Implementation Issues for Electronic Commerce: What Every Developer Should Know

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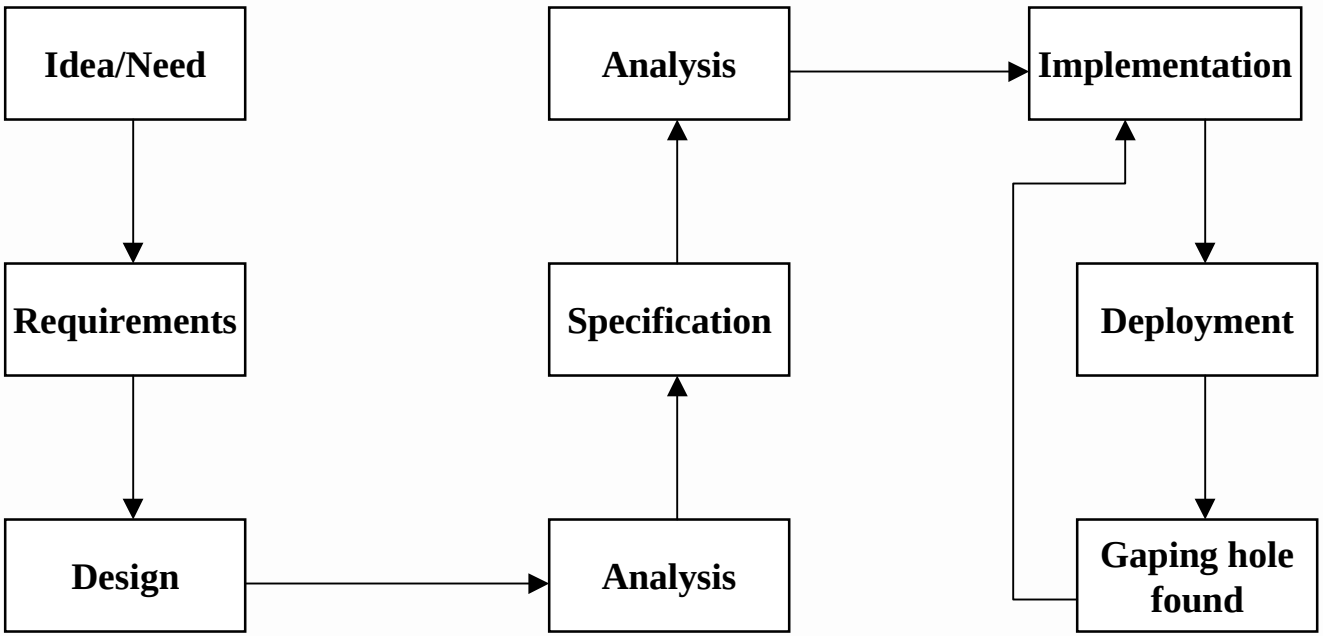
Some components of a secure system

- ✔ Sound requirements
- ✔ Flaw-free design and specification
  - automatic specification tools (*formal*)
- ✔ “Provably” secure protocols
  - logics, model checkers, complexity theoretic arguments (*formal*)
- ✔ Strong crypto algorithms
  - rigorous analysis by the whole community (*formal*)
- ✔ bug-free implementation
  - code review (*eyeballing it*)
- ✔ Others:
  - bug-free compiler, bug-free O/S, bug-free hardware (*hopeless?*)

Security system development



Examples

- ✔I.E. flaw led to shortcut files executing when URL is accessed
  - 400K patch delivered in 48 hours
- ✔PGP Passphrase cached
- ✔I.E. Res parsing problem
- ✔Netscape Mail in “secure” mode
- ✔SSH AF_Unix problem
  - users can authenticate as other users

Challenges

- ✔ E-commerce systems are being deployed
  - as fast as they can be built
  - all over the place
- ✔ How can we do more at the development stage?
- ✔ Can formal methods be applied to implementation?
- ✔ Need to educate implementers about security
- ✔ Not enough to know the API
  - must know something about how algorithms work, choices for parameters, etc.