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http://www.mosquito-fp7.eu
Fragmentation?

**Anything** that drives developers to build several versions of the same application

- Definition captures both platform competition and platform variants
- Not limited to platform issues
- Ecosystem dynamics and constraints
Hardware differences

**Not optional**
- Microphone
- Loudspeaker

**Variable**
- Processor
- Memory
- Screen

**Optional**
- Front & rear camera
- Bluetooth, WiFi, NFC or FM transmitter
- GPS receiver
- Gyroscopes, accelerometers
- Compass, barometer
- Proximity, light or thermal sensor
- Secondary
  - Microphone, screen or speaker
  - SIM card reader
- Memory card reader
- Flash light
Platform(s)

- Fragmentation **never** got fixed by introducing a new platform
- It only gets better when platform dies
- Inside each platform, with varying severity
  - Bugs, specification issues, new and deprecated APIs
  - Missing or varying components: codec, handler, *etc.*
  - Integration issues: system events, component clash, *etc.*
- HTML5 will not solve fragmentation. Let's just hope it will be internally consistent
Is the bad really lessening?

Yesterday - *complete mess*
- Symbian
- Windows Mobile
- Java ME
- RIM Blackberry
- DoJa
- Palm OS
- Brew
- Flash
- BaDa

Today
- *Leaders*
  - iOS
  - Android
- *Outsiders*
  - HTML 5 web apps
  - Window Phone
  - RIM Blackberry
iOS

- “Apple doesn't exactly make it easy to support old versions of the iPhone SDK”
- Despite hardware planned obsolescence, some old is still out there
- There are variants: plain iPhone, iPod Touch (no GPS) and iPad
- Many users not updating or lagging
- iOS 5 over the air updates could improve this
Android

- Agreed, Android is fragmented, more than iOS
- Let's be fair.
  - It has to be
  - Many OEM/ODM
  - Hundreds of models
- Consistency matters to Google
  - Google apps & logos licensed if passing CTS test suite
  - Open source consistency contributions are accepted
- Consistency at this scale has never been attempted
Firmware updates

- Cultural change
  - Fire-and-forget
  - 1 to 3 year maintenance - what's the incentive?
- Even changes corporate accounting
- Less versions per OS
- More hardware per version
- Installed base inertia often underestimated
  - Full speed (*i.e.* technology in all device shipments)
  - 2 to 3 years to reach 50% penetration in installed base
  - Faster in the smart phone segment
Developer generated fragmentation

• Users accept tablet versions at a premium
• Some tablets apps are indeed more complex
• But many apps having both versions are not so different
  o Premium ratio exceeds the extra development ratio
• Providing a tablet version is easy money

• How developers accounts for mobile development?
  o CAPEX in the service industry
  o OPEX in the content industry
• Porting apps is a business
Fragmentation Maze

- Some programming language adds fragmentation (e.g. JavaScript)
- Networking: bandwidth, filtering, etc.
- Video: H.264 v. WebM
- Application store requirements
- App and in-app payment options
- Legal requirements: privacy, location, free speech, etc.
- Internationalization
Two-sided market

- Increasingly, smart phones are bought for their apps
- Same as game consoles or video players
- New economic model called “Two-sided markets”
- Multi-homing: use of several platforms
  - If possible - coexistence possible (e.g. debit cards)
  - If not possible - convergence (e.g. VHS v. Beta)
- Same feedback loop drives convergence or fragmentation
- Smart-phones have “special” functions... phone?
- SIM centric does not encourage multi-homing
Can we fix this?

- Nobody but developers really knows about fragmentation
  - Learnt the hard way
  - Fragmentation knowledge becomes an asset
- Sharing fragmentation knowledge
  - Consumes time
  - Helps competitors avoiding issues
  - May fix future devices, useless against present ones
- Many issues remain unfixed
- Web developers do share - but the Web is free
- Paid app ecosystem
  - Not resilient against fragmentation
  - No incentive for developers to report issues
Off topic? Android Patent War

- The market is not the only driving force of ecosystem
- IPR matters
- Injunctions can shape the ecosystem
Conclusion

• Education. Developers not trained for that
• Development tools & methods not ready
  o Coding sequentially rather than concurrently
  o Tracking issues per target
• Beware of magic bullet & snake oil vendor
• Developers shall have incentive to report fragmentation issues (as for security)
• Device manufacturers lack incentive against fragmentation, except Apple
• Are market & IPR the only driving forces?
• Growth in emerging countries
MOSQUITO is carrying a survey on mobile fragmentation but more particularly on standardisation issues and gap and how helping to reduce fragmentation.

Please give your views:
Fragmentation or Diversity?

- MOSQUITO (Orange, ETSI, …) and MobiWebApp (W3C) projects are organizing a series of events around Mobile Web Challenges and HTML5.

- Three events:
  - Workshop (29 May): Mobile Web Challenges
  - HTML5 training (30 May), conducted by W3C staff
  - HTML5 Interop event (30/31 May)

Registration is free but mandatory. Register yourself from the event website: [http://mosquito-fp7.eu/paris](http://mosquito-fp7.eu/paris)
Thank you! Thank you! Thank you! Thank you!

For questions ask our expert:

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