Deployment of an App for Self-Monitoring and Social-Support within a Health Promotion Programme

John Rooksby
Mattias Rost
Doudou Tang
Matthew Chalmers
School of Computing Science
University of Glasgow
Glasgow, UK

{firstname.lastname}@glasgow.ac.uk

On behalf of the EuroFIT Consortium

Work-in-progress report submitted to WISH 2016.

Abstract
This paper describes work-in-progress on the deployment of MatchFIT, an app for enabling self-monitoring and on-going social support for people that have participated in a healthy living programme called EuroFIT. The app is currently in use by approximately 250 people in 15 locations across three countries. It will be launched in a fourth country shortly and based upon the lessons learned will be redesigned for a second round of the EuroFIT programme in late 2016. This paper discusses the design challenges we have encountered and issues in redesign.

Author Keywords
Health behaviour change; personal tracking, social support.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous;

Introduction
The European Football Fans in Training (EuroFIT) programme is a healthy living programme being delivered by club community coaches to groups of male football fans in fifteen professional football clubs in four

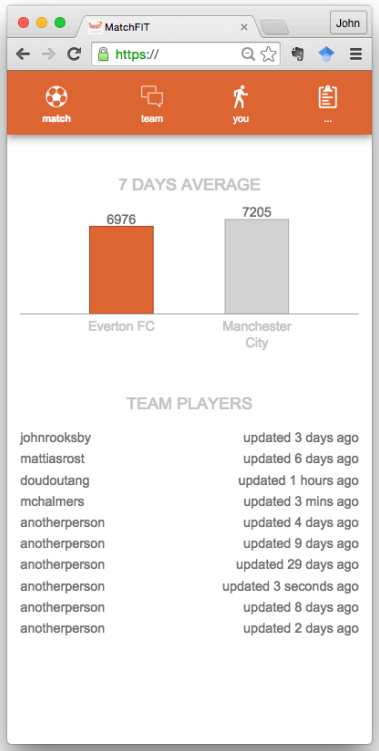

Figure 1: The "match" page in MatchFIT (browser version).

European countries. It is a gender-sensitised programme, designed specifically for men (who typically are underrepresented in healthy lifestyle programmes). The primary focus is on increasing physical activity and decreasing sedentary time.

EuroFIT is based upon a successful program developed in Scotland (the FFIT programme [1]), and has been extended and tailored for delivery in England, Norway, The Netherlands and Portugal. The extension has included the development and deployment of two novel technologies: the SitFIT and MatchFIT. The SitFIT is a hardware device for counting steps and measuring uptime (i.e. time standing). MatchFIT is an app that is interoperable with the SitFIT and is intended to facilitate on-going social support beyond the twelve weekly EuroFIT group sessions. In this paper we will describe the design and deployment of MatchFIT.

Background

There has been a great deal of innovation in recent years in technologies for supporting and promoting healthy lifestyles. Such technologies have the potential for delivering timely and cost effective interventions at scale. However, it is not necessarily the case that they are suitable for, or can reach those who have the most to gain. Maitland et al [1] discuss diet in low-income families and suggest that technology should be considered as part of a wider community based approach. Siek et al [3] argue that the effectiveness of health promotion websites and technologies is currently limited for low-income communities because they have been designed with little consideration for the social and environmental contexts of health behaviours.

Weight loss interventions and commercial weight management programmes can successfully encourage and support people to lose weight, for example the FFIT programme (upon which EuroFIT is based) has helped a large number of men to lose a clinically important amount of weight [1]. Given the much smaller evidence base on the effectiveness of technology based interventions, and indications that technology alone may not form a suitable basis for an intervention, it is worthwhile to explore how new technology can be used within lifestyle programmes. The work we present in this paper is novel and challenging because the technology is not the intervention but one part of a larger, complex intervention.

