripts were produced for kiosk introduction and for the on-screen feedback questionnaire (see Appendices 12 and 13). In addition, a contacts page (*Who to talk to*) and an events page (*What's happening in the community*) were scripted and refined through feedback from content and cultural experts, as was a list of acknowledgments. As noted earlier, an introductory script was later developed specifically for Yarrabah. Production of the final scripts was coordinated by JSC – the importance of ensuring tight control of all versions of the numerous scripts developed in this collaborative effort was emphasised (each script version was numbered and masters retained by JSC). This iterative process demanded frequent and clear communication between JSC and the content team at Inala.

6.1.2.3 Recording of scripts

Recording occurred on site in Inala and involved new technology and methods on the part of JSC to facilitate local recording of scripts and, hopefully, transferability and cost effectiveness (the alternative, studio-based, options are clearly more expensive). For this purpose JSC provided a minidisk recorder and a set of customised instructions, with a set of noise reducing headphones to avoid the necessity of recording in a totally quiet environment (the cost of this equipment is approximately \$1000).

Zip files containing the completed scripts were sent from the UK ready for recording. The scripts were split into two parts, one for a male voice and one for a female voice (to add variety to the program and distinguish system use from topic information). The voices used were those of Dr Noel Hauman and Sr Nola White, both Indigenous health professionals at Inala. The completed sound files were sent back to the UK by post, where they were processed, entered into the database that the software is run from, and tested.

6.1.2.4 Development of the attractor

The attractor resembles a screensaver, a series of images or screens without sound, which play continuously while the kiosk is not in use, each screen having a defined display time. It has a number of functions. It attracts attention, invites people to touch the screen, imparts brief health messages, and displays and promotes local photographs, artwork and events. It plays an important role in conveying messages about local health initiatives, and ideally needs to be updated regularly to maintain people's interest (See section 6.1.4.3, Updating). Both sites had an individual attractor customised to the location. Yarrabah's was updated by the project team towards the end of the project to enhance community engagement, as it did not have the benefit of local voices on the kiosk. (See section 6.1.4.6, Support, for details of how community artwork, photographs and music were sought and included). Straplines for scenic photos were written and included messages like *Health and land go hand in hand; Go fishing and hunting for good healthy tucker; Care for country. It cares for you* (see Appendix 19 for an example of an attractor page for Yarrabah).

6.1.2.5 Commentary

Local script development and recording proceeded relatively smoothly. However there were other aspects to this process which presented challenges, such as feedback and coordination to JSC which was complicated given the number of contributors involved across serial developmental iterations, with consequent time delays. These factors also emphasised the importance of clear definition and understanding of roles and requirements, and a broad understanding by all participating of the overall process (and their part in it). This complexity was compounded because, in this case, the software was written before the scripts, that is, before it was known exactly what was required. Ideally content is built into the software *after* scripts are written and audio is made.

This experience has emphasised the importance of: communication (both in terms of clarity in relation to project tasks, but also in terms of appropriate use of mail versus electronic transmission (which, in the case of audio files was, with current technology, cumbersome); and, a reasonable timeline for script development to facilitate software production; and, appropriate use.

Local updating of the attractor is clearly important in strengthening community ownership and engagement as well supporting local skills development, but was not achieved in either site. The process for updating is described in section 6.1.4.3, Updating.

6.1.3 Development and build

Development and build refers to the technical processes of software development and production (both for the customised and new modules), its integration into the software environment to be used as the kiosk operating system, building it into the hardware of the kiosk itself,

thus producing a finished product ready for installation. Prerequisites to this step include the following:

- Choosing the kiosk hardware and the software environment to be used as the kiosk operating system. These choices are driven by a number of requirements particular to the project;
- Enabling communication between the two kiosks and the UK office;
- Choosing methods for updating the content material on the kiosks, remotely and locally; and,
- Customising and developing reporting tools to suit project needs.

A full description of this process is being provided as a separate report by JSC that will complement this evaluation (a brief summary is included as Appendix 14).

6.1.3.1 Commentary

The choice of hardware and software made by JSC for this project was driven by the requirements outlined in Appendix 14. Importantly, JSC believed the NCR kiosk to be the most portable, attractive, reliable unit able to work under the most extreme conditions, and able to be installed and supported throughout Australia. A stable software platform was selected to house software written to allow for easy content change. These are essential considerations for remote communities where maintenance and freight costs are high. Anti-interference measures were also contained within the kiosk, important in clinical settings where medical technology can cause interference. NCR recommend buying the kiosk with onsite support so that NCR would be responsible for fixing and maintaining the kiosks, but this cost was not supported by the funding body for the pilot project. JSC provided this support and such costs need to be considered in future applications.

Though at the expensive end of the market (and save for an initial glitch during installation involving an incompatible sound card) the NCR hardware proved reliable. The kiosks required no technical maintenance and worked well. A fault with the printer in Yarrabah is yet (at the time of writing) to be resolved but is not likely to be a hardware problem. The appeal of the paper printouts to children was well demonstrated there, showing that they provide an effective incentive for children to use the kiosk and access information tailored to their needs (while clearly effective as an enticement, strategies for taking such use into account need to be developed to avoid wastage). The potential of the printers was not fully realised during the project and needs to be further explored (See sections 6.1.4.4, Printouts, and 8, Recommendations).

Maintaining adequate phonelines in Yarrabah was problematic, making it extremely difficult and at times impossible for JSC to download data over long periods. Sound emerged as an important issue which will influence future design and choices of hardware and software. The importance of sound in enhancing

engagement and understanding needs to be weighed up against issues of confidentiality and privacy for the user. Volume control currently sits with the project team in the UK, whose ability to respond to requests for change is made difficult by the extreme time differences and problematic communications between the UK and Australia and, potentially, within Australia with remote communities.

6.1.4 Implementation

The process of implementation is central to this report and is dealt with below in sections that relate to separate but overlapping activities: negotiation, installation and commissioning; updating; printout capacity; and training and support.

6.1.4.1 Negotiation

The importance of negotiation to this process, particularly issues of ownership and management, was evident from the outset. The differences between the two sites proved to be significant. The clinical service at Inala established clear lines of responsibility and a sense of ownership from the outset, with implementation proceeding smoothly. By contrast, there were competing priorities for time and energy for the local project manager in Yarrabah. Consequently, the vital link to both the kiosk and the community was wanting. However, these different circumstances provided an opportunity to identify crucial points of negotiation required for a well managed, sustainable implementation. Relevant responsibilities include:

- Ownership of kiosk
- Siting of kiosk
- Financial responsibility for:
 - Phoneline rental costs
 - Power costs
 - Maintenance & service costs
 - Insurance costs
 - Printer paper replacement costs
- Assignment of community support roles:
 - Onsite caretaker of kiosk
 - Technical support person
 - Community health promotion person
 - Kiosk manager
- Training of support personnel
- Handover of relevant documents and hardware
- Identification of ongoing support mechanisms.

Site negotiations in Yarrabah were challenging. The original supermarket site proposed by community stakeholders could not be utilised due to delays in opening, which was, ultimately, some twelve months later than planned. Gurriny Yealamucka was nominated to house the kiosk until the supermarket opened, but the project team was concerned that it is accessed by only a few people. The evaluators felt that while they did not

want to unduly influence the decision made, it was their responsibility to facilitate a discussion around the suitability of the site. Ultimately, an alternative, the waiting area of the Centrelink office was chosen which provides a number of services including housing, family support, Australia Post, a venue for land meetings, and other local government matters. It is open nine days a fortnight and is accessed by men, women and children. The kiosk remained there for approximately nine months before being trialed in the new Yarrabah pharmacy (the supermarket still being unavailable). Due to the business failing, the pharmacy closed down a short time later, but had proved unsuitable for a number of reasons. At the time of writing, the original supermarket site is currently being re-negotiated with the supermarket board, and it is expected that the kiosk will remain there indefinitely. A site analysis conducted by the evaluators in Yarrabah concluded that Yarrabah's current health facilities did not meet the criteria set out by JSC for suitably locating the kiosk (see section 6.1.5, Relocation of kiosk, for details).

Inala staff had to weigh up the benefits of placing the kiosk in the main waiting area of the community health centre, where it would be accessed by many more people of whom only a small proportion would be Indigenous, or in the much smaller waiting area of the Indigenous health clinic, where both space and the numbers of patients would be smaller, but the majority of users would be Indigenous. After due consideration the latter was chosen.

6.1.4.2 Installation and commission

Installation and commissioning in both sites was oversighted by a JSC software consultant from the UK. The initial plan called for installation of each kiosk in one day, having loaded the software and partly completed content beforehand, with an introduction for relevant staff to the use of the touchscreen later the same day. A second day was allowed for unforeseen problems that might occur during commissioning, to make any obvious content changes and to train someone to use the laptop update tool (see section 6.1.4.3 Updating). Changes that were not rectified on site were to be logged and put on the 'wishlist' for correction after the first project review, with content uploaded by phone to be completed later.

While both kiosks were installed within one week, there were some initial installation problems between the software and hardware (an incompatible sound card), which resulted in a delay of approximately one month before the properly functioning kiosk was operating. JSC report that this kind of event rarely occurs and were able to resolve it from the UK, albeit with some delay.

The kiosks were found to be extremely portable, requiring only a power supply (with UPS in North Queensland) and dedicated phonenumber to become operational. They require only seven screws to attach them to a wall. Onsite issues such as lighting, power and sockets, dedicated phonenumber and positioning of the unit were to be addressed prior to installation. In Yarrabah the

kiosk was placed in the front corner of the waiting room, attached to the wall at a height most suitable for adults, but accessible to children. In Inala, it was placed on the wall of the waiting room, under the television, accessible to adults and children (see Appendix 15, Kiosk installation checklist).

While the kiosks used in this project are durable they remain vulnerable to 'cruel and unusual punishment' (such as spilt drinks or direct violence). During the life of the project no such problems arose. Indeed, the only obvious cause for concern in terms of durability with this particular kiosk relates to the housing of the printer which could result in problems with the printer itself. This does, however, appear to be rectifiable.

Installation at Yarrabah presented numerous challenges. Some of these reflected distance and differences in time constraints between visiting overseas software consultants and community members involved locally. Thus the site for the kiosk in Yarrabah had not been definitively confirmed on the planned day for installation necessitating a reschedule of the NCR hardware engineer, the hourly cost of which is usually \$200 per hour and availability limited. While alternative arrangements were made, had this not been the case an engineer would not be available again for another three weeks, long after JSC staff had returned to the UK.

Yarrabah kiosk installation was undertaken in half a day rather than a full day because it was a rostered day off for council employees. The office was opened specially for the exercise and was closed again by 12 midday, allowing no margin for error, and the engineers worked under considerable pressure. Because the office was closed, no-one could tell the engineer what the wall that the kiosk was to be mounted to, was made of (a block wall lined with fibro-cement sheeting). A special trip had to be made to a hardware shop in Cairns to get suitable screws for the job, compounding time pressures. In addition, separate phonenumber had not been arranged prior to installation. An existing fax line from an adjoining room was brought through the wall, sufficient to get the kiosk up and running and tested, but requiring replacement to allow JSC to carry out updating, reporting and maintenance work. A dedicated powerpoint was not available. A temporary measure was found but which similarly needed to be addressed as a priority later. Finally, because the JSC software engineer was installing in Australia and liaising constantly with the UK, time differences meant operational work on the ground by day, and email/upload/download of data by night demanding difficult work hours. Of necessity, installation had to take priority over training. A brief update training session was conducted onsite, using an update of the attractor as an exercise to work through.

6.1.4.3 Updating

Updating was planned to allow local customisation of content material, particularly for the attractor, an issue consistently raised as important during the project. While

JSC developed the update tool it was not effectively trialed. During the first months (in which there were many teething problems), all updates were carried out remotely (by dialling the kiosk directly from London overnight and uploading the data files). Inala staff successfully added text information locally to update community events and contacts. For Yarrabah, where local technical support was an issue until midway through the project, and where a major update of the attractor and inclusion of a localised introduction to the kiosk were carried out late in the project, JSC were reluctant to trial local updating and retained responsibility for this through the project. Health staff did, however, work with the evaluator to collect and collate photographic material, artwork, music and community events information, and to produce a local audio recording for the changes to the attractor and introduction. While it was hoped that text changes could be done locally this continued to be UK based.

Both sites were provided with the update tool (a laptop PC which replicates the content of the kiosk) and a set of user guide instructions to make day-to-day changes (see Appendix 16). In theory, they were to begin by making simple text changes to designated pages and if successful, progress to including local photographs and artwork. The latter would require some simple software changes by JSC. Health topics content was isolated so that it could not be affected by any of these changes. Because limited experience was actually gained of the process locally, it remains an important aspect of the project yet to be trialed and evaluated. In the long term, software development to enable local production of health content material will be important to community ownership, capacity building and sustainability.

Updating was also required during the trial to correct technical problems that arose, for example with the sound files (see section 6.1.4.2, Installation). Once sound was working on the kiosks and software updated in the UK, CD updates were cut for all of the media files and sent out as the preferred method of updating, as to do the minor resequencing that was required by current modem connection would have taken many hours. CDs and instructions were sent out to both sites and updates achieved on the laptops and kiosks. In Yarrabah the help of the council IT support person was required to interpret the instructions and translate them to the technology. The evaluator and kiosk manager were unable to do the exercise without guidance. This feedback was given to the software engineer.

6.1.4.4 Printout capability

The kiosk houses a 'tally roll' printer which, at the request of the user, provides a small printout of any of the community contacts listed. In much the same way as an ATM machine does, the unit prints on the paper and cuts it to size before issuing it to the user, preventing damage that may be caused by pulling on the paper before it is ready. Though the printers in both sites have worked well, their capabilities have not been fully explored. The

review process during the project recommended that 'take home' printout scripts be developed for *Diabetes and Joint Pains, Sprains and Feet* (providing brief advice, the 10 most important points about the conditions and tips for self care). The scripts were developed but further production did not occur as the software consultants felt that they were too simplistic in content. The review process also recommended that if 'print' is at the top of the menu users will be less likely to proceed through the material on the screen. Instead, it was felt better for it to be located one layer down requiring users to enter a path first.

6.1.4.5 Training

Following installation of the kiosks, JSC offered systems introduction and training which included a brief introduction to the kiosk, an emphasis on feedback features, a demonstration of what can be changed and how, and how to translate changes from the laptop to the kiosk. Staff were also shown how to change the rolls of paper in the printer. Training occurred as planned in Inala, but was rushed in Yarrabah due to installation pressures. The local kiosk manager later reported that he did not feel confident enough to use the laptop and could not remember the training content. This lack of confidence compounded the inconsistency of support for the kiosk in Yarrabah, and impacted on their ability and willingness to update locally. Feedback from Inala also indicated the need for more staff training about basic kiosk maintenance and the update tool.

There would be benefit in offering a short series of training sessions rather than one-offs, especially on updating the kiosk, to encourage familiarity and experimentation while offering guided support. This is difficult for JSC to deliver, being based in London, but the 'Update User Guide' is clear and user friendly, and could be used by another agent to conduct training at the required pace.

It was suggested that the laptop update tool could also be used as an education tool by health workers. Subsequently, demonstrations of the laptop version of the touchscreen were conducted with twenty service providers in the area to gain their views on the content, the approach, and local issues such as how to target key people. There was consensus that the touchscreen kiosk and laptop are useful educational tools which have great potential, particularly in the area of chronic disease management.

6.1.4.6 Support

Support in this context refers to local activities to maintain the kiosks operational. The differences between the two sites again emerged as key determinants. Basic responsibilities, such as maintaining the power supply and testing aspects of kiosk function, are critical and were most consistently undertaken in the Inala health service setting. These issues were more complex when support activities demanded further communication. This was the case in terms of sound control. For this project, volume

was controlled from the UK, which resulted in communication difficulties due to time differences between the two countries and which were usually undertaken overnight on the basis of email feedback. In Yarrabah this difficulty was compounded by the absence of a designated person to test and provide daily feedback on volume of the kiosk to the UK. As a consequence, the evaluators entered the communication loop. Regardless, lengthy delays resulted. While this particular problem is resolvable with alternative technology that places sound control locally, this experience does exemplify the importance of task responsibility and communication.

The issue of sound also highlights another contextual issue. In the case of Yarrabah the sound was felt to be too loud by some staff working in the Centrelink office who reported that it became annoying. Furthermore, the pharmacist who hosted the kiosk in its second site frequently turned it off because he and his wife also found it annoying. By contrast, sound was not found to be an issue at Inala, even though the space was smaller and generally more crowded. This probably relates to site-specific expectancies.

Support may also be understood to include taking advantage of opportunities to encourage use or integrate the touchscreen into relevant activities. During the course of this project (in January 2002) a WHO Rheumatism Project was implemented in Yarrabah through Gurriny Yealamucka. The project's director was enthusiastic about tying the touchscreen (with its *Joint Pains and Sprains and Feet* content) into a followup community education strategy, to be developed by Yarrabah health service providers with results of the screening program posted on the touchscreen. The lack of support for the kiosk in this setting, however, meant that opportunities such as this were missed.

In response to the local implementation and evaluation issues in Yarrabah, the following task-focused roles were identified by the local owners of the project and the evaluators. The need for identification and ownership of these roles became a priority as people realised the complexity of project implementation and project success was contingent on building a strong sense of ownership and commitment by key people within the community. The evaluators felt they had a legitimate role in facilitating project development through positive critical feedback, and by promoting discussion and resolution of key issues. Relevant roles and responsibilities that were developed during the project are outlined below.

Caretaker of Kiosk:

- Check kiosk is working each morning
- Clean the screen each morning
- Reboot if necessary (turn off at powerpoint for 30 seconds, then switch back on)
- Replace paper in printer if required. Advise Operations Manager when new paper needs to be ordered from NCR

- Provide feedback to Operations Manager on issues such as kiosk sound volume
- Contact Operations Manager if there are problems.

Technical Support

- Ensure power supply (UPS) and access to phoneline are maintained
- Caretake the laptop (used for updating)
- Perform technical updates on kiosk using laptop when required
- Notify the software consultants by email (cc to Operations Manager) of any technical issues that arise. Wait for their direction. They may advise that you need to contact the kiosk company (NCR)
- Notify the Operations Manager when you are advised to contact NCR for repairs.

Kiosk Promotion

- Introduce and demystify the technology for people in the community
- Conduct community education and health promotion activities relating to the kiosk
- Provide input into changes to the attractor screen – local photos, local artwork
- Provide input into updating of 'what's happening in the community' & 'who to talk to'
- Contact Operations Manager regarding ideas or problems.

Kiosk Manager

- Maintain ownership of the project
- Give support & direction to other community support roles
- Manage placement issues (eg conduct site negotiations with supermarket or other site)
- Make decisions about content changes on the attractor screen
- Conduct relevant community negotiations (eg with Community Council)
- Conduct weekly review of kiosk – go and use it, going through each part, to make sure that things are working properly. Record results in technical diary
- Make service calls to NCR when maintenance or repairs are required
- Phone NCR when new paper is required for printer
- Collate and secure Feedback Report information.

It will be obvious that this is a complex set of responsibilities, particularly in a non-service setting. In June 2002, interviews were conducted with two Gurriny Yealamucka employees who had had an experience of providing community support roles for the health touchscreen project in Yarrabah. In an open, conversational style, they were asked:

- to comment on this experience of providing a community support role,

- about the real implications for the role,
- about how realistic it was for them as Health Workers to carry out the role, and
- to offer recommendations for the future.

In terms of the technical support role:

If I had my way I'd do the whole thing (the graphic design and layout). Make it the way to get to the people here.

It's a realistic job for me to do. I felt comfortable with it. I didn't look complicated. It's just the equipment. Doin' them posters and that. How the photos were blurry. I need to update my computer and get new software. I need to be set up to do it. My equipment is fine for loading digital photos and things, and updating the text, but not for posters. And I've got a digital camera I can use.

As for time for it, when I've had time I've done it and it's been okay. (Long pause) But it's testing me too, to see if I can do it. But one day, I can see it (the touchscreen pages) looking totally different. I could change the whole thing.

I suppose in the long term it's gunna be different. In the short term it's gunna be me getting used to the laptop and to downloading. I've never done it before. It'll be easy because I understand it, but it's a matter of being shown the first time.

I reckon that in one year, there'll be more local people talking on it. I would change the backdrop on it, the orange part of the screen. Take that out. It's not really cultural for us. Doesn't really capture the eyes. It'll give me the opportunity to change things. Put more information for and about young people on it. Should be more community events on there. Photos. I want to write to the Seahawks (Yarrabah rugby league football club) to ask whether I can stand on the sideline and take photos. It would work two ways. Might encourage people to come along and support their team and be on the touchscreen. I can be like a journalist but with a digital camera. Capture the community events.

In relation to community promotion for the IT project

I don't mind doing this job as long as it doesn't take me away from the real job I have to do. The one that Council is paying me for. But it's not an everyday thing, maybe only once a fortnight.

We're so short of human resources here, the touchscreen can do a lot of work for us. I think it's a really valuable thing. It can free people up to do other things. It can provide education for people, but it can also advertise what's coming up in the months ahead – like NAIDOC, the sports events, health programs. Then everyone's up-to-date with us and everything that's going on. Even the store could advertise healthy food that's coming on special.

I reckon you're looking at a full-time job there, with CDEP base and top-up or something. Because there's so many things you could do with it. And to keep it changing all the time, and to keep people interested. You need an outgoing, committed community person who can really relate to people and services in the community. To go to the school

and do education, and to get the kids doing artwork for that health program, and to put it on the touchscreen so that everyone can see it. And the kids can see it and be proud of what they do. And to put all the things that people want to know. Like who women can contact at the Women's Resource Centre in an emergency. Print out the name and number. The rehabilitation centre contact for people when they need it. So many things. Not just health programs.

The eye clinic (run by Wu Chopperen) is so big at Gurriny now. We have some digital photos of it. We could put those on with the dates of the next eye clinic. And some photos of me taking a sugar test from someone. People can start to see what we do at Gurriny, and they can know who they need to see for different things.

I would love to take it on, as long as I don't get too involved, just once a month. If I could have someone come with me, a CDEP person that I could train up, that would be good. Then I could hand it over when they are confident.

But we need to stabilise it and keep it in one place, and really get it going. I think it's a wonderful machine and we should definitely keep it. We don't want to lose it. Let it start with me and I can hand it over.

The Senior Health Worker at Gurriny Yealamucka emphasised that because this technology is new to the community, there is an important marketing role for project staff: “people need to be told what the machine is for, how to use it, who it is for, and to be proud of it, because it is theirs. They need to own it. It's there for the betterment of their health and families”. She suggested that the first step was to make a laminated poster telling people what the kiosk is and inviting them to use it. This was done, though, as the trace data demonstrates, there is no obvious difference in use as a result. The second suggestion in relation to promoting use involved spending time at the kiosk on a busy day, for example a pay day, and personally introducing people to it. However, observation of this exercise on a busy pay day suggests that people were in the Centrelink office for a particular reason and for as short a time as possible. They did not appear interested in being ‘hijacked’ to see a health program. It is important to note that the pay office was actually adjacent to the waiting room that housed the kiosk, so people had to be enticed inside to see it and were, as a consequence, apparently uncomfortable. The exercise was not repeated but it would appear to be appropriate in the right setting.

In the different context of the Inala clinic there was clearly a difference in staff willingness and interest to engage with the kiosk. Thus, in the early weeks of what was a reasonably problematic installation in Inala, the kiosk lay fairly dormant and was without sound. During her first site visit, four weeks after installation, the JSC software consultant arrived at the clinic to find staff: “standing around a talking kiosk, all smiles – they had had patients use it today. So much for our introducing it. Apparently a patient just came up and touched it, which was when Nola realised it was working”. This level of

general interest probably reflects the relevance of material and a sense of ownership through participation in the production of the content and recording of sound. That staff did not seem active subsequently in introducing patients to the kiosk probably relates to service load rather than interest.

JSC tailored a generic problem form for this project to enable support staff to communicate technical problems by email, by using a paper-based system, or both. At Inala it was not utilised during the trial as there were few problems after the initial implementation was completed. By contrast, in Yarrabah it appears not to have been used as the evaluators were perceived to be a much more immediate, accessible and real point of contact when assistance of any kind was required. Staff in Inala are comfortable and well practiced in the world of global email communication, and were happy to converse directly with JSC in London throughout the project. In the context of a remote community the importance of a direct personal contact appears clear.

6.1.4.7 Commentary

Participation in the process of implementation demanded that the Project Officer learn a significant amount of technical material as well as facilitate complex interactions between various parties. The experiences in Yarrabah throughout the project clearly emphasise the importance of negotiation prior to project commencement and the need to foster a sense of ownership and pride in the people who are the recipients of the project. Trust and clarity of communication is essential between the person 'championing' the project and other key organizations in the community. The 'champion' needs to be confident to negotiate the practical arrangements that are essential to facilitate installation, such as power and phonelines which, for larger rollouts, will be essential to containing costs. The JSC software engineer commented that for future translation to other sites, the setup and installation method would have to be streamlined and standardised to support these activities locally rather than from the UK.

Critical to implementation and supporting this technology are a number of process activities, for instance, to enable routine local updating of content material. Community protocols for these activities were developed during the course of the project but should, ideally, be part of the negotiation and planning phase. Similarly, a set of quality assurance measures needs to be defined to standardise the quality of material produced for inclusion. In addition, a backup process for incremental changes to content, on disc or server, needs to be developed for all versions of material produced on all kiosks. Currently updates are solely under the control of the production team in the UK, so backup and quality assurance measures are not issues, but feedback about the importance of local customisation make them a priority for future work.

