Experience Design for IoT Security: Lessons from Architecture School

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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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Conclusion
Buildings Are Becoming Sites of Surveillance
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Samsung’s Smart TVs recording and transcribing conversations and Mattel selling children’s questions to Hello Barbie are recent examples.

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.
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
Introduction

**Lessons from Architecture School**

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

Conclusion
Architecture school teaches problem finding
A new report suggests that public transit services can significantly improve quality of life for residents. The study found that cities with well-developed public transit systems tend to have lower levels of poverty, higher rates of employment, and greater overall economic growth. This highlights the importance of investing in public transit infrastructure to support sustainable urban development.

### Table: Public Transit and Quality of Life

<table>
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<tr>
<th>Public Transit</th>
<th>Quality of Life Indicators</th>
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<tr>
<td>Efficient</td>
<td>Lower poverty rates</td>
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<tr>
<td>Accessible</td>
<td>Higher employment rates</td>
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<tr>
<td>Reliable</td>
<td>Greater economic growth</td>
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</table>

The report also recommends prioritizing investments in public transit services to address these benefits. It suggests focusing on improving connectivity, increasing frequency of service, and expanding the network to reach more residents. These strategies can help cities attract new businesses, improve transportation access for seniors and individuals with disabilities, and enhance overall community health and well-being.

In conclusion, public transit services play a critical role in modern urban planning. By recognizing the benefits of well-developed public transit systems, cities can make informed decisions to support sustainable growth and improve the quality of life for all residents.
## Architecture School Teaches the Design Process

<table>
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<th>Presenting work in charettes (pitch)</th>
<th>Learning by doing</th>
<th>Master and apprentice model</th>
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<tbody>
<tr>
<td>Building to think/making it visual</td>
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Lessons from Architecture School: Learning to See

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

European Article 29 Working Party on information privacy


Sandy Clark’s “Honeymoon Effect” paper

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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Hvitträsk, Finland 1903. Photo by Markku Haverinen

Design rooted in Finnish Nationalism + Romanticism
Hvitträsk, Finland 1903. Photo by Markku Haverinen

Environment inside reflects culture outside
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


Supervisory Control and Data Acquisition (SCADA)

https://en.wikipedia.org/wiki/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
Nationalism

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

https://threatpost.com/weak-homegrown-crypto-dooms-open-smart-grid-protocol/112680

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
Security Thought-Starters

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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