

An In the Wild Study: The UbiFit Garden

This case study was presented in the fourth edition of *Interaction Design: Beyond HCI* in chapter 14. It is no longer included in the 5th edition but we have included it on the website in case some readers find it useful.

Another early example of an in the wild study was the UbiFit Garden project (Consolvo *et al*, 2008), which evaluated activity sensing in the wild to address the growing problem of people's sedentary lifestyles. A mobile device was designed to encourage physical activity that used on-body sensing and activity inferencing. The personal mobile display had three components: a fitness device that monitored different types of fitness activities, an interactive application that kept detailed information, including a journal of the individual's activities, and a glanceable display that ran on cell phones. The system worked by inferring what the wearer was doing, in terms of walking, running, cycling, and using gym equipment based on data detected from accelerometer and barometer sensors. The sensor data was processed and then communicated to the cell phone using Bluetooth. The data was analyzed and used as input for the glanceable display that depicted the UbiFit Garden (see Figure 14.8). The display depicted a garden that bloomed throughout the week as the user carried out the various physical activities. A healthy regime of -physical exercise was indicated by a healthy garden full of flowers and butterflies. Conversely, an unhealthy garden with not much growth or butterflies indicated an unhealthy lifestyle.



(a)



(b)



(c)

Figure 14.8 UbiFit Garden's glanceable display: (a) at the beginning of the week (small butterflies indicate recent goal attainments; the absence of flowers means no activity this week); (b) a garden with workout variety; (c) the display on a mobile phone (the large butterfly indicates this week's goal was met)

Source: From Consolvo, S., McDonald, D.W., Toscos, T. *et al* (2008) "Activity sensing in the wild: a field trial of UbiFit garden". In: *Proceedings of CHI 2008*, ACM Press, New York, p. 1799.

Data collection and participants.

Two evaluation methods were used in this study: an in the wild field study over 3 weeks with 12 participants and a survey with 75 respondents from 13 states across the USA that covered a range of attitudes and behaviors with mobile devices and physical activity. The goals of the in the wild study were to identify usability problems and to see how this technology fitted into the everyday lives of the six men and six women, aged 25–35, who volunteered to participate in the study. Eleven of these people were recruited by a market research firm and the twelfth was recruited by a member of the research team. All were regular cell phone users who wanted to increase their physical activity. None of the participants knew each other. They came from a wide range of occupations, including marketing specialist, receptionist, elementary school employee, musician, copywriter, and more. Eight were full-time employed, two were homemakers, one was employed part time, and one was self-employed. Six participants were classified as overweight, five as normal, and one as obese, based on body mass calculations.

The study lasted for 21 to 25 days, during which the participants were interviewed individually three times. The first interview session focused on their attitudes to physical activity and included setting their own activity goals. In the second interview sessions (day 7) participants were allowed to revise their weekly activity schedule. The last interview session took place on day 21. These interviews were recorded and transcribed. The participants were compensated for their participation.

Data analysis and presentation.

Figure 14.9 shows the data that the evaluators collected for each participant for the various exercises. Some of the data was inferred by the system, some was manually written up in a journal, and some was a combination of the two. The way in which they were recorded over time and participant varied (the participants are represented by numbers in the vertical axis and the day of the study is represented by the horizontal axis). The reason for this is that sometimes the system inferred activities incorrectly which the participants then changed. An example was housework, which was inferred as bicycling. Manually written up activities (described as ‘journalled’ in the figure) included such things as swimming and weightlifting, which the system could not or was not trained to record.

