Sprout: Using a Garden Metaphor to Visualize and Support Customizable and Collaborative Health Tracking

Garden Metaphor  Customizable  Collaborative

Pape Sow Traore
Thesis Committee

Liz Murnane (advisor)  Lorie Loeb  Tim Tregubov
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1. Background
2. Problem
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What’s personal informatics all about? 😊
What is...

personal informatics

self-tracking
What is…

personal informatics

self-tracking
What is personal informatics?

A class of systems and tools that allows us to collect and reflect on personal data.
We love to collect things

- Rocks
- Books
- Crystals
- Stamps

100,000 years ago

Now
Personal Informatics

**Stages** of tracking

**Styles** of tracking
Personal Informatics

**Stages** of tracking

**Styles** of tracking
How do people actually track?

The tracking process involves 5 iterative stages (Li, 2010).

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So... what’s the problem? 😞
…they are not doing the trick for everyone
Three main limitations

“I am not a numbers person.”

“I cannot customize.”

“I feel so alone or guilty.”
“I am not a numbers person.”

Many people find quantitative feedback confusing 😞, overwhelming, and demotivating.
“I cannot customize.”

Even self-tracking tools with qualitative feedback provide a generic experience, having the same data representation for all users.
“I cannot customize.”

Even self-tracking tools with **qualitative feedback** provide a **generic experience**, having the **same data representation** for all users.
"I feel so alone or guilty."

Conventional tools are designed with a **single-user perspective** rather than supporting more collective personal informatics practices.
Our solution: *Sprout*

A self-tracking application that supports more qualitative, customizable, and collaborative experiences for health management.
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A self-tracking application that supports more qualitative, customizable, and collaborative experiences for health management.
Let’s talk to people first.
What we wanted to know…

**what** do they track

**why** do they stop tracking

**what** do they want to see
Exploring preliminary design concepts

- Using **nature theme**
- Each element in the scene represents **piece of information** user is tracking
- Brainstormed different nature scenes

Background | Problem | Formative Research | Sprout | User Study | Results | Design Takeaways | Future Work
Interviews setup

Participants

- N=8
- 4 male, 4 female
- 20-24 years old

Format

- Semi-structured
- In-person
- 20-45 minutes
Interviews setup

Participants

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Format

- Semi-structured
- In-person
- 20-45 minutes
What they want to see

People preferred the garden scene

- Personal connection
- Familiar with idea of community garden

“I connect garden with growth... it makes sense... trees and plants are things that can grow” (P2)
What they track

Data related to fitness and activities were the most popular options
What they track

Data related to **fitness and activities** were the most popular options

![Graph showing frequency of selected categories]
Why do they stop tracking

We identified 3 main barriers:

- Negative feelings
- Wrong data displayed
- Exhausting input system
Why do they stop tracking

Negative feelings (e.g. guilt)

“I feel bad when I look at my graphs, and I see that I’ve slept five hours.” (P2)
Why do they stop tracking

Tools displaying wrong information (e.g. frustration)

“It will say that I slept 10 minutes and I know I did not sleep 10 minutes. So that’s frustrating.” (P4)
Why do they stop tracking

Exhausting input system

“...then I also have to do the mental math” (P6)
# Design guidelines

We derived and applied **6 principles** to create *Sprout*.

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<td>Users should have the ability to <strong>determine what</strong> they want to <strong>track</strong> and <strong>how</strong> to see it</td>
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<td>Familiarity</td>
<td>Design <strong>features</strong> should be <strong>familiar</strong> to users</td>
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<td>Passive Tracking</td>
<td>Data <strong>tracking</strong> should be <strong>automated</strong> by default but still allow for <strong>manual input</strong></td>
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<td>Social Influence</td>
<td>App should provide <strong>features</strong> that <strong>foster</strong> a sense of <strong>community</strong> among users</td>
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<td>Privacy</td>
<td><strong>Data representation</strong> and <strong>social features</strong> should be <strong>anonymous</strong> by default</td>
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Let’s create *Sprout*. 🌹
Onboarding

(a) Groups representing different experimental conditions
(b) Select which data to track via Apple Health
(c) Set daily goals for the two data selected
(d) Select tree type out of a list of 8 trees
Onboarding