MatchFIT

The role of MatchFIT in EuroFIT is to enable on-going, socially-supported achievement of personal physical activity goals beyond the programme (which lasts twelve weeks). MatchFIT has two key functions: (1) to display and gamify data from the SitFIT device, and (2) to provide a communication channel for the men. MatchFIT is an optional part of the programme. The men are not obliged to use it. There is no expectation that men who join the EuroFIT programme will own a computer or smartphone or be technology literate. The men are also encouraged to explore and use other apps if they prefer.

Design process

Our original intention was to produce a mass-scale, league based game that could be used by EuroFIT participants, their families and others across Europe. But over multiple design iterations over more than 12 months we came to a much simpler design, with support for small groups and integration with the SitFIT

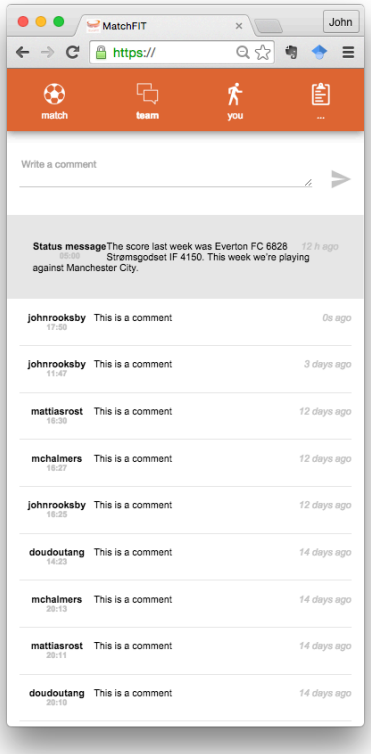

Figure 2: The "team" page in MatchFIT (browser version)

only (previous versions had a built in pedometer and were compatible with other devices). The change here was from the kind of novel system that often characterises Human Computer Interaction research, to something more mundane but more appropriate for its context. Our design decisions were influenced by many factors, including:

- Alignment within EuroFIT: The app had to 'find a place' within a complex intervention, and be suitable for inclusion in a randomised controlled trial. Part of the design challenge here was in effective communication, collaboration and coordination with an interdisciplinary, and internationally dispersed team.

- Interoperability with the SitFIT: The app displays data from a novel hardware device. This device was going through its own design process. Our design decisions were contingent on those being made about the SitFIT. It was important that not only were the technologies interoperable but that we created a coherent user experience across the two technologies.

- Uncertainty about users and coaches: We were uncertain about the characteristics of the people that would participate in EuroFIT, and the community coaches that would deliver the programme. The challenge was to create a technology that would work on a range of devices and be simple to explain and use.

- Translating theory: EuroFIT draws from a number of theories of masculinity and behaviour change. The ideas in the programme needed to be reflected (or at least not contradicted by) the app.

The challenges in the design process, it became clear, were not just technical, but sociotechnical in nature.

Overview of MatchFIT

MatchFIT has been implemented for use in a web browser or as a mobile app on Android or iOS. Screenshots from the browser version are shown in figures 1 to 3. The app itself has four main sections (which are accessed via the four icons at the top of the interface).

Section 1: "Match"

The "Match" page is shown in figure 1. On this page, the user sees the average step count for their team and a step count for a simulated opponent team. Team averages are used so that a player can only indirectly compare their step count with that of others. The opponent team's step count is calculated to be slightly higher than the teams' previous week, thus challenging the group to improve its average each week. The match against the simulated opponent lasts one week, with a new opponent being introduced on Monday mornings. Each MatchFIT team is a group of men who have participanted in EuoFIT together (there are two groups at each club).

Beneath the team scores, a list of players is given along with the last time they uploaded data. The upload time is given so that players can see who is participating and perhaps encourage this. Individual step counts are not visible.

Section 2: "Team"

On the "Team" page (figure 2), users can communicate within their team. Communication is in-group only, to

Figure 3: The "you" page in MatchFIT (browser version)

encourage social support among peers and to reduce competitiveness or rivalry with others.

