Improving the usability of PIN pads

Sector: Retail

In 2002-2003, more than 20,000 PIN (personal identification number) pads were installed in Post Offices throughout the UK so that customers could still access their money locally, following a Government decision to pay pension and benefits directly into customers' bank accounts.

At the time, the use of chip and PIN was limited to the banking sector’s Automated Teller Machines (ATMs) and there were very few PIN pads available for use in retail environments.

The PIN pad selected by the Post Office was functional but not optimally designed from a usability perspective. For example, customers who were elderly, with limited dexterity, or with sight loss experienced difficulties using the PIN pad due to the physical design of the key pad.

Understanding users’ needs

Ergonomics professionals adopted an inclusive approach to the specification, review and improvements to the design of these PIN pads, adapting them for the needs of people with physical disabilities and sight loss, through interaction with actual users.

Initial user testing of the PIN pads found that the pads were usable by the majority of customers for the limited amount of interaction needed. However, older people and people with sight loss, with dexterity impairments and wheelchair users needed modifications to the PIN pads to be able to use them effectively.

For those with sight loss, this meant including a key pad guide and tactile markings to improve navigation across the key pad. For older customers and those with hearing loss, a more pronounced audible feedback was needed.

Further testing also showed that inserting a bank card into a slot on the PIN pad caused difficulties for some customers. This included not being able to find the card slot, difficulty putting the card into the slot and pulling it back out again, and putting the card in the wrong way round.

Modifications to improve usability included more visible indicators of where and how to insert the card, and tactile markings on the card to indicate how to orientate it.

These changes were tested by groups of up to 60 people who were elderly, had sight loss, hearing loss, mobility or dexterity impairments to determine the optimum design of the modifications.
Making a difference

Several modifications were made to the original PIN pad designs to improve the usability for those who had difficulty in using the pads. These were specifically those customers who were elderly, experienced sight loss, hearing loss, mobility or dexterity impairments.

- A cover was put over keys that were not for customer use so that the top keys were 1, 2 and 3.
- A tactile pimple was added to the number 5 key to help customers with sight loss navigate around the key pad.
- A yellow funnel was added to the card slot to make it easier to identify the slot and to insert and retrieve the card.
- An illustration was added above the card slot to help customers insert their card the right way up.
- Post Office bank cards were notched on one edge to help customers determine which end of the card to insert into the slot.

Ergonomics input was also provided in the development of training for Post Office counter clerks. A workshop was designed and facilitated which included representatives of disability access groups and Post Office training specialists.

Wider applications

The PIN pad, such as that used by the Post Office, is just one example of an input device in the retail sector that is used by the majority of the general public. Designing for a wide ranging population can be challenging but the early application of ergonomics and human factors principles and methods ensures that as broad a range of capabilities as possible is taken into account in the design and user testing stages. This results in a device that is highly usable, fit for purpose and provides a quality user experience.

Other examples of this type of public design application are cashpoint machines, ticket machines and parking meters.

More restricted target populations may occur with devices used within businesses, for example, to log picked orders in warehouses or shelf-stacked inventories in supermarkets.

Consultation with others

Throughout the ergonomics work on the PIN pad, input was sought from special interest groups including the RNIB, the Multiple Sclerosis Society, Parkinsons Disease Society, the Stroke Association and various local accessibility groups.

Further information

An international standard, ISO 9241-11 Ergonomic requirements for office work with visual display terminals, provides guidance on usability.

It explains how to identify the information necessary to take into account when specifying or evaluating usability in terms of measures of user performance and satisfaction.

Guidance is given on how to describe the context of use of the product and the measures of usability. It includes an explanation of how the usability of a product can be specified and evaluated as part of a quality system, for example, one that conforms to ISO 9001.

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