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PERSONAL INFORMATION MANAGEMENT FOR THE ELDERLY

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ABSTRACT
Given the current desire to draw a greater percentage of the elderly population into a significant use of ICT, a reflection is presented on the suitability of computer-based personal information management systems for older people. The paper is presented from the point of view of a computer-literate grandchild trying to demonstrate to a grandparent the benefits of using an electronic system. The main focus of attention is the address book.

KEYWORDS
PIM, elderly, addressbook.

1. INTRODUCTION

Personal information management can in principle be defined widely to include paper documents but in practice it is commonly assumed to be the management of electronic information. The world of electronic gadgets offers us mobile phones, PDAs and media players for messages, diary, contacts, documents and photos/music/video. Arguably this technology has recently converged so that the newest mobile phones are able to perform all these functions for us. Well for some of us, but not all of us. An older person faced with a gadget in this category will typically complain that the display is too small, the buttons are too small and that it is too complicated.

Many older people who are ICT adopters report that it was the influence of a younger member of the family that persuaded them - even forced them - into adoption [Selwyn 2004]. So what can I offer to my Gran in terms of personal information management? Looking at the information management from an older rather than a younger person's perspective, does an elderly person have enough information to be worth managing? Assuming that their world is dominated by paper documents, how could they approach the business of converting to electronic documents? What potential benefits would tempt them to embark on the process of conversion? The current interest in "brain training" might suggest that there are ways of presenting an electronic system such that its very use could have beneficial effects on the memory and mental agility of the user [Elsweiler 2007].

This paper presents a case study of an attempt to create a personal information system that might be attractive to an elderly person, discusses some of the shortcomings of current software and hardware products and reflects on the requirements for a successful solution.

2. PIM FOR THE ELDERLY

The general area of PIM is of interest to researchers e.g. [Boardman 2004] and [CACM Special issue on PIM, 2006] although the research often considers information management at work rather than at home. The focus here is on the elderly and their everyday needs. Consider first the address book. For an elderly person this is likely to be 'real' book with the edges of the pages cut away to provide a quick thumb index. Opening the book at the page for any given letter will typically reveal some addresses and telephone numbers written
neatly in the same hand - those that were written when the book was first started. There will be some crossings out, some additions in more wobbly writing. On the floor will have fallen a small collection of scraps of paper torn or cut from correspondence with "new" addresses on them. Gran's indexing system will be by surname so, when the birthday of her daughter's youngest child is approaching and Gran wants to send a birthday card, she has to remember her daughter's married name to look up the address. And how did she know it was birthday time? - she just 'remembered'.

A scenario like this can be used to inform the design of an electronic system which would better support Gran in this process. In fact the computer-literate, problem-solving brain tends to leap into overdrive. It is clear that a surname-only indexing is not sufficient. So we will implement a search-engine approach to finding addresses (searching on any remembered fragment of any part of the name or address). Another leap - we can store relationships between people in the address book and offer selection from a family tree type of display. Of course if Gran had the dates of all the significant family events stored, she could be reminded of them automatically. And if she found it difficult to write the address on a birthday card or she felt that her handwriting was a bit wobbly, the system could print the address on the envelope. And if she found it difficult to get out to the shops to buy a birthday card then she could make a card herself. And if she had run out of stamps, she could print the post-paid label on the envelope.

But wait. Before inventing any more let us pause to see how realistic this scenario is with current tools. We need to check both hardware and software. From the software point of view it is possible using an AddressBook application to store names, addresses, telephone numbers, pictures and family relationships. A text-based search is implemented which responds live, key by key. By using some scripting and a diagramming too a family tree diagram can be drawn automatically based on any chosen entry. So there seems to be a solution or potential solution in the area of software.

Regarding hardware it is likely that Gran does not yet have a computer. Arguably the dominant electronic gadget in the home of an elderly person is the television set with some kind of recording/playback device and associated remote control(s). So this is one obvious display device that could be used for PIM. So we introduce another 'black box' under the television, another (!) remote control and we have introduced a computer into the living room. Another possibility is to use a personal mobile device. The scenario described presupposed the existence of a printer and possibly an internet connection. So there are additional hurdles to overcome.

### 3. PRACTICAL ISSUES

There are a number of issues and problems with the above approach. Will Gran want to swap her addressbook for something else. For all its faults it belongs to her and has probably been with her a long time. The proposed alternative is very computer oriented - will Gran accept a computer into her home? Using a computer at a desk with a screen and keyboard is very different from using one from the comfort of your favourite armchair and using the domestic television as the screen - would that actually work?. A further problem is that nothing has been said so far about the initial problem of entering the raw data or the continuing problem of keeping it updated.

