

MOBILE FIRST

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THE GROWTH OF MOBILE INTERNET: OPPORTUNITY & CHALLENGE

Smartphone is getting smarter

- Personal
- Taken Everywhere
- Frictionless access(NFC...)
- Sensors, cameras
- Location
- Payment
- Social platform
- Much Easier to use



Tech is selling to everyone

- Est ~28m smartphone devices sold as of Sept 2014
 - Growth rate at > 30% annually
 - 830k smartphone vs 870k feature phone
- Price starts at just \geq 1m Vnd

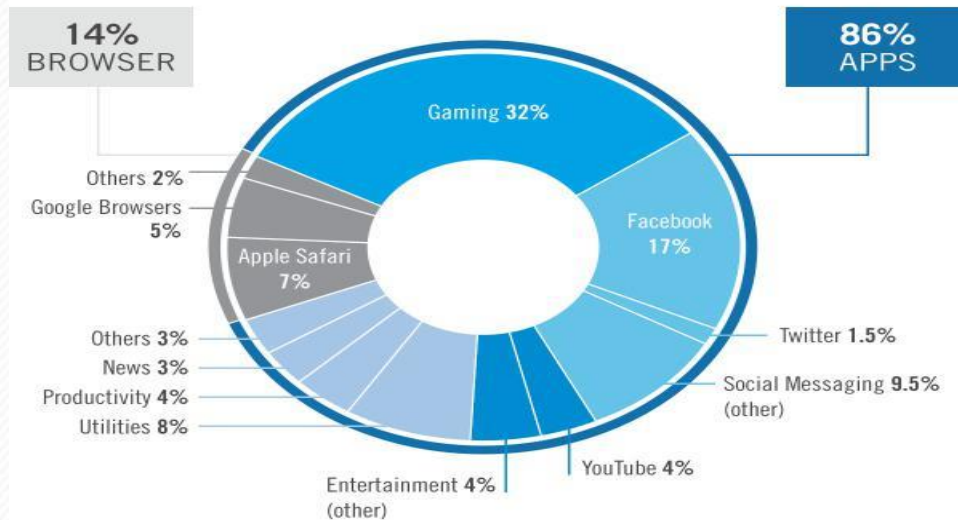


Mobile changes Internet

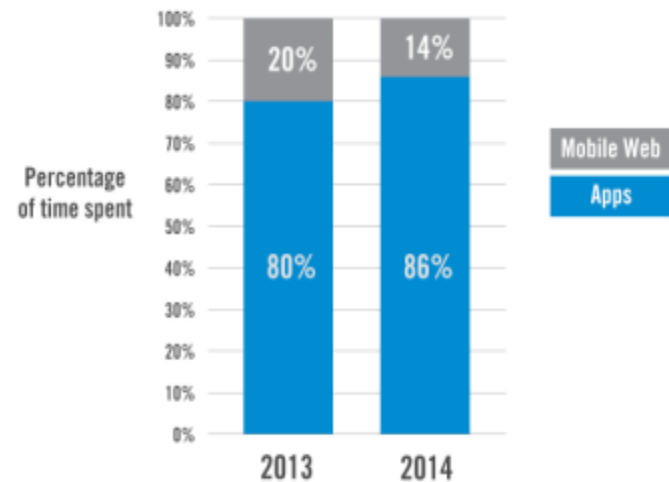
- Zing
 - 50% total visitors on Zing sites are from mobile and keep growing fast
 - Total sessions from mobile exceed PC, increase 4x in last 12months
 - Zalo, Zing Mp3 mobile app have 1.2m-1.5m new users monthly
 - Typical devices are likes Galaxy Y, Trend

Customer are moving to native apps

Time Spent on iOS and Android Connected Devices



Apps Continue to Dominate the Mobile Web



- Total time spent on Zing Apps(Zalo, news, mp3, tv...) = 2-3x Zing mobile web
- Zing Mp3 has 25m mobile app users vs 18m unique web visitors(mobile + pc).

