SAL: a small, simple, situated, ambient logger

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INTRODUCTION AND BACKGROUND

We all have activities and tasks that we intend to do every day, to achieve diverse long term goals, such as those for health and wellbeing. For example, for good health we may aspire to eat 5 serves of vegetables, get exercise and take prescribed medications each day. To learn a musical instrument, we may intend to practice each day. Loggers and reminder systems have the potential to help us achieve those goals in several valuable ways: (i) helping to build a new good habit; (ii) or break a bad one; (iii) building awareness of whether you are meeting your goals; (iv) N-of-1 personal studies where a person collects personal data to test a hypothesis about ways to achieve a desired effect. SAL enables people to create a personal interactive checklist or log of events. This can be powerful in helping achieve intended behaviours. This is because a SAL logger can help people translate their intentions into simple plans so aiding goals of type (i) and (ii). By doing logging for personally relevant aspects, the long term record can contribute to goals of type (iii) and (iv) where the user reflects on the data captured. The broad value of logging is reflected in the thousands of smart-phone apps for varyingly specialised ways to log many different things. However, the very nature of a smart-phone means that it has many functions other than logging and is used in many places.

We have create SAL to enable people to create their own small, simple, situated, ambient loggers. SAL is distinctive in aiming for a minimalist architecture and interface that logs to a personal data store. The logger device should be small enough to ensure it does not intrude unduly on the space. It should be simple to log. The logging list should be small, to enhance achievability [24] and to make the interface quick and easy to use. The device and its list of items to log is also personal: dedicated to a single user. A key aspect is that a SAL logger is situated by the user in the precise place they expect, or discover from experience, to be effective. For example, to build the habit of putting on sunscreen each morning a person may decide to place the logger right near their toothbrush because they reliably use that each morning. SAL loggers are ambient in the sense that they do not intrude, but rather are in the periphery of the user’s attention. In addition to these aspects that the user will see every day, SAL harnesses rich network connectivity and low cost hardware to create a ubicomp infrastructure that places log data in a store that the user owns and controls. This approach tackles the challenge Abowd identified to put the control and creation of Ubicomp facilities in the hands of the average person [1].

THE SAL LOGGING INTERFACE

We will demonstrate the minimalist SAL interface, using examples from deployed loggers. The first is a logger in the user’s bathroom. The user goals are: to put sunscreen on, do Achilles stretches and use moisturiser twice a day. The logger is placed in their bathroom because they intend to usually do these activities in that place. Another logger is placed on a bedside table and used to log when they did cardio exercise, weights and stretches that day and whether they felt they had slept well the previous night. This user started this set of logging because they thought that doing exercise regularly would improve their sleep quality. They experimented with the various locations for this logger, settling with the spot near their desktop, as they found they reliably noticed it there most evenings.
We now describe the design of the elements of the logger interface, using the example in the figure. The display is always on so that it can be visible enough to help people notice targets yet to be met. We designed the interface for a personal space where there is no login or initial action to reach the logger interface; we wanted minimal barriers to logging actions. Each midnight the display is reset, with all log elements set red. When the user wants to log an activity, they tap it. So, for example, if the user did cardio, they tap that screen element and it becomes green as in the figure. The figure shows the user has logged doing cardio and stretches and not weights and they slept well last night. The large brightly coloured buttons for logging are intended to be visible in the periphery of the user’s vision as they go about their normal activities. We chose red for the uncompleted targets so that, even in the periphery, this should be noticeable and alert the user to act. The green was chosen to give the same peripheral feedback of success. The user can configure the colours, perhaps to take account of the environment and personal preferences.

If a user makes an error, they can tap the Undo element. Our goal of minimalism meant we considered a SAL logger with simple toggles like a checklist. This would mean one tap could show an action was done and a repeat tap could undo it. We concluded this was too restrictive. We wanted to support logging multiple repetitions (eg. using moisturiser twice a day, eating 5 serves of vegetables). So we needed an undo and chose to make it very visible. We also included the Nothing today element so people can distinguish the failure to meet a goal from failing to log it (eg when they actually did it but forgot to log it). This was a compromise with minimality. It could be important when the user’s logging goal is to gain self-awareness or do an N-of-1 personal study. They may need to assess just how often they logged.

The horizontal bar under each logging element shows the recent history, indicating the last 30 days of logging. In the figure, the sleep OK log was white for about the first week but has been mainly green since then. (This user discovered their sleep was actually better than they had expected.) The user can configure the number of days of history to show. The default is 30 days, in line with an appropriate time to set for a new goal [2] and in line with the low end of time to form a habit [4]. The default colours for this history bar are green for success, white for failure to meet the target and black for Nothing today. We chose white rather than the red of the current day large element since the user cannot do anything about their history.

We drew on the large body of work on ambient, calm, peripheral displays, from Weiser’s earliest vision[5], with diverse early work such as the waterlamp ambient display [6], the decorative information percolator [7] and an enhanced photo frame of an elder showing key information about them, for use by their carer [8] as well as more recent examples such as subtle ambient light displays to remind users of upcoming tasks [3], ambient displays for behaviour change [9] and motivating ambient mirrors [10]. Many of these are beautiful, in contrast to the current utilitarian SAL interface. But they differ from SAL as our design focus is on logging.

CONCLUSION

Logging is a useful way for people to build or break habits. The SAL system provides a simple, unobtrusive and convenient way for users to log repeating actions in their lives and so provide reminders, build habits and gain insight into behaviour. Our contributions in this work are a simple but valuable class of ubi-comp device and its realisation in a minimalist, elegant, flexible architecture grounded on providing user control of personal data. SAL is the foundation for future work on minimalist interfaces that aid behaviour change.
REFERENCES