#### 3.1 Acceptability of a Computer

In various earlier experiments involving the scanning and storing and displaying on to the television screen of treasured pictures, there did not seem to have been any reluctance on the part of older people to the addition of an extra box connected to the tv, provided that it did not disturb any of the current uses of the television. There did however seem to be a reluctance to embrace the concept of setting aside some desk or work surface space permanently for a computer, a screen, a keyboard, a mouse and a tangle of wires.

#### 3.2 Armchair Computing

In theory, software producers have all been making applications and web sites 'accessible' for many years and there are 'accessibility features' in modern operating systems. If we turn on these accessibility features we should be able to use the interface for a PIM component like an address book with just a wireless mouse
from across the room in the comfort of our armchair. But if the PIM software was not thought out or designed for such use then the user experience will be less than perfect. It is common to find provision to simulate mouse movement and selection using a keyboard. However, to be able to simulate a keyboard so as to enter text as part of a search or an entry update, additional software might have to be purchased. Armchair computing is in its infancy with just a few 'multimedia systems' being designed for living room use. But it is rather revealing that all the applications seem to have had to be redesigned for 'remote control' (c.f. Front Row, AppleTv).

If there are problems using Applications, maybe we can use a browser-based solution with web pages. Certainly we can export the data from our PIM application and turn the information into web pages. The biggest problem here is providing a replacement search strategy. Since a modern browser is likely to have quite a sophisticated search facility built-in, it may be possible to use this if the address book is rendered as a single page.

3.3 Entering Data & Updating

If Gran (or a helper or some relation) has to start from scratch to enter all the information then this is a time-consuming and error-prone task. It would be of great help if there was a family member who already had many of the addresses in electronic form. Photos (face or head-and-shoulders) of all the family and friends ought not to be a problem in these days of digital photography, but in practice gathering the pictures one-by-one is a long process. Again there is a huge difference between performing the task for the first member of a family in comparison with subsequent members. Here we are moving away from personal and towards group information management [Erickson 2006].

3.4 Formal Addresses

An address book is essentially a collection of Vcards each of which describes a single person. So a married couple (e.g. the Browns) have two entries (cards) naming the husband (John) and the wife (Mary), and usually duplicating the address. But if we are trying to help Gran by printing her Christmas card address labels, she will not be happy to send just to 'John Brown', or just to 'Mary Brown', or even to 'John & Mary Brown' but it will have to be 'Mr & Mrs J Brown'. This will necessitate a third entry for Brown, destined for the 'Christmas Card' group, and we have the makings of a very messy update problem.

4. OTHER INFORMATION MANAGEMENT

All of the discussion so far has centred around the address book. What other 'information' could be managed, and would this other information be seen as separate or integrated. It is very likely that Gran will have a range of photographs ranging from small black and white photos from her youth to colour prints from a digital camera. She might even have some recent photos viewable on screen via a photo-CD or a digital picture frame. There are any number of variations on media players which will store digital photos and they all seem very attractive when they have a tiny number of images. The problem comes as the collection grows. The effort required to tag photos with enough information to find them by some kind of search technique is more than even some enthusiasts can manage. The process of managing digital photos is not trivial [e.g. Latif 2006]. It is quite common to find that people have tried to organise their images by tagging or something similar, have abandoned the attempt and are relying instead on finding images using date order and their own memory.

The one big success of course is pre-recorded music. Because the tagging comes for free (from the CDDB database), vast music collections can be searched very successfully. However there are other documents that might reward being brought into electronic form. Does Gran use recipes? Where are they stored? If they are on scraps of paper hand-written or torn from magazines maybe they could be converted to electronic form where they could be searched much more easily. A new printout in large font could be taken into the kitchen and it would not matter if this copy met with a spillage accident. Other important documents that could usefully be stored are identity, historical and medical papers like passport, birth certificate, passport, and records of medication.
The problem with widening the net of information to be managed is that we are used to compartmentalisation. We are offered an address book for contacts, a family tree for relationships, a photo viewer for our images, a player for our music and there is very little integration. Well there is integration between address book and email and there can be integration between address book anniversary information and calendar/diary. However there is much more that could be done in the way of linking in family tree type information and photos. Why shouldn't Gran be able to receive a 'thank you' letter from a grandchild, look up the family in the family tree, click to view some photos of their home, stumble on a picture of when she and her sister were both visiting together, lookup her sister in the address book, discover that it was indeed her birthday in a few days time, make her a greetings card and have the envelope address printed.

Another much underused form of information is sound. Gran would probably quite like to hear sound recordings of people in her family, especially those at a distance. Thus "Hi Gran, this is a picture of us on holiday at xxxx" could be associated with a picture (or a group of pictures) and "Hi Gran my address is ..." could be associated with an entry in her address book.