Apps are easily selling and marketing

- Distribution

- Itunes Store, Google Play
- 3rd: AppStoreVN
- App installing behavior are becoming popular

- Viral Growth

- Facebook, Instagram, Zalo...

Big Opportunity: Mobile First

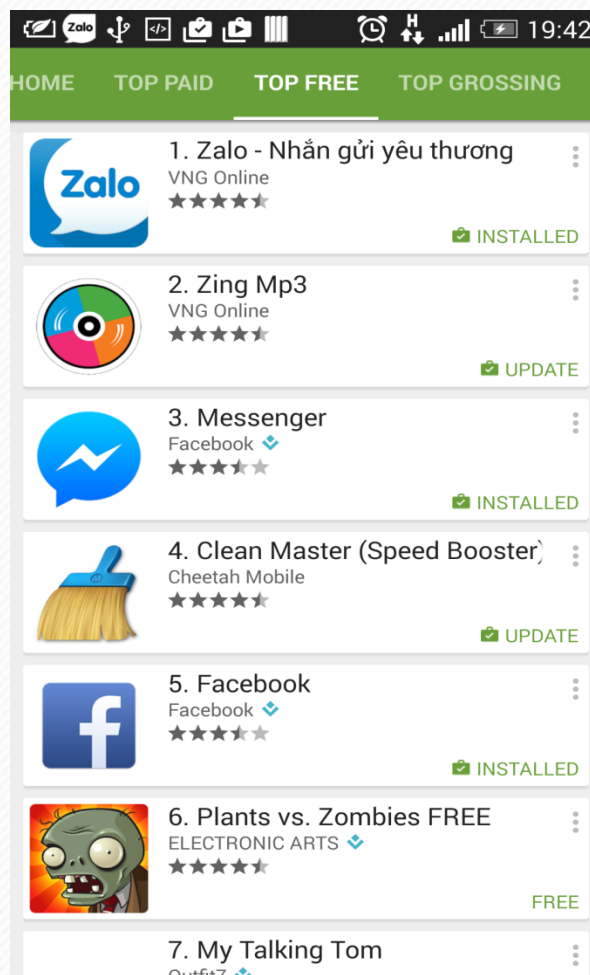
- Customer are demanding native experience
- 2-3x smartphone more than pc => Much bigger the opportunity
- Example:
 - Whatsapp
 - Whatsapp 7.2tr msg vs SMS 7.5tr msg a year
 - Snapchat
 - Snapchat 400M photos+video vs facebook 350M daily photos
 - Sharing economy: Uber, AirBnB
 - Flappy bird

Challenge: Development

- Long lived, highly stateful apps
- Multithreaded
- Constrained Environment(Limited power, mem)
- Less Agile Deployment Model(Multiple versions in the wild)
 - OS Upgrade rate is slow
 - No Itunes acc
- Diversified Network
- Android: fragmented ecosystem
 - > 16000 different models using Zalo
 - Android is growing faster: 12.5M Androids vs 6M iOS unique devices(IMEI)

