Morphome project researching proactive computing in homes

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The research results of Research Director Frans Mäyrä's Morphome project confirm that test subject perceptions of computer technology are often critical or negative. The idea of computers playing a central role in the home is anathema to many. Computers are seen as being complicated and unreliable, so no one would readily submit key household functions to their control. Conversely, there is a great deal of curiosity in computer technology as well as interest in new applications.

"Test subjects listed, for example, their wishes for a small infoscreen in the foyer which, as they were leaving the house, would alert them if a potentially dangerous electrical appliance was left on or they had forgot their keys, " explains Mäyrä. The Academy of Finland-funded project has created models for use in the design of future smart homes and compiled data on the acceptibility of proactive technologies as a part of everyday life.

Smart homes can advantage proactive technology, which the home uses to respond to the wishes of its residents and adjust household functions accordingly. For example, locks, lighting, climate control or various appliance functions can be seamlessly adapted to the time of day, day of the week, or resident wishes. The more commonplace this type of technology becomes, the more important is the need to understand the needs, knowledge, wishes and fears that people associate with its applications.

How new technologies look determines whether they will be accepted in the home

The multidisciplinary Morphome project studied, among other things, the control of light and sound as part of the proactive experience. Independent computer control of such household functions as lighting in low-risk areas are considerably easier to accept than, for example, door locks, the control of stoves and other home appliances, or home entertainment content, such as television broadcasts, over which test subjects wanted to maintain greater control. Conversely, test subjects were willing to make concessions for things enhancing home safety, such as the home computer system turning off a stove left on.

The project developed a variety of designs and functions for smart lights, which were tested in test subject homes. It was found that household items with an entirely new way of functioning change the lives of residents in many, even unexpected ways. The lights, which were able to "listen" to surrounding noises and change their intensity or colour, made the residents consciously control their voices in a new way. This type of "decibel-light" might lead to a situation in which the residents begin to actively avoid doing things that make loud noises when they learn what the actual impact of those actions is. Conversely, noise readings taken on decibel meters differ from those picked up by a human ear: the extreme response of a light to a sudden sneeze caused some degree of amusement as well as irritation.

Design tests showed that the concrete character of a new technology has a major influence on its ability to be accepted into a home environment. The low-profile nature of climate control or alarm systems made them easier areas in which to employ computer technology. People want their homes to be first and foremost cosy, peaceful and filled with personal, familiar things. The project developed, for example, smart pillows,

whose embedded microprocessors and RF sensors measured the reactions of people of different ages to technology, which was clad in a familiar, soft form. Children in particular enjoyed "lively" and noise-making pillows, playing with them like toys. Embedding computer technology in a soft and familiar item like a pillow made it seem easily approachable and safe. Pillows are not perceived as having anything to do with computers, and when a prototype made a sort of animal sound, the test subjects immediately associated the fuzzy pillows with a dog or other pet.

Human-based ideas and ethically-sustainable choices must be taken into consideration in design

The project's results demonstrate that the development of proactive technology should respect the abilities and decision-making power of people in regards to their living environment. Designers should give thought to what makes a house a home, and strive to develop technology so that it will not interfere with, but support and enhance precisely these dimensions of the home.

The Morphome project focused on the development of proactive home technologies which are grounded in human-based ideas and ethically-sustainable choices. Research also demands a broader social debate on the development and application of smart monitoring, sensing and control technologies. The proliferation of proactive systems in homes is hindered by industry standards as well as a lack of updates and maintenance services. Because each home is its very own, unique living environment, it is a challenge to develop standardised solutions for it.

Source: Academy of Finland