6.1.5 Relocation of kiosk in Yarrabah

Relocation of the kiosk from the Centrelink office to the pharmacy occurred nine months into the project, as a result of advice from the supervisor that the Centrelink office (which would itself house two touchscreens) would close at the end of January 2002 and move to a space adjoining the pharmacy and supermarket. The new Centrelink office would house two touchscreens of its own. The pharmacy was chosen primarily because the opening of the supermarket was delayed. It also provided the opportunity to expose the touchscreen to a different audience, to observe its use in a setting more closely related to health, and to see it operating in a setting where its caretaker appeared to have a greater interest in it and its content, including the ways in which it might benefit his clients, particularly diabetics.

Relocation would usually be organised and negotiated by the kiosk manager in the community. In this instance the task fell to the evaluation team. In this case, preparatory tasks included:

- Negotiate terms and conditions, including costs
- Obtain quotes for replacement value of the kiosk for insurance, including costs for supply of the kiosk, installation of NT, supply of printer, installation of software, installation onsite, freight and testing. A note is required from NCR confirming that the system is being fixed by an approved supplier.
- Book NCR engineer and obtain quote to relocate kiosk. Allow for time differences when booking the engineer, because JSC will need to conduct tests in the UK during installation to ensure that the modem is operating on the kiosk as required.
- Provide engineer with information on what the wall is made of, gyprock, render etc. so that the appropriate tools are onsite.
- Obtain quote for costs of NCR engineer:
 - relocation (deinstall, relocate & reinstall)
3hrs @ \$199/hr = \$597.00
 - return travel from Cairns:
2 hrs @ \$199/hr = \$398.00
- Total cost for relocation (including GST) = \$1094.50
- Organize installation of a dedicated phoneline, powerpoint and UPS onsite
- Send the new phone number and contact details to JSC to enable testing of the modem at the time of installation and the download of traces.
- Confirm beforehand with JSC any onsite testing that is required.
- Ensure that the criteria set down by JSC for suitable positioning of the kiosk are met (JSC have recently provided a 'Kiosk Installation Guide'.

The remote community context provided further complexities. Critical factors such as a dedicated phoneline not being installed prior to installation, the inability of the engineer to remove the kiosk from a tiled wall, time pressure, and difficulty reinstalling onto a wall that was not flat, resulted in an installation process that

occurred over two days instead of one (normally prohibitively expensive – the evaluators covered these costs as the project team was unable to). Remoteness also impacts on the availability of specialised personnel. There was one NCR engineer who travelled to remote communities in North Queensland. He conducted the installation on his last day of work with the company, cancelling other jobs to complete it. Problems such as the lack of a dedicated phonenumber would otherwise have meant postponement of the job. The phonenumber issue took some time to resolve, (it was only installed after the evaluators agreed to meet the costs), and it was just one of the reasons that the pharmacist frequently turned the kiosk off. As a result, JSC were rarely able to access the kiosk to upload new material and to download trace information. The new musical introduction, photographs and children's artwork on the attractor have still not been seen in Yarrabah at the time of writing.

At the time of installation in the pharmacy the kiosk and printer functioned well, though the screen's visual impact was compromised by its proximity to a large glass window. Because of powerpoint location the kiosk was higher than in the previous setting and not as easily accessible to smaller children, though adults could use it comfortably. It was agreed that a large poster inviting people inside to use the kiosk would be made, and placed on the window adjacent to the screen, to create shade for it. Posters were also made for inside the pharmacy, inviting people to use the printer, and making them feel welcome to use the kiosk generally, though they were never put up. Kiosk support staff reported feeling uncomfortable about going into the pharmacy, and once again had very little contact with the kiosk.

These difficulties may be attributable to the decision to locate the kiosk having been made primarily by the project team and not the community. The difficulty at the time was that there appeared to be no alternative. The pharmacy closed its doors within two months and the kiosk remains behind locked roller-doors at the time of writing. As of the beginning of September 2002 the supermarket operator had raised concerns about the kiosk being located there as this could encourage young people, with whom there were at that time some problems, to gather. The decision about the location of the kiosk is now with Gurriny Yealamucka who are considering site options, the most obvious being in Gurriny Yealamucka itself or in the Queensland Health Community Health clinic.

Towards the end of the project, the evaluators negotiated with Gurriny Yealamucka's Health Committee to formalise ownership of and responsibility for the kiosk, before assisting in the process of negotiation required to once again relocate the kiosk, this time to the supermarket. A 'Community Handover Checklist' was developed as a guide to process. At the time of writing, the board of the Yarrabah CDEP Community Store were yet to inform Gurriny Yealamucka of their approval. When approved, the kiosk manager in Yarrabah will take on full responsibility for relocation.

The engineer made recommendations to enable easier installation and maintenance in the future. They include purchasing a 'one-piece wall mounting bracket' instead of the two-piece which was supplied with this kiosk, and a new APC Back-UPS 500 which will come standard with a phonenumber connection to prevent surges coming down the line.

6.1.6 Process evaluation reflections

Participant observation in components of development and implementation of this technology entailed involvement with two overlapping but distinct processes, one being technical, the other, broadly, social. The technical components of this project were largely conducted off-shore and were not amenable to observation by the Project Officer. Furthermore, early plans to obtain feedback in depth from the technical consultants did not occur as these reflective activities were not covered in the budget allotted for technical purposes to JSC. This evaluation team was informed that these issues would be addressed in the technical report to which the reader is referred.

In relation to the social or contextual factors associated with content development and implementation of this technology the blurred boundaries of the evaluation team provide insights. The evaluators were involved from the outset in progressing this project and remained so engaged throughout its course. While this clearly raised concerns regarding the ability to separate roles as evaluator versus facilitator, it also provided a privileged position from which to ascertain the coordination and support dimensions associated with the project. It can safely be said that these were significantly greater than had been anticipated, with the Project Officer functioning as the key link between community and various technical and content experts. This role was substantially more demanding in the community setting compared to a health service. This role was more than simply functioning as a conduit of information, or encouraging action to undertake particular tasks. It involved, at times, complex processes of translation across the different understandings and expectations of technical experts and community members. It also involved becoming knowledgeable and conversant in technical areas and in terms of technical and human resources necessary to maintain kiosk activity. Finally, it required being attuned to and capable of responding sensitively to the different demands that result from corporate versus community agendas.

6.2 Outcome findings

This project set out to explore two related issues – the use of a specific technology to health ends, and the effectiveness of that technology in addressing a specific health issue – diabetes. For reasons outlined earlier, it was not possible to measure outcomes in terms of changed health behaviour or status. Outcomes are thus considered here in terms of the acceptance and use of

the technology by relevant users, and the impact of this use on health understandings and health-behaviour intentions as determined from user and provider interviews.

6.2.1 Utilisation

As noted earlier, relevant questions in relation to utilisation include:

- Who are the users?
- Who are the users of interest?
- What are the patterns of use of the latter and what are relevant influential contextual factors?
- What do these users think of the technology/content?
- What do health service providers think of the technology/content?
- What do health service providers think of the use of the technology/content?
- How do health service providers themselves use the technology/content?
- What do other relevant stakeholders think (Council, other relevant services)?

In the following section data are presented in relation to utilisation as determined from:

- Trace information;
- Key informant interviews;
- Exit interviews.
- Diabetic patient interviews; and
- Observation.

Drawing on the experience of MediBooks in the United Kingdom in which a 'comments box' was used successfully to gather written information from kiosk users, a proforma was developed and located adjacent to the kiosk at Inala. This approach was not fruitful and only two comments sheets were filled out (the proforma and the two comments received are included as Appendix 17). Clearly this approach in an Indigenous setting does not appear likely to generate useful information.

6.2.1.1 Trace information

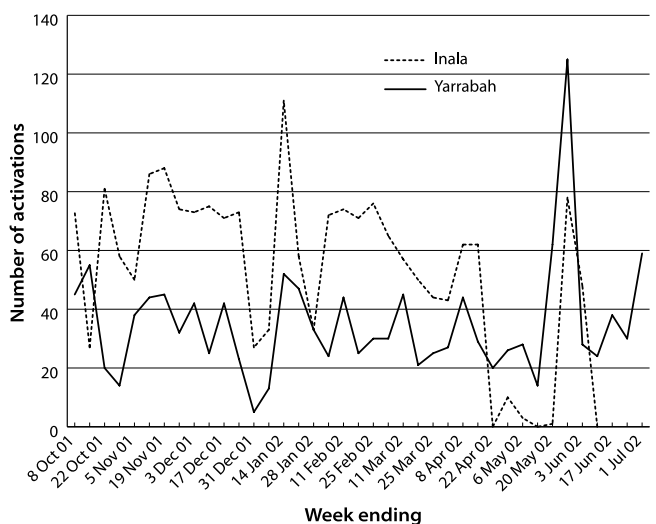
Internal traces within the program were utilised to gather data in relation to kiosk use, and were supplemented by an on-screen questionnaire that was used to elicit information regarding both kiosk use and content. These questions were formulated at the beginning of the project and were done so on the basis of relatively limited understandings of the capacities of this approach on the part of the content and evaluation team. With the benefit of hindsight and a more sophisticated understanding of Indigenous responses to kiosk-based questionnaires a different structure may have provided additional benefits. Unfortunately, to change these elements while the project was in train would have compromised subsequent evaluation. The results presented below address kiosk and available comments regarding subject materials (specification of

format for trace capture files, and a detailed statistical analysis of trace data replicated in Appendices 20 and 21 respectively, only relevant positive findings are presented below).

6.2.1.1.1 Results

Between mid-October 2001 and the end of June 2002 there were 3280 activations of the kiosks, 1373 (42%) of these occurred at Inala. The temporal distribution of activations is shown in figure 6.1 which demonstrates troughs for both sites associated with Christmas, and for Yarrabah for late April and May 2002 during which time the kiosk was being relocated from the Centrelink office to the pharmacy, and in mid-June when the pharmacy closed. Of these 3280 activations there were 1987 sessions where at least one selection was made. The proportions of activations that were spurious were substantially the same in Inala (37.1%) and Yarrabah (41.0%).

Figure 6.1: Number of kiosk activations by week and community



The distribution by day of the week (table 6.1) demonstrates the anticipated absence of activity on weekends but also service activity-related features (pension/pay day at Yarrabah on Thursday with limited activity on the following day, clinic scheduling at Inala).

Table 6.1: Kiosk sessions by day of week and community

Day	Yarrabah	Inala	TOTAL
Mon	220	156	376
Tue	268	198	466
Wed	231	182	413
Thu	303	83	387
Fri	89	225	315
Sat	12	18	30
Sun		2	2
TOTAL	1123	864	1987

Access to content was determined by activation of at least one content rich sequence. Of the 1987 sessions in which at least one selection was made, 58% of activations at Inala and 48% of activations at Yarrabah involved activation of at least one content rich sequence (table 6.2). Descriptive statistics of the number of content rich sequences accessed per session, and the number of content rich sequences per session are presented by community in tables 6.3 and 6.4.

Table 6.2: Access to content (at least one content rich sequence) by community

Community	Content accessed	No content	TOTAL
Inala	505	359	864
Yarrabah	541	582	1123
TOTAL	1046	941	1987

Table 6.3: Descriptive statistics of the number of content rich sequences accessed per session

	Yarrabah	Inala
Median	0	0
Mean	1.1	1.4
Std Dev.	1.47	1.64
N	1123	864

Table 6.4: Number of content rich sequences per session, by community

No. of content rich sequences accessed	Yarrabah	Inala
0	582	359
1	191	166
2	198	183
3	76	79
4	39	38
5	15	19
6	12	7
7	6	5
8	2	4
9	2	1
10	0	2
11	0	0
12	0	0
13	0	1

This data is not normally distributed. Sessions at Inala were significantly more likely to access at least one content rich sequence (RR(95%CI) = 1.21(1.12-1.32),

p<0.001). Furthermore, the number of content rich sequences accessed per session was significantly higher in Inala than in Yarrabah (Kruskall-Wallis p<0.001). This may partly be due to the location of the kiosk within the health centre setting in Inala.

Of all content rich sessions, 2% ran longer than 21 minutes. The longest session was listed as 4320 minutes. This result (72 hours) is clearly spurious. Sessions longer than the 98th centile (21 minutes) were excluded as outliers. Summary statistics of the resulting 1026 sessions are demonstrated in table 6.5, which shows that 50%of sessions lasted between 3 and 7 minutes.

Table 6.5: Summary statistics of the length of sessions in minutes, n=1026

Summary measure	Value (minutes)
Mean	5.25
Median	4.81
Std Dev.	3.47
Minimum	0.00
Maximum	20.85
25th centile	3.00
50th centile	4.81
75th centile	7.00

In terms of the relationship between session length and content, the number of content rich sequences accessed was a significant (but poor) predictor of the temporal length of a session (r2 = 0.196, p<0.001).

Of the 1987 sessions in which at least one selection was made, a further 941 where no content was accessed are excluded from the subsequent analyses of the remaining 1046. Of these, sessions where content was accessed in Yarrabah were significantly less likely to have a survey question answered than those in Inala, RR = 0.70(0.56-0.87), p=0.002 (table 6.6). Sessions where content was accessed were no more likely to answer a question than sessions where no content was accessed, suggesting the importance of site/location rather than content access in relation to likelihood of answering questions.

Table 6.6: Access to content (at least one content rich sequence) by community

Community	Answered any questions?		TOTAL
	Yes	No	
Inala	105	436	541
Yarrabah	140	365	505
TOTAL	245	801	1046

The on-screen questionnaire contained five questions. The number and proportion of sessions where each question is answered is shown in table 6.7.

Table 6.7: Question subject matter, number of respondents and response rate

Question order	Subject of question	Number of respondents	Response rate (%)
1	Ease of use	383	36.6
2	Prior use	381	36.4
3	Age	360	34.4
4	Gender	348	33.3
5	Ethnicity	330	31.5

By correlating the question rank with the response rate we find a relationship of:

Response rate = 38.4 – 1.33*Question Rank (r2 = 0.96).

This means that almost 62% of participants did not answer any questions and there is a consistent drop-off rate of 1.33% for each additional question that is asked. There were no significant differences between the responses given in Inala and Yarrabah (table 6.8).

Table 6.8: Responses to survey questions, by community

Subject of question		Yarrabah	Inala
Sex	Male	55/156(35%)	80/192(42%)
	Female	101/156(65%)	112/192(58%)
Age	<20	70/164(43%)	94/196(48%)
	20–34	45/164(27%)	40/196(20%)
	35–49	25/164(15%)	32/196(16%)
	50+	24/164(15%)	30/196(15%)
Ethnicity	Indigenous	121/145(83%)	143/185(77%)
	Non-Indigenous	24/145(17%)	42/185(23%)
Prior use	Yes	69/178(39%)	93/203(46%)
	No	109/178(61%)	110/203(54%)
Ease of use	Easy	102/186(55%)	119/197(60%)
	A little hard	27/186(15%)	24/197(12%)
	Quite hard	12/186(6%)	17/197(9%)
	Very hard	45/186(24%)	37/197(19%)

While there were no differences in ease of use by site, a significant increasing trend in the proportion of respondents who answered 'Very Hard' and increasing age (p trend = 0.038) was evident (table 6.9).

Table 6.9: Association between self-reported age of the survey respondent and the answer given to the 'Ease of Use' question

Age	Answer to the <i>Ease of Use</i> Question				Total
	Easy	A little Hard	Quite Hard	Very Hard	
<20	85	19	10	21	164
20–34	42	8	3	14	85
35–49	31	5	3	7	57
50+	19	4	5	15	54
TOTAL	221	51	29	82	1046

There was content available in two subject areas (pain and diabetes) on the kiosk and the proportions of total activations in which content was accessed, by subject and community, are demonstrated in table 6.10. There were no significant associations between the access to pain and diabetes data and age, gender, ethnicity, reported ease of use and prior use of the kiosk.

Table 6.10: Access to pain and diabetes data by community

Data accessed (%)	Yarrabah	Inala
Pain data	49.8	50.2
Diabetes data	54.0	46.0
N	541	505

In addition to questions regarding use there were a small number of questions relating to the two subject areas. In approximately four per cent of sessions the survey questions relating to pain were answered. For the diabetes specific questions, approximately one half of a per cent of session provided answers. While these proportions are small, it is also clear that this technology offers a means to gather information regarding perceived needs and priorities independent of the subject content. Thus, in response to the question seeking user's desire for further information the four most commonly identified areas were women's health, kids, and drugs and alcohol.

6.2.1.1.2 Summary and methodological reflections

A similar proportion of activations were spurious (no further buttons pressed after the kiosk screen was activated) in Yarrabah and Inala. Beyond this however, it seems that kiosk users in Inala were more likely to access content and accessed more content on average. While the likelihood of users answering any of the survey questions was independent of whether they had accessed any content, Inala users were more likely to answer the survey questions than Yarrabah users, these differences in utilisation between the Yarrabah and Inala settings possibly reflecting the contexts of the kiosks.

Fifty percent of the users of the kiosk engaged the machine for between three and seven minutes. This indicates that the capacity of a kiosk is somewhat less than 100 sessions in a eight hour day. There were very few sessions where both pain and diabetes content were accessed. Whether this is due to a high degree of specificity in the demand for content by individual users or whether this reflects an inability to navigate back up the content hierarchies is not known.

The response rate to the first survey question was low (~37%) and rates decreased with subsequent questions in a linear manner. This indicates that many users walked away from the machine before answering any questions or during the survey. While there is probably little that can be done to improve the number of people who answer the first question, there may be ways in which people who initiate the survey can be retained.

It appears that age is weakly associated with reported difficulty is using the machine. However, it is possible that in reality this association is much stronger than is shown by the session traces, given that sessions traces are only available for clients who completed their sessions and successfully answered the questions. This suggests a bias in that people who had the most difficulty with the kiosk are probably less likely to have answered the questions.

While the issues noted above make it difficult to interpret the data, it appears there were no significant associations between self reported age, ethnicity, ease of use, prior usage and gender and the content accessed in the session.

The method used in this instance to capture the activity of users of the kiosk used a summary of each activation. This method allows reasonably sophisticated analyses to be performed in terms of associations between content accessed and survey answers given.

Another possible method by which to track the actions of the user would be to record the timestamp for each button pressed on the kiosk. This would allow the analyst to determine the amount of time spent looking at each page and to determine points at which the users allow sessions to “time out”. While this method would allow for a more powerful analysis, the costs of analysis would be substantially higher.

6.2.1.2 Key informant interviews

Key informants were identified in both sites who had primary care responsibilities in relation to chronic disease, specifically diabetes (the proforma for this interview is included as Appendix 3). This turned out to be particularly difficult in Yarrabah, reflecting uncertainties associated with changing sectoral and service responsibilities, high (and recent) turnover of staff, and the location of the touchscreen away from the primary care service. The interview with Yarrabah providers was dominated by concerns regarding service load and collaboration/communication. While these providers were not placed to observe kiosk use directly, issues raised included sound (in terms of privacy), the benefit of a self-directed instruction tool and the potential usefulness of a laptop version for health professional use. Based on their experiences these providers also identified further topics for consideration:

- Glue ear and how to prevent it
- Hypertension and its consequences
- Sexual health
- Immunisation program/schedule
- Rheumatic heart disease
- Caring for babies and young children (a module for young mothers)
- Good tucker for babies (utilising existing poster content)
- Skin infections and infestations.

At Inala, interviews with primary care staff were held at two points in time – August 2001 and April 2002 (two and eight months after commencement of the project). The placement of the Inala kiosk was acknowledged at the early interview as an issue of some complexity. Locating it in the waiting room of the Indigenous health clinic, which functioned only three days a week, offered, on the one hand, the opportunity to target Indigenous users, but at the expense of wider access. This space is also relatively small and the rapid turnover of patients provided little time for potential users. However, another informant noted that being so located allowed for supervision of the kiosk by responsible staff and, additionally, provided for a sense of ownership and investment by clinic staff (this issue was also raised in relation to comments regarding local contact with software producers and ability to produce and update material). Indeed, questions were raised by staff members from elsewhere at the Inala complex as to why this resource was not more widely available.

The importance of the first experience of kiosk use was raised, specifically that it was non-intimidating. All informants were agreed that young users, and possibly males more than females, were both less intimidated and more likely to explore the kiosk and its potential. One practitioner noted that known diabetics did not seem to be using the kiosk, which may reflect the age differential among users. This may also go some way to explain why the Joint Pains, Sprains and Feet module received greater attention, as users tended to be:

the younger ones. A lot more younger people use it – the ones in their thirties and forties and less. Both men and women – probably those with a high school education. For example, the young athletic types with a sports injury go and look at the pains and sprains. The older ones are more reluctant, unless there's no-one else there in the waiting room. If it's crowded it's the younger ones who come forward.

Getting started clearly demanded different levels of support or encouragement, for instance some users required:

prompts from us. People would ask us about it and then we'd show them, and they'd continue on from there. Some of the younger ones will encourage others to use it after them. And often it's just the machine itself. Some people just walk in, see it, and have a play with it.

The initial interaction thus appears to be a more significant issue with respect to older users for whom technology more generally may be intimidating – however perhaps less so in this setting than in others, as suggested by two comments:

It has lived up to my expectations. There are more people using it here who would have been afraid to touch them in other places. But they are happy to do it here where it feels safer. Lots of people still ask what it is.

We will try and change older people's attitudes so that they can be more confident using this kind of

technology. Make it easier for them to use it in other places. A lot of older people won't use ATM machines and will only withdraw money from the teller in their bank. But it costs them to do that. It would be good to get them using touchscreens.

While the technology is used, provisions for specific groups, particularly older users who are those most likely to have health information needs, were raised as a longer term priority:

I am surprised because way more people are using it than I expected. One of my early questions was, Will Aboriginal people use this technology? And the answer is yes. But only the younger ones. We need a strategy to encourage the older ones to do it.

One of the difficulties presented by very young users is intentional but non-health-purposeful use. For example, while the Yarrabah kiosk was briefly located in the private pharmacy, the pharmacist made a number of observations regarding use by children who came to the pharmacy to buy confectionary. He noted that children would play around on the screen, often activating the printer and selectively making certain on-screen commands to generate particular sound patterns. Indeed this resulted in the computer being unplugged in anticipation of children arriving and frequently not being reactivated, raising another set of problems relating to local support.

Regardless of user age, maintaining interest over time was discussed by several informants who noted the importance of relevant and current material on the attractor. Various innovative suggestions were made in relation to engaging content and some providers noted the comments of users who had remarked positively about having a personally recognisable voice associated with the modules.

Being located in a clinic waiting room, kiosk users at Inala often had their kiosk use interrupted as they were called to see the doctor or for some other clinical purpose. Some of these users constituted an important subgroup of repeat users. While repeat users clearly constitute a minority of observed users, it was noted that:

Some people are using it again, a couple or a few times. Sometimes because they've only been able to see a little bit of what's on there before they get interrupted by the doctor. So they come back next time – the younger ones mainly, although there is one older diabetic woman I have noticed using it again.

This raises the issue of the purposeful use of the kiosk as a means to access supplementary information, either as a means to clarify or to raise particular issues with a practitioner, for instance with:

people who are confused about something, for example, taking their blood. They might say to the doctor "I heard it on the screen outside," and get an explanation from him, but they can also then go back to the touchscreen and listen again and again until they understand.

An issue raised which cannot easily be ascertained either

from internal trace records or observation is proxy use (both in terms of learning about use and learning about content):

A lot of people sit and listen while someone else is using it – doing the hard work. They get to hear the information that way. I guess we don't know how many people are happy to sit and listen instead.

6.2.1.3 'Service user' interviews

Two sets of interviews were undertaken with 'service users' at Inala – service users defined as patients at the service, thus actual or potential kiosk users. Fourteen exit interviews were undertaken by the Project Officer with patients following their clinical contacts utilising a standard interview schedule. This provided information, primarily, on kiosk usage (rather than content per se). To obtain further information on the content specifically produced for the project (diabetes) a focus group was also planned. Ultimately, for a range of reasons, this was not possible and the four diabetic patients who had earlier agreed to participate in a focus group were interviewed individually by an Indigenous health practitioner utilising the question format for the focus group. This small group thus constitutes a further set of service users (the exit and diabetic patient interview proformas are included as Appendix 4).

6.2.1.3.1 Exit interviews

Of the fourteen individuals approached opportunistically on leaving the Inala clinic setting, all had noticed the wall-mounted kiosk. Of these, nine (64%) were aware of what the unit was. Of the five who were not aware, all accepted the offer to have the kiosk demonstrated. Of the nine who recognised the purpose of the kiosk, six had previously used a similar machine (Centrelink (all six, 43% of all interviewed), Brisbane City Council, the Gabba and Global Arts Link in Ipswich), and seven had tried the Inala health kiosk itself (50% of all interviewed), three of whom indicated that they would use the kiosk again at some time in the future.

Clearly, then, there was familiarity with this technology from other settings. Regardless, 'permission' to use kiosk appears to reflect a broad set of factors beyond awareness and familiarity. This includes preconceptions: "I thought it was a game so I never touched it", visual acuity: "I'm not always carrying my glasses, so I don't do things I have to read", personal relevance: "I just saw the diabetes sign on it, and thought it was only for people with them problems". Others used the kiosk after observation: "I just happened to be there. Seen other people use it. So one day when I got game enough I used it", after asking staff or, as occurred later in the project, after a sign was attached to the kiosk inviting use.