Challenge: Competition

- Top 10 apps in VN Google play
 - 2 Vietnamese
 - 5 US
 - 3 Chinese



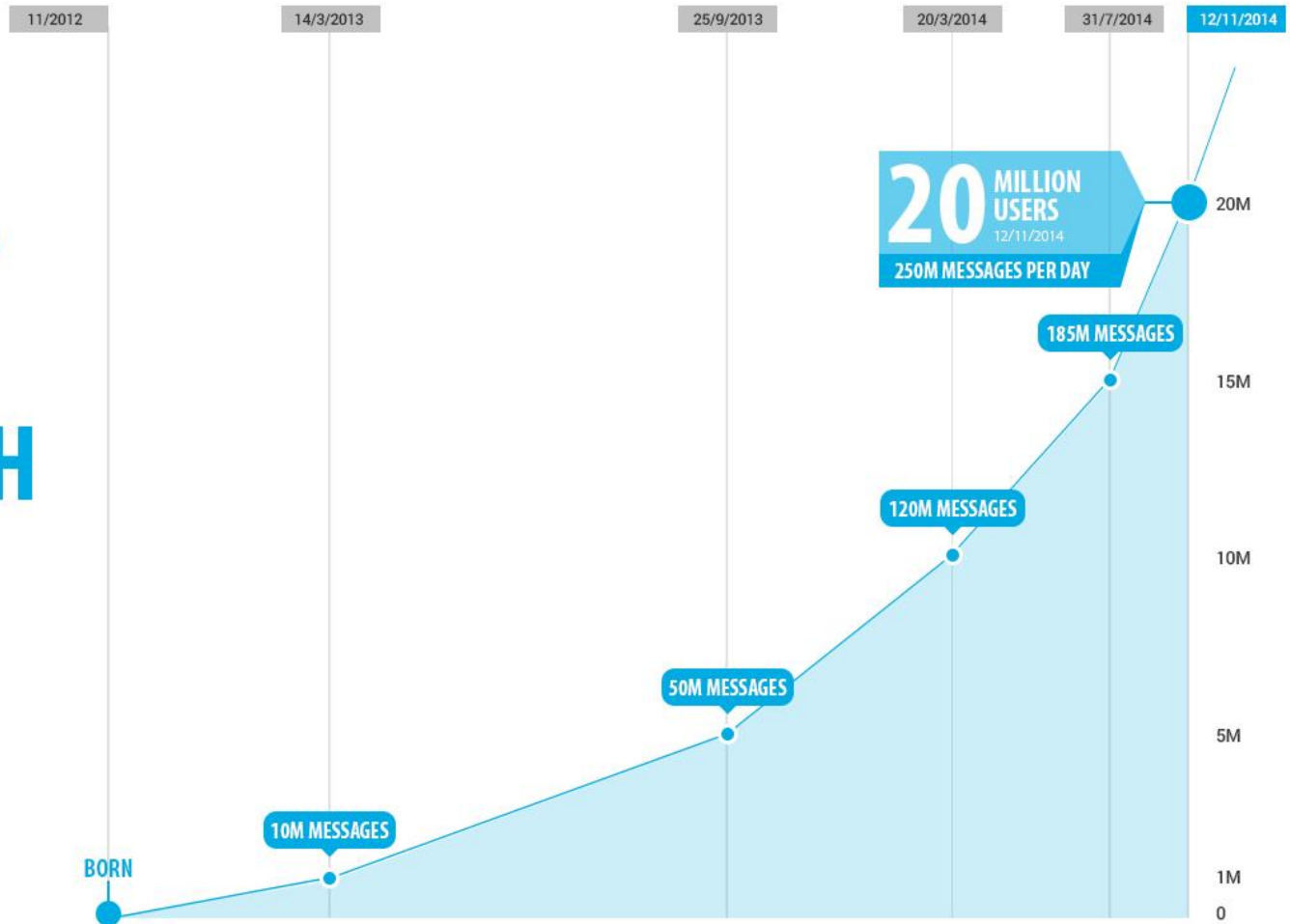
ZALO: SOME LESSONS LEARNED BUILDING A MOBILE FIRST PRODUCT

Zalo

- Model
 - Phonenum & Contact Graph
 - Instant messaging & Instant friends
 - Private social sharing
 - Focus on voice, photo, video, location
- 20m users(3x growth in 2014)
- 250m msg
 - ≥ 16 m photo
 - ≥ 4.5 m lbs
- ≥ 500 pages: Coke, KFC, Lotte...shops

Growth History

Zalo[®] USER GROWTH



Some Challenges

- Our first extended-web based infrastructure does not work well
- The growth speed of userbase/usage on Zalo > any of our PC/Web products
- Customers constantly demand better UX and higher quality

Optimize tech pieces for mobile first