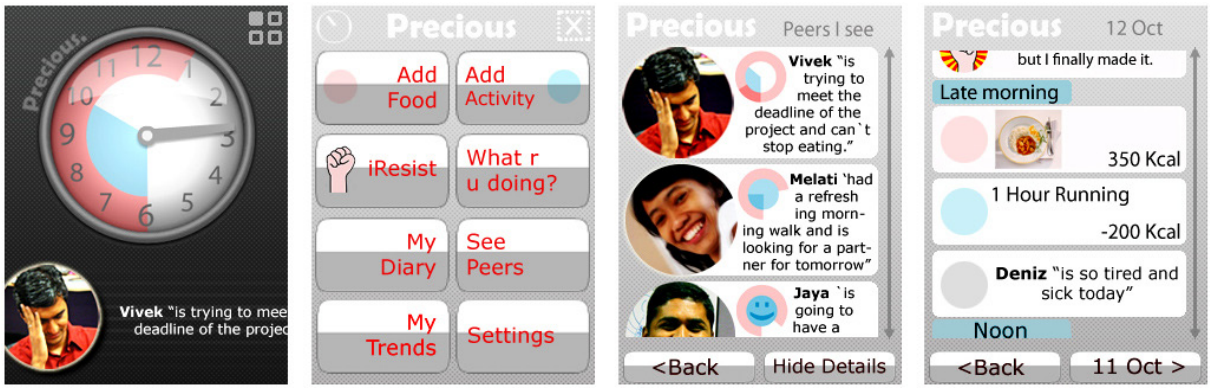

Figure.1 *Precious* interface. From left to right: *Main Screen* with real-time personal and peer information, *Menu Screen* giving access to different features, *Peers View* with medium level of detail, A day from *Diary* showing diverse entries.

2. An example: *Precious* [2]

For illustrating the guidelines we'll make use of the *Precious* project.

Precious is a proposed PDA application that aims to motivate urban Indians to adopt and maintain a healthier lifestyle. The interface lets the user keep a journal of exercise and diet in an easy way and shows progress towards daily and long-term targets. Most important of all, it is a peer based application where the user can see how their loved ones are doing and can communicate with them.

The main screen, that also becomes the screen saver of the phone when the application is on, shows information about current status of the user (clock with red and blue progress indicators for food and exercise respectively) as well as diverse information coming from friends, sliding under the screen continuously. (Fig.1)

Peers are represented with reactive profile pictures, changing from worried to neutral and to happy, based on their current performance. (Fig.1)

Achievements are rewarded with new levels in *Precious*. (Fig.3) When the user passes to the next level, she is allowed to watch the real-time details of one more peer.

3. Method

During the course of the project, we have made use of conventional and online questionnaires, user and expert interviews and email reviews of the progress with potential stakeholders. Face to face user and expert interviews with the help of a local polyglot interpreter proved to be the most gainful when compared to other field research techniques mentioned above.

The other major component of our analysis has been literature research about previous such projects, theories of behaviour change, more specifically Health Belief Model (HBM) [3], Social Learning Theory (SLT) [4], and Transtheoretical Model (TTM) [5]. All these theories are comprehensively summarized in [6]. Last but definitely not least, Captology [7,8], the field of persuasive computers provided us with valuable insights.

Knowledge that we have acquired with the methods mentioned above always formed the base of our decisions in the project. This same knowledge also helped us come up with the guidelines presented in this paper.

4. Guidelines

In this section the guidelines we have formulated based on our project will be presented. The first 5 guidelines are product related guidelines and the last 3 are process related guidelines.

Our purpose was to keep them as universal as possible, widening their domain of application. The readers are invited to judge the usefulness of each of them for their own special case.

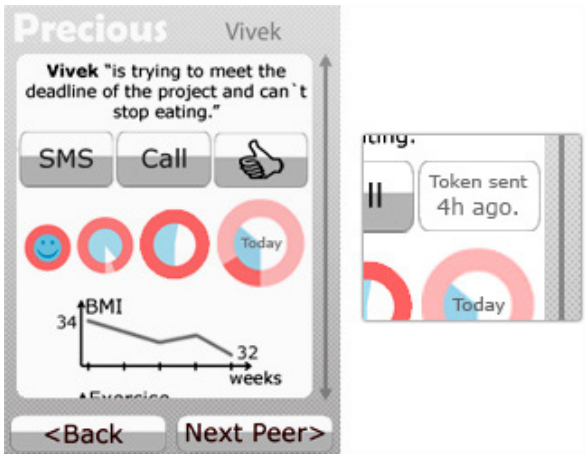

Figure.2 Detailed view of a peer, and among other things, the *Token of Encouragement* before and after sending.

Figure.3 Some of the rewarding schemes in *Precious*.

4.1 *"The product should encourage frequent user interaction."*

In persuasive technology applications, more frequent interaction is correlated with better behaviour change results. [9] Frequent interaction with the product should be encouraged in order to keep the personal goals in user's mind, facilitate more frequent self reflection and if the product requires timely user input, to make the user input to the device more punctual.