One patient, who had not operated the machine himself, exemplifies both hesitancy and proxy use: "My missus uses it every time she comes here. She told me what it's all about. She tells me everything I need. I don't need to use it. I'm not interested really". This individual was the only respondent who at the conclusion of the interview

refused an offer of being taken through a trial run. His comments suggest interest in content but reluctance or disinterest in using this technology. A possible explanation was suggested by a respondent's description of similar kiosk's elsewhere – literacy:

Those other ones like in Centrelink don't have sound. Just touch them and then you have to read. They're a waste of time. People want to print out on those, you know, to take information on a job, but they can't even read the instructions, can't do it. Then they feel shame. The young ones not so much, but the older people. This one here though (the kiosk) that's a learning system, and a good one. They should have sound on the ones that you use to get your driving test.

This issue was emphasised by another respondent who stated: "It's easy for people to use. You don't have to read too much. They're doing the talking for you", and also by a young man in his early twenties who noted that obtaining important health information this way was: "Better than pamphlets. Two or three years ago I couldn't read or write, and lots of people can't. So I reckon the voices are great".

First time use clearly is important, one respondent commenting that it was "a bit confusing. You can't follow it properly. Harder than poker machines. But at least it's free". Although the earlier comments emphasise the importance of sound, another informant was put off by the volume:

I touched it once. But it made a big noise, and it was quiet all around, so it was too embarrassing to touch it again. I didn't want people to hear what I was looking at. I wanted it more private. It also sounds like one of those recorded voices on the phone or something.

However, recognising the voice associated with the modules was commented on several times as a reassuring factor. This may reflect that the voice is a known Murri person, a professional, or both, as suggested by one informant: "I listen to the same story every time – Noel's story. Diabetes story. I just sit there and play with it. I just listen to Noel's talking and that's enough. I don't answer the questions. The best thing is that sound".

While first time use may be simply curiosity driven it may, however, increase the likelihood of later purposeful use:

I thought it was okay. Then later on, when I hurt my shoulder, I came back to it. I had to go and see my musculo-skeletal doctor and he gave me a questionnaire to fill out – to cut down on the time he has to see me. So I came down to the touchscreen to get the information – help me fill in the answers. Like where the pain is and things.

Such, almost furtive, first time use may also inform others' use, for instance: "I just used it that once, really quickly, but now I'll be telling people about it, to come and get information about their diabetes and things". It may also allow users to obtain information for others, for instance: "It's very handy to know – informative. Because all

of the conditions my husband has – diabetes mellitus, hypertension and so on – I would like to see more information put on it".

A number of issues perceived as problems were raised, the most frequent being privacy in terms of being able to control sound volume or to mute it. Response time, location of activation buttons, ways of making it even easier for people without literacy, and certain other issues were also raised. A range of suggestions were offered regarding the technology or its use, the more detailed of which are included below:

I think that the waiting room for the clinic is a good place for it. You could put information for women on it, like where they can go to get help – where the women's shelters are and things – so women can know. You could have different ones in schools for the kids, on kid's nutrition. You could put one in the library and put simple to-the-point information on it for them to help them with their school assignments. So they can find information easily when they need it. Libraries are hard for kids sometimes.

You could put information for women on it about breast cancer. And for people with disease, real bad illness with no immune system left – like mine. I reckon a lot of people will use it to find out about their illness, but also it would be good for me if more people understood what I've got (ITP) so they can understand what my life is like.

This is a good place to have it. I admire them in this place. But you could have a separate one for kids in this one's place, and then have this adult one somewhere else out the back. Put things on the kid's one like things that happen to them at school – bullying, drugs and alcohol (how it affects your brain, your future), good eating habits for teenage girls (anorexia, bulimia), advice for teenage boys who are bodybuilding, quit smoking information.

You could look at ways to make it even easier for people who can't read, to follow the instructions. Like light up the button that they're talking about so they know which one to press. And you could put pictures of local people and things on it to draw them into the other information, instead of what's on it now – when it's not being used.

It would be useful in hospital outpatient's clinics, but again looking at privacy. Indigenous liaison officers in hospitals could be on there, video them telling people who they are and what they do, how they are there to help them, and how to find them. Just a two minute session or something. They're better than investing in lots of pamphlets that end up all over the place and being thrown away. This at least is permanent for people, and you can have lots of different things in one big resource – a way of bringing it all together. Almost like the internet. You could put housing information on it for people. And the police liaisons – they're involved in everything from petrol and paint sniffers to Lifeline. You could let kids know who they are, and how to contact them. Print out their phone numbers in case they need

them. And Emergency Relief Funds – where people can get them from. A community notice board for murriss. And they're learning something at the same time – how to use new technology.

When no-one's using it, put murri music on it to attract people's attention, and photos of local people and places. A lot of people probably see it on the wall over there, and just think of it as a computer, especially with the Queensland Health and government logos on it. They think it's something for staff to use. Not for them. It's a good idea to have that sign you've got on it now.

At the conclusion of the exit interviews, those respondents who were unaware of the purpose of the kiosk unfamiliar with its use were offered a demonstration. As mentioned earlier, all save one of these eight respondents accepted the offer and the following seven comments were then provided:

I think it's a pretty good idea. Yeah, it's useful. More fun way than reading. Bit loud. Should get headphones.

I reckon it's a good idea. Sound is good – makes it easier for people who can't read. But it's a bit loud, like when you're answering the questions. You should give people the choice – have headphones or something. Say on the screen, if you do not want anybody else to listen, please pick up the phone.

It's quite interesting. I been coming here and used this clinic a lot. I had this diabetes for 20 years. So a lot of it I know about now. I just need to get onto the right food. I just need to get serious about that now. To put on it the right food to eat would be good, and print that out. I think it's an excellent idea but it needs to be advertised a bit more – a sign like an invitation to use it. Old people like me who don't have a computer brain will bypass it unless someone will show them how to use it. A bit of paper telling them is no good. And reading is a problem for a lot of people. I only went up to grade four. My gift is my hands – building with wood. But you have to show them. You could put on the sign Ask Nola to show you how. The sound is good.

It's really good. I like the pictures on it. It's good to have ordinary people on it. It would be good to use them in hospitals, outpatients departments and in AMSs.

It was competing with the TV and kids playing and things, but I still think it's OK where it is.

I probably wouldn't use it. If someone handed me a written survey I'd do that – it gives me time to think it through. For getting information, I prefer face-to-face. The ladies here are excellent. I wouldn't use one of those. It's like when you ring up on the phone for information, and you get that recorded voice. It's boring and too slow. Face-to-face is quicker and more interesting. I can ask what I want to ask. It might be a good idea for those out in rural areas who don't have access to services like we do in the city. But here they've got time to talk to you. They tell you everything you need to know. We don't realise how good we've got it. You can ask as many questions as you want, and they answer them. Spend as

much time as you want. And they know you so you can really talk face-to-face. I found out I had sugar diabetes last year and the service here is excellent.

Oh yeah, they're a good idea. For young and old. It's a start. I'd use it again if it had more interesting things on it. A bigger range of topics, like the most common diseases – AIDS and STDs and women's business, and kids rashes or measles and chicken pox. You could have photos of them. And something about vitamin and mineral supplements that you can take – what they are and what they're good for and how much to take.

It's clear and precise, easy to understand. The timing of it was OK, reasonable. Information on heart problems would be good. It's great to access the printout information list – addresses and things.

6.2.1.3.2 Diabetic patient (user) interviews

These four informants provided comments regarding the kiosk itself which were similar to the above quoted positive comments, the absence of negative comments perhaps being a reflection of the condition-specific relevance of the material. The heightened awareness of family history in relation to diabetes was also noted in terms of its usefulness: *"I thought it was ideal for people to get to know about diabetes. It is very good to give people who haven't got it yet but it's in their family"*. Perhaps because of the chronic nature of their condition, requiring frequent and regular clinic attendance, all had observed others using the kiosk (particularly children) and had used it themselves. All found the unit easy to use and provided comments regarding sound and a recognisable voice similar to those noted above (there were several comments that the loud sound made it appropriate for people with hearing deficits!). Cultural appropriateness of the graphics was noted, one informant commenting: *"Culturally appropriate is most important. Our people identify with it. Throw in something from the Islands"*. Only two of these informants had used the printer and one of the others was unaware of this capacity.

All informants commented on the personal relevance and appropriateness of the diabetes content, including for those people who have not yet developed the disease. This 'preventive' use was extended by one to addressing complications, for instance in relation to diabetic foot care: *"If you give information of the percent of Aboriginal and Islander people who have had to have amputations because they didn't stick to the diet"*.

Despite the positive response, the content of the Diabetes module was broadly known to these four informants as they all attended a local diabetes group. Regardless, there was room perceived for relevance to those less well informed: *"Everyone who attends the excellent Diabetes Support Group would know the information. But for those on borderline it would be good"*. Comments regarding approaches to increasing use reflected concerns regarding use by children (but also producing material specifically relevant to children, such as resisting peer pressure). For this group privacy was not

raised as an issue, indeed its public placement was seen as critical to ensuring wider use. For these informants, all of whom had relevant information on the kiosk, the utility of developing other modules was noted with a range of suggestions broadly similar to those suggested elsewhere with a focus on chronic disease (such as hypertension, and problems of children and youth.

6.2.1.4 Observation

'Observation' in this project involved more than simple observation of kiosk use *in situ*. It also included the experience of the project officer as a participant observer in the unfolding of the project more broadly, including participation in earlier phases of development and implementation, interaction with the various parties involved in production and support, and with service providers. Elements of the latter have been recorded in earlier sections. In what follows, activities and interactions around and with the kiosks are presented by site.

Again, the differences across the two project sites are informative. In both sites the kiosks are active for only a small proportion of the time available for activation. In the Yarrabah Centrelink office there appeared little acknowledgment by clients in the office of the kiosk. This did not appear to change with placement of a sign informing clients about the kiosk and no change in usage was detected in trace data. In this setting there were no instances noted of staff directing clients to the kiosk or providing instructions regarding use. This office space was generally quite quiet and some workers (indeed, in an adjacent room) expressed irritation at the sound levels. On the other hand, other workers did not appear concerned. No workers appeared to be spontaneously motivated to provide feedback, comment or reflection regarding the kiosk or its operation.

The setting at Inala was, by contrast, much noisier and busier. The kiosk noise in this context did not appear to cause any disturbance. However, it is important to recall that the voices from the kiosk were, in fact, those of staff in the Inala centre and the commentaries were service relevant. While this probably reflects issues of ownership and investment in kiosk, no instances were observed of patients being directed to or instructed about kiosk use, despite there having been more work undertaken with service providers in this setting. The purposeful users who were observed in this setting appeared to be younger and while the introduction of a sign was not reflected in increased trace activations, the sign was noticed, with one younger patient commenting that he had not realised that he could use the kiosk having presumed, due to Queensland Health logos, that it was for staff rather than patients. In this cramped setting patients appeared less willing to explore kiosk use when the waiting room was crowded.

The differences across Yarrabah and Inala suggest the importance of 'contextual cues', that is of environmental factors and expectancies that influence interest and motivation. Thus, the client at a welfare agency is there

for a particular purpose and may experience health messages as a distraction or intrusion – they are irrelevant to that person's immediate needs. By contrast, in the clinic setting there are both expectancies of health messages and, possibly, greater motivation and receptiveness given the purposes for which people attend medical clinics.

6.2.2 Health behaviour

Four questions regarding health-related behaviour were raised at the outset:

- Are there proximal or more distant indices of health behaviour change?
- Are there potential longer term indices of improved outcomes?
- What are the service benefits of these changes, if any?
- Are there collateral or unanticipated health-relevant outcomes?

It has not been possible in this evaluation to determine whether the presence of the kiosks has influenced health behaviour or outcomes at Yarrabah or Inala. There is, however, some circumstantial information. Furthermore, the experience of participating in this project and undertaking the evaluation has provided insights that will facilitate future evaluations in terms of health outcomes.

Information from both the internal trace recordings and in the interviews with providers and users (as per Appendices 3, 4 and 5) suggests purposeful (and thus more likely consequential) use. This is reflected in topic selection (for instance the unanticipated higher access of the *Joint Pains, Sprains and Feet* module across both sites) and in patterns of repeat and proxy use. From both providers and users comments were obtained suggesting that some users subsequently encouraged others to access information, again suggesting use with intent. However, this is clearly not sufficient to indicate any definitive changes in knowledge, attitudes or behaviour. Particularly in relation to chronic disease, it may be that changes in behaviour brought about through the use of touchscreens may be through reinforcing existing knowledge and changing personal attitude (thus galvanising resolve). This was suggested in the comments of an informant with a long history of diabetes:

I been coming here and used this clinic a lot. I had this diabetes for twenty years. So a lot of it I know about now. I just need to get onto the right food. I just need to get serious about that now. To put on it the right food to eat would be good, and print that out.

There are a number of important components to this statement. This individual has long experience of her/his disease process and has a positive and trusting relationship with the service providers. S/he recognises that diet is important and, furthermore, that attitude about being "serious about that" is critical. The comment suggests the importance of continuing reinforcement, of incremental change associated with consistent health input.

These comments have reflected one aspect of health behaviour – that of the users and potential beneficiaries of the intervention. Behaviour change relevant to health outcomes may also occur among health care providers. Thus an Indigenous primary care provider at Yarrabah commented:

We're so short of human resources here, the touchscreen can do a lot of work for us. I think it's a really valuable thing. It can free up people to do other things. It can provide education for people, but it can also advertise what's coming up in the months ahead – like NAIDOC, the sports events, health programs. Then everyone's up-to-date with us and everything that's going on. Even the store could advertise healthy food that's coming on special...

The eye clinic is so big at Gurriny now. We have some digital photos of it. We could put those on with the dates of the next eye clinic. And some photos of me taking a sugar test from someone. People can start to see what we do at Gurriny, and they can know who they need to see for different things.

Another Indigenous provider's comments suggest local skill acquisition and capacity building as the possibilities of the technology are explored:

I reckon that in one year there'll be more local people talking on it. I would change the backdrop on it, the orange part of the screen. Take that out, it's not really cultural for us. Doesn't really capture the eyes. It'll give me the opportunity to change things. Put more information for and about young people on it. Should be more community events on there – photos. I want to write to the Seahawks to ask whether I can stand on the sidelines and take photos. It would work two ways. Might encourage people to come along and support their team and be on the touchscreen.

These issues are reflected in comments from another Indigenous worker with a specialist role in nutrition who noted that the laptop version of the Diabetes module is:

a very positive thing for health workers. If health workers were out there in the community doing education with people using technology like this, then their professional profile would rise in the eyes of community people, because they would see them using this sophisticated technology. The health workers in turn would have better self esteem and more confidence in their abilities to teach...

Health worker skills would be developed in terms of technology use, but also perhaps in terms of their knowledge of content material. The spoken word on the laptop would give them the script that they need to know well to be good educators. The content on the laptop can duplicate that of the kiosk and still be useful – but – a brief intervention guide for health workers

needs to accompany it.

A non-Indigenous nutritionist echoed these sentiments:

Health workers would definitely benefit from having something that reinforces the correct information for them in conducting their diabetes education sessions for people. Diabetes is such a difficult story to tell, and so many health practitioners, even doctors and Diabetes Australia, do not know or give the correct information...

It would be important to ensure that if health workers were equipped with a tool like this, that they received an updated CD each year. It would mean that all information remained current, and that interest in the tool would be maintained.

6.2.3 Costs

An understanding of the efficiency of health touchscreens in Indigenous settings requires a clear demonstration of the intervention costs and comparison with costs of conventional or other relevant interventions. As noted in the literature review, this task has been undertaken in elsewhere with efficiencies by comparison to conventional paper-based health promotion information distribution demonstrated. This body of literature also suggests benefits in terms of information retention associated with personalised IT approaches.

For this project this assessment has been rendered impossible due to several factors. First, and as will be evident from process descriptions, there are developmental and start-up costs associated with this project which are non-recurrent. Second, there are other costs that will be reduced with a more sophisticated understanding of process requirements. Third, many of the coordination and support activities essential to this project (some of which will not be recurrent) were carried out by the Project Officer for this evaluation and costs for this have been absorbed within the budget for evaluation rather than the implementation itself. Finally, the evaluation team for this project sought to generate comparative costs across a range of identified fields outlined in Table 6.11 in which costs have been considered separately for one-off and recurrent expenditure, and activities supporting the project as a whole versus site-specific requirements. For various reasons it was not possible to obtain current or projected expenditure from JSC. This probably reflects that funding for this project derived from various sources (GSK, JSC, OATSIH), with overlapping objectives and outcomes, and unanticipated and difficult to quantify developmental costs.

Table 6.11 Program costs

	Item	Currently provided by
Program (one-off)	Production customised material	JSC and community
	Production new material	UQ, JSC, health experts
	Recording (audio) of material	JSC and community
	Software production	JSC
	Integration/setup (onto kiosk)	JSC and NCR
	Customising & developing reporting tools	JSC and evaluators
	Production update tools	JSC, health experts
Program (recurrent)	Updating content material	JSC and community
	Producing & disseminating kiosk feedback reports	JSC and community
Site (one-off)	Hardware	NCR
	Installation	
	• engineer	NCR
	• phone, power, UPS	Community
	• transit insurance	JSC
	• transport	JSC
• training	JSC	
Site (recurrent)	Maintenance	JSC
	Phone line rental & costs	Community
	Insurance	Community
	Power	Community
	Printer paper replacement	Community

However, regardless of difficulties encountered in this project it is manifest that there are a range of costs associated with this technology which must necessarily be considered in ensuring sustainability. We presume that the funding body will have access to a breakdown of the funding required by the technical consultants (JSC) to undertake this work and will thus be in a position to consider these efficiencies. At the conclusion of the project a local health-related software developer with experience in Indigenous communities (Dr Deon Canyon, James Cook University) examined the *Diabetes* touchscreen module. Dr Canyon acknowledged the difficulties of development and the additional costs entailed but provided an estimate of \$75,000 for the production of one module. While this clearly needs to be considered cautiously it does emphasise the importance of considering on-shore options in terms of software production. This will need to be balanced against the experiential base that JSC has as a result of developing and refining the production and technical processes.

Consideration of other options must also address ownership and copyright of existing modules, and processes entailed in their production. This will be a particularly important issue to clarify before tendering for any wider implementation, as will those issues that relate to local production and ownership. In considering these issues the funding body should also consider how localising processes will impact currency (maintaining up to date information) and quality, and weight up the benefits against those of more centralised (potentially web-based) approaches.

6.3 Summary

From *process participation/observation* it is clear that health related touchscreen interventions can be used in Indigenous settings. Adaptation of material is simple and overdubbing may make existent modules more appropriate for other Indigenous populations. Local involvement in this process also serves to increase a sense

of ownership and responsibility. The content generation process, including material for the attractor, is simple and replicable and should function well as a template for other Indigenous health issues. While not the specific domain of this report, technical aspects of production can be simplified and standardised. There are considerations in this regard that relate to the operational environment of Indigenous communities in which technical support is limited. Audio use has benefits and disadvantages (privacy), however the benefits in an Indigenous population are clearly greater and privacy considerations are amenable to technical and hardware solutions.

Negotiation is critical and inclusion of host community members in development will facilitate this process. Implementation and support are complex and clearly defined (and standardised) protocols for installation and commission that take into account local service capacities facilitate this process. This requires that local commitment and roles in relation to the intervention are identified and agreed on at the planning stage, including in relation to siting options and updating. Updating is essential to local ownership, and while not adequately trialed in this project, appears entirely feasible given sufficient technical support. The need for such support is significantly greater in non-service/non-urban settings and in this project a *de facto* local coordinator (in fact the Project Officer) was responsible for these activities.

Kiosk durability is obviously important and the NCR unit used in this project was reliable, the only issue raised being in relation to the printer housing which is amenable to modification. Unfortunately, the printout capacity was not adequately trialed save to demonstrate its functionality. The literature and feedback from key informants suggests that printouts will provide additional benefits. Technical feedback indicates that this should be embedded within the program rather than at entry level. While these kiosks are relatively simple to install, relocation is not cost-neutral and requires forward planning and coordination, emphasising the importance of thoughtful primary siting.

Training needs to be comprehensive and appropriate to the capacities and circumstances (including time) of local staff and services, and should seek to integrate the kiosk into service activities. Standard protocols for support and maintenance must be locally adapted and in non-metropolitan settings this should include clearly defined (and feasible in terms of time and costs) arrangements for servicing.

Trace and questionnaire data demonstrate that these units are used and that a typical session lasts around five minutes. Younger Indigenous people appear more likely to initiate use and older users indicate less ease of use. A predictable proportion of total users appear to do so purposefully and proceed to give on-screen feedback. The proportion of these individuals responding to questions is informed by the number of previously answered questions indicating functional limitations to the amount of information sought by this means using a

standard format. However, alternative approaches (such as embedding questions within a narrative or quiz) may maintain user motivation. Responding to subject-specific questions (rather than kiosk use) is contingent on subject selection and this, in turn, varies. Symptom immediacy (acute reasons for presenting versus chronic conditions) may inform this process and also influences the proportion of users at different ages.

Kiosk use is informed by content, however significant siting issues have emerged. Decisions regarding siting must balance competing priorities across the following issues:

- **Volume/exposure** of potential users passing the proposed site;
- **Receptivity** of these potential users, which relates to site-specific expectancies. Thus individuals in a health context are more likely to be drawn to health-related material than, for instance, individuals using a welfare service or in a public space. The health context thus functions to cue use;
- **Intentionality** of those who choose to use the kiosk, that is, the likelihood that use of the kiosk may cue subsequent action. For instance, siting a kiosk with nutrition-related material proximate to a supermarket may influence purchasing behaviour;
- **Support systems** to maintain the functionality of the hardware;
- **Security** of the same; and,
- **Space considerations** that inform issues of privacy and the capacity for vicarious or proxy use.

This project has demonstrated that additional information may also be collected through kiosk use, for instance in relation to perceived areas of information need. While this use has shown the feasibility of utilising traces, its potential has not been fully explored and the lessons learned from this exercise have suggested that further refinement will significantly enhance quantitative data gathering.

Key informant and user interviews supported these findings and emphasised the importance of the context and experience of first use and the need for different strategies to facilitate use by age and with acute versus chronic conditions. The importance of proxy/vicarious use was reinforced, as was 'context cueing'. Aspects of presentation that were reinforced included: non-text-based presentation, recognisably Indigenous (and 'recognisable') voices, culturally appropriate graphics, and the discouraging influence of institutional signifiers (departmental logos). Various use issues in relation to navigation, response time, inability to control volume and privacy were raised by informants and are, as noted earlier, amenable to modification.

Observation reinforced the importance of health service siting in terms of site-based worker engagement in encouraging use or providing kiosk support, and of contextual cueing in relation to motivating use and receptiveness to messages.

Changes in **health behaviour** were not ascertainable from this evaluation and reflect content (a chronic condition, diabetes) and circumstantial (siting difficulties at Yarrabah where the intent had been to be proximate to a health-decision-making site, the supermarket) factors. However, there is indirect support for purposeful use and for a role, particularly for chronic conditions, in reinforcing existing knowledge and for such interventions as a part of multi-approach strategies. In this regard, touchscreens may influence the behaviour not only of the target population, but of providers, particularly Indigenous providers both through providing a user-friendly (provider and consumer) modality and facilitating local adaptation.

The experience across these approaches suggests the utility of trace, observation and interview approaches, but not of written questionnaires as a means of obtaining feedback in Indigenous populations, findings which are unlikely to be different in more remote settings where literacy is an even greater issue.

Finally, while the literature supports **cost** efficiencies

by comparison to pamphlet-based health promotion approaches, in this project such efficiencies were not ascertainable. However, consideration of implementation costs for this particular project should factor in a substantial amount of the evaluation Project Officer's time, which was dedicated to coordination and facilitation. While the *start up* or '*proof of concept*' costs of this project will be reduced in replication or expanded implementation, these ancillary coordination/facilitation costs, particularly in non-service settings, need to be built in. Other non-technical ancillary activities have been identified that will also need to be factored in to subsequent projects. This project being completed and lessons taken on board, discrete technical *replication* costs should be ascertained directly from the software consultants. Future tendering processes will need to balance experience (on the part of JSC) with potential benefits of on-shore providers. In so doing ownership and copyright considerations must necessarily be determined at the outset which will be particularly important when local production and ownership are considered.

This report has included commentary and reflection within individual sections with a summary of findings presented immediately above. Rather than reiterating what is contained therein, this discussion will proceed by restating the evaluation framework, summarising salient findings, and integrating these elements.

7.1 Evaluation framework

As noted at the beginning of section 5 (Evaluation), the Australian and New Zealand Telehealth Committee (1999) identified three issues in relation to evaluation of telehealth activities, the first being a descriptive 'proof of concept' of the technological application, the second being an economic analysis by comparison to existing clinical interventions (efficiency), and the third a comparative analysis of performance (effectiveness). While this application of touchscreen technology to health is quite different to the clinical considerations that were of interest to the Telehealth Committee, ultimately these three elements are critical. We have emphasised that as a less mature application in a non-mainstream context this evaluation has generated information primarily in relation to the first of these elements. While there is substantially less in relation to the second and third, this work has produced a 'platform' that will facilitate these analyses.

This 'platform' is informed by wider appreciation of technical and other evaluation considerations but is, primarily, the expanded understanding of the interaction of 'concept' (or the 'mechanism') and context, that is – a more sophisticated appreciation of what is entailed in the application of this IT based mechanism in a specified socio-cultural context (particular Aboriginal settings). It is thus possible to return to the "realistic evaluation" frame identified in section 5.1 (Pawson & Tilley, 1997):

Context + mechanism = outcome

While outcome in terms of health status change has not been ascertainable, it is possible from the results of this report to comment on outcome in terms of the use or uptake of this medium in these Indigenous settings (proof of concept). Clearly however, for this to be efficient and effective it must function as a mediating factor, facilitating or enabling subsequent behavioural change. This mediating effect is contingent on use/exposure influencing change in attitude and intention, and thus behaviour. Numerous factors influence the suasive influence of particular interventions or communications in health and other fields. For instance, McGuire (1984) utilises a "communication/persuasion matrix" in reviewing public communication strategies for inducing health-promoting behavioural change, the matrix composed of input variables and output factors.

