Illustrating Privacy Engineering Concepts with Potty Talk

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@lorrietweet
What does privacy mean to you?
Please draw a picture.

cups.cs.cmu.edu/privacyillustrated/
Mechanical Turk is a marketplace for work.
We give businesses and developers access to an on-demand, scalable workforce.
Workers select from thousands of tasks and work whenever it's convenient.

376,614 HITs available. View them now.

Make Money
by working on HITs

HITs - Human Intelligence Tasks - are individual tasks that you work on. Find HITs now.

As a Mechanical Turk Worker you:

- Can work from home
- Choose your own work hours
- Get paid for doing good work

Get Results
from Mechanical Turk Workers

Ask workers to complete HITs - Human Intelligence Tasks - and get results using Mechanical Turk. Get Started.

As a Mechanical Turk Requester you:

- Have access to a global, on-demand, 24 x 7 workforce
- Get thousands of HITs completed in minutes
- Pay only when you're satisfied with the results
 PRIVACY

Me in my bedroom. Nobody is in my bedroom.

My kitty in my bathroom.

PRIVACY

PRIVACY

PRIVACY

Me hiding under the covers in my bedroom.
GET OUT!!! GET OUT!!! GET OUT!!!

OMG!
This is the only time during the day, where I am truly alone and nothing bothers me. No man, no children, no dogs.
This facility is proud to participate in the healthy building initiative. Behaviour at these toilets is being recorded for analysis. Access your live data at quantifiedtoilets.com
### Recent anonymized random data feed

<table>
<thead>
<tr>
<th>Time</th>
<th>Toilet ID</th>
<th>Sex</th>
<th>Deposit</th>
<th>Odor</th>
<th>Blood alcohol</th>
<th>Drugs detected</th>
<th>Pregnancy</th>
<th>Infections</th>
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<td>T119</td>
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<td>90ml</td>
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</tr>
</tbody>
</table>
Capturing toilet behaviour for real-time data and health analysis.

See our features  Live Feed CHI 2014
Hydralert is the world's first highly engaging, real-time, non-invasive hydration testing and warning device for individuals.

Hydralert automates traditional manual hydration testing, assists in evaluating a group's risk of heat related illness and actively engages individuals in proper hydration habits via self-testing.

SMART DISC HARDWARE

The Hydralert hardware consists of the Hydralert smart disc, approximately the size of a hockey puck, and an easily mountable OLED screen. The Hydralert smart disc is placed at the isostom of a urinal with the screen mounted at the users' approximate line of sight. As urine contacts the Hydralert smart disc the individual's hydration range is read and displayed on the screen instantaneously via Bluetooth communication.

Waterproof Hardware

Bluetooth Connectivity

AI toilets will scan your poop to diagnose your ailments

Micron CEO Sanjay Mehrotra sees smart loos in our future and is anxious to sell the chips they will need.

BY STEPHEN SHANKLAND | NOVEMBER 12, 2018 3:46 PM PST
Design exercise: quantified toilets

In your breakout groups, come up with an effective way to provide privacy notices to users. Feel free to redesign the toilet, stall, or entire restroom. Bonus points for integrating consent options!
privacy policies are essential but are not suitable for users
2)

- <SIGN>
  - Flush up!
  - Decline

<SIGN>
- Confirm
- Flush down

<DECLINE>

<ACCEPT/CONFIRM>
SETUP:
Privacy Policy posted outside of bathroom entrance.
Includes link to website with privacy policy.

Screen monitor with auditory capabilities for visually impaired.

Foot controlled on/off controls.
Would you like to be analyzed?
- Yes
- No

(touch screen) default
(microphone)

"Speak now or forever hold your pee....."
Do your Duty!

Your deposit makes a difference.

"Swipe + Wipe" Program

regular health care costs ↮ no swipe or badge

employee: employee

notice

HR Group

+ Employee hand

NO DATA FLOW

For DATA FLOW

THANKS... IF YOU LIKE

EXIT

CMS KWC
By opening door—consent to processing of biodata

Data Free

Data Free

Quantified Toilets

Standard Toilets
Here's how smart toilets of the future could protect your health

“Everything these days is connected and smart, but I feel like the bathroom is a very untapped area.”
Virus that causes COVID-19 found during wastewater test at two UNCC dorms

CHARLOTTE, N.C. — Students at the University of North Carolina at Charlotte are having to stay inside their dorms after the virus that causes COVID-19 was detected in the wastewater at two residence halls.