Frequent interaction with a product may have the drawback of making the product more obtrusive, which may, in turn, deteriorate user experience. However more frequent glances at the status of the product can also be achieved without using alarms and reminders. Research shows that peer supported technologies enjoy a higher frequency of user interaction. [9]

In *Precious*, the *Main Screen* is intended to evoke a feeling of curiosity in user's mind. It shows real-time information coming from peers. (Fig.1)

This screen appears as an attractive screensaver of the phone which ensures that at least every time the phone is interacted with, the user will also have a quick glance at the status of the application and will perhaps notice something going wrong and take action.

One final feature of *Precious* encouraging frequent interaction is the *Token of Encouragement*. (Fig.2) It is a digital token that you can send to your peers, only from the screen showing their details. Once you send the token, in order to receive it back, your peer has to acknowledge it. Your peer will only see and acknowledge it next time she goes to the main menu of *Precious*.

The token's meaning is twofold: after receiving the token notification with words of encouragement and support, your peer will know that you have been browsing through her details, she'll know that she is not forgotten and that she is supported. But, at the same time, you'll know when your peer goes to the main menu for the next time, giving you a hint about how frequent she interacts with the application. This will help build additional social pressure on your peer to frequently interact with the application.

4.2 *"The product should communicate in the appropriate style."*

The communication style should be carefully thought of for effective persuasion to take place.

Rothman & Salovey [10] have found that loss and gain-framed messages used for persuasion work in different ways. In their work, titled "Shaping perceptions to motivate healthy behaviour: The role of message framing.",

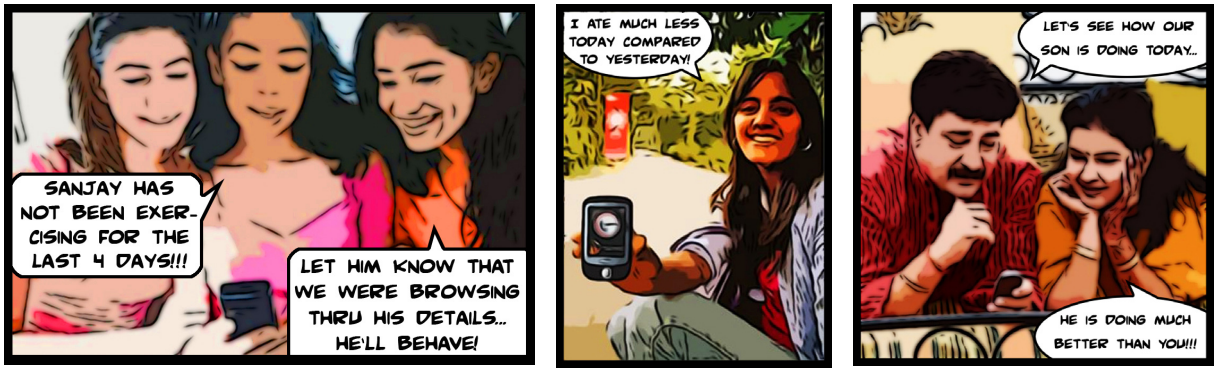

Fig 4. Usage scenarios of *Precious*

This brings the idea of involving these very important others into the design, perhaps (but not necessarily) by means of simple networking applications, since we are designing in technology domain.

When the others, that you feel responsible to, are following your behaviour, a kind of *social pressure* is established [12], and the chances are you show greater effort to behave the ideal, desirable way. Taken the other way, when a loved one needs to change his or her health behaviour, you can better motivate, advise and persuade him if you have the means to see what goes bad in more detail. This is *social support*. [12]

In *Precious* this is the idea on which the entire application is based. (Fig.4) By social networking with a few important people you know, your behaviour is socially transparent, which puts a pressure on you to come closer to ideal behaviour. You can also know what goes wrong with your peers and you can help them, with practical advices, words of inspiration or simply listening to them.

Observational Learning is another concept discussed in SLT. According to this concept, people form certain beliefs by observing others being punished and rewarded for their actions. These beliefs are influential in behaviour change. In *Precious*, one can see the direct causality between exercise and diet patterns of a peer and her weight.

4.5 *"The product should make use of easy qualitative inputs and representations and avoid difficult quantitative ones."*

This is a very important factor to consider, at least in India, where people do not have much quantitative knowledge about diabetes management. [2]

In the expert interviews, we have come to know that, as opposed to what one would expect in Western countries, doctors and dieticians did not mention many numbers when they were advising about diet to diabetes patients. Advices were in the lines of "Eat less each time, but eat more frequently" "Make vegetables at least half of your meal". [2]

In consequence, in *Precious,* we tried to come up with other less accurate but more usable methods of food entry along with conventional method of quantification of food consumed and determining the food components it contains. (Usual diet chart approach)

The timing component of *Precious* is also only as accurate as needed. Instead of a "hh:mm" format, we decided to use tags mapping to different times of the day such as "early morning", "noon", "late evening" etc. which takes away the cognitive discomfort of trying to remember the exact time of an event, and speeds up event logging.

When it comes to displaying information, there are examples from literature making use of qualitative representations (such as blossoming flowers as the user exercises) and avoiding quantitative ones (such as displaying numerical values of burned calories). They also suggest this approach to other designers. [11,14]

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