According to this paradigm, input variables include five subsets, these being:

- 1 **source or communication variables**, these being credibility (perceived expertise and trustworthiness), attractiveness (informed by similarity and familiarity), power of the communication, and the number and unanimity of the sources;
- 2 **message variables** such as the style, the type of appeal and argument, perceived inclusions and omissions, and the organisation and repetition of message elements;
- 3 **channel or medium variables** that relate to the number and type of sensory modalities, whether the messages are direct or mediated, verbal or nonverbal, and the context in which this occurs;
- 4 **receiver variables** that relate to the degree of receiver participation, demographics, and personality and ability factors, and;
- 5 **destination or target variables**, which relate to existing knowledge, attitudes and behaviours, expectations of immediate versus delayed change, and factors informing change versus resistance.

Factors influencing behavioural output are multiple and include:

- 1 **exposure** to the communication;
- 2 **attending** to it;
- 3 **liking and being interested** in it;
- 4 **comprehending** it;
- 5 **learning** and/or acquiring skills;
- 6 being **receptive** to allow attitude change;
- 7 **retention** of change once it has occurred;
- 8 **ability to draw on and utilise** this new attitude; and,
- 9 **act** accordingly, so as to;
- 10 **behave consistently** with that changed attitude;
- 11 retention being contingent on **reinforcement** of achieved behaviour; and,
- 12 **postbehavioural consolidation** processes or factors.

McGuire's input factors may be considered to be dimensions of 'mechanism', that is, they define the nature of the IT intervention. The technical report accompanying this evaluation examines in some detail issues in relation to input factors or mechanism, from which it will be clear that all five sets of variables – source, message, medium, receiver and target – have been taken into consideration in the production of this IT resource, that is, in those processes that in this report have been referred to as adaptation (of existing material) or production (of new material), and develop and build. The twelve factors that McGuire posits as influencing behavioural 'output' fall within the domain of 'context'. Those activities that

influence this arena, in this report, are considered in the section on implementation.

McGuire's input and output variables provide a means for considering how aspects of mechanism and context, that is, the technical and socio-environmental, may be adapted to provide the greatest potential for this intervention to result in positive health outcomes. Before doing so the outcomes of the project will be reviewed.

7.2 Overview of project outcomes

This is a technology that will be used by Indigenous people. This use will be influenced by aspects of the program itself that relate to cultural appropriateness, specifically content, graphics and sound. Beyond program design there are identifiable implementation factors that will support use in Aboriginal settings. Use will be influenced by location, both in terms of the total number of potential users but also in terms of health-motivated potential users. In this regard primary care settings appear to be appropriate sites both because a high volume of potential consumers pass through this setting, and because this population is more likely to be concerned about health and, thus, receptive to health-relevant material. While this needs to be balanced against space and time considerations in such service settings, the experience at Inala where the available space was very limited and patient turnover rapid, suggests potential even when these factors are constrained.

Many Indigenous people in urban settings are already familiar with touchscreen technology from other services and institutions. Regardless, and certainly for non-urban settings, facilitating first use is important through appropriate signage and permission-giving introductions. Indigenous users may initiate use in an exploratory manner, gauging ease of use and content interest, returning to engage in more purposeful use at a later time. Technical concerns regarding privacy, speed of program response and navigation issues have all been noted which are potentially solvable and will increase perceptions of ease of use and personal control. While voiceover in this application sought to provide access for users with limited literacy, introduction remains particularly important for this group whose previous experience of similar technology may lead them to believe that this is another text-based application.

Users were found to come from all age-groups but there is a greater willingness for younger Indigenous people, particularly males, to explore kiosk use. Providing content that engages and maintains interest is critical and thus consideration of needs across the age range is necessary with particular attention to encouraging and facilitating use by older potential users. Of all users who activate the kiosk a consistent proportion do so purposefully and this group appears willing to provide information on-screen. Some of these users also function as vehicles for further dissemination of information about subject matter (and kiosk use) either as proxy users (providing information to

others, for instance family members) or to bystanders in the vicinity (vicarious use). In relation to proxy use the availability of printouts of relevant material may act as a reinforcer. Printout impact was not evaluated but comments and observation suggest that this capability increases perceptions of personal relevance and reinforces messages. The existent literature supports this and also emphasises the importance of ensuring that material is complemented by other sources (such as pamphlets) and is consistent with health service messages and approaches. Localising is clearly identified as being a key issue in terms of engaging users and critical in this regard is that information is interesting, relevant and up to date. This applies as much (indeed, probably more) to information provided on the attractor. The ability to generate and include material locally is essential.

Implementation and support of this technology is complex and demands clear identification of roles, responsibilities and procedures, and coordination across those involved. This is particularly important in settings which do not have substantial service and infrastructure support, and where the service or activity focus is not health (the intervention thus being perceived as less relevant to core functions). While the difficulties encountered at Yarrabah can clearly be addressed through carefully designed protocols, identifying responsibilities and ensuring communication, it is equally clear that contextual impediments can be minimised in well-functioning service environments that see the kiosk as relevant to their interests. Consequently, choice of setting may well be a balance of competing factors. Regardless, a comprehensive support structure is essential including content and updating, technical, hardware, and ancillary requirements (power, telephone access, insurance...).

In addition to relevance and technical aspects of program use, the literature and feedback from informants suggests that use and impact of this technology will be improved by provision of choice through increasing the range of topics (additional modules, there is probably a critical mass of subject matter necessary to maintain community level engagement) and by incorporating interactive and personalised responses, for instance by providing a mechanism for personal information to be entered which informs subsequent program responses. Such use of this technology also provides an additional means of collecting information, for instance through screening instruments regarding smoking or alcohol use, that may be of use in local health planning. This project has demonstrated that relevant information can be gathered through this technology, for instance regarding what health issues community members feel additional resources should be made available – this, arguably, being an index of community concern.

While such information is obtainable several caveats are critical in relation to interpretation. Those giving information are a motivated minority and belong to that

subgroup who use the kiosk purposefully. Even so, the amount of information that they are willing to provide is informed by several factors including the nature and complexity of questions presented and the total number of questions, with an inverse relationship between the proportion of users providing answers to a particular question and the number of questions already answered. This project has also demonstrated that other means of obtaining information regarding kiosk use and program content are feasible, particularly face-to-face interviews with users and key informants, and that certain other approaches, specifically requesting written feedback, is unrewarding. Ultimately a thoughtful mix of trace observation and structured interviews appears most useful, complemented by observation of process and kiosk use.

The materials used in this project are able to be accessed through the kiosks at Inala and Yarrabah, but are also available for use on laptops. While these laptop versions have been used primarily for demonstration purposes, there has been feedback from various sources regarding the use of laptop versions as a resource for Indigenous health workers to use directly with clients. Such mediated use has not been evaluated but appears a logical extension and a means of accessing targeted populations (including those with limited exposure to technology and/or with limited literacy, who are likely, as a group, to have greater health needs).

Both mediated (laptop) and kiosk use are context dependent. This context critically includes the wider health system within which these resources are located, and which provides technical and human support. The extent to which this resource is used and degree to which it is efficacious will be determined by the level of encouragement of use, and the resonance in terms of content messages with those provided within the service. Implementation and evaluation of this technology should be informed by, and integrated into local service planning.

7.3 Synthesis

This project has been an amalgam of technical and social activities. The JSC report accompanying this evaluation has demonstrated that, technically, touchscreen technology can be deployed to address health improvement in Indigenous settings. Utilising McGuire's paradigm it will be evident that in doing so all five input variables have been considered and, to varying degrees, addressed (there is a substantial overlap between input and output factors but they will be treated discretely for the purposes of this discussion). For instance, **source or communication** variables through use of particular graphics and credible Indigenous voice-overs in content production; **message** variables in the simple format and basic messages; **channel or medium** by utilising both visual and audio input with a potential for both direct and mediated influence on users; **receiver** issues such as general interest through locally relevant attractor

content, and reduced literacy through non-text-based format; and, **destination** variables by attuning content to existing knowledge, real options for change, and relevant information regarding local resources.

Clearly there is room for technical/content refinement – ease of navigation, more appropriate graphics, content adaptation, privacy options for audio reception and more. However, while such mechanism modifications will produce a more appropriate, relevant and appealing product, this will not result in an efficient or effective health intervention without serious attention to contextual factors.

Where mechanism and context most obviously overlap is in coordination between technical and local workers, both in terms of knowledge and responsibilities. Implementation of these kiosks, particularly in the non-service/non-urban setting would not have been possible without the functions carried out by the evaluation Project Officer. These functions are as critical for sustainability as for implementation and must be thought through and built in to subsequent interventions. At the time of writing, of the two project sites, it is in the urban/service setting that the kiosk remains operating. While this relates to the above-documented location issues at Yarrabah (which should be resolved in the near future), with the withdrawal of the Project Officer from the support/facilitation role it will be important to follow up operational status in both sites. The coordination role, be it dedicated or built in to existing service structures, is critical, and subsequent project planning must take this into account and prioritise assessment of sustainability. It is likely that context will, again, be the critical factor.

In terms of McGuire's output factors (that is, those factors more directly contextual), **exposure** and **attention** relate to the six factors noted earlier that should be taken into account in kiosk siting: volume (of potential users in the vicinity of the kiosk); receptivity (to content, cued by the service setting); intentionality (of users, cued by program content); support; and, security which are necessary to keep the kiosk operational; and, space considerations. Attractiveness or **liking and being interested** in the kiosk is a function of technical issues: kiosk design (does it 'invite/welcome' Indigenous users) and software characteristics as noted earlier; and setting considerations such as space, placement and privacy, as well as staff who have been trained and are willing to facilitate use, particularly for certain user subgroups (such as the aged, or those with limited literacy or who are technology averse). Decisions regarding all of the above will ultimately require a balancing of competing purpose and resource priorities.

This intervention ultimately aims to influence knowledge, attitudes and behaviour. Of the above output factors, *knowledge* requires **comprehending** and **learning** from the intervention and will be informed, again, by technical issues relating to presentation, but also to consonance with and building on existing

understandings, wider service messages and activities, and the motivation of users to return to the kiosk for supplementary information for personal or proxy use. It will also require that information is updated and supplemented by other resources (for instance printouts from the kiosk or other subject pamphlets).

Attitude will be determined by users being **receptive** to the possibility of change, their capacity for **retention** of, and **ability to draw on and utilise** changed attitudes. These factors require that content be informed by an understanding of realistic local opportunities to act on information and recommendations provided. It will also be influenced by resonance with other messages, state-dependent factors (an individual may be more likely to be influenced by concerns that are pressing and acute) and, thus, the extent to which the kiosk can be relevant to needs by having a sufficient range of material (which will, in addition, encourage repeated use and, consequently, repeated exposure). Potentially most important in this regard it that the content of the kiosk material is perceived as being personally relevant which relates not only to the subject material but to the extent that the program personalises by encouraging interactivity.

Finally, in terms of McGuire's output factors, *behaviour* will be informed by users' capacities to act on new resolve, **behave consistently** with this resolve, receive reinforcement as a consequence either of improved wellbeing or service activities including **postbehavioural consolidation** processes. These factors are obviously informed by aspects of the wider social environment (a healthier diet demands that appropriate foods are functionally available, a reduction in substance use may be very difficult in settings of unremitting stress...). Realistically, transforming the Indigenous social context is beyond the abilities or resources of the health sector (let alone one discrete health promotion intervention). However, individuals' capacities will be optimised in service settings that promote personal empowerment and actively maintain relationships with patients, thus supporting a problem solving or solution oriented approach in relation to the obstacles to change. Such settings are likely to be those that take reinforcement seriously.

These latter statements may be familiar to health promotion practitioners who have long recognised that their interventions often have the best chance of working with those whose needs are least. However the

point here is, rather, that this intervention will have maximum chance of effectiveness, not with those Indigenous people whose health needs are least, but with those people (who may have great needs) whose (health) service providers have a coordinated and committed approach to individual and population needs and are open to integrating innovative approaches to patient care.

In conclusion, touchscreen health interventions are technically feasible in Indigenous communities and the technology or 'mechanism' will be improved through some simple modifications to existing software and hardware. While the developmental and startup costs associated with this technology and use are considerable, there will be efficiencies with replication and with extension. In preparing a proposal for a wider implementation and evaluation of the materials used in this project with a further module to four remote Indigenous health service settings in north Queensland, quotes for software production account for approximately 20% of total costs over a three year project with hardware purchase/lease accounting for a further 15%. Much of the remainder of the proposal costs relate to what is the substance of this report, that is, to the range of what has been referred to as contextual factors. These need to be considered diligently and comprehensively. The earlier contextual (or output) factors mentioned above are most closely aligned to technical (mechanism or input) factors and are most easily modifiable. Less easy to address are those that support sustained alterations to knowledge, attitude and, in particular, behaviour, where the contextual issues in question are far broader and more complex. They are, however, also modifiable and this will best be achieved by being integrated into well-functioning service settings characterised by clear communication, cooperation and coordination of health-related activities, and which are involved in production and implementation, and take ownership of the intervention.

This project has functioned as a 'proof of concept' for health touchscreen use in Indigenous settings. It has shown that this technology will be used (and by whom and in what situations) and has provided circumstantial evidence that this changes attitudes and intentions. It was not possible to assess behavioural or health status change or to ascertain sustainability (which needs to be considered broadly to include both technical and content issues). These remain priorities for future work.

8 RECOMMENDATIONS

The following recommendations flow from both the evaluation outcomes and project participation. These fall into three groups. The first set relates directly to this project and consists of issues for consideration in replication or extension. The second set relates to process, the importance of which has been highlighted by the participation of the evaluation team in the project more widely. The final set is a range of opportunities that this intervention signals for Indigenous health and wellbeing more generally.

8.1 Project related issues

- 1 The funding body (OATSIH) must assess its role with respect to future development of this technology in Indigenous populations. Regardless whether this involves direct funding or facilitation, optimising the potential of this intervention across diverse populations will demand some centralised coordination and oversighting. This is particularly critical in the short term.
- 2 Regardless of future decisions there is an important short or intermediate term role for OATSIH in ensuring that the developments that have occurred as a consequence of this project are supported. This transitional phase includes ensuring the continuity of activities and addressing certain technical issues and processes that have been identified but not covered through the funding arrangements for this project. This may be considered as an extension of the hardware 'hand-over' that will be occurring in each site.
- 3 If the funding body chooses to take an active role in funding development, major consideration must be given to the significant investment (either up front or incremental) that will be necessary to enable local production activities. This includes extending software possibilities, transfer of skills, and development of process and protocol.
- 4 Ownership and copyright issues relating to project content and operation need to be clarified. This applies to the content and attractor materials produced for this project, production related activities (such as protocols for content generation), and kiosk-use trace data collection processes and results. It is likely that with improved technology and awareness of its potential in this population that the pool of interested providers will expand (probably through competitive tendering), as will the possibilities for conflict. These matters must be resolved at the planning stage of any future activity.
- 5 With an increasing number of parties interested in production, OATSIH should must consider its role in disseminating and encouraging this approach to be adopted widely and weigh this up against the benefits of centralisation which provides for control over appropriate process, quality of content and support processes, and the ability to share and integrate material across platforms.
- 6 Ownership and copyright must also be considered at a local level. This applies to providing the resources and skills for local content generation, thus 'owning' this technology and its potential, but also includes clarifying ownership and use of materials generated locally by others.
- 7 Having demonstrated the feasibility of touchscreen applications in Indigenous health, priority should be given to examining effectiveness and efficiency of this intervention both in similar populations and more widely (across different Indigenous populations). To this end an appropriate health issue should be identified in which relatively short term changes in behaviour can be anticipated and which can be measured with sufficient sensitivity using direct and collateral sources of information.
- 8 In order to ascertain efficiency future projects must have a detailed economic analysis that is inclusive of technical, hardware and human resource costs and that identifies not only developmental costs but expected replication and extension costs, and projected cost efficiencies with wider implementation.
- 9 Effectiveness and efficiency should be gauged for touchscreen interventions with the greatest likelihood of demonstrable effect, that is, that personalise, have incorporated amplifying modalities (for example printout capacity), and which are reinforced by context (as in being integrated into service setting and activities).
- 10 OATSIH should encourage development and extension projects based on collaborative relationships across other government and non-governmental service sectors (for instance Telstra, Universities, Health Departments, and corporate and community-based IT organisations such as the Cape York Digital Network)
- 11 OATSIH should explore collaboration across relevant governmental agencies working with Indigenous populations in the use of this technology as a means of sharing operational costs.

8.2 Process issues

- 1 Clear, locally-informed protocols should be defined during project planning for all support-dependent activities including negotiation, site identification, installation, kiosk care, hardware and software maintenance, updating and relocation.
- 2 Local negotiations should result in a clear and

comprehensive understanding by relevant local community members of the nature of this intervention and its potential, and the full extent of local financial commitment and human support. This negotiation process must also provide for a mutual understanding in relation to cultural issues influencing the inclusion and use of locally generated material.

- 3 Siting of such interventions must take into account a range of factors as identified in this report (volume/exposure, receptivity, intentionality, support systems, security and space). While final decisions regarding location may be a balance of competing considerations, clinical settings that incorporate kiosk use and support into service activities offer clear advantages (there may, however, be specific goals influencing 'intentionality' on the part of users that suggest alternative locations). These decisions must take into account the capacity for technical support and future systems developments.
- 4 Support activities and responsibilities need to be clearly identified and carefully costed in any future proposals.
- 5 Evaluation should be built into any future activities in this area and informed by an understanding of the expanding knowledge base. As noted above, it should move from proof of concept to assessment of effectiveness and efficiency, and must incorporate a sophisticated understanding and analysis of, and contribution to, further refinements of process.

8.3 Opportunities

In the course of this project a number of potential uses of health related touchscreen technologies in Indigenous settings became apparent. The following is a sampling to demonstrate the range of opportunities that further development may enable.

- 1 There are numerous technical matters that are amenable to improvement or refinement. Thus, issues of privacy may be addressed through provision of an handset, or of an audio 'hood' as in public phones. However another option is to provide on-screen volume control. Intuitive use can be addressed by more sophisticated approaches to navigation and speed of response.
- 2 This technology may function as a catalyst for brief interventions and screening activities in primary health care centres. This requires personalising, interactivity and integration into service systems.
- 3 As an example of the above, the current evaluation team has submitted a proposal for extension of this technology to remote communities incorporating an adapted version of the AUDIT alcohol consumption screening tool. This provides for personalising, addressing an issue that is theoretically amenable to change in the relatively short term, for which assessment is feasible through both direct and collateral approaches.
- 4 The findings of this study demonstrate the strengths

and limitations of on-screen questionnaires which clearly are consequential in terms of the abovementioned screening options. Alternative presentations of questionnaires should be considered. Thus, a questionnaire such as the AUDIT may be reconfigured as an on-screen, interactive journey with items located in culturally-appropriate form at particular points in the journey so as to reduce response falloff.

- 5 To facilitate mediated use, a laptop health-education outreach tool to be used by Indigenous health workers could be developed. This would require the production of protocols and support for this form of intervention that should be integrated into wider service protocols. This also provides for increasing Indigenous health worker knowledge and skills.
- 6 Content targeting specific population groups, such as youth, can easily be developed (either as alternative modules or as 'detours' within existing material). This may involve linking with other initiatives. For instance, Kids Help Line has offered to adapt existing web-based youth counselling tools for touchscreen use. Another suggestion from Glaxo SmithKline has been to adapt the *Happy Hands* children's hygiene program, which has been trialed and evaluated internationally, for touchscreen use.
- 7 Because, as demonstrated in this project, youth is associated with a greater willingness to engage with IT-based interventions, this presents an opportunity to engage with a section of the population that is particularly difficult to access using conventional health promotion approaches. Consequently this may provide a means to 'repackage' some of the core health concerns for younger Indigenous people.
- 8 Technical innovation should provide for a multimedia community noticeboard: *What's happening in the community*. One local community member commented on the possibility for this supporting a community-based 'digital journalist' providing information and commentary available on site.
- 9 Kiosks located in communities provide a mechanism for accessible, on-demand feedback of health (and other) information generated in the community, for example regarding service activity. This may be wider than the health sector.
- 10 Furthermore, this also provides a mechanism for collection of community-generated information to inform strategic directions in training and health.
- 11 In doing so this resource may function as a virtual referral centre: *Who can I talk to?* This could provide for both on-screen and printed information about issues and community service providers.
- 12 The production of content for the touchscreen will provide material for marketing and positive promotion of the community, both in terms of content located on the attractor screens, but also as this content becomes available for wider use. This could include using the kiosk as a venue for exhibiting local art and history.

- 13 Touchscreen technology is now used across a range of government and other service sectors. The health kiosk may thus act as source of revenue, thus offsetting the ongoing costs through sale of pages to government departments such as Medicare and Centrelink.
- 14 In maximising the persuasive capacities of this medium, much could be added by providing input from expertise in areas of health promotion, corporate psychology, advertising etc.
- 15 At least in Far North Queensland, Telstra is now engaged with the Cape York Digital Network to locate internet access sites in all remote Indigenous communities. Telstra also has a Broadband Development Fund which innovations such as this may be able to take advantage of. The potential of touchscreen interface with community members, and high speed internet communication can, at present, only be wondered at. This should be explored.

Appendices

Abuzz Technologies: Aboriginal kiosk design



Interview: Evaluating Electronic Health Information for Indigenous Communities

1 Interview Date & Location

14 September 2001, at Balkanu Cape York Development Corp office, 34 Florence St, Cairns

2 Interview with: Daniel Grainger

3 Interviewee Position/Activity

Cape York Digital Network (CYDN) Project Coordinator.

4 Interview Circumstances

CYDN project was identified as one of the key regional initiatives having a direct correlation with this one. As such it was targeted for initial broad scoping interviews that would help to inform the wider context and future potential of the project.

5 Key Issues Addressed

- Description of CYDN project
- Perceived potential for touchscreen kiosks in remote Cape communities – in health and other areas
- Ways in which touchscreen project might strengthen/benefit the work that the CYDN project is doing, and any mutual benefits.
- Whether or not enabling people to access health information on their own, without the help of a health professional, will empower them to make personal change.

6 Narrative

Description of CYDN Project

The CYDN Project 'rollout' is funded by the Commonwealth Government for 5.2 million dollars in 2001-2002. This network of 'wireless technology' will be rolled out to every community in Cape York, sixteen in all, providing a menu of technological tools for communities to use, including:

- Business computing
- A Thin Client System (enables fixing of computers remotely)
- Ability to carry data, eg. Telstra, QUIN, video-conferencing, police data, internet at no cost
- Telemedicine facilities – the network supports 384 KB/sec, the requirement for QH interaction. Support demonstrated by Terry Mehan, Zonal Manager QH.

The network will create a community facility in each place that operates at very low cost; eg. in Hopevale, the museum would be equipped with four computers and state of the art technology for everyone to use. (It is able to operate at no cost, but the project recognizes the importance of reciprocity in service and resource provision).

The CYDN will generate income through use of its videoconferencing facilities by government departments like Corrective Services, Health, Education etc. It would support their inclusion in the network facilities for the first year at no charge, on the understanding that they seek and organize funding for ongoing use.

Each community will be provided with two seconded positions to manage and maintain the technology, generating considerable employment opportunities. They will be supported by the CYDN centre in Cairns.

NDC (Network Design and Constructions) are building the network. Because it is 'wireless technology' and doesn't need a phone line, it can be used anywhere (as with a mobile phone).

CYDN is using government funds to establish a business (by providing the infrastructure) which will eventually generate its own income. It will be operational in two trial sites, Aurukun and Coen, by November 2001, and in the remaining 14 Cape sites by November 2002. Everything is on schedule so far to do this.

'Distributed Technologies' are normally expensive to run because of the lines that carry them. The CYDN has been designed to aggregate these lines and use them efficiently. It has also successfully negotiated with Telstra to decrease the costs of the lines used.

Goals

- The Information Technology and Training sector is opened up in Cape York for the first time, creating real employment
- A suite of technologies is provided to communities, allowing them to prioritise and customise their use
- Asset management of all government department equipment by local community occurs.

Potential for touchscreen kiosks in remote indigenous communities:

- Daniel's original project proposal included the use of touchscreens as community billboards. For example, he suggested you could post an event happening in another community, eg. a football match, and invite people to register their names, or simply find out numbers, of people wanting to go. You could then plan transport etc. in light of information gained.

- He stepped away from this idea because the technology required is expensive, and it was outside the core technology that people were willing to fund. Canberra saw other technology as more important. CYDN are still very interested in it and Daniel has always thought that touchscreens would be the most effective technology to introduce to communities initially.
- Every single government department could have a touchscreen page or website, and CYDN could have someone on the ground to market it and maintain it for them. Income could be generated this way.

Potential benefits

The Touchscreen project will certainly strengthen the CYDN because it is in line with the technology they want to push. Daniel thinks it is one of the better technologies available for low computer-literate communities.

- CYDN could provide the human resources that would be required for the project. They could provide data input and do research on community views and local ownership of content. *These initiatives must be championed by someone in the community to succeed.*
- CYDN will have developed a culture of technological training already, and could include touchscreen training and maintenance as another 'chapter'.

Will the Touchscreen empower people to make personal change?

