GAMIFICATION OF APPROPRIATION: INCREASING THE CURIOSITY FOR TINKERING

THE CHALLENGES OF DISCOVERING NOVEL CREATIVE ITUSES

Technologies increase human capabilities and quality of life best if its users are able to appropriate technologies to multiple purposes. This is however rare, due to three reasons:

1. Serendipitous discoveries are very rare: appropriation does not usually happen through fortuitous accident, but requires a perceived need.
2. Discovery based on a perceived need requires technological expertise and/or programming skills about the surrounding IT resources, which most users do not possess.
3. Purposeful but playful exploration of technological resources (e.g., by tinkering and hacking) does not interest all people.

Because of these reasons, the traditional end-user programming is unlikely to become widespread.

GAMIFICATION OF END-USER PROGRAMMING

Gamification of IT appropriation can be a solution for helping more people find new uses for IT.

We are exploring this opportunity by developing end-user programmable Internet of Things system for homes [1]. By extending the trigger–action programming paradigm that IFTTT web service has made popular [2], we provide users with a toolkit, consisting of sensors, actuators, and a mobile-friendly web-based end-user programming environment.

Users can start their appropriations from simple yet useful “recipes” which then can chain together. The figure below provides an example. Through careful interaction design, we also try to instigate a sense of "intriguing incompleteness": feeling that by adding just one more feature to the rules, they become even better.

TACKLING THE CHALLENGES

By making programming fun, and creating a sense of intriguing incompleteness, we aim to tackle the three challenges. We encourage the users to design new rules just for the sake of its inherent enjoyment, which creates more opportunities for serendipitous discoveries.

In user studies during summer 2017, we hope to show that the excitement of exploration will increase perseverance and motivates users to continue interacting with the system and identify new interesting challenges. Finally, the experiences of success in turn increase self-efficacy and expertise.

We hope to show that this way even those not usually interested in programming will find the system interesting, will remain as active users, and learn to think of IT as material that can be adapted to one’s personal needs.

HOW EASY IS IT TO PROGRAM A SYSTEM THAT HELPS YOU SAVE ENERGY BY MEASURING THE WEEKLY TIME SPENT IN A SHOWER?

Recipe 1:

**Preparation:**

Create “Shower time counter” and set it to 0:0:00 as its initial value.

**Recipe 1:**

IF hot water pipe is hot in the shower and there is loud noise in the shower [i.e., someone is having a shower]...

THEN keep the Shower time counter active as long as the IF condition is true.

Recipe 2:

IF it is Friday evening 6PM and the Shower time counter is under 60:00:00 [one hour]...

THEN award “Energy savers’ ice cream badge” to the family and reset Shower time counter to 0:0:00.

Recipe 1 + Recipe 2:

The finished recipe that consists of two recipes chained together, and measures weekly shower time.

Users can create rules like this with our system, using an editor from the mobile phones.

Gamified creation of home automation rules. Complex rules can be created by chaining two recipes together by using time counters (as pictured) or with point counters.