This page also has a 'team status' section that gives the match result from last week and comments on the match in progress. There is no permanent record of wins and losses, or a league.

Section 3: "You"
On the "You" page (figure 3), users can view the personal data they have uploaded from their SitFIT. Both the step count and uptime data can be viewed. The data is aggregated by week. The week can be clicked on to view the counts for individual days. This information is only available to the individual user and not the whole team.

The user can write in a textbox beside each daily step count and uptime data, enabling them to reflect on or remember salient information about that day and their numbers for that day. This information is personal to the user and not shared in the team.

Section 4: "…"
The fourth page, prosaically called "…", contains privacy information, instructions for uploading SitFIT data, and a logout button.

Data collection and privacy

MatchFIT collects and stores two kinds of data, 'functional' data and 'interaction' data. The functional data is the data seen by the user and is necessary for the functioning of MatchFIT. This data resides on the production server. The 'interaction' data is collected and used for our research. It resides on a research server. It consists of timestamped log entries for selected actions within the app such as "app start", "app stop", "page load", "comment post" and so on. All data is sent securely over HTTPS.

An additional source of data that we will have access to is fieldwork and focus group data from EuroFIT. Most of this will be collected by fieldworkers who are investigating the programme as a whole and not MatchFIT specifically.

Progress and initial findings

The EuroFIT programme has been delivered in twelve football clubs accross three European countries: Portugal, Netherlands and England. Delivery is now beginning at three clubs in Norway. We have begun to examine the data from the first three countries. Our initial points of interest are:

- Uptake of MatchFIT has been approximately 50%. We have had over 250 registrations. Just over 100 people have used the mobile app, with an almost 50:50 iOS/Android split.

- Uptake and retention is uneven across groups, clubs and countries. Uptake has been at or near 100% in some places, particularly in Portugal, but very low in other places, particularly several UK clubs. Retention (return weekly visits) is also uneven.

