

Future Direction & Trends in Information Technology Panel

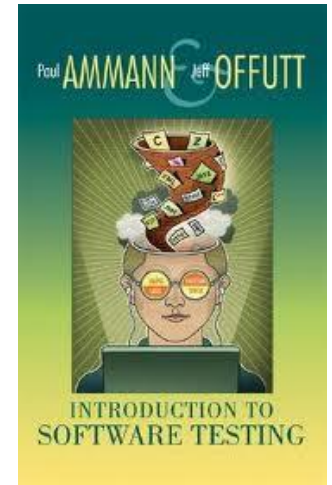
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My Perspective

- Software engineering
 - As seen from academia
- Interests
 - Testing, security, usability
 - “Why things go wrong”
- 25 years teaching at George Mason
 - Many students who actually build stuff
- Former faculty associate at NIST (about 5 years)



Advanced Technology

- It is everywhere, and is becoming more so
- It changes how people do things
 - Do people still use phones to make calls?
 - Autonomous vehicles won't just drive themselves
 - Our entire notion of transportation will change
- How advanced technology is built is changing
 - 3D printers let anyone produce most anything
 - No longer the exclusive domain of engineers at tech companies
- In this new world
 - What do “standards” mean, and how are they most useful?

Ubiquitous Updates

- There are no more “finished” products
 - Even washing machines get software updates
 - Updates are a strong motivator for the “internet of things”
- Often updates have problems
 - Sometimes the problems are very serious
- Every company has its own update approach
 - Shouldn’t this be standardized?
 - What are “best practices”?

Quality

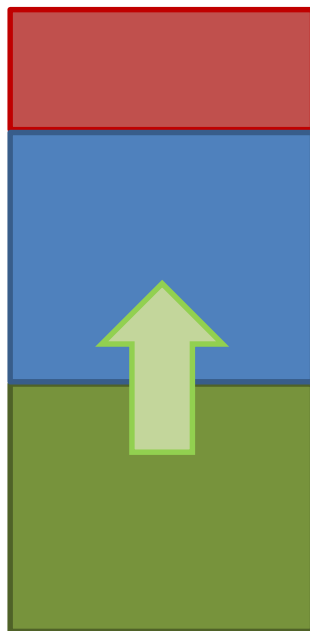
- Changing role for quality in IT products
 - Market forces *have* produced higher quality
 - If your product is lousy, your customers have options
 - In the shrink-wrap days, the customer had already paid
 - The bar is set by the competition
 - Challenge for engineers: How to make quality routine?
 - One way to think about the Agile movement
- Quality problems often turn into security problems
 - What does a “minimum bar” look like here?

More on Market Forces

- Security, Privacy, Reliability
 - Often market forces work against these attributes
 - Companies want data! It's valuable!
- NIST Challenge:
 - Providing direction where the market is
 - weak
 - countervailing

Usability Matters for Security

- IT Departments No Longer Control Security
 - Users Have Many Options, Especially Smartphones
- The Ability and Willingness Model



Can't do

Simply unreasonable for most users
Example: Memorize strong, unique passwords

Could do but won't

More effort than perceived return on investment
Example: Authentication with RSA token

Willing and able

Sweet spot!
Ideally not the empty set...