Towards Designing Multi-Device Digital Self Control Tools

Elia Bravo

Politecnico di Torino
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Supervisors: Luigi De Russis and Alberto Monge Roffarello

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Introduction

▶ Nowadays, people typically own more than one device (PC, smartphone, tablet, etc), and they often use them concurrently or sequentially.

▶ The multi-device ownership enhances the time and the frequency of technology usage, with related risks for digital wellbeing.

▶ Recent studies define digital wellbeing as a “degree to which users perceive their digital device usage to be well-aligned with personal, long-term goals”, suggesting that the self-control of the user over their devices is central to this topic.

▶ However, most of Digital Self-Control Tools (DSCTs) are typically developed just for a single device: we need to investigate digital wellbeing in a multi-device context.
1 - Digital Habits
Habits

A “habit” is a human behaviour with a high frequency, a high level of automaticity and a consistent link with the individual and social context that triggers the behaviour.
Habit formation

▶ Most of the studies related to digital wellbeing identify the habit formation approaches as crucial for long-time behaviour change.

▶ The most implemented features in DSCTs for mitigating bad habits and promoting the formation of new, positive habits, are time limits, launches limit and redirection of user’s activity.

▶ The previous definition of digital habits, as well as the features of DSCTs, look easily suitable for an adaptation to a multi-device world.
Goal of the thesis

- To extend the mentioned strategies in a multi-device context, with a focus on the digital habits.
- To develop a software tool that implements some of these strategies in a few dedicated multi-device settings.
- To evaluate the developed tool with an user study.
2 - FeelHabits
FeelHabits strategies

- In FeelHabits, I tried to adapt the strategies of **time limits** and **launches limits** in a multi-device context composed of the PC and the smartphone.

- To mitigate multi-device digital habits, the user can define **intentions** that implement these limits in a chosen temporal context (morning/afternoon/night - working days/holidays).

- When the user reaches a limit, he/she is warned by a blocker or a notification.
FeelHabits Intentions

The categories for the intentions are:

- **Multi-device apps.** To mitigate habits that consist of visiting too often or for too long an application on smartphone and/or the respective website with the PC (time/launches limits → blocker/notification)

- **Smartphone at PC.** To mitigate habits that involve a excessive usage of a smartphone app while using PC. This is a case of “Multi-device context Habit”. (time/launches limits → blocker/notification)

- **Screen time.** To form the good habit to make a break after a long multi-device session, and to control the overall daily screen time. (time limit → notification)
FeelHabits Architecture
FeelHabits intention definition: new intention (1/4)
FeelHabits intention definition: When (2/4)

Tell me when your bad habit occurs 🎉

Choose at least one option per line

- Working Days (Mon-Fri) 🕒 Holidays (Sat-Sun) 🕒 All days 🕒
- In the morning (6-13) 🕒 In the afternoon (13-19) 🕒 By night (19-6) 🕒 The whole day 🕒
FeelHabits: intention definition: What (3/4)

Select the involved application(s) in your habit
Choose one or more options

- Smartphone apps + URLs on PC
- Amazon Shopping
- eBay
- Privia
- Wish
- Zalando
- Facebook
- Instagram
- Pinterest
- Telegram
- TikTok
- Twitter
- WhatsApp
- Mediaset Play
- Netflix
- Prime Video
- Twitch
- YouTube
- Booking
- Tripadvisor
FeelHabits: intention definition: How (4/4)
FeelHabits: blocker examples

FeelHabits

You reached the limit for Instagram usage of 15 launches (PC + smartphone). The limit will end next morning, at 6am. May you respect your proposal?

OK, I won't use it  PLEASE, DON'T BLOCK ME AGAIN

Feel Habits

You reached the time limit for facebook.com usage. The restriction ends today, at 7pm. May you respect your proposal?

Ok, I won't use it  Please, don't block me again
3 - Evaluation
FeelHabits test

The user test has been conducted with 7 participants, for 14 full days. I did not provide any suggestions about how to use the application: they were asked to use FeelHabits without any constraints.

After the test period, I evaluated:

▶ The choice of intentions.
▶ The device usage compared to the set limits, and the reaction to interventions.
▶ The users multi-device habits.
Results

- The average number of intentions kept for the whole test time was 3.
- The most common intention choices were “multi-device app” (50%) and “smartphone at PC” (43%). Two users defined a non-stop session limit.
- About the intentions at app level, the associated intervention choices were blockers (16) and notifications (16).
- The most common category for app choice was social networks (46%), followed by communication (22%), and video (18%).
- Generally, users deleted intentions to substitute them with new ones.
- Users behaviours were significantly varied: some users (2) tried to respect restrictions and improved their behaviours, other participants (2) often ignored them.
Discussion

- Users are not fully aware of their digital usage. Launches limits are typically underestimated, time limits sometimes too long.
- The “smartphone at PC” intention looks as the most suitable for every user (multi-device context habits).
- The “multi-device apps” intention choices contained limits associated with a single device, other included aggregate limits, but their usage was more commonly performed with a unique device.
- The non-stop sessions have been overestimated by the system.
- In general, the FeelHabits app received positive feedback for the effectiveness in reducing some app-related digital interactions.
Future Work

▶ Detecting more precisely the PC usage sessions and controlling the Windows desktop apps.
▶ Involving other digital devices (smartwatch, tablet, smart TV).
▶ Implementing an automatic system able to detect the multi-device habits and consequently suggest the most adapt interventions for the user.
FeelHabits: multi-device app-context habits

<table>
<thead>
<tr>
<th>user</th>
<th>applications</th>
<th>context</th>
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</table>
| user 1| Homescapes → *web.whatsapp.com*  
|       | primevideo.com → *Instagram* | afternoon - working days    |
|       |                         | night - working days          |
Thank you!

Any questions?