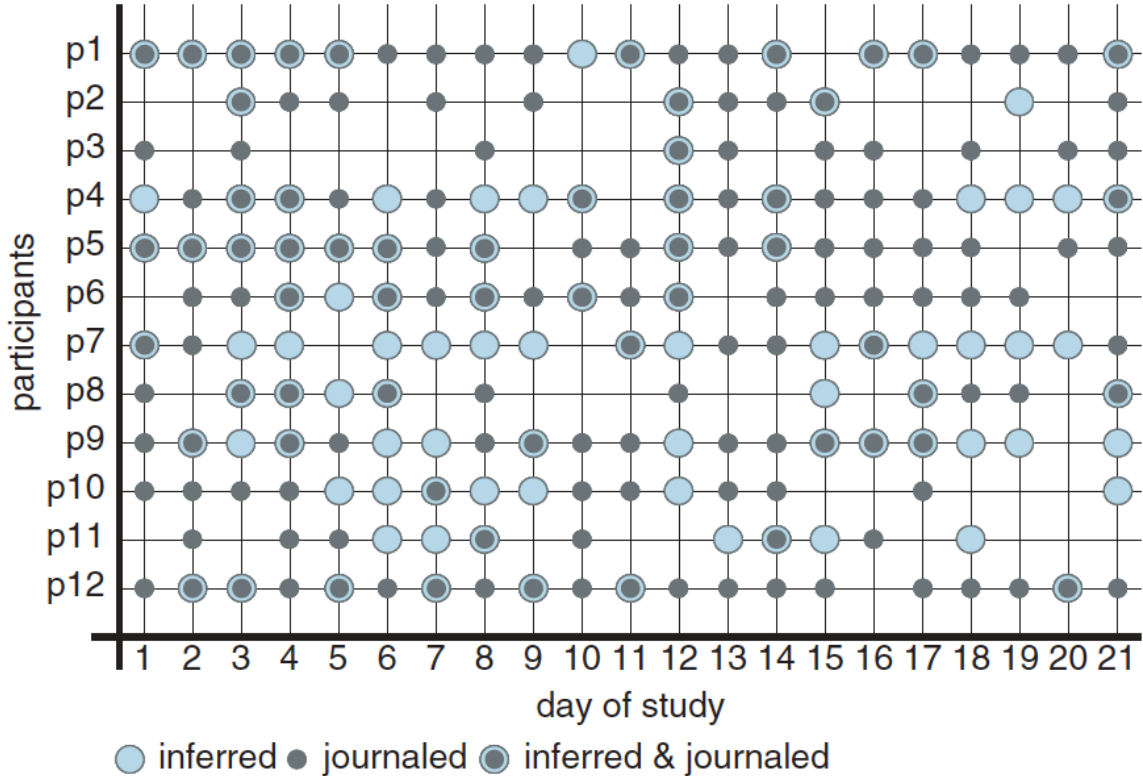


Figure 14.9 Frequency of performed activities and how they were recorded for each participant

Source: From Consolvo, S., McDonald, D.W., Toscos, T. *et al* (2008) “Activity sensing in the wild: a field trial of UbiFit garden”. In: *Proceedings of CHI 2008*, ACM Press, New York, p. 1802.

From the interviews, the researchers learned about the users’ reactions to the usability of UbiFit Garden, how they felt when it went wrong, and how they felt about it in general as a support for helping them to be fitter. Seven types of error with the system were reported. These included: making an error with the start time, making an error with the duration, confusing activities in various ways, failing to detect an activity, and detecting an activity when none occurred. These were coded into categories backed up by quotes taken from the participants’ discussions during the focus groups. Two examples are:

What was really funny was, um, I did, I did some, um a bunch of housework one night. And boom, boom , boom, I’m getting all these little pink flowers. Like, ooh, that was very satisfying to get those. (P9, Consolvo et al, 2008, p. 1803)

. . . it's not the end of the world, [but] it's a little disappointing when you do an activity and it [the fitness device] doesn't log it [the activity] . . . and then I think, 'am I doing something wrong?' (P2, Consolvo *et al*, 2008, p. 1803)

An example of a general comment was:

The silly flowers work, you know? . . . It's right there on your wallpaper so every time you pick up your phone you are seeing it and you're like, 'Oh, look at this. I have all those flowers. I want more flowers.' It's remarkable, for me it was remarkably like, 'Oh well, if I walk there it's just 10 minutes. I might get another flower. So, sure, I'll just walk.' (P5, Consolvo *et al*, 2008, p. 1804)

Overall the study showed that participants liked the system (i.e. the user experience). Some participants even commented about how the system motivated them to exercise. However, there were also technical and usability problems that needed to be improved, especially concerning the accuracy of activity recording.

ACTIVITY

1. Why was UbiFit Garden evaluated in the wild rather than in a controlled laboratory setting?
2. Two types of data are presented from the field study. What does each contribute to our understanding of the study?

COMMENT

1. The researchers wanted to find out how UbiFit Garden would be used in people's everyday lives, what they felt about it, and what problems they experienced over a long period of use. A controlled setting, even a living lab, would have imposed too many restrictions on the participants to achieve this.
2. Figure 14.9 provides a visualization of the activity data collected for each participant, showing how it was collected and recorded. The anecdotal quotes provide information about how the participants felt about their experiences.