You are not your developer, either

A research agenda for usable privacy and security beyond end users

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Security and human error

"Not long ago, [I] received an e-mail purporting to be from [my] bank. It looked perfectly legitimate, and asked [me] to verify some information. [I] started to follow the instructions, but then realized this might not be such a good idea … [I] definitely should have known better."

-- former FBI Director Robert Mueller

Security and human error

Facebook birthday invite leads to mayhem in Dutch town, authorities say

From **Dominique Van Heerden**, CNN

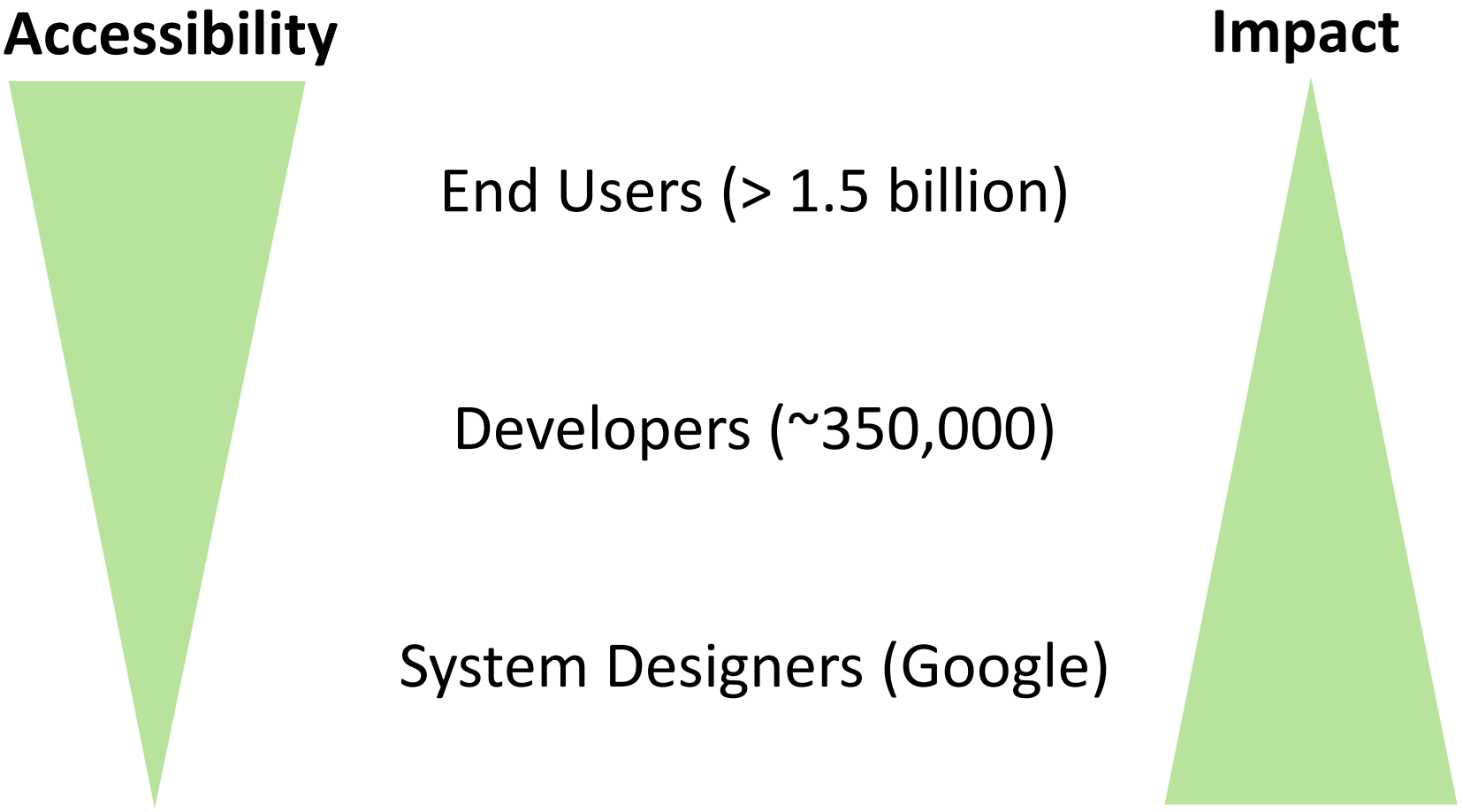
updated 8:49 PM EDT, Sun September 23, 2012

(cnn.com)

~~Why are users stupid or lazy?~~

How can we make security more usable?

Beyond end users for more impact



Example: Android

What about software developers?

Developers are experts, right?

Or not.

```
.t ((err = SSLHa
        goto fail;
        goto fail;
.f ((err = SSLHa
        goto fail;
```

http://www.slate.com/content/dam/slate/articles/technology/future_tense/2016/06/160610_FT_Barbie-promo.jpg.CROP.cq5dam_web_1280_1280_jpeg.jpg
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Why are developers stupid or lazy?