School officials sent out a Niner Alert Monday evening saying the university’s wastewater testing detected the presence of SARS-CoV-2, the virus that causes COVID-19, in its routine sampling at two residence halls.

The University of Arizona says it caught a dorm’s covid-19 outbreak before it started. Its secret weapon: Poop.

Graduate students and employees process pooled tests from coronavirus tests in a lab at the University of Arizona in Tucson on Aug. 24. (Cheney Orr/Bloomberg News)

By Jaclyn Peiser
August 28, 2020 at 5:50 a.m. EDT

As 5,000 students prepared for move-in day at the University of Arizona this week, the school warned they would be tested periodically for the coronavirus. One test, though, doesn’t involve a nose swab. The university is regularly screening the sewage from each dorm, searching for traces of the virus.
India's city of Pune focuses on sanitation system of the future

More than 400 million people defecate in the streets in the world's second-most populous country.
A mountable toilet system for personalized health monitoring via the analysis of excreta

Seung-min Park, Deyoung D. Won, Brian J. Lee, Diego Escobedo, Andre Esteva, Amin Aalipour, Tayte Jesse Ge, Jung Ha Kim, Susie Suh, Elliot H. Choi, Alexander X. Lozano, Chengyao Yao, Sunil Bodapati, Friso B. Achtberger, Jeeseo Kim, Hwan Park, Youngae Choi, Woo Jin Kim, Jung Ho Yu, Alexander M. Bhatti, Jong Kyoung Lee, Ryan Spiller, Shan X. Wang and Sanjiv S. Gambhir

Technologies for the longitudinal monitoring of a person’s health are primarily integrated with clinical workflows, and have rarely produced actionable biomarker data for healthcare providers. Here, we describe easily deployable and software-free systems for the long-term analysis of a user’s excreta through data collection and modeling of health conditions. The ‘smart’ toilet, which is self-contained and operates autonomously by leveraging pressure and motion sensors, analyzes the user’s urine using a standard-off-the-shelf healthcare analysis that traces red-green-blue values from images of urinalysis strips, calculates the flow rates and volume of urine using computer vision as a non-invasive, and classifies stool according to the Bristol stool form score using deep learning, with performance that is comparable to the performance of trained medical personnel. Because the identity of the toilet is identified through their fingerprint and the distinctive features of their anatomy, and the data are securely stored and analyzed in an encrypted cloud service. The toilet may find use in the screening, longitudinal monitoring of specific patient populations.

User: John Doe
Accuracy score: 108
TOMORROW’S PIPE

Smart Pipe

TODAY.

youtu.be/DJklHwoYgBQ
Is the lavatory occupied?
How do you turn on this shower?
Which way do you turn it to make it hot? Is notch on the top a pointer?
To Activate Shower
Pull Handle Forward
For Hot Water
Turn Red Arrow to Left
For Cold Water
Turn Blue Arrow to Right
Water-Saving Dual-Function Handle

UP for #1 (liquid waste)

DOWN for #2 (solid waste)

Cleaned to protect against germs
Where is the light switch?
Where is the light switch?
How do you unplug the sink?
Hand dryer is attached to faucet
It’s a bit awkward to wash your hands
Unfortunately these Urinals are out of order. We aim to resolve this maintenance problem as soon as possible. We apologise for any inconvenience caused.
Unlock the door to a brand new restroom experience

Just launched! Find and securely access modern restrooms – all through your smartphone

Free for a limited time!

Download on the App Store  GET IT ON Google Play
Get notified when available in your city  Map of Locations
Unlock the door to a brand new restroom experience

Just launched! Find and securely access modern restrooms – all through your smartphone

Free for a limited time!

i'm in san francisco, the city where I can't use the restroom as it requires me to sign up for an app with a US phone number

Unlimited access to all Good2Go locations FREE for a limited time

Download your key today

Get notified when available in your city

Map of Locations
FLUSHING SOUND

FLUSH

音姫

流す
Locking and unlocking door automatically changes color of lock indicator. Inside latch. Outside indicator.
Restroom Need Attention?

Send a text to: 43766
Include the room code below along with any comments:

“7334 needs soap!”

All feedback is completely anonymous. Your name and phone number are never disclosed.

PITTSBURGH INTERNATIONAL AIRPORT

RestroomAlert.com
Message and data rates may apply. Send STOP to opt-out.

Room Code 7334
A patch for a privacy problem
- Easy to find
- Attractive
- Easy to use
- Privacy friendly
• Add words to icons
• Standardize controls
• Don’t hide controls
• Build PETs that are simple, intuitive, attractive, and fail safe
• Test with users