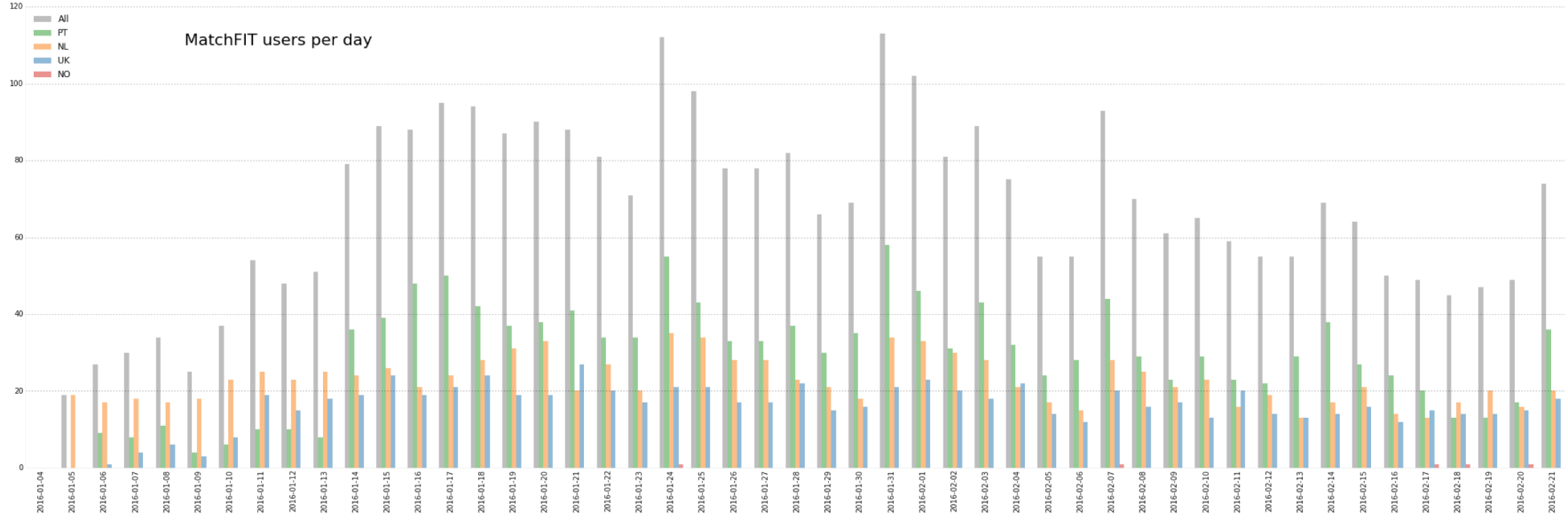

Figure 4: Daily users of MatchFIT

- We have between 120 and 160 unique weekly users. Some users are checking the app every day, but others do so less frequently. There are clear spikes on Sundays with people updating and viewing data before each weekly match ends.

- Some participants have had trouble uploading their SitFIT data, and not all MatchFIT use is by people with recently uploaded data.

We are continuing to collect data, and to analyse how people use MatchFIT. Data collection will continue, with three Norwegian clubs joining later in 2016.

Future work

In late 2016 the EuroFIT programme will be repeated with a new group of men at each club. This means that MatchFIT will be used for a second time. We intend to use the lessons learned from the first round in order to improve the design of MatchFIT. Our analysis of MatchFIT is therefore progressing with a view to informing re-design.

Our experience with the initial design of MatchFIT was that there are multiple factors and sociotechnical issues to navigate. The redesign process will be no different. We envisage our redesign to be influenced by factors including:

- The analysis of log data and qualitative data gained from the first release of MatchFIT. The log data will help us understand the experiences of those who used it, and enable us to address factors in user retention. The qualitative data will be essential for considering who didn't use MatchFIT and why.

- Continuation of "unfinished" plans. There are several ideas that we did not have the opportunity to implement in the first version.

- Responding to ongoing design of the SitFIT. The SitFIT itself will continue to be refined as a technology. One strong possibility is that in the next round it will be able to communicate wirelessly, which will potentially make uploading data easier and more frequent.

- The developing understanding of the relationship of MatchFIT with the relevant theories of masculinity and behavior change, the practicalities of its administration, and its reifying position and role in the programme.

- Potential commercialization of the programme or parts of it (including MatchFIT and SitFIT).

The work we have described has many of the characteristics of field deployment research (see Siek et al [4]), but with particular constraints and obligations towards the wider study and with an overt trajectory towards redesign. What is important to recognize is that the redesign is not just a question of insight from data but will need to involve multiple inputs and orient to multiple ongoing themes. When a technology sits within an intervention, rather than being the central mechanism of delivering and intervention, its ongoing design is enmeshed with that broader context.

Conclusion

We have discussed the design and deployment of an app as part of a behaviour change programme. We have recognised that the design challenges are socio-technical in nature.

Acknowledgement

This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 602170.

References

1. Hunt, K, et al. (2014) A gender-sensitised weight loss and healthy living programme for overweight and obese men delivered by Scottish Premier League football clubs (FFIT): A pragmatic randomised controlled trial. The Lancet 2014.
2. Maitland, J., Chalmers, M., Siek, K. (2009) Persuasion Not Required. Improving Out Understanding of the Sociotechnical Context of Dietary Behavioural Change. Pervasive Health 2009. 3rd International Conference on Pervasive Computing Technologies for Healthcare: 1-8.
3. Siek, K., LaMarche, J.S., Maitland, J. (2009) Bridging the information gap: collaborative technology design with low-income at-risk families to engender healthy behaviors. In *Proc.* ACM OZCHI'09, 89-96.
4. Siek, K., Hayes, G.,Newman, M., Tang, J. (2012) Field deployments: Knowing from using in context. In: Ways of Knowing in HCI. Judy Olson and Wendy Kellogg, Eds. Springer Verlag, 119–142.