(e) Select tree color out of a list
   10 colors

(f) Select flower type out of a list
   3 flowers

(g) Select flower color

(h) Map each data to either tree
    or flower
Types and colors of trees

Figure 1.2. Examples of trees and colors; the first word corresponds to the color
Earning droplets and seeds

(a) User opens the application
(b) Sleep is updated, and seeds are awarded to the user
(c) Step count is updated. Droplets are awarded to the user
(d) Updated values are displayed on the dashboard
User garden

(a) Closing lock and small moving tree
(b) Opening lock; selecting droplets and growing tree size
(c) Selecting seed and planting flowers
Community messages

(a) Select message type
(b) Select the recipient, write content, and choose whether anonymous
(c) Switch between received and sent messages
(d) Write content of group message and choose whether anonymous
(e) User can view community feed
Community badges
Community badges
Customization
What do people think of Sprout? 😐
Deploying *Sprout*

**Goal**: Understand people’s experiences with *Sprout* in everyday life and validate our approach.

---

**Behavior change?**

Not yet because still in the *early stages*.
Deploying Sprout

**Participants**

- N=22
- 6 male, 16 female
- 18-44 years old

**2 week field trial**

- Pre/post study interviews & surveys
- Logs of screen views, messages, etc
Deploying Sprout

Participants

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Study groups

- Between subjects 2 × 2 design (4 conditions)
- Variables: social × customization
## Study groups

- Between subjects 2 × 2 design (4 conditions)
- Variables: social × customization

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<td>G1 (6)</td>
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What did we learn? 🕵️‍
Deployment Findings

Qualitative

Customizability

Social features
Deployment Findings

Qualitative

Customizability

Social features
Qualitative themes can create a fun and playful experience.

Participants found *Sprout* to be…

- fun (76%)
- enjoyable (88%)
- entertaining (76%)

Participants enjoyed…

- the use of droplets & seeds to show progress
- planting trees and flowers
Some people use **multiple** types of **visualizations**.

Some users found **Sprout** as a tool that would **complement** existing tools.

“I don’t think the purpose should be to replace those numbers. This [Sprout] is a good augmentation of those numbers.” (P22)
Deployment Findings

- Qualitative
- Customizability
- Social features
Deployment Findings

Qualitative

Customizability

Social features
Customization did not have a significant impact

- Customization features were used 26 times by 6 different participants.
- Picked options they liked the most during onboarding.
- Same as changing wallpaper on phone.
- Not many options to choose from after.
Customization did not impact engagement.
Customization did not impact goal completion.
People want **social features**.

People in the **non-social** conditions requested **social** features to be included in the future.

“Having some **community** feature...would be nice” (P14)
Deployment Findings

Qualitative

Customizability

Social features
Deployment Findings

Qualitative

Customizability

Social features
Social features increased engagement.
Social features increased goal completion.
Cooperation can have negative impacts.

- **Lack of participation** from others can lead to...
  - frustration
  - tracking abandonment

"I was **frustrated** with them so much that I had to calm myself down…it’s not that deep…but it would really **upset** me" (P7)
Users do **not** want to be fully anonymous

19 group messages but **only 1 DM**.

- Participants did **not** want to send DMs to strangers
- Fear of being seen as odd by others

“There is not much to talk about, because you don’t really know them that well…” (P9)

“...random people… we didn’t know anything about them” (11)
Helping future designers...🎨
Design Takeaways

Metaphors plus numbers

Flexible customization options

Optional social inclusion
Metaphors plus numbers

*Use metaphors but numbers can still be beneficial:*

- Combination of metaphors + animations = ✓
- Numbers can still be useful based on **questions users ask** about their data (e.g. over time)
Flexible customization options

*Provide a wide range of customization options:*

- **Enough features** to allow users to personalize their experience
- **Increase** in sense of **ownership**
Optional social inclusion

*Include friends but do not force social interaction:*

- **Social** features are **not** for **everyone**.
- Enable users to **connect** with **people** they **already know**
Where is *Sprout* headed?
Future Work

- Longer study to accurately measure impacts of customization
- More customization options
- Allow people to track with friends
- More sensitive data (e.g. mental health, with patients)
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- Committee (Liz, Lorie, Tim)
- Labmates at the Empower Lab
- DALI Family
- Family (dad, mom, brothers)
- All the students that worked on the project
- And so many others…
Thank you! 😊
Appendix
User performs activity → Health App → Third-party apps → Change in entry detected → Sprout updates database and itself