Experience Design for IoT Security: Lessons from Architecture School

Solid Conference
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Simply Secure
Agenda

Introduction

Lessons from Architecture School

  Start with people, in context
  Understand unspoken needs
  Homes are more than houses

Conclusion
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Buildings Are Becoming Sites of Surveillance

CONNECTING COLLECTING
Buildings Are Becoming Sites of Surveillance

Samsung’s Smart TVs recording and transcribing conversations and Mattel selling children’s questions to Hello Barbie are recent examples.

"How we sold our souls – and more – to the internet giants," Bruce Schneier in The Guardian

"Beware the Listening Machines," Ethan Zuckerman in The Atlantic
Buildings Are Becoming Sites of Surveillance

There needs to be richer discussion than the tension between what’s technically possible and what’s legal. Security for IoT needs design.
Buildings Are Becoming Sites of Surveillance
Privacy and security are exciting opportunities for UX design
IoT may be new, but buildings have been around a long time.
Appropriate complexity is the key UX challenge for IoT.
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Architecture school teaches problem finding
<table>
<thead>
<tr>
<th>Presenting work in charettes (pitch)</th>
<th>Learning by doing</th>
<th>Master and apprentice model</th>
</tr>
</thead>
<tbody>
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Architecture School Teaches the Design Process
Lessons from Architecture School: Learning to See

Start with people

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Man Handing a Letter to a Woman in the Entrance Hall of a House

Pieter de Hooch, 1670
Man Handing a Letter to a Woman in the Entrance Hall of a House

Pieter de Hooch, 1670

Windows, morality, and privacy as a dirty word
Man Handing a Letter to a Woman in the Entrance Hall of a House

Pieter de Hooch, 1670

Internet of 1670

From the Rijksmuseum
Man Handing a Letter to a Woman in the Entrance Hall of a House

Pieter de Hooch, 1670

Multiple people with different privileges inhabit the home

From the Rijksmuseum
Homes have multiple people with varied permissions. Children, and others who can’t or won’t consent, generate data. More aggressive rules govern collection of their data, and regulatory changes are likely.
Security Thought-Starters

Plan for change and don’t take on privacy debt in a quickly-changing landscape

European Article 29 Working Party

Sandy Clark et al’s “Honeymoon Effect” paper
Managing profiles for ambient capture: right mode + right feedback

Netflix manages multiple profiles with explicit login, but many media services are struggling to identify group members present when video is played.
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Design rooted in Finnish Nationalism + Romanticism
Environment inside reflects culture outside

Hvitträsk, Finland 1903. Photo by Markku Haverinen
This is the childhood home of Eero Saarinen
Eero Saarinen was the architect of New York’s JFK Airport T5
One generation of buildings is much longer than the 18-month hardware churn.
Buildings last and are upgradable.
Think firmware and plan an upgrade path

Internet Engineering Task Force (IETF) working on firmware standards, e.g. Carsten Bormann

Supervisory Control and Data Acquisition (SCADA)
Reimagining updates as a form of engagement: design for behavior change

Cautionary tale of routers, keeping the internet of 10 years ago alive
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Shophouses are Southeast Asian vernacular architecture.
Covered awnings protect the public from sun + rain
Designed by social custom, then Singaporean law in 1822
Vernacular is not the same as amateur
You can have cultural knowledge and still do a bad implementation. There are roles for standards and for professional knowledge.
Security Thought-Starters

Don’t invent your own crypto - use professional standards

Open Smart Grid insecurity

Real World Crypto Conference: Stanford, CA in Jan 2016
Appropriate Complexity

Exposing the underlying systems to build knowledge

Interfaces on electric cars like the Toyota Prius teach engine function and driver behavior
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Architecture school teaches lessons for UX for IoT security
Lessons from Architecture School

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Homes have multiple people with varied permissions

Understand unspoken needs

Buildings last and are upgradable

Homes are more than houses

Implementation matters in vernacular architecture
Plan for change and don’t take on privacy debt

Think firmware and plan an upgrade path

Don’t invent your own crypto—use professional standards
Managing profiles for ambient capture
Reimagining updates as a form of engagement
Exposing underlying systems to build knowledge
There’s a need for design to shape the conversation between possible and legal.

The UX problems for IoT are inspiring and important.
Thank You

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