- It will certainly assist them with literacy and numeracy issues, and will take this aspect one step further than the RHTU audio graphic training courses did. That course was pitched only at Health Workers (HWs). This is pitched at the whole community. HWs could use it as a tool to teach community people, who would in turn come back and show it to their family or friends, and so on. It's referred to as 'Virulent Technology' – it has the potential to replicate quickly.
- It fits well with the new approach to enhanced Primary Health Care. Health professionals are being encouraged to change their practice and go out into the community more often to teach people. They can use this as a tool to do that.
- BUT it needs a place, and its reason for existence needs to be spelled out clearly or it will fail (eg. look at the BRACCS project).

- This is a mechanism that informs, that helps to get messages out there to people in a local and immediate way. In the past we have used the BRACCS video and radio system, leaflets and posters, brochures etc. But this is interactive media. There can therefore be a real sense of ownership if direct and timely feedback is given to people.
- The Inuit, Nunavit mob have progressed telecommunications there to the point where they have their own satellite. They may possibly have touchscreens.
- The great thing is, if you can list the functionalities you want in a piece of technology – the absolute ideal – engineers will rise to it. They love problem solving. They love to be able to test their technologies in new ways. Give them an idea, give them time and they will do it.
- The CYDN project, through Balkanu, developed a regional IT forum as a vehicle to progress indigenous IT issues in North Queensland. Mark Davies, from the Queensland Government's Department of Premier and Cabinet, is the chair of this committee. The evaluators of the touchscreen project are formally invited to participate in this forum.

7 Key Points Emerging

- The CYDN included touchscreens in their original proposal, and although this form of technology was removed due to cost, they continue to see them as one of the better technologies available for use in low literacy, low computer-literate communities.
- The CYDN could provide the human resources that would be required for the project. They could provide data input and do research on community views and local ownership of content. *These initiatives must be championed by someone in the community to succeed.*
- The CYDN will have developed a culture of technological training already, and could include touchscreen training and maintenance.
- Every government department could have a page on the kiosk, and CYDN could have someone there on the ground to market and maintain that site for them. Income could be generated by the kiosk this way. (Use seconded Westpac consultants to help draw up a project business plan to suit).

Kiosk use: Clinician interview proforma**Use of technology**

I am going to ask some questions about use of the machines.

- 1 What were your expectations when the project started?
- 2 In what ways has the use of this machine lived up to your expectations?
- 3 In what ways is your experience of the machine different to your expectations?
- 4 Are you able to characterize those people who spontaneously use the machine?
Age/sex/education/illness?
- 5 Are you able to characterize those people who did not use it?
- 6 How were people encouraged to use the machine?
The machine itself / a sign / prompting? And was that effective?
- 7 Do you know whether people were multiple users?
How would you characterize them? Were there people who introduced others to the machine?
- 8 Did people talk about the machine and its contents with you? What issues were raised?
- 9 What do you think would support the effective use of this machine? Have you seen any misuse of it?
- 10 What issues do you think compromise its use?
Shyness/shame/embarrassment?
- 11 What would you do to address those issues?

Condition-related outcomes

(related to attitude, knowledge & behaviour)

- 1 In relation to diabetes or joint problems, how do you think patients responded to getting information in this way?
- 2 Does there seem to be a difference in patient attitudes, receiving information in this way compared to others?
- 3 Is there any indication that patient's knowledge of these conditions was affected by their use of the machine? Questions raised/statements made/other?
- 4 Can you comment on whether patient behaviour may have been changed as a result of using the machine? Eg. things like asking more questions/ demanding participation in services, activities/ change in self care/ change in illness status.

Kiosk use: Exit interview (1) and Diabetic patient interview (2) proformas

User interview: Exit interview

1 *While you were in the waiting room did you notice the machine with a screen like a television attached to the wall?*

No GO TO 16

1 Yes

2 *Do you know what that machine is?*

No GO TO 16

2 Yes

3 *How did you find out what it is?*

(sign, watch others, shown by others...)

4 *Have you used a machine like that before somewhere else?*

No GO TO 6

Yes

5 *Can you tell me about that?*

6 *Have you used that machine?*

No GO TO 13

3 Yes

7 *Tell me about the first time you used it.*

8 *What were some of the good things about using that machine (interesting, entertaining, good material...)?*

9 *Tell me about some of the problems of using that machine (privacy, time, content...).*

10 *Can you tell me any ideas you have that would make that machine better for helping people with their health?*

11 *Will you use that machine again?*

No

Yes finish

12 *Why not?*

From Question 6

13 *Did you think about using it?*

No GO TO 16

Yes

14 *Can you tell me about any things that may have stopped you from using it?*

15 *Can you tell me what might help you to feel okay to use it?*

16 *Would you like me to show you how it works?*

No FINISH

Yes BRIEF DEMO

17 *Can you tell me any thoughts you have now that you have tried it?*

User interview: Diabetic patient interview

1 *When you first saw that machine what did you think?*

Did you think it was something you could use?

Did you notice people using it?

Did you know there was something about diabetes on it?

2 *Tell me about the first time you used it?*

Were you worried about touching it?

Ease

Graphics

Voice

Questionnaire

Timing

Printer

3 *Tell me what you thought about the diabetes story.*

Did it feel true for you?

Was it believable?

Was there something in this that was new or important?

Was there part of that story that was a worry?

What about the way it was presented?

4 *What would make more people use it?*

Where would you put it?

Would you make it more private?

What kinds of things would you put on it?

Can you think of other ways that this machine could be useful?

Would you put a sign up asking people to use it?

Health outcomes: Provider (1) and diabetic patient (2) proformas

Preamble

What we're trying to do here is to get information about any health outcomes that may have occurred as a result of the touchscreen intervention. Can you reflect on your patients and tell me anything that to you, has changed the understandings of what they know?

- With your experienced diabetic patients, how do you think their understanding of their condition has been affected by having the kiosk here?
- You mentioned 'x'. What made you think that change occurred?
- And what about new diabetic patients?
- And other people?
- In what way do you think motivation or attitudes of your experienced diabetic patients have been changed by having the kiosk in the clinic?
 - For new diabetics?
 - For non-diabetics?
- This may seem repetitious, but just in case it's pushed any buttons, is there anything different that people are actually *doing*?
 - In what way has patient behaviour altered now that the kiosk is here? Eg. compliancy with tests, requesting information about test, etc.

As I said earlier, what we're trying to do here, is to get information about health outcomes that resulted from the project. Now that we've thought about it, and with your experience on all of this, how do you think it's possible to get better information about health outcomes for the project? How do we better get some estimation of health outcomes?

At the outset, emphasize that what we really want to find out is how to change the touchscreen for the better (not whether it's a good or bad idea).

- Ask about kiosk use:
 - Number of times used
 - Whether they were shown the kiosk the first time or not
 - Whether they have seen the diabetes and/or pains pages or not
 - Whether they have come back to use it more than once.

Set 1: Knowledge & Understanding

1 New ideas

Did you find out something from the diabetes story that you didn't know before?

Yes What was that?
Were there things that surprised you?
Anything else?

No So you knew that stuff already?
Given your knowledge, did the diabetes story on computer sound right?
What sounded right? What didn't?

2 Reinforcing the importance of issues

Did the diabetes story talk about the things you already know are important?

Yes What was that?

No What things do you think need more explaining?
What was missing?

3 Confronting incorrect ideas

Was there anything in the diabetes story that didn't seem right to you?

Did you see anything on there that was different to what the nurse or doctor has told you before?

Yes What was that?

No Does that mean it was too simple or boring?
Or that it didn't make you think enough?

Set 2: Intentionality/motivation (attitudes)

1 Initiation

Did the diabetes story make you think about your diabetes any differently?

Yes How?

No

Did it make you think about doing anything new or different? For instance about:

- Yourself (prompts – diet/exercise /smoking/alcohol/stress)
- Visits to the clinic (prompts – testing /medications/ footcare)

Bookmark the points that people say they have thought about, and come back to them in the set of questions about behaviour change.

2 Sustainability

It can be hard work looking after your diabetes well all the time. Is there anything in the diabetes story that helps to keep you strong to keep looking after the diabetes properly?

Yes What was that?

No What would you change?

3 Proxy effect (influence on others)

Was there anything in the story that you thought would be good for someone in your family to know?

Yes Did you actually show them?

Refer back to the bookmarked responses about intentionality, and ask them whether they actually did anything:

Yes What was that?

Customisation (Joint Pains and Sprains scripts)

Original Pains and Sprains script

ACUTE NECK PAIN

Acute neck pain (sprained neck) most commonly comes from a whiplash injury in the car or from a jolt, for example, landing on the heels heavily. Sometimes there is no obvious cause and it may even occur during sleep by having slept in an awkward position.

Far and away the commonest cause is a sprain, to one of the small joints in the neck, it is rare for major diseases to cause acute neck pain of this sort. Usually with treatment there is gradual improvement.

The immediate or 'first-aid' treatment is rest (the use of a felt collar at night is sometimes very helpful indeed). Physiotherapy, by a chartered physiotherapist, can be very helpful and treatments may include mobilisation of the joints and a home exercise programme.

CHRONIC NECK PAIN

Neck pain going on over a period of months or years is usually the result of degeneration in the discs or joints of the neck or spine. This may show up on an X-Ray. There is limitation in certain movements, for example rotation or sideways movement. Sometimes the pain extends down to both shoulders and even down to both arms. There may even be pins and needles in the fingers and this suggests that the nerves of the neck are being irritated. Treatment usually involves physiotherapy (including exercises and, where appropriate, neck manipulation or traction). This treatment should always be supervised by a qualified physiotherapist or osteopath. During 'acute' flare-ups of neck pain, a felt collar worn at night is helpful, possibly by protecting the neck nerves from position pressure during the one or two hours of deep sleep.

SHOULDER PAIN

The shoulder is a complicated joint in which a variety of movements are possible, these movements being controlled by various small muscles around and within the shoulder joint itself. The shoulder pain itself may also not arise in the shoulder but may be 'referred' from the neck and it is always wise for the patient to ask him or herself whether there has been any recent neck stiffness or discomfort.

The two commonest conditions giving rise to shoulder pain are; 'painful arc syndrome' and 'frozen shoulder'.

- PAINFUL ARC SYNDROME
- FROZEN SHOULDER

Touch a red button to find out more or OTHER DISEASES to look at another disease.

Painful arc

'Painful Arc Syndrome' is pain in the movement of the arm (between on the clock a quarter to and five to). It is due to a strain of one of the tendons in the shoulder joint and often grumbles on for many months.

A local steroid injection into the shoulder is sometimes very helpful and physiotherapy treatment to the strained tendon is also very effective. This treatment may include an exercise programme to prevent recurrence. 'Painful arc syndrome' usually settles but may take a long time.

Frozen shoulder

'Frozen Shoulder' is a much more severe and painful problem than 'painful arc'. All movements of the shoulder are painful and restricted. Moving the arm forwards, backwards, sideways or rotating the shoulder – all are painful.

This is usually due to inflammation or a tear in the capsule surrounding the joint.

Physiotherapy may be helpful in reducing the pain and regaining the range of shoulder movement.

In some patients the pain and stiffness are severe enough for an injection of steroids to be considered. This treatment sounds extreme, but is very effective. The injection is relatively small and is carried out after a local anaesthetic is given (as an outpatient).

Injections may need to be repeated on more than one occasion. This is a very slow lesion to heal but, even so, the majority of cases do get better totally. Don't be worried about the need for a second injection. First time success, unfortunately, is not always the rule.

ARE THERE OTHER CAUSES OF SHOULDER PAIN?

Other rheumatic diseases such as Rheumatoid and Psoriasis cause shoulder pain but, most commonly these diseases affect many other joints at the same time.

Customised pains and sprains script

Nola

Menu Pains, Sprains and Feet

[Version 3, 27 July 2001, yikmenupsv3.doc]

Lots of people get aches and pains or have an injury. For people with diabetes injury and particularly care of the feet is important. Learn more about:

- Neck pain

- Shoulder pain
- Elbow pain
- Back pain
- Pain all over
- Looking after your feet

These provide you with general information. You must also seek professional advice and see your doctor. Look at as many as you like, those you have visited will be marked with a tick, but this does not stop you looking at them again. When you have finished choose 'Bye' to leave or 'Go on' to see other choices. You can also look at 'Have your say'.

Noel

Pains & Sprains Q1 Submenu Q1 Chronic neck pain

[Version 1, 11 July 2001, yikosq1m1q1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

¹Neck pain going on over a period of months or years is usually the result of degeneration in the discs or joints of the neck or spine. This may show up on an X-Ray. There is limitation in certain movements, for example rotation or sideways movement. ²Sometimes the pain extends down to both shoulders and even down to both arms. There may even be pins and needles in the fingers and this suggests that the nerves of the neck are being irritated. ³Treatment usually involves physiotherapy (including exercises and, where appropriate, neck manipulation or traction). This treatment should always be supervised by a qualified physiotherapist or osteopath. ⁴During 'acute' flare-ups of neck pain, a felt collar worn at night is helpful, possibly by protecting the neck nerves from position pressure during the one or two hours of deep sleep.

- 1 Person with hand on neck, in pain, photo.
- 2 Body diagram with shoulders and arms highlighted.
- 3 Traction photo.
- 4 Felt collar photo.

Noel

Pains & Sprains Q1 Submenu Q2 Acute neck pain

[Version 1, 11 July 2001, yikpsq1m1q2.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

⁵Acute neck pain (sprained neck) most commonly comes from a whiplash injury in the car or from a jolt, for example, landing on the heels heavily. Sometimes there is no obvious cause and it may even occur during sleep by having slept in an awkward position.

⁶Far and away the commonest cause is a sprain, to one of the small joints in the neck, it is rare for major diseases to cause acute neck pain of this sort. Usually with treatment there is gradual improvement.

⁷The immediate or 'first-aid' treatment is rest (the use of a felt collar at night is sometimes very helpful indeed). Physiotherapy, by a chartered physio-therapist, can be very helpful and treatments may include mobilisation of the joints and a home exercise programme.

- 5 Sleeping awkwardly photo.
- 6 Person with hand on neck, in pain, photo.
- 7 Felt collar photo.

Noel

Q1 Neck pain

[Version 1, 10 July 2001, yikpsq1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change)

⁸Neck pain is a very common problem, affecting about a third of all people in their lifetime. The commonest cause is a sprain, due to poor posture, (such as working or sleeping with the neck in awkward positions and injuries (such as falls and car accidents). ⁹Pain in the neck commonly spreads into the head or into the shoulder and upper back, so if you have pain in these areas, you should ask your doctor or physiotherapist if your neck could be the cause. Thankfully, serious causes such as fractures and cancers are rare.

¹⁰Most people with acute neck pain will get better within a few days to a few weeks, but a small number will not get better and so develop chronic pain. Treatment of neck pain involves relief of pain with painkillers and physiotherapy. Physiotherapy and exercises may help the stiffness, which often goes with the pain. Heat and liniments are generally safe and soothing. ¹¹Neck collars are usually not needed and should only be used in the first few days after more severe injuries, such as whiplash. Good neck posture with the head held high and the chin tucked in (like a soldier) is important for treatment and prevention of neck pain. A thick pillow, tucked into the shoulder to support the neck during sleep is also very important. If your pillow is thin, it can be raised by tucking a small folded towel under it or into the pillow case.

- 8 Sleeping awkwardly photo
- 9 Doctor photo
- 10 Physiotherapist photo
- 11 Felt collar photo

Noel

Pains & Sprains Q2 Submenu Q1 Painful Arc Syndrome

[Version 1, 11 July 2001, yikpsq2m1q1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

¹²'Painful Arc Syndrome' is pain in the movement of the arm (between on the clock a quarter to and five to). It is

due to a strain of one of the tendons in the shoulder joint and often grumbles on for many months.

¹³A local steroid injection into the shoulder is sometimes very helpful and physiotherapy treatment to the strained tendon is also very effective. This treatment may include an exercise programme to prevent recurrence. 'Painful arc syndrome' usually settles but may take a long time.

12 Cartoon – person in pain when moving shoulder.

13 Cartoon – person who feels better.

Noel

Pains & Sprains Q2 Submenu Q2 Frozen Shoulder

[Version 1, 11 July 2001, yikpsq2m1q2.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change)

¹⁴'Frozen Shoulder' is a much more severe and painful problem than 'painful arc'. All movements of the shoulder are painful and restricted. Moving the arm forwards, backwards, sideways or rotating the shoulder – all are painful.

¹⁵This is usually due to inflammation or a tear in the capsule surrounding the joint. Physiotherapy may be helpful in reducing the pain and regaining the range of shoulder movement. In some patients the pain and stiffness are severe enough for an injection of steroids to be considered. This treatment sounds extreme, but is very effective. The injection is relatively small and is carried out after a local anaesthetic is given (as an outpatient).

¹⁶Injections may need to be repeated on more than one occasion. This is a very slow lesion to heal but, even so, the majority of cases do get better totally. Don't be worried about the need for a second injection. First time success, unfortunately, is not always the rule.

14 Cartoon – snowman with shoulder pain.

15 Physiotherapist photo.

16 Cartoon – person who feels better.

Noel

Q2 Shoulder Pain

[Version 1, 10 July 2001, yikpsq2v1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change)

¹⁷The shoulder is a complicated joint in which a variety of movements are possible, these movements being controlled by various small muscles around and within the shoulder joint itself. ¹⁸The shoulder pain itself may also not arise in the shoulder but may be 'referred' from the neck and it is always wise for the patient to ask him or herself whether there has been any recent neck stiffness or discomfort.

17 Person opening door, in pain, photo.

18 Person with hand on neck, in pain, photo.

Noel

Q2 Elbow Pain

[Version 1, 12 July 2001, yikpsq3v1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change)

¹⁹There are two very common causes of elbow pain, 'tennis elbow' and 'golfers elbow'. Although these names are meaningless, they have stuck.

²⁰'Tennis Elbow' is pain localised over the outside epicondyle or 'outside' of the elbow – funny bone. 'Golfers elbow' is pain on the inside. They are thought to be due to a very small tear of the tendons around the elbow and the pain may be extreme. Certain movements such as rotation (opening a heavy door) for example cause severe pain.

²¹Treatment is physiotherapy possibly together with a local steroid injection into the inflamed area. Painful activity should be avoided with the pain usually settling with time.

19 Cartoon – sportsman.

20 Person opening door, in pain, photo.

21 Physiotherapist photo.

Noel

Pains & Sprains Q1 Submenu Q1 Mechanical Low Back Pain

[Version 1, 12 July 2001, yikpsq4m1q1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change)

²²This is thought to be most commonly due to bulging of one of the discs or a tear in the very complicated ligaments surrounding the lower back. The disc or shock absorber may protrude and irritate one of the nearby nerves sending pain and/or pins and needles down the leg – so called 'Sciatica'. This type of low back pain may come on very acutely and be totally immobilising.

²³Another cause of mechanical low back pain is wear and tear of the spinal joints – otherwise known as osteoarthritis or spondylosis. A lumbar support may be required. Occasionally local anaesthetic injections (epidural) may be needed into the back to relieve the pain. In the majority of cases the pain subsides within two or three weeks and, in terms of statistics, most patients do not suffer from further severe attacks.

In a small percentage of patients, pain is so recurrent and the disc irritation of the nerve so clear-cut that surgery may be required to remove the pressure. Such cases are the exception rather than the rule.

²⁴A maximum of 3 days and forms of physiotherapy or osteopathy when given by a registered therapist are generally recommended.

22 Slipped disc illustration.

23 Cartoon – person who feels better.

24 Physiotherapist photo.

Noel

Pains & Sprains Q4 Submenu Q2 Diseases Causing Low Back Pain

[Version 1, 12 July 2001, yikpsq4m1q2.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

²⁵Some causes of low back pain are due to other conditions, such as kidney (urinary) infection, or Rheumatological disease. So as to establish the cause a full medical examination as well as tests are required.

²⁶Rheumatic disease is often characterised by marked stiffness, especially in the mornings, and the pain is sometimes relieved by anti-inflammatory drugs. Sciatica – pains shooting down one leg or other leg, sometimes made worse by a cough or sneeze – is rare. The diagnosis of these diseases needs to be made by a physician with the appropriate X-rays and blood tests.

²⁷Rheumatic diseases that commonly cause low back pain are:

- Ankylosing Spondylitis
- Reiter's Disease
- Osteoporosis – if bone fracture occurs.

²⁵ Kidneys illustration.

²⁶ Anti-inflammatories illustration.

²⁷ Bullet list – diseases.

Noel

Q4 Low Back Pain

[Version 1, 12 July 2001, yikpsq4v1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

²⁸Probably, ever since man first stood on his own hind legs, low back pain has been one of his most common afflictions. In trying to define the causes and identify the best treatment, there are a number of important questions to be asked.

²⁹Firstly, is the pain localised in the middle of the back or does it spread to either side of the low back?

Secondly, is the back stiff – especially in the mornings?

Thirdly, is the pain and stiffness helped by an anti-inflammatory medicine

Fourthly, is there any pain down the leg?

³⁰Fifthly, did the pain come on suddenly or gradually?

And finally are there any pins and needles in the leg?

Answers to these questions are very helpful in making an accurate diagnosis.

²⁸ Cartoon – hands on lower back in pain

²⁹ Bullet list – Is the pain localised or spreading? Is the back stiff? Is the pain helped by anti-inflammatory medicine? Is there any pain down the leg?

³⁰ Bullet list – Did pain come on suddenly or gradually? Are there any pins and needles in the leg?

Noel

Q5 Pain All Over

[Version 1, 12 July 2001, yikpsq5v1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change).

³¹For some patients the whole body hurts. Here, differential diagnosis, establishing exactly what is wrong, is complicated and should be left entirely to the doctor. There are many reasons for the symptom of 'pain all over', non-rheumatological, rheumatological disease and also some causes of muscle inflammation.

³²The dozens of 'non-rheumatological' causes of 'pain all over' vary from certain viral infections such as influenza and glandular fever through to metabolic abnormalities, such as thyroid problems. One condition that often causes generalised pain is ME (Myalgic Encephalopathy). This is a diagnosis of absolute exclusion in which all the other diseases mentioned here have been clinically ruled out.

³³Some of the major rheumatological diseases that cause 'pain all over' are:

- Rheumatoid Arthritis
- Psoriatic Arthritis
- Ankylosing Spondylitis.

And Polymyalgia Rheumatica – a particularly important diagnosis in older patients.

³¹ Tired / fed up person photo.

³² Doctor photo.

³³ Bullet list of diseases.

Noel

Q6 Feet and legs

[Version 1, 10 September 2001, yikpsq6v1.doc]

See footnotes for illustration ideas (numbers in text show where pictures would change). Noel

³⁴Foot pain is a very common problem in the community – the most frequent cause is a sprain usually from a sports injury a fall or twisting of the ankle.

Other causes of foot pain include gout, arthritis and poorly controlled diabetes, which causes a burning pain.

³⁵Diabetes can also cause foot infections that are slow to heal.

Foot pain in most people will resolve within a few days to a few weeks, but a small number will develop chronic pain, particularly in arthritis.

Pre-workshop MediBooks introduction and questionnaire

Background

MediBooks have been proven in large general hospitals to be a good way of helping people to learn about health factors associated with a disease or condition they are facing.

Normally, MediBooks run on a publicly placed touch screen unit – one might say ‘it looks like an interactive television’. Most of the information will be given in audio format, supported by images in order to reach the user in a conversational and interesting manner.

Although it is possible to create web version of a MediBook, it is not practical at present because audio files demand higher bandwidth connections for a smooth replay than some Internet users currently have.

Typically, a MediBooks ‘touch point’ will comprise of:

- a rolling set of screens giving key messages including ‘touch the screen’
- an introduction and choice of what is on the kiosk unit (accessed when the rolling sequence is touched)
- an introduction to each path on the top menu leading to a questions screen
- a set of questions like ‘what are the symptoms?’ which when selected are answered by voiceover with images
- a closedown sequence or return to top menu.

The menu screens can be looked at as many times as desired and questions can be revisited.

Evaluation

Often these MediBook units need to be evaluated and the content adjusted when results from use and users are known. It is possible to do some of the research on-line by providing some pages of questions (no more than 3 screens). Also the path taken through the material is logged so it can be established how long a person used the system, what they chose, where they exited, etc.

Producing the information

Usually the framework for a MediBook unit is agreed and then the set of common questions on which it is based established. The subject expert will then take each question and answer these according to a number of simple rules. It has been found that it is best to produce the answers on tap, being read, rather than written on paper as a more conversational style is created.

No single voice answer should be more than 4 minutes in length and it is proposed that even if messages are negative, the sequence must end with a positive note.

Illustration

MediBooks are illustrated by using simple images of people and everyday events. Some medical images may be used. If these are needed they are annotated and explained. Blood test results, equipment used in tests or other common diagnostic or maintenance aids are often explained with pictures.

Aims

The aim of a MediBook is to inform and increase confidence both for the patient and their family or friends. The material isn't meant to replace a doctor or nurse but it is intended to be there all the time so someone can check they understood what was told to them. The success of a MediBook is only as good as the understanding of health needs from the subject expert.

How to write a MediBook

STEP 1 – Getting started

Objective

To establish who the title is for, what it will cover, the age range, gender and any special factors. Also to set how success will be measured.

Key activities

- Using the form provided state the age range, gender and other factors
- Using the examples and form provided fill in a suggested name and key health messages
- Are there any general messages that should be displayed all the time?
- Using the form provided state the desired outcomes (no more than 10) and how will these be achieved and monitored?

Who for?

Please confirm your understanding of the following so that appropriate images and style can be selected:

What age groups are targeted?

