

4.8 Smart Cards and Terminals

John M. Gill and Kelvin Currie

Introduction

Telecommunication terminals are becoming increasingly sophisticated and can now offer a bewildering number of choices to the user. To handle this increased number of choices, the terminal often incorporates a sophisticated interface which can cause problems for users who are elderly or have a disability. However some of these terminals give the potential for modifying the interface to meet the needs of the individual user.

To select a preferred interface, the user could simply press a button or select from a menu on the screen. This is unlikely to find favour with service providers if it significantly increases the time taken to undertake the transaction, but it may be viable for simple operations such as increasing audio amplification on a public telephone. The user's preferences could be stored on a card. With the magnetic stripe or optical cards there is very limited spare capacity for storing this information, but this method has been used successfully for storing the user's preference for language (e.g. English or French). A smart card has fewer restrictions on storage capacity so it appears to be ideal for this purpose, as long as some international standard is agreed for the coding of this information on the card.

A smart card is a credit card sized plastic card incorporating an integrated microcircuit. This circuit holds information in electronic form that can be easily, securely and accurately accessed by a range of terminals.

Smart cards are one of three main types:

- memory only - often used as pre-payment cards for public telephones;

Although some of these biometric methods are used in specialized application areas, it is likely to be some years before they are used on telecommunication

- visual recognition of the user (e.g. face).
- retinal scan;
- dynamic signature verification;
- voice recognition;
- hand geometry;
- fingerprint;
- remember the correct digits but in the wrong order;
- a problem for people with dyslexia since they may
- Personal Identification Number (PIN) - this can be

Preferred customer verification method:

In an ideal world, the user would be able to select and store their preferred interface any time they use the card at a terminal. However practical constraints may restrict this choice to being at the time of issuing the card.



(Figure 4-32)
Example of a "memory only"
smart card.

- microprocessor - this adds the possibility of in-
- applications);
- contactless - eliminates the need to put the card in a reader which makes this type attractive for public transport applications.

terminals for use by the general public. However, when they do come into general use, it is highly desirable that the user has a choice of verification method since some groups of disabled people will be excluded if there is no choice.

Preferred input:

- more time - this is particularly important for many elderly persons. On a public telephone, this could involve storing the number being dialled and then sending it at a press of a function key;
- keyboard only - for instance, a blind person may prefer not to use a touchscreen;
- touchscreen only - this may be easier for people who are not used to operating keypads;
- speech recognition - this may be restricted to giving basic instructions to the terminal.

Preferred operation:

- reduced functionality - this is for limited use of the terminal such as automatically dialling a pre-stored number on a telephone card (a useful feature for some intellectually impaired persons);
- pre-set amount (for an Automatic Teller Machine) - after entering the PIN, the cash dispenser would automatically issue say £100 (this is a mode which might be surprisingly popular among many elderly users);
- simple instructions on touch screen - this is a feature which might be useful for customers who are technophobic.

Preferred output:

- large characters on screen - this includes size of characters as well as foreground / background colours or the choice of font;
- audio - this can vary from beeps to indicate the acceptance of an instruction, to speech feedback on key pressed (but not for the PIN or password), to speech prompts, to speech output of information normally displayed on the screen. Speech prompts can usually be achieved by using stored speech

If close contactless card:

- No card insertion - this would help people in wheelchairs who cannot reach the slot for the card reader, those with hand tremor or arthritis, and blind persons.



(Figure 4-33)
 Person having difficulty reading the screen due to lighting conditions.

- which is inexpensive and of good audio quality; full vocabulary speech synthesis is of lower quality which may be unacceptable to the occasional older user;
- for audio systems such as the telephone, it would be desirable to be able to select the amplification for each frequency band - this would go some way towards compensating for a hearing loss in a particular frequency band;
- maximize use of icons - this may be desired by persons who are illiterate or who do not understand any of the languages available on that terminal;
- Braille display - these are expensive (adding a few thousand pounds to the cost of a terminal) and it is estimated, for example, that only 19,000 people can read Braille in the UK. However there may be some special application areas where the cost is justified.