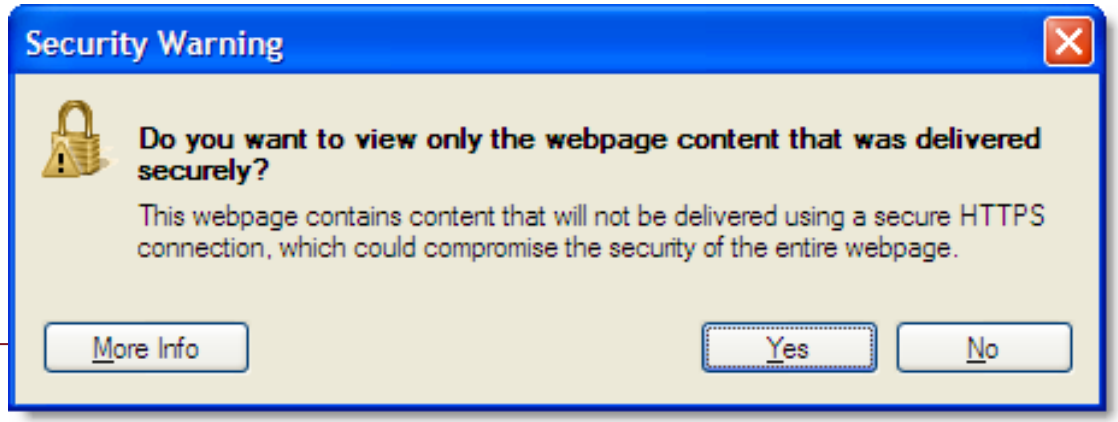
How can we make secure programming easier?

Lessons learned: Usec for end users

- You are not your user
- Security is a secondary concern
- More is not always better

You are not your user

- Confusing warnings and error messages
- Too much security jargon
- Don’t assume security knowledge just because they know how to program
- Design for usability, evaluate it explicitly



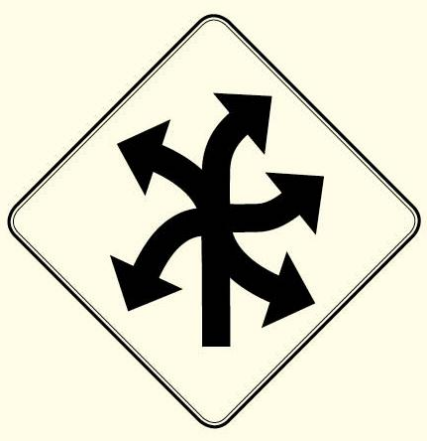
Security is secondary

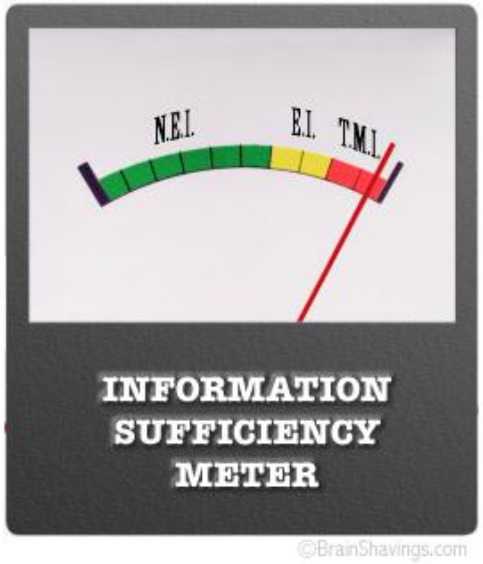
- No one turns on their computer to do “security”
  - Functionality, time to market, maintainability, etc.
  - May (appear to) conflict with security
- Attention and time are limited!
- Try: Take developer out of the loop
- Try: Persuasive design

https://www.scripps.org/sparkle-assets/images/multitastking-600x375.jpg

More is not always better

- Too much advice is overwhelming
  - Hard to roll it back
- Can’t just keep asking users (developers) to do and remember more stuff





https://rpseawright.files.wordpress.com/2013/10/too-much-info.png

http://blogs.babycenter.com/wp-content/uploads/2011/09/too-much-sugar.jpg

Research agenda: Beyond end users

- Measuring the status quo
- Understanding developers
- Methodology and validity

Measuring the status quo

- APIs, tools, documentation
- What is actually used and why?
  - Can we make security tools more attractive?
- How effective are security tools in practice?
  - Which are best and why?
  - What design features are effective?
  - Where in the development process to intervene?

Measuring the status quo: Agenda

- Expert review / cognitive walkthrough
- Field measurements in existing software
  - Github, app markets, etc.
- Controlled experiments for direct comparison

- Compare: security APIs, static analysis tools, security training materials, coding standards, etc.

Understanding developers

- What (anti) motivates secure behavior?
- How do developers learn about security?
  - How can we improve information resources?
- Where are knowledge gaps?
  - Can we address them or work around them?

Understanding developers: Agenda

- Ask about: priorities, information sources, acceptance of security tools, how security fits into the development process

- Interviews and surveys
- Diary studies
  - Experience sampling
- In-situ observation

Methodology and validity

- What type of study to use?
- When can you use students (vs. pros)?
- How to design useful study tasks?
  - Sufficiently complex to capture useful data
  - Doable in a study environment

Methodology and validity: Agenda

- Comparative studies of tasks, groups
- Compare study results to field observations
- Develop new measurement tools
  - Online study development platform
  - IDE with telemetry and experience sampling

Openclipart.org

Usable security for developers

- Lessons learned from end users
  - You are not your user, security is secondary
- A lot we don’t yet know
  - Comparison of existing tools and techniques for usability, effective security in practice
  - Motivations, incentives, knowledge gaps
  - How to best structure studies

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