Children (below 12 boys and girls)

yes no

Teenagers only (12 to 18 male and female)

yes no

Adults (14 upwards female and male)

yes no

Males only (adult above 14)

yes no

Females (adult above 14)

yes no

Seniors (male and female above 55ish)

yes no

Suggestion

For the diabetes subject material it is suggested to be adult male and female including the older citizen.

Usage of the touch screen unit

Do you expect the MediBook to be used:

only in clinics and hospitals>

yes no

throughout the day and weekend – (according to the public opening hours)?

yes no

with a health professional?

always sometimes never

If always, what kind of professional?

Professional nurse

Health community worker

Doctor

Other

Do you expect people to come and check up on facts using the unit on their own?

yes no

Suggestion

It is proposed that the unit be available, certainly on weekdays, in an open area and that it may be used unassisted, but sometimes with health professionals (probably a nurse or community subject expert from the health area).

Titles and key messages

When the touch screen unit is not in use it will roll some messages to be attractive, ie. have a brand message.

The touch screen unit may cover more subjects than Diabetes and the messages that roll will give the name of the subjects to entice people to have a go.

Title of the touch screen unit:

Is there an indigenous name that would be engaging and acceptable?

Suggestion

The following are suggestions to date:

- *Health touch point*
 - *Be healthy – find out more!*
 - *Understanding you...*
-

Title for the diabetes material:

Current thinking is that there will be a group of key questions with answers relating to those who know they have diabetes. In addition a general good health 10 or 20 questions path will also be put on the same touch screen unit. Some 'pains and sprains' information may also be added from the other topics, if these can be made appropriate for the indigenous community within timelines and budgets.

What should the diabetes information be called?

Suggestion

Titles or other MediBooks have been:

- *Understanding Lupus*
 - *So you have Rheumatism?*
 - *Insight into Glaucoma*
 - *Switch on to skin problems*
-

Key messages on the rolling screens

There will be ten slots into which a message can be inserted. These are key points. Four slots will be used by the system saying how to use the unit, showing the titles on it etc.

Six slots are available for local use and should cover any very key health points – for example the Glaucoma MediBook shows how to put eyedrops in.

Can you list any short key messages that you feel should be shown to patients when the units are not being used?

How to use messages and subject titles:

- 1 _____
- 2 _____
- 3 _____
- 4 _____

Key Health Points:

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

Further comments

Do you have any further comments?

Writing for success

What would make a touch screen information kiosk on Diabetes and health useful?

Please list the 10 key points you feel are essential for people to know about diabetes:

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

Of the list of measurements below can you say which are not important?

The following measurements can be captured by a simple form integrated in the touch screen:

Age group

yes no

Male or female

yes no

Date of use

yes no

Length of time used

yes no

Paths visited how many times in a session (to be traced/measured from first touch)

yes no

Have you used this system before? (a touch screen questionnaire 'how many times','how often?' etc.)

yes no

User feedback

For future improvement it is useful to ask how helpful the information was to the user:

Question 1: Did the information help you with...

Please give 5 answers for them to tick on the touchscreen form. Each answer should not have more than 31 characters (see attachment 2):

1 _____

2 _____

3 _____

4 _____

5 _____

Also, a general touch screen questionnaire is very important to draw a picture of the user's attitude towards the unit. The user is able to select if the information was useful, not helpful, or purely interesting.

Question 2: Did you like unit path, (for example diabetes)?

Please give the answers you'll find important to gain from the user:

1 _____

2 _____

3 _____

4 _____

5 _____

Do you have any other comments on what the unit might measure?

It is assumed that no user names etc. will be captured for this phase.

Your comments:

Suggestion

For direct collection of statistics it is proposed to:

- Keep a trace of each session used anonymously (by software on the unit)
- Have up to three pages of optional touch screen questions (keeping the results with the trace)
- Provide questionnaires to gain general feedback (ask which question was the most useful etc.)

It is assumed that some formal interviews and observation will be part of the evaluation JSC's role here is to ensure that the statistics are available from the unit on a day to day basis as a simple report.

*Julia Schofield, Justin Flute & Marianne Markowski
1 April 2001*

STEP 2 – The questions

Objective

To set the key questions to be answered for diabetes which will be the framework of the information

Key tasks

- Look at the examples and decide what are the key questions for diabetes
- Agree these and define scope
- Draw up framework.

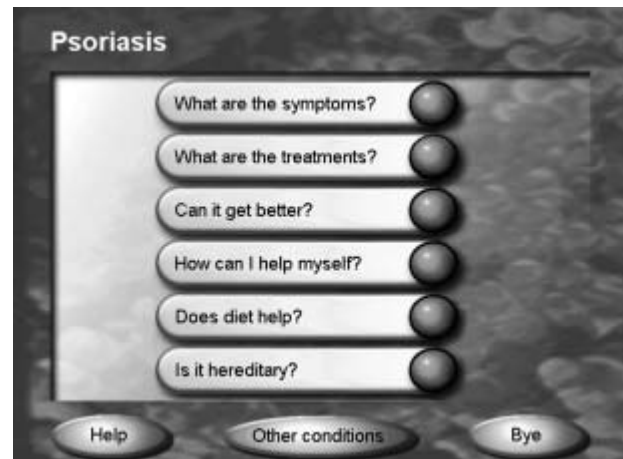
Note: This step develops the framework, which will be scripted later. See the other MediBook titles to provide background.

Background

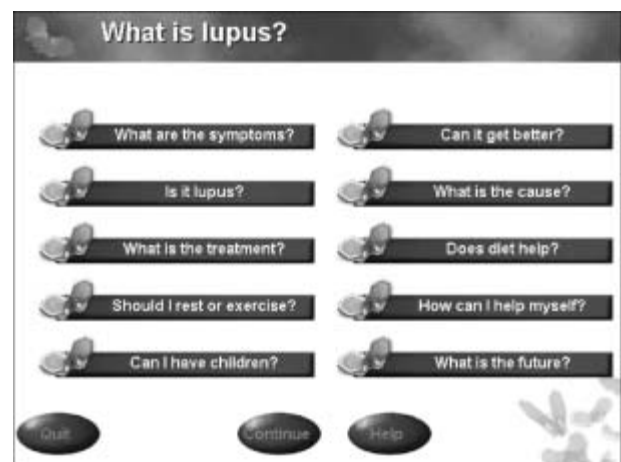
When a condition is selected the user will be told automatically what it is and a little about it – see 'What is Rheumatoid Arthritis?'

Here are three topics where questions have been set:

Psoriasis



Lupus



Rheumatism



Feedback on questions

Please give your opinion of the key questions – no more than 8 – that should be addressed for diabetes?

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____

Note: 'What is diabetes' will be covered before you come to these questions.

Suggestion

- *What are the symptoms?*
- *How can I help myself?*
- *Can it get better?*

Are retained as 3 of the key questions.

Workshop agenda **Yarrabah / Inala – Content Workshop: Diabetes and Key Messages**

JSC Australia

Provisional timetable

09.00	Introductions, coffee and demonstrations of MediBooks (for those who have not seen the existing titles)
09.15	Welcome – Prof. Ernest Hunter, Alan Thorpe
09.25	The day – the ten steps – Julia Schofield
09.30	Step 1 Who for, key
10.00	Step 2 The questions – agreeing a framework (draft from input will be available)
10.30	<i>Coffee and break</i>
10.40	Step 3 Developing a script (do's and don'ts)
11.00	Workshop Step 2 First four questions scripting
11.30	Exchange idea on scripts and consolidate
12.00	Step 4 How to illustrate a script or break it down into sub menus if too long
12.30	Lunch with illustration ideas and general discussion
13.00	<i>Break (15 minutes)</i>

13.15	Step 5 Common messages (What does the system show when not in use?)
14.00	Workshop on scripts (remaining 4 and refine earlier efforts)
15.00	<i>Break</i>
15.15	Step 7 The start and finish sequences; what should they say?
15.45	Step 8 Collecting information the question pages
16.15	Step 9 Other messages, where to find out more, etc.
17.00	<i>Break</i>
17.15	Next steps

Note: The process has 10 steps but the 10th is refine and check which is not normally carried out at a workshop as the content has to be built. All of the above will be supported by questionnaires and consultation prior to the workshop.

*Julia Schofield, David Schofield
and Marianne Markowski
23 April 2001*

Feedback from questionnaires

1 Key health points

- Heart disease among indigenous Australians
- Lifestyle diseases – what are they
- Diabetes
- Smoking
- Early checkups and early detection
- Access to Medicare
- Identifying as Indigenous
- Young people – substance use
- Young people – sexually transmitted diseases
- Alcohol
- Mental health
- Nutrition
- Respiratory disease
- Renal disease
- Early childhood.

2 Key diabetes points

- Importance of early detection
- You can successfully manage it
- How to get the help you need
- Risk factors
- Healthy living to reduce risk
- Dispelling myths
- How it affects your body
- How does it occur?
- How is it diagnosed?
- Need for glucose monitor
- What tests we need to do?
- Treatments – diet, exercise, tablets etc.
- Complications
- Diabetes and your family
- Can you prevent diabetes?

3 Questions arising

- What is the cause?
- What are the symptoms?
- What are the treatments?
- Will I get better?
- Does diet help/what am I allowed to eat?
- Should I exercise?
- How can I help myself?
- What are the complications?
- How do you get diabetes?
- Do I have to inject insulin?
- Will my children get diabetes?
- How often should I be tested?
- Are there different types of diabetes?
- I'm well, why should I get tested now?
- What happens in the body in diabetes?
- I'm well, why should I get tested now?
- Will I have to stop eating things I like?
- Why me?
- Will I have to go to hospital?
- Does this mean I will get other illnesses?
- Pregnancy.

Preliminary lifestyle script (Workshop 23.4.01)**Section on lifestyle**

What can I do for myself?

Healthy living is the most important thing you can do to prevent or manage diabetes. This includes keeping to a healthy weight, what you eat, how active you are with your body, drinking alcohol, smoking, and stress.

Being overweight makes it hard for your body to control the amount of sugar in the blood. If you are overweight you can still make your diabetes better with a healthy diet and keeping active with your body. A healthy diet means eating fruit and vegetables, cereals like bread, rice and pasta, as well as fish, chicken and lean meat. Cut down on fatty foods and sugar. Foods that are good for someone with diabetes are good for the whole family.

Being slack also makes it hard for the body to manage sugar in the blood. Getting the body moving and keeping it active will help to prevent or control diabetes. The best activities are those that keep the body moving for a while, like walking, dancing, working in the garden, or sports. Try to keep it up so that over the day the body is active for at least a half an hour. Try to make it

something you enjoy.

Drinking alcohol can make managing diabetes difficult and can make some of the problems that result from diabetes worse. [**connection to complications**]
Control of diabetes will be easier if you don't drink at all, but if you do – the less the better.

Smoking and diabetes both make it hard for the blood to go round the body. That can cause problems for the heart and blood vessels. So, it is best not to smoke at all.

There are many causes of stress and worry. Being stressed and worried can make blood sugar harder to control. If you have diabetes you can reduce stress by leading a healthy lifestyle and learning some ways to manage stress – such as taking time to relax, talking to friends or listening to music. If you still have stress and worries you can talk to a counsellor or staff at the clinic.

First level questions and question clusters

What is diabetes?

Q0.1 How do you get diabetes?

(Only intro shared with 1)

Q0.2 I'm well why should I be tested now? *(Intro rest in 2)*

Q1 What are the causes of diabetes – is it common?

Q1.1 What are the causes?

Q1.2 Are there different types of diabetes?

Q1.3 What happens in the body in diabetes?

Q1.4 How common is diabetes?

Q1.5 Why me?*(Also question 6)*

Q1.6 How do you get diabetes?

Q2 How do I know if I have diabetes?

Q2.1 What are the symptoms?

Q2.2 I'm well, why should I get tested now?

Q3 What can I do for myself?

Q3.1 What am I allowed to eat? *(Other suggestion does diet help?)*

Q3.2 Should I exercise?

Q3.3 Will I have to stop eating things I like?

Q3.4 Will I get better? *(Part of also 4 and 5)*

Q4 What can the doctor do for me?

Q4.1 Will I get better? *(Also part in 3 and 5)*

Q4.2 What are the treatments?

Q4.3 Do I have to inject insulin?

Q4.4 How often should I test myself?
(Patients rights and responsibilities)

Q5 What happens if I don't look after myself?

Q5.1 Will I get better? *(Part of also in 3 and 4)*

Q5.2 What are the complications?

Q5.3 Risk factors for complications

Q5.4 Will I have to go into hospital?

Q5.5 Does this mean I will get other illnesses?

Q5.6 How often should I test myself? *(also in 4)*

Q6 What about my family and my baby?

Q6.1 Why me? *(Shared with Q1)*

Q6.2 Pregnancy?

Q6.3 Will my children get diabetes?

Q7 Where can I find out more?

(From workshop on 23 April 2001)

Julia Schofield, 26 April 2001

Introductory scripts

Yarrabah Introduction Script

Introduction heard by people after touchscreen is first touched.

Original Script sent by JSC

[Version 1, 28 November 2001, yikintroYarrabah-v1.doc]

Here in Yarrabah, this self-help system has been built for you to learn more about what is happening and your health. Have a go.

Information here shouldn't stop you talking with your health helper or doctor – always get advice or go along to the groups.

If you are diabetic check up on facts, if you have some pains or sprains, learn more and if you have forgotten who to contact or where to find out more take a look and then print the contact details.

Have your say in the questionnaires or even leave a note for those involved so the system gives you what you want.

Here are some things to look at, explained by Noel and Nola. Give it a try!

Customised Script

Script customised: 10.12.01 by Charmaine Yeatman & Helen Travers. Recorded: 10.12.0. Narrator: Charmaine Yeatman

Recording technicians: Helen Travers, Andy Morton

This touchscreen has been built for you to find out what is going on in Yarrabah, and to talk about your health. Have a go!

This shouldn't stop you talking to a health worker or doctor. Always get their advice and have regular checkups.

The touchscreen is useful if you are diabetic or have pains and sprains, or want to learn more about them.

Touch the print button, and the touchscreen will print out details about who to see or where to find out more about your health.

At the end you can have your say by pressing the 'have your say' button. You can choose your answer.

This will help us find out what *you* think, and what you want to see on the touchscreen in future.

Health Kiosk – Feedback question layouts

Figure 1

Have you ever been told that you have diabetes by a doctor or health worker?



Figure 2

Have any of your family members got diabetes?



Figure 3

Did it help you to learn about diabetes?



Figure 4

What parts were most helpful for you? (diabetes)

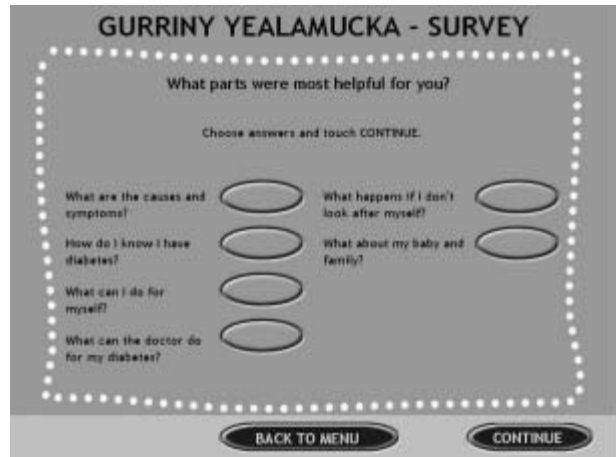


Figure 5

What parts were most helpful for you? (pains)

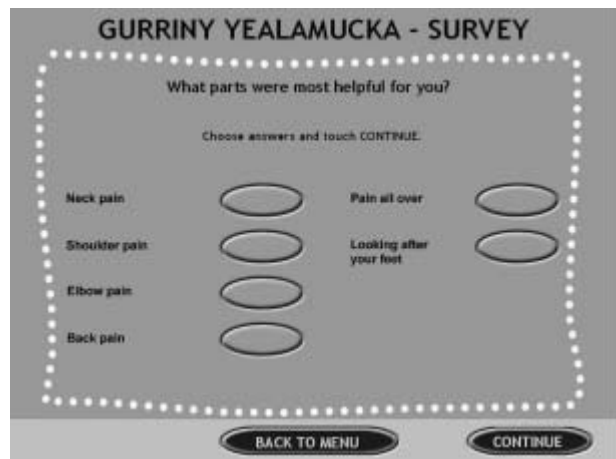


Figure 6

Did you find it easy or hard to use this touch screen?



Figure 7
Have you used this kiosk before?

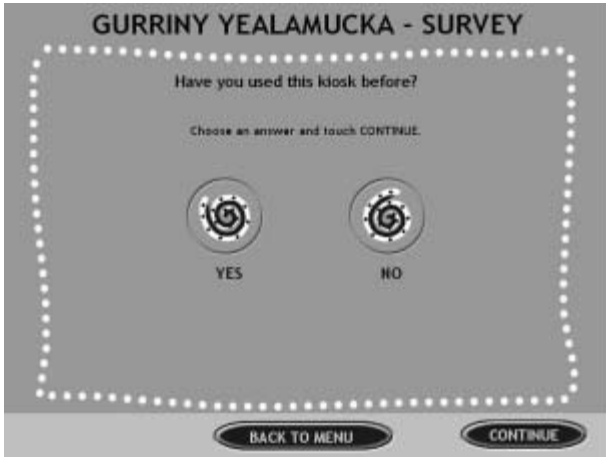


Figure 10
Are you Aboriginal or Torres Strait Islander?



Figure 8
How old are you?



Figure 11
Would you use a machine like this to find out about other health problems?

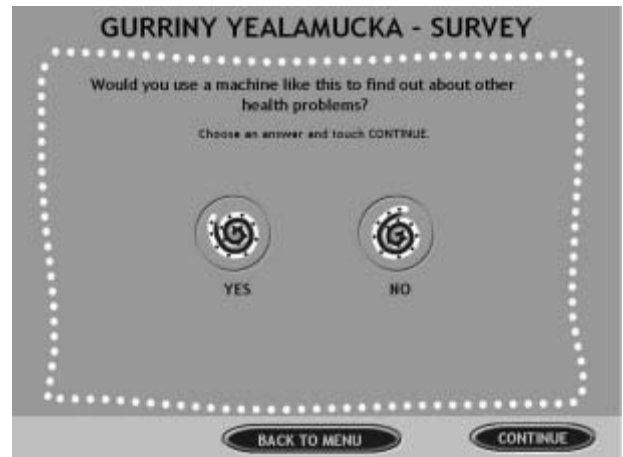


Figure 9
Are you male or female?

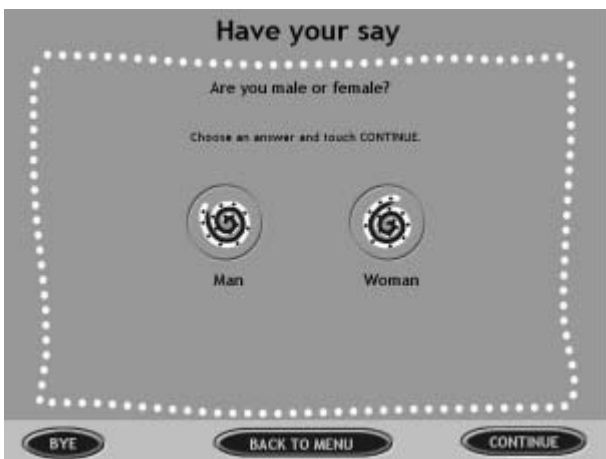
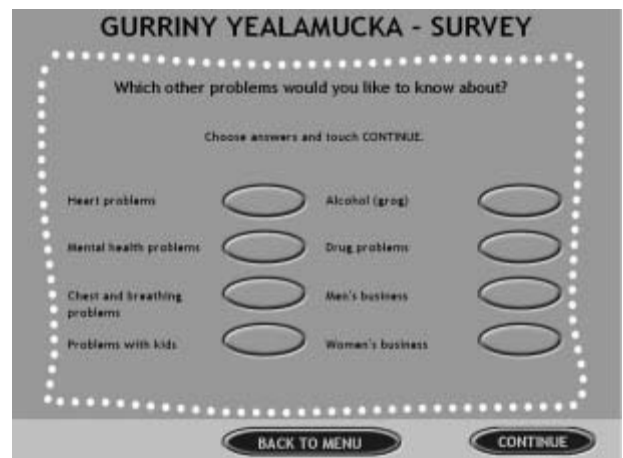


Figure 12
Which other problems would you like to know about?



Inala/Yarrabah technology

This attachment details the hardware and software chosen for use in the Inala / Yarrabah trial. Although kept non-technical it will include the specification of the kiosk giving reasons for the choices made. Functionality of the software produced is discussed in a separate attachment. Where it is felt to be helpful, comparisons with the previous similar hospital systems are given.

Requirements

The choice of hardware was driven by a number of requirements:

- The kiosks needed to be chosen so that there was as little risk as possible of them having interference from hospital equipment. This affects the screens particularly so TFT displays were needed.
- The kiosks needed to be secure. This meant selecting a unit that could be fixed to the wall and wasn't either floor mounted alone or made to be free-standing on a table or desk. Wall mounting also has been shown to minimise damage from the units being banged in to or moved.
- The unit needed to conform to health and safety requirements with no possibility of it being moved so cables trailed or were strung across areas.
- The unit needed to be small so it didn't take up too much space.
- The units needed to have high definition clear displays that didn't suffer from degradation when in strong light.
- The units needed to be modern so that they would be supportable for some years without needing expensive upgrades.
- The units needed to be known to be robust when used in public places for long periods of time.
- The unit chosen needed to be extendable as the trial might show a need for printers, card scanners, etc.
- The unit needed to be easily serviceable for paper change etc. by a novice who didn't have engineering experience.
- The unit needed to support sound
- The unit needed to be supportable throughout Australia and be able to be duplicated or 'rolled out' to a number of sites easily
- The printer chosen was required to print and be cut off inside the unit so that people pulling the paper before printing had been completed didn't cause damage.

Kiosk Hardware choice

The hardware chosen was the NCR 7401 because this unit was known to be built for retail and so would exhibit most of the requirements listed above. NCR had the capability to roll out a number of systems, clone these or duplicate throughout Australia. The specification of hardware selected is:

Processor: Intel Pentium PIII 500 MHz
 RAM: 128 Mb
 Display: 15" LCD capacitive touch screen
 Hard disk: 20 Gb
 Sound: Cirrus/Crystal CS4614
 Speakers: Hi Fi
 Modem: 56K (V.90)
 Printer: K580 (or K585w?)

Additionally, the kiosks include the following peripherals (currently not in use):

- Scanner
- Motion sensor
- Infrared reader
- Magnetic stripe reader (MSR)

Software environment

Microsoft NT was selected as the kiosk operating system because this was the environment already used by the kiosks. The kiosk software itself was written in simple tools so that no further expensive licences were needed if more units were purchased. Although Internet technology was considered seriously because this tends to change very quickly and need updating it was not selected. VisualBasic 6 was used for linking the databases together with Microsoft Access selected as the database tool (this does not require a licence for delivery systems). A retail printer was selected that had a paper knife inside the unit so that users couldn't pull out paper before printing had been completed. The NCR OPOS software was used for the printer driver because the kiosk environment required this.

Communications

It was decided to have phone links to the two kiosks during the trial so that updates and changes could take place remotely to keep down travel costs. A modem (interface from the machine to the telephone system) was used with a normal telephone line. A program called PCAnywhere was added so that remote use of the kiosk could take place whilst faults were being looked in to – this would not be used normally in a production system but is useful during testing.

Updating

Given that each kiosk had a modem then two methods of updating could be considered.

Remote updating

This worked through the telephone line with the update tool on any PC. The method required that 'off line' changes were made on a PC and then the kiosk is dialled up with the database including its changes being sent. As the setup of local machines differed this was not used as the preferred option.

Local updating

For the two kiosks in the trial inexpensive notebooks were provided for the update tools. This meant that the environment was controlled whilst the update level was being established – what updates should be made by whom, where. The specification of the laptops used is:

Processor: Intel Celeron 788MHz FCPGA
Display: 12.1" TFT (800x600)
RAM: 64Mb SDRAM
Hard disk: 10Gb

Cache: 128Kb
CD-ROM: 24x speed
Floppy drive: 1.44 Mb
Video card: Integrated SIS graphics Chips Shares System
Modem: 56K (V.90)
Audio: Built-in 3D Stereo Sound
Speakers: Stereo

Additionally, the laptops have a built in LAN port.

Reporting

The kiosks keep traces of each user dialogue. A small tool is being produced to pick the traces up and produce meaningful information from the raw trace data. The reporting tool can be run on the laptops or remotely although some problems have been experienced with the quality of the phone lines in Yarrabah.

*Julia Schofield / Eleonora Budden
29 August 2001*

Kiosk installation checklist

NOTE: Specific manufacturers will have their own list of checkpoints for any unit, which should be asked for. These points are purely included here as guidance.

Lighting

- Position the unit so the screen is not in direct light as this makes it difficult to view.
- Some screens are damaged by bright light or direct sunlight (check if there are any restrictions).
- Look at the angle of the screen, as well as just its potential position, so there is no reflection from windows, lights, or other illuminated items (some units offer a range of screen finishes which vary in their reflectivity).

Power and sockets

- Ensure sockets are kept out of the reach of children
- If possible hide the socket behind the housing or above the unit so it is not easy to turn off inadvertently
- Avoid trailing wires or even loops of cable around the unit (cables should be tucked away out of sight)
- If a phone line is needed position a point at the kiosk, preferably plugged in permanently and staple the wire if it has to travel to another point.