5. NETWORKING AND SECURITY

Many of the difficulties referred to above are caused by the start-up issues of entering so much information. If this was shared by all the households in the address book the load would be negligible. If each household was responsible for creating and maintaining its own Vcards and Gran's copies could be kept in synchronisation with them, then everyone would have up-to-date information with minimal effort. It is not hard to imagine this kind of facility being grafted onto a social networking site. The benefits of communal responsibility for information was remarked on in the PK-MAST system [Cheung 2006].

Of course in our current society we have to worry about the security of such information but maybe it would be better to seek ways of solving this problem rather than letting it prevent the idea being tried. There are several levels at which the problems arise. At one extreme there are the close family relationships where the trust is at it highest. At the other extreme there are the professional relationships where one might approach a medical practice and ask for a photo of Gran's doctor to go into her address book.

6. THE FUTURE

Will future generations of older people have the same problems and requirements as this generation? They will probably have solved the data entry problem if they have been using some kind of PIM in their earlier years. What might be most important to them is a system which will compensate for their own degrading senses. This might begin with something quite gentle like increasing on-screen sizes of fonts, etc. to compensate for failing vision. There will at some point be a requirement to reducing the number of 'hit' points on the screen to compensate for failing dexterity with fingers. The trend towards ever larger screens with increasingly overloaded displays is frightening for someone with failing vision. The number of different functional places where a selection/click can be made on the screen of a typical desk top computer runs into thousands - e.g. 15 menus, 20 icons in each of 3 application toolbars, 35*80 cursor edit positions (assuming 35 lines of a document are on view with approximately 80 characters per line), various hot spots in scroll bars, many icons in an application dock, etc.

Given the current trend for 'games' that purport to check your brain age it may be possible for systems to become more able to track long-term degradation of aspects of their user's abilities. The challenge will be to allow the whole system to react to such information. Without being too specific it is clear that a reduction in complexity will be required and this would mean simplification of choices. This may not necessarily mean removal of choice. There is an information theoretic principle at stake here. If there are 1024 different 'hit' points on the screen for a visually sound, dexterous user then the same choice can be made by a sequence of 10 binary choices by a visually impaired, less dexterous user. Moreover there is a range of steps in between offering different trade-offs between speed and simplicity. Once a system has been imagined to help with failing abilities it would be possible to think of it being used in reverse. When an elderly person makes takes first tentative steps towards using a new system it could behave in a very simple way offering only simple choices. The behaviour of the system could gradually offer more complex choices (which would allow faster
use) as the user got used to the system. However the system could retreat towards simple choices again at any time that it senses that the user shows any kind of degradation whether it be because of a temporary handicap (e.g. bandaged wrist) or a more permanent failing associated with the aging process.

7. CONCLUSIONS

In the end it would be so much easier if we could find what is called in other circles the "killer app" - the one that is guaranteed to entice an older person to (a) purchase and (b) use some new technology. According to popular rumour Nintendo (almost unintentionally?) started selling large numbers of their DS-Lite console to older people when they released "Brain Training". But now that the device is in people's hands what else could they do with it other than brain training. Well, one answer is to add a web browser. This mirrors to some extent what has happened with Apple's iPod. In the quest to be able to do more with the device, it can now go online wirelessly and run internet applications.

It seems clear that elderly people are not keen to import a computer into their house if that means providing desk space for a monitor, keyboard and messy wires. A solution involving another use for the domestic tv is acceptable, as is a mobile device (provided it is not too small).

In the area of software even a simple thing like an address book provide problems. Applications keep falling into the same traps - rushing in to adopt the latest fad in the look of an interface ("e.g. brushed metal"), ignoring basic rules of accessibility and failing to integrate with related applications. One current trend, that of using open solutions - e.g. xml data - for storing information about electronic picture albums and music collections is to be applauded as this does allow scripters to leverage some integration.

As things stand, for the considerate younger person looking at an aging relative and thinking that there must be something in the ICT world that will help, there is an uncertain path to follow. It is not clear what equipment to offer, what area to start in and there are no guarantees of success. On average the current offerings are still hard to use.

An apparently simple area like the address book can cost a lot of effort to convert from paper to electronic form. After that there are problems lying in wait as regards updating. The delivery platform of choice would probably be a mobile device of significant size with a touch screen. A browser-based solution would seem to offer more possibilities for integration - at least it will fight against the independent applications problem. It would be good to remain optimistic [Jones 2006] that "Advances in PIM may help old people 'match their mental lifespan to their physical lifespan'".

REFERENCES