Positioning the unit

- Ensure if the unit is to be wall mounted that the wall is strong enough and, if it is not solid, that the fixings can be placed in to supports, not a vacuum.
- People may pull themselves up on the kiosk, hang on to it, trip and need to hold on, or lean on the unit – it must have the right fixings!
- Look at whether the unit will protrude and ensure it is tucked away not in a walkway or thoroughfare
- Ensure the unit can be seen easily
- Ensure that someone both sitting and standing can use the screen at the height set – the recommended

height is around 120 cm measuring from the floor to the centre of the screen

- Ensure someone can put something down like a shopping bag near the kiosk beside them and has space for this
- Ensure the kiosk unit and its position conform to any local regulation for health and safety, emission control or other factors
- Ensure the kiosk is not close to a door or blocking a fire exit if someone is using it.
- If there is a printer put a waste paper bin close to the kiosk and allow for this in the positioning.
- Do not position near a drinks vending machine or water dispenser to avoid liquids being poured on the unit.
- Ensure there are no shelves or window sills immediately next to the unit where people may put drinks down, then knock them over.

Installation

- Have the supplier of the units install them and ask for their installation checklist prior to the visit.
- Ensure that the kiosk is fully tested, ie. all functions gone through with someone watching, including the printing.
- Ensure that the printer isn't just tested on the test setting but that it is used 'for real'.
- Write a test scenario for the engineer.
- Ensure that the modem or communications are tested fully not just shown that the setting is 'live'.
- Check that the unit powers up correctly after being switched off (turn the power off and, after a few seconds, on again), then run through the installation checks again.
- Ensure that the software is pre-loaded before installation so the system is delivered working and ready for use. This makes testing much easier and doesn't lead to a non-working kiosk being present in a public area.

Updating

Yarrabah / Inala Health Kiosk User Guide

This document gives brief instructions on the use and tools of the Health Kiosk, for staff concerned with updating.

It is organised in the following sections:

- 1 Health Kiosk
- 2 Update tool
- 3 Using the laptop to update the kiosk
- 4 Troubleshooting
- 5 Maintenance of the kiosk and laptop by JSC
- 6 Contact numbers
- 7 Fault report template.

During the first few weeks, whilst teething problems with the kiosks and software are ironed out, all updates will be carried out by JSC remotely.

1 Health Kiosk

The Touch Screen Health Kiosk provides you with health information using simple language with photos and illustrations accompanying locally recorded audio. There are two kiosks: one is set up in Yarrabah, Cairns and the other in Inala, Brisbane.

The Health Kiosk shows – while not in use – a series of images with key messages intended to attract and invite people to touch the screen. Having touched the screen, visitors can choose between:

- **Diabetes**
Introduces diabetes and answers six questions visitors are likely to ask.
- **Pains sprains and feet**
Gives information on conditions concerning joint pain and foot care.
- **Who can I talk to**
Shows a range of useful contacts.
- **Where to find out more – help & groups**
Lists regular community meetings and other sources of help.

The Health Kiosk also includes information about patient rights and responsibilities in *Your rights* and visitor surveys, *Have your say*. The survey questions cover questions on the kiosk itself – how easy is it to use, how useful etc, and about the visitor – age, family history of diabetes etc.

People can see the information as many times they want and stay as long they want. They can leave at anytime either by pressing the *Bye* button or simply by leaving the Health Kiosk, which returns to the attractor automatically after a period of time.

2 Update tool

The Update tool is designed for day-to-day changes giving a simple way of updating the attractor sequence. Users can:

- Change the order in which the attractor pages are played
- Add text based attractor information pages
- Edit and delete text based attractor information pages
- Edit the text on attractor image pages.

From the Windows Start menu select Programs, Health Kiosk, UpdateTool. Enter your user name and password and press **OK** – see section 3.2 below.

2.1 Main Menu

This shows the attractor pages listed by title. You can change the order in which an attractor page appears on the kiosk, edit the sub-title text on a picture page, delete a page, add a bullet page or a text page. When you have finished choose Save and Quit.

2.2 Editing pages

Select the page you want to edit and choose the **Edit** button. You will then see the chosen page with editable text fields to make the relevant changes. You will not be able to edit the images, only the text.

2.3 Deleting pages

You can delete text or bullet pages, but not those with images. The **Delete** button fades out when selecting image pages.

2.4 Add bullet page

The 'bullet page' provides you with four text areas in a list. Give the page a sub-title and enter text for at least one bullet. Choose **Save** to add the page or **Cancel** to discard it and return to the Main Menu.

2.5 Add text only page

For the 'text only page' enter a page title and some text in the main entry field. There is a maximum number of characters for the text entry fields. When reaching this, the tool will not allow you to type any more words.

2.6 Changing the play order on the Main Menu

Select the page of your choice to change the position in the play order of the attractor and press the up or down arrows on the left-hand side.

Remember:

- The sub-title field must never be left blank and should not be the same as any other page.
- All entry fields have a maximum number of characters

- Bullet list screens need at least one bullet point
- Text only screens need to have some text entry – you can space the text by adding blank lines in between.

3 Using the laptop to update the kiosk

This section details the procedures for using the laptop to update the kiosk, step by step, from logging on, updating the attractor, checking updates through to uploading changes to the kiosk.

3.1 Logging on to the laptop

The laptop is set up with a Windows user name and password. These must not be changed as they are configured for correct interaction with the kiosk when uploading.

User name: Administrator

Password: password

The password is case sensitive and should be typed in all lower case.

3.2 Running the Update tool

From the Windows Start menu select Programs, Health Kiosk, UpdateTool. The Update tool asks for a user name and password. These are set up for each community as follows.

Yarrabah user name: Les

Yarrabah password: les

Inala user name: Noel

Inala password: fiveik

These user names and passwords are not case sensitive – i.e. they are accepted in both upper and lower case.

To make changes to the attractor refer to section 2 above. When changes have been completed, close the Update tool by clicking on **Save and Quit**.

3.3 Testing the update on the laptop

The kiosk application is also installed on the laptop so that changes can be checked before uploading to the kiosk. To run the kiosk application on the laptop, from the Windows Start menu select Programs, Health Kiosk, YarrabahKiosk (or InalaKiosk).

On the laptop the application behaves similarly to the kiosk, with the following differences:

- use the mouse pointer to point and click on the buttons
- the print function will not work – unless a printer is installed and attached to the laptop

To exit the kiosk application press the ALT, CTRL and DEL keys together. This brings up a Windows **Close Program** dialog. With **kiosk** selected in the list box click on the **End Task** button. This procedure for closing the application is essential so that on the kiosk users cannot gain access to the Windows environment.

3.4 Preparing for upload

- On the laptop, from the Windows Start menu select Programs, Health Kiosk, Yarrabah (or Inala) DOWNLOAD. This prepares, in a special area of the laptop's hard disk, all the files needed for the upload.
- A Windows command window appears on the screen. The program is paused with a message asking you to 'press any key to continue...'. Press any key and you will see scrolling lines of text reporting progress. This only takes a few moments, depending on the number of changes. When it has finished another message will be displayed saying 'Download complete. Press any key to continue...'. Press any key and the window closes.

NOTE: If you did not intend to run the download you can close the window by clicking on the close button (top right hand corner of the window). A window will open confirming that you require to close the box. Click the yes button to continue closing.

3.5 Uploading to the kiosk

- Take the laptop to the kiosk. If the batteries are fully charged you do not need to plug in the power supply.
- Open the printer cabinet on the kiosk with the key provided. The network cable is coiled up in the bottom of the cabinet. One end is already attached to the kiosk computer. Attach the other end to the LAN socket on the laptop.
- On the laptop, from the Windows Start menu select Programs, Health Kiosk, Yarrabah (or Inala) UPLOAD.
- A Windows command window appears on the screen. The program is paused with a message asking you to switch off the kiosk, then on again and to wait till a message on the kiosk tells you a 'transfer is in progress'.
- Switch off the kiosk, wait 30 seconds and switch it on again.
- When Windows has fully loaded, the command window on the kiosk may or may not appear (it usually does not), but the kiosk application will not run. If the command window does not open automatically, open it by double-clicking (tap twice in succession) on the icon labelled 'Emergency Kiosk Update'. This will start the command window.
- The command window now says there is a transfer in progress.
- Return now to the laptop and press a key to continue.
- Lines of text will scroll reporting on progress as files are transferred to the kiosk. When it has finished a message will be displayed saying to 'press any key to complete the update'.
- Press any key on the laptop. Another message says 'you can now switch off the kiosk'.
- Press a key on the laptop to close the command window.
- Disconnect the network cable from the laptop and coil it up, place it back in the bottom of the printer and lock the cabinet.

- Switch off the kiosk, wait 30 seconds and switch it on again.
- Once Windows has booted the kiosk application will start as usual, displaying the changes to the attractor.

4 Troubleshooting

This section is included for dealing with problems that could arise.

4.1 The printer is not working

If no printout appears when the print button is touched, this might be due the door not making proper contact or the printer being out of paper.

Check that the magnetic contacts top left and bottom left of the cabinet door are making contact. With the door locked, if you push in the corners you will hear a click as the magnet makes contact.

To replace the paper, open the printer cabinet with the key provided and insert a new roll following the diagrammatic instructions on the inside of the door.

If neither of these steps solves the problem, report the error to JSC support using the fault report template given in section 6 below. If an error message is displayed on the screen when trying to print, write down the message and include it in the fault report.

4.2 An error message is displayed on the screen

Write down the error message and touch the OK button. If more than one message is displayed, write down all of them and the order in which they appeared. Report the error to JSC support using the fault report template given in section 6 below.

4.3 The application is stuck

If the application appears to be stuck on one screen and will not move on when a button is pressed, switch the kiosk off, wait 30 seconds and switch on again. If that does not clear the problem, report the error to JSC support using the fault report template given in section 6 below.

4.4 The kiosk emits a strange noise

If the kiosk starts making a noise (the Inala kiosk has been known to make a loud high pitched noise and a rattling kind of noise), first try switching the kiosk off, wait 30 seconds and switch on again. If it persists, try leaving it off for 30 minutes before switching on again. If it still persists report the problem to both JSC support and the NCR Service desk (see section 5 for contact details).

4.5 The kiosk does not come on when switched on

If the kiosk fails to load when it is switched on the power supply should be checked in the first place. If when you plug in another appliance, that fails to come on, an electrician should be called to fix the power supply. If, however, there is nothing wrong with the power supply, both JSC support and the NCR service desk should be notified.

5 Maintenance of the kiosk and laptop by JSC

In order that JSC can update and troubleshoot any problems over the phone lines, the kiosks must be left running overnight. JSC will be checking them regularly between the hours of 6pm and 3am Australian time.

For the first few weeks, whilst final touches are made to the content, the laptops will also be checked and updated. It would be most helpful if the laptops could also be left plugged in and connected to a designated phone number during the same time period (6pm and 3am Australian time).

During this period any changes to the attractor made locally may be lost unless JSC is notified of the change. After a settling down period, once the content has been finalised, JSC will notify the communities that they have full control of updates.

6 Contact details

JSC support line: 00 61 44 20 8843 8302

JSC reception: 00 61 44 20 8843 8300

JSC support email: support@jsc.co.uk

NCR service desk: 07 131 447

NOTE: the NCR service desk should only be phoned direct in the event of a hardware malfunction, such as the kiosk hardware emitting a strange noise or the kiosk not powering up. JSC should also be notified of the problem and resolution, so that records can be kept.

7 Fault report template

The information describing the fault in as much detail as possible should be emailed to JSC as soon as possible after the fault has been found. Because of the time difference, it may be possible to fix the problem remotely during the Australian night, thus minimising downtime.

Information to be provided in all reports

- Location (Yarrabah or Inala)
- Machine (Kiosk or Laptop)
- Name of person reporting the fault:
- Date
- Time
- Description of fault
- Error messages (try to write these as accurately as possible):
- How to reproduce (if possible write down what you did prior to the fault).

JSC will log the fault, investigate and provide a fix if it is a software fault. If the fault is hardware or kiosk related JSC will report to the NCR service desk and inform Leslie Baird (Yarrabah) or Noel Hayman (Inala) as appropriate.

Eleonora Budden, Version 1.1, 29 August 2001

Comments box proforma

In light of their previous experience in the UK, the project's software consultants suggested placing a 'comments box' and individual sheets of paper and pens next to the touchscreen, so that people could offer written comments, eg:

- what they liked
- what was hard
- what else they would like.

JSC collected about 100 of these in the UK and found them very useful. We called it *Have Your Say* to correlate with titles already used on the kiosk, and printed up sheets containing the following:

Have your say

Thanks for giving us your ideas. What do you think about...

- The sound
- Where the touchscreen is
- Whether it's private enough
- Whether it's easy to use
- Any other ideas.

Can you write on this paper and then put it in the box?

The comments box was used in only one site, Inala, and received only two responses in the three months that it was there. The comments received were:

- **The sound:**
Too loud, should have ear phones; very clear.
- **Where the touchscreen is:**
Too close to TV.
- **Whether it's private enough:**
Not private enough, needs to be more private; it needs somewhere else in the building so you can have more privacy.
- **Whether it's easy to use:**
OK;
sort of.
- **Any other ideas:**
Too slow, needs quicker responses.

Kiosk signs

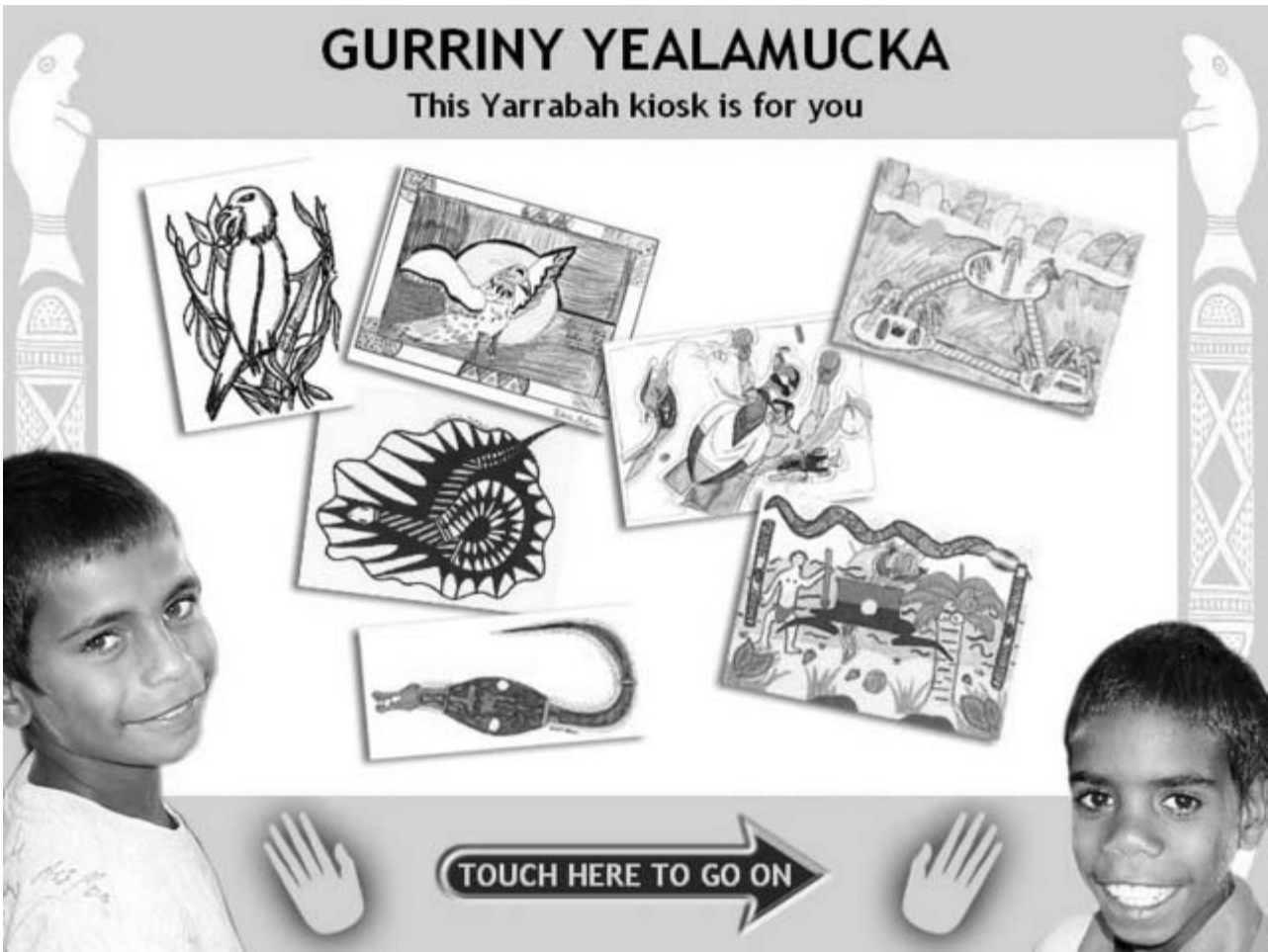
Kiosk sign: Yarrabah



Kiosk sign: Inala



Example of attractor for Yarrabah



Specifications of format for trace capture file

The following is a key to the column headings for Feedback raw data and interpretation of the answers to the questions, as laid out in the sample tab delimited text file attached.

Questions are keyed Q1, Q2, Q3, to Q12. All questions except Q9, Q10 and Q12 have only one possible answer and, therefore, one column. Questions Q9, Q10 and Q12 are multiple choice questions. The answers to each of these is given as a 1 (selected) or 0 (not selected) in one column per answer, headed Q9.1, Q9.2, Q9.3, etc.

A response value of 0 indicates that the user did not visit the question or subject.

A response value of -1 in questions indicates that the user visited the question but chose not to respond.

Subjects visited are keyed S10 to S16 (Diabetes), S20 to S26 (Pains), S30 and S40.

Source: EB (JSC), version 2, 1 February 2002

Key	Question	Value	Response meaning
Q1	Are you male or female?	1	Man
		2	Woman
		-1	visited the question but did not respond
Q2	How old are you?	1	Less than 20
		2	20 to 34
		3	35 to 49
		4	50 or over
		-1	visited the question but did not respond
Q3	Are you Aboriginal or Torres Strait Islander?	1	Yes
		2	No
		-1	visited the question but did not respond
Q4	Have you used this kiosk before?	1	Yes
		2	No
		-1	visited the question but did not respond
Q5	Did you find it easy or hard to use this touchscreen?	1	Easy
		2	A little hard
		3	Quite hard
		4	Very hard
		-1	visited the question but did not respond
Q6	Did it help you to learn about diabetes?	1	Not at all
		2	A little
		3	Quite a bit
		4	A lot
		-1	visited the question but did not respond
Q7	Have you ever been told that you have diabetes by a doctor or health worker?	1	Yes
		2	No
		-1	visited the question but did not respond
Q8	Have any of your family members got diabetes?	1	Yes
		2	No
		-1	visited the question but did not respond

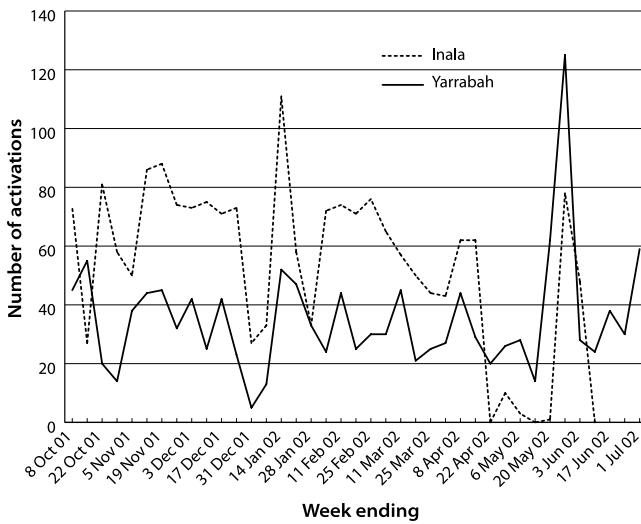
Key	Question	Value	Response meaning
Q9.1	What parts (of diabetes) were most helpful for you?	1	What are the causes and symptoms?
Q9.2		1	How do I know I have diabetes?
Q9.3		1	What can I do for myself?
Q9.4		1	What can the doctor do for my diabetes?
Q9.5		1	What happens if I don't look after myself?
Q9.6		1	What about my baby and family?
Q9.7		-1	visited the question but did not respond
Q10.1	What parts (of pains) were most helpful for you?	1	Neck pain
Q21.2		1	Shoulder pain
Q10.3		1	Elbow pain
Q10.4		1	Back pain
Q10.5		1	Pain all over
Q10.6		1	Looking after your feet
Q10.7		-1	visited the question but did not respond
Q11	Would you use a machine like this to find out about other health problems?	1	Yes
		2	No
		-1	visited the question but did not respond
Q12.1	Which other problems would you like to know about?	1	Heart problems
Q12.2		1	Mental health problems
Q12.3		1	Chest and breathing problems
Q12.4		1	Problems with kids
Q12.5		1	Alcohol (grog)
Q12.6		1	Drug problems
Q12.7		1	Men's business
Q12.8		1	Women's business
Q12.9		-1	visited the question but did not respond

Key	Question
S10	Diabetes
S11	What are the causes and symptoms?
S12	How do I know I have diabetes?
S13	What can I do for myself?
S14	What can the doctor do for my diabetes?
S14	What happens if I don't look after myself?
S16	What about my family and baby?
S20	Joint pains, sprains and feet
S21	Neck pain
S22	Shoulder pain
S23	Elbow pain
S24	Back pain
S25	Pain all over
S26	Looking after your feet
S30	Who to talk to?
S40	Where can I find out more?

Detailed statistical analysis of trace data

Descriptive data

Kiosk activations



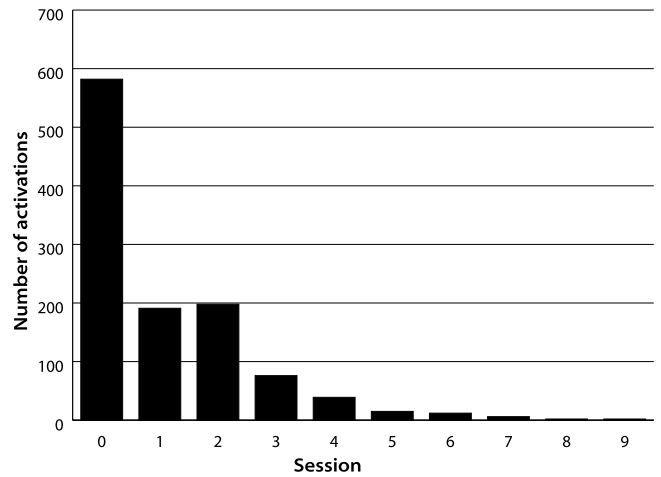
In total there were 3280 activations of the kiosks, 1373 (42%) of these occurred at Inala. Of these 3280 activations there were 1989 sessions where at least one selection was made. The proportions of activations that were spurious were substantially the same in Inala (37.1%) and Yarrabah (41.0%).

Session by day of week and community

	Yarrabah	Inala	Total
Monday	220	156	376
Tuesday	268	198	466
Wednesday	231	182	413
Thursday	304	83	387
Friday	90	225	315
Saturday	12	18	30
Sunday		2	2
TOTAL	1125	864	1989

Access to content

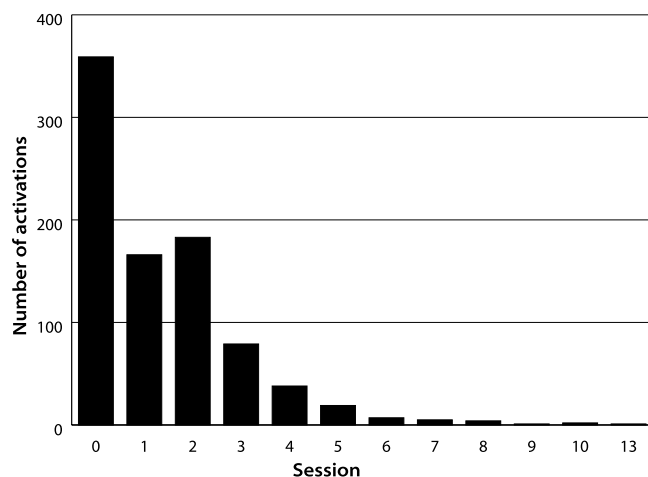
Number of content-rich sequences accessed per session, Yarrabah



Access to content – Yarrabah

	Number	Frequency	Percent	Valid Percent	Cumul Percent
Valid	0	582	51.7	51.8	51.8
	1	191	17.0	17.0	68.8
	2	198	17.6	17.6	86.5
	3	76	6.8	6.8	93.2
	4	39	3.5	3.5	96.7
	5	15	1.3	1.3	98.0
	6	12	1.1	1.1	99.1
	7	6	.5	.5	99.6
	8	2	.2	.2	99.8
	9	2	.2	.2	100.0
	Total	1123	99.8	100.0	
Missing	System	2	.2		
TOTAL		1125	100.0		

Number of content-rich sequences accessed per session, Inala



Access to content – Inala

	Number	Frequency	Percent	Valid Percent	Cumul Percent
0	359	41.6	41.6	41.6	41.6
1	166	19.2	19.2	19.2	60.8
2	183	21.2	21.2	21.2	81.9
3	79	9.1	9.1	9.1	91.1
4	38	4.4	4.4	4.4	95.5
5	19	2.2	2.2	2.2	97.7
6	7	.8	.8	.8	98.5
7	5	.6	.6	.6	99.1
8	4	.5	.5	.5	99.5
9	1	.1	.1	.1	99.7
10	2	.2	.2	.2	99.9
13	1	.1	.1	.1	100.0
TOTAL	864	100.0	100.0		

This data is not normally distributed. Sessions in Inala accessed significantly more content rich sequences than those at Yarrabah (Kruskall-Wallis $p < 0.001$) It is possible that this is due to the location of the kiosk in the AMS.

Access to content by community

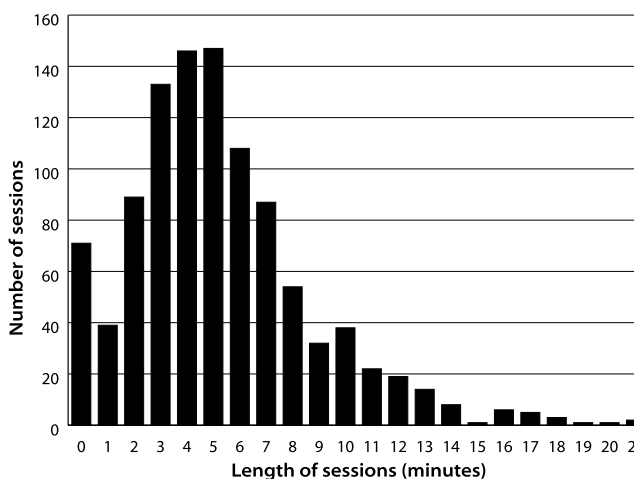
Community	Content accessed	No content accessed	TOTAL
Inala	505	359	864
Yarrabah	541	582	1123
TOTAL	1046	941	1987

2% of content rich sessions ran longer than 21 minutes. The longest session was listed as 4320 minutes. This result (72 hours) is clearly spurious. Sessions longer than the 98th centile (21 minutes) were excluded as outliers.

Statistics

Community	Content accessed	No content accessed	TOTAL
Inala	505	359	864
Yarrabah	541	582	1123
TOTAL	1046	941	1987

Length of sessions (minutes)



Model summary

Model	R	R Square	Adjusted R Square	Std error of the Estimate
1	.442	.196	.195	3.1172100

Coefficients^a

Model	Unstandardized coefficients		Standardized coefficients		t	Sig.
	B	Std error	Beta			
(Constant)	2.872	.179			16.033	.000
total content rich accesses	1.059	.067	.442		15.786	.000

a. Dependent variable: SESSTIME

Who answered the questions?

Community – answered any questions crosstabulation

Community		Answered any questions		Total
		Yes	No	
Yarrabah	count	219	905	1124
	% within community	19.5%	80.5%	100.0%
Inala	count	239	625	864
	% within community	27.7%	72.3%	100.0%
TOTAL	count	458	1530	1988
	% within community	23.0%	77.0%	100.0%

Chi-square tests

	value	df	Asymp. sig. 2-sided	Exact sig. 2-sided	Exact sig. 1-sided
Pearson Chi-Square	18.426 ^b	1	.000		
Continuity Correction ^a	17.968	1	.000		
Likelihood Ratio	18.304	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	18.417	1	.000		
N of Valid Cases	1988				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 199.05.

Did the person access content?

Did the person access any content – answered any questions crosstabulation

Did the person access any content?		Answered any questions		Total
		Yes	No	
No	count	213	728	941
	%	22.6%	77.4%	100.0%
Yes	count	245	801	1046
	%	23.4%	76.6%	100.0%
TOTAL	count	458	1529	1988
	%	23.0%	77.0%	100.0%

Chi-square tests

	value	df	Asymp. sig. 2-sided	Exact sig. 2-sided	Exact sig. 1-sided
Pearson Chi-Square	.173 ^b	1	.677		
Continuity Correction ^a	.131	1	.717		
Likelihood Ratio	.173	1	.677		
Fisher's Exact Test				.709	.359
Linear-by-Linear Association	.173	1	.678		
N of Valid Cases	1987				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 216.90.

Association between question rank and response rate

All sessions

Answered ease – Q

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	742	37.3	37.3	37.3
	No	1246	62.6	62.7	100.0
	TOTAL	1988	99.9	100.0	
Missing	System	1	.1		
TOTAL		1989	100.0		

Answered prior – Q2

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	771	38.8	38.8	38.8
	No	1217	61.2	61.2	100.0
	TOTAL	1988	99.9	100.0	
Missing	System	1	.1		
TOTAL		1989	100.0		

Answered age – Q3

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	735	37.0	37.0	37.0
	No	1253	63.0	63.0	100.0
	TOTAL	1988	99.9	100.0	
Missing	System	1	.1		
TOTAL		1989	100.0		

Answered sex – Q4

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	712	35.8	35.8	35.8
	No	1276	64.2	64.2	100.0
	TOTAL	1988	99.9	100.0	
Missing	System	1	.1		
TOTAL		1989	100.0		

Answered ATSI – Q5

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	658	33.1	33.1	33.1
	No	1330	66.9	66.9	100.0
	TOTAL	1988	99.9	100.0	
Missing	System	1	.1		
TOTAL		1989	100.0		

$$y=0.0114x+0.6018 \quad R^2=0.7149$$

Content-rich sessions only

Answered ease – Q

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	383	36.6	36.6	36.6
	No	663	63.4	63.4	100.0
	TOTAL	1046	100.0	100.0	

Answered prior – Q2

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	381	36.4	36.4	36.4
	No	665	63.6	63.6	100.0
	TOTAL	1046	100.0	100.0	

Answered age – Q3

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	360	34.4	34.4	34.4
	No	686	65.6	65.6	100.0
	TOTAL	1046	100.0	100.0	

Answered sex – Q4

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	348	33.3	33.3	33.3
	No	698	66.7	66.7	100.0
	TOTAL	1046	100.0	100.0	

Answered ATSI – Q5

		Frequency	Percent	Valid Percent	Cumul Percent
Valid	Yes	330	31.5	31.5	31.5
	No	716	68.5	68.5	100.0
	TOTAL	1046	100.0	100.0	

$$y=0.0113x+0.6157 \quad R^2=0.9586$$

What did they answer?

Community

– answered any questions crosstabulation

Comm.		Sex				Total
		No answer	Not asked	Male	Female	
Yarrabah	count	19	366	55	101	541
	% comm.	3.5	67.7	10.2	18.7	100.0
Inala	count	14	299	80	112	505
	% comm.	2.8	59.2	15.8	22.2	100.0
TOTAL	count	33	665	135	213	1046
	% comm.	3.2	63.6	12.9	20.4	100.0

Comm.		Age						Total
		No answer	Not asked	<20	20-34	35-49	50+	
Yarrabah	count	28	349	70	45	25	24	541
	% comm.	5.2	64.5	12.9	8.3	4.6	4.4	100
Inala	count	18	291	94	40	32	30	505
	% comm.	3.6	57.6	18.6	7.9	6.3	5.9	100
TOTAL	count	46	640	164	85	57	54	1046
	% comm.	4.4	61.2	15.7	8.1	5.4	5.2	100.0

Comm.		ATSI					Total
		No answer	Not asked	Male	Female		
Yarrabah	count	19	377	121	24	541	
	% comm.	3.5	69.7	22.4	4.4	100.0	
Inala	count	14	306	143	42	505	
	% comm.	2.8	60.6	28.3	8.3	100.0	
TOTAL	count	33	683	264	66	1046	
	% comm.	3.2	65.3	25.2	6.3	100.0	

Comm.		Prior				Total
		No answer	Not asked	Male	Female	
Yarrabah	count	43	320	69	109	541
	% comm.	7.9	59.1	12.8	20.1	100.0
Inala	count	32	270	93	110	505
	% comm.	6.3	53.5	18.4	21.8	100.0
TOTAL	count	75	590	162	219	1046
	% comm.	7.2	56.4	15.5	20.9	100.0

Comm.		Ease						Total
		No answer	Not asked	A little Easy	Quite hard	Very hard		
Yarrabah	count	92	263	102	27	12	45	541
	% comm.	17.0	48.6	18.9	5.0	2.2	8.3	100.0
Inala	count	71	237	119	24	17	37	505
	% comm.	14.1	46.9	23.6	4.8	3.4	7.3	100.0
TOTAL	count	163	500	221	51	29	82	1046
	% comm.	15.6	47.8	21.1	4.9	2.8	7.8	100.0

Differences in people who accessed pain and diabetes information

This analysis only includes those sessions where at least one content rich sequence was accessed.

All communities

SEX		Dicot PAIN access		
		Yes	No	Total
No answer	count	28	5	33
	% within sex	84.8	15.2	100.0
Not asked	count	422	243	665
	% within sex	63.5	36.5	100.0
Male	count	91	44	135
	% within sex	67.4	32.6	100.0
Female	count	146	67	213
	% within sex	68.5	31.5	100.0
TOTAL	count	687	359	1046
	% within sex	65.7	34.3	100.0

SEX		Dicot DIAB access		
		Yes	No	Total
No answer	count	19	14	33
	% within sex	57.6	42.4	100.0
Not asked	count	321	344	665
	% within sex	48.3	51.7	100.0
Male	count	66	69	135
	% within sex	48.9	51.1	100.0
Female	count	100	113	213
	% within sex	46.9	53.1	100.0
TOTAL	count	506	540	1046
	% within sex	48.4	51.6	100.0

AGE		Dicot PAIN access		
		Yes	No	Total
No answer	count	40	6	46
	% within sex	87.0	13.0	100.0
Not asked	count	404	236	640
	% within sex	63.1	36.9	100.0
<20	count	119	45	164
	% within sex	72.6	27.4	100.0
20-34	count	56	29	85
	% within sex	65.9	34.1	100.0
35-49	count	37	17	54
	% within sex	68.5	31.5	100.0
50+	count	37	17	54
	% within sex	68.5	31.5	100.0
TOTAL	count	687	359	1046
	% within age	65.7	34.3	100.0

AGE		Dicot DIAB access		
		Yes	No	Total
No answer	count	25	21	46
	% within age	54.3	45.7	100.0
Not asked	count	310	330	640
	% within age	48.4	51.6	100.0
<20	count	78	86	164
	% within age	47.6	52.4	100.0
20-34	count	34	51	85
	% within age	40.0	60.0	100.0
35-49	count	31	26	57
	% within age	54.4	45.6	100.0
50+	count	28	26	54
	% within age	51.9	48.1	100.0
TOTAL	count	506	540	1046
	% within age	48.4	51.6	100.0

ATSI		Dicot PAIN access		
		Yes	No	Total
No answer	count	26	7	33
	% within age	78.8	21.2	100.0
Not asked	count	435	248	683
	% within age	63.7	36.3	100.0
Yes	count	180	84	264
	% within age	68.2	31.8	100.0
2.00000	count	46	20	66
	% within age	69.7	30.3	100.0
TOTAL	count	687	359	1046
	% within age	65.7	34.3	100.0

ATSI		Dicot DIAB access		
		Yes	No	Total
No answer	count	17	16	33
	% within ATSI	51.5	48.5	100.0
Not asked	count	331	352	683
	% within ATSI	48.5	51.5	100.0
Yes	count	128	136	264
	% within ATSI	48.5	51.5	100.0
2.00000	count	30	36	66
	% within ATSI	45.5	54.5	100.0
TOTAL	count	506	540	1046
	% within ATSI	48.4	51.6	100.0

PRIOR		Dicot PAIN access		
		Yes	No	Total
No answer	count	57	18	75
	% within prior	76.0	24.0	100.0
Not asked	count	368	222	590
	% within prior	62.4	37.6	100.0
Yes	count	114	48	162
	% within prior	70.4	29.6	100.0
2.00000	count	148	71	219
	% within prior	67.6	32.4	100.0
TOTAL	count	687	359	1046
	% within prior	65.7	34.3	100.0

PRIOR		Dicot DIAB access		
		Yes	No	Total
No answer	count	44	31	75
	% within prior	58.7	41.3	100.0
Not asked	count	283	307	590
	% within prior	48.0	52.0	100.0
Yes	count	76	86	162
	% within prior	46.9	53.1	100.0
2.00000	count	103	116	219
	% within prior	47.0	53.0	100.0
TOTAL	count	506	540	1046
	% within prior	48.4	51.6	100.0

EASE		Dicot PAIN access		
		Yes	No	Total
No answer	count	117	46	163
	% within ease	71.8	28.2	100.0
Not asked	count	307	193	500
	% within ease	61.4	38.6	100.0
Easy	count	158	63	221
	% within ease	71.5	28.5	100.0
A little hard	count	32	19	51
	% within ease	62.7	37.3	100.0
Quite hard	count	15	14	29
	% within ease	51.7	48.3	100.0
Very hard	count	58	24	82
	% within ease	70.7	29.3	100.0
TOTAL	count	687	359	1046
	% within ease	65.7	34.3	100.0

EASE		Dicot DIAB access		Total
		Yes	No	
No answer	count	77	86	163
	% within ease	47.2	52.8	100.0
Not asked	count	239	261	500
	% within ease	47.8	52.2	100.0
Easy	count	101	120	221
	% within ease	45.7	54.3	100.0
A little hard	count	30	21	51
	% within ease	58.8	41.2	100.0
Quite hard	count	20	9	29
	% within ease	69.0	31.0	100.0
Very hard	count	39	43	82
	% within ease	47.6	52.4	100.0
TOTAL	count	506	540	1046
	% within ease	48.4	51.6	100.0

DICHOT DIAB ACCESS (DDA)		Community		Total
		Yarrabah	Inala	
Yes	count	273	233	506
	% within DDA	54.0	46.0	100.0
No	count	852	631	1483
	% within DDA	57.5	42.5	100.0
TOTAL	count	1125	864	1989
	% within DDA	56.6	43.4	100.0

Chi-square tests

	value	df	Asymp. sig. 2-sided	Exact sig. 2-sided	Exact sig. 1-sided
Pearson Chi-Square	1.879 ^b	1	.170		
Continuity Correction ^a	1.740	1	.187		
Likelihood Ratio	1.874	1	.171		
Fisher's Exact Test				.177	.094
Linear-by-Linear Association	1.879	1	.171		
N of Valid Cases	1989				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 219.80.

DICHOT PAIN ACCESS (DPA)		Community		Total
		Yarrabah	Inala	
Yes	count	342	345	687
	% within DPA	49.8	50.2	100.0
No	count	783	519	1302
	% within DPA	60.1	39.9	100.0
TOTAL	count	1125	864	1989
	% within DPA	56.6	43.4	100.0

Chi-square tests

	value	df	Asymp. sig. 2-sided	Exact sig. 2-sided	Exact sig. 1-sided
Pearson Chi-Square	19.632 ^b	1	.000		
Continuity Correction ^a	19.213	1	.000		
Likelihood Ratio	19.568	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	19.622	1	.000		
N of Valid Cases	1989				

a Computed only for a 2x2 table

b 0 cells (.0%) have expected count less than 5. The minimum expected count is 298.43

Inala only

		Dicot PAIN access		Total	
		Yes	No		
SEX					
	No answer	count	12	2	24
		% within sex	85.7	14.3	100.0
Not asked	count	199	100	299	
		% within sex	66.6	33.4	100.0
Male	count	54	26	80	
		% within sex	67.5	32.5	100.0
Female	count	80	32	112	
		% within sex	71.4	28.6	100.0
TOTAL	count	345	160	505	
	% within sex	68.3	31.7	100.0	

		Dicot DIAB access		Total	
		Yes	No		
SEX					
	No answer	count	8	6	14
		% within sex	57.1	42.9	100.0
Not asked	count	136	163	299	
		% within sex	45.5	54.5	100.0
Male	count	40	40	80	
		% within sex	50.0	50.0	100.0
Female	count	49	63	112	
		% within sex	43.8	56.3	100.0
TOTAL	count	233	272	505	
	% within sex	46.1	53.9	100.0	

		Dicot PAIN access		Total	
		Yes	No		
AGE					
	No answer	count	17	1	18
		% within sex	94.4	5.6	100.0
Not asked	count	192	99	291	
		% within sex	66.0	34.0	100.0
<20	count	74	20	94	
		% within sex	78.7	21.3	100.0
20-34	count	30	10	40	
		% within sex	75.0	25.0	100.0
35-49	count	14	18	32	
		% within sex	43.8	56.3	100.0
50+	count	18	12	30	
		% within sex	60.0	40.0	100.0
TOTAL	count	345	160	505	
	% within age	68.3	31.7	100.0	

		Dicot DIAB access		Total	
		Yes	No		
AGE					
	No answer	count	8	10	18
		% within age	44.4	55.6	100.0
Not asked	count	135	156	291	
		% within age	46.4	53.6	100.0
<20	count	42	52	94	
		% within age	44.7	55.3	100.0
20-34	count	12	38	40	
		% within age	30.0	70.0	100.0
35-49	count	20	12	32	
		% within age	62.5	37.5	100.0
50+	count	16	14	30	
		% within age	53.3	46.7	100.0
TOTAL	count	233	272	505	
	% within age	46.1	53.9	100.0	

		Dicot PAIN access		Total	
		Yes	No		
ATSI					
	No answer	count	11	3	14
		% within age	78.6	21.4	100.0
Not asked	count	204	102	306	
		% within age	66.7	33.3	100.0
Yes	count	101	42	143	
		% within age	70.6	29.4	100.0
2.00000	count	29	13	42	
		% within age	69.0	31.0	100.0
TOTAL	count	345	160	505	
	% within age	68.3	31.7	100.0	

		Dicot DIAB access		Total	
		Yes	No		
ATSI					
	No answer	count	7	7	14
		% within ATSI	50.0	50.0	100.0
Not asked	count	140	166	306	
		% within ATSI	45.8	54.2	100.0
Yes	count	68	75	143	
		% within ATSI	47.6	52.4	100.0
2.00000	count	18	24	42	
		% within ATSI	42.9	57.1	100.0
TOTAL	count	233	272	505	
	% within ATSI	46.1	53.9	100.0	

		Dicot PAIN access		
		Yes	No	Total
No answer	count	24	8	32
	% within prior	75.0	25.0	100.0
Not asked	count	176	94	270
	% within prior	65.2	34.8	100.0
Yes	count	69	24	93
	% within prior	74.2	25.8	100.0
No	count	76	34	110
	% within prior	69.1	30.9	100.0
TOTAL	count	345	160	505
	% within prior	68.3	31.7	100.0

		Dicot DIAB access		
		Yes	No	Total
No answer	count	31	11	32
	% within prior	65.6	34.4	100.0
Not asked	count	122	148	270
	% within prior	45.2	54.8	100.0
Yes	count	40	53	93
	% within prior	43.0	57.0	100.0
No	count	50	60	110
	% within prior	45.5	54.5	100.0
TOTAL	count	233	272	505
	% within prior	46.1	53.9	100.0

		Dicot PAIN access		
		Yes	No	Total
No answer	count	52	19	71
	% within ease	73.2	26.8	100.0
Not asked	count	154	83	237
	% within ease	65.0	35.0	100.0
Easy	count	86	33	119
	% within ease	72.3	27.7	100.0
A little hard	count	17	7	24
	% within ease	70.8	29.2	100.0
Quite hard	count	10	7	17
	% within ease	58.8	41.2	100.0
Very hard	count	26	11	37
	% within ease	70.3	29.7	100.0
TOTAL	count	345	160	505
	% within ease	68.3	31.7	100.0

		Dicot DIAB access		
		Yes	No	Total
No answer	count	32	39	71
	% within ease	45.1	54.9	100.0
Not asked	count	107	130	237
	% within ease	45.1	54.9	100.0
Easy	count	54	65	119
	% within ease	45.4	54.6	100.0
A little hard	count	14	10	24
	% within ease	58.3	41.7	100.0
Quite hard	count	10	7	17
	% within ease	58.8	41.2	100.0
Very hard	count	16	21	37
	% within ease	43.2	56.8	100.0
TOTAL	count	233	272	505
	% within ease	46.1	53.9	100.0

Yarrabah only

		Dicot PAIN access		Total	
		Yes	No		
SEX	No answer	count	16	3	19
		% within sex	84.2	15.8	100.0
Not asked	count	223	143	366	
	% within sex	60.9	39.1	100.0	
Male	count	37	18	55	
	% within sex	67.3	32.7	100.0	
Female	count	66	35	101	
	% within sex	65.3	34.7	100.0	
TOTAL	count	342	199	541	
	% within sex	63.2	36.8	100.0	

		Dicot DIAB access		Total	
		Yes	No		
SEX	No answer	count	11	8	19
		% within sex	57.9	42.1	100.0
Not asked	count	185	181	366	
	% within sex	50.5	49.5	100.0	
Male	count	26	29	55	
	% within sex	47.3	52.7	100.0	
Female	count	51	50	101	
	% within sex	50.5	49.5	100.0	
TOTAL	count	273	268	541	
	% within sex	50.5	49.5	100.0	

		Dicot PAIN access		Total	
		Yes	No		
AGE	No answer	count	23	5	28
		% within sex	82.1	17.9	100.0
Not asked	count	212	137	349	
	% within sex	60.7	39.3	100.0	
<20	count	45	25	70	
	% within sex	64.3	35.7	100.0	
20-34	count	26	19	45	
	% within sex	57.8	42.2	100.0	
35-49	count	17	8	25	
	% within sex	68.0	32.0	100.0	
50+	count	19	5	24	
	% within sex	79.2	20.8	100.0	
TOTAL	count	342	199	541	
	% within age	63.2	36.8	100.0	

		Dicot DIAB access		Total	
		Yes	No		
AGE	No answer	count	17	11	28
		% within age	60.7	39.3	100.0
Not asked	count	175	174	349	
	% within age	50.1	49.9	100.0	
<20	count	36	34	70	
	% within age	51.4	48.6	100.0	
20-34	count	22	23	45	
	% within age	48.9	51.1	100.0	
35-49	count	11	14	25	
	% within age	44.0	56.0	100.0	
50+	count	12	12	24	
	% within age	50.0	50.0	100.0	
TOTAL	count	273	268	541	
	% within age	50.5	49.5	100.0	

		Dicot PAIN access		Total	
		Yes	No		
ATSI	No answer	count	15	4	19
		% within age	78.9	21.1	100.0
Not asked	count	231	146	377	
	% within age	61.3	38.7	100.0	
Yes	count	79	42	121	
	% within age	65.3	34.7	100.0	
2.00000	count	17	7	24	
	% within age	70.8	29.2	100.0	
TOTAL	count	342	199	541	
	% within age	63.2	36.8	100.0	

		Dicot DIAB access		Total	
		Yes	No		
ATSI	No answer	count	10	9	19
		% within ATSI	52.6	47.4	100.0
Not asked	count	191	186	377	
	% within ATSI	50.7	49.3	100.0	
Yes	count	60	61	121	
	% within ATSI	49.6	50.4	100.0	
2.00000	count	12	12	24	
	% within ATSI	50.0	50.0	100.0	
TOTAL	count	273	268	541	
	% within ATSI	50.5	49.5	100.0	

		Dicot PAIN access		
		Yes	No	Total
No answer	count	33	10	43
	% within prior	76.7	23.3	100.0
Not asked	count	192	128	320
	% within prior	60.0	40.0	100.0
Yes	count	45	24	69
	% within prior	65.2	34.8	100.0
No	count	72	37	109
	% within prior	66.1	33.9	100.0
TOTAL	count	342	199	541
	% within prior	63.2	36.8	100.0

		Dicot DIAB access		
		Yes	No	Total
No answer	count	23	20	43
	% within prior	53.5	46.5	100.0
Not asked	count	161	159	320
	% within prior	50.3	49.7	100.0
Yes	count	36	33	69
	% within prior	52.2	47.8	100.0
No	count	53	56	109
	% within prior	48.6	51.4	100.0
TOTAL	count	273	268	541
	% within prior	50.5	49.5	100.0

		Dicot PAIN access		
		Yes	No	Total
No answer	count	65	27	92
	% within ease	70.7	29.3	100.0
Not asked	count	153	110	263
	% within ease	58.2	41.8	100.0
Easy	count	72	30	102
	% within ease	70.6	29.4	100.0
A little hard	count	15	12	27
	% within ease	55.6	44.4	100.0
Quite hard	count	5	7	12
	% within ease	41.7	58.3	100.0
Very hard	count	32	13	45
	% within ease	71.1	28.9	100.0
TOTAL	count	342	199	541
	% within ease	63.2	36.8	100.0

		Dicot DIAB access		
		Yes	No	Total
No answer	count	45	47	92
	% within ease	48.9	51.1	100.0
Not asked	count	132	131	263
	% within ease	50.2	49.8	100.0
Easy	count	47	55	102
	% within ease	46.1	53.9	100.0
A little hard	count	16	11	27
	% within ease	59.3	40.7	100.0
Quite hard	count	10	2	12
	% within ease	83.3	16.7	100.0
Very hard	count	23	22	45
	% within ease	51.1	48.9	100.0
TOTAL	count	273	268	541
	% within ease	50.5	49.5	100.0

All communities - ease of use and age cross tabulation

AGE		Ease					Total	
		No answer	Not asked	Easy	A little hard	Quite hard		Very hard
No answer	count	27		8	5	1	5	46
	% within age	58.7		17.4	10.9	2.2	10.9	100
Not asked	count	67	500	36	10	7	20	640
	% within age	10.5	78.1	5.6	1.6	1.1	3.1	100
<20	count	29		85	19	10	21	164
	% within age	17.7		51.8	11.6	6.1	12.8	100
20-34	count	18		42	8	3	14	85
	% within age	21.2		49.4	9.4	3.5	16.5	100
35-49	count	11		31	5	3	7	57
	% within age	19.3		54.4	8.8	5.3	12.3	100
50+	count	11		19	4	5	15	54
	% within age	20.4		35.2	7.4	9.3	27.8	100
TOTAL	count	163	500	221	51	29	82	1046
	% comm.	15.6	47.8	21.1	4.9	2.8	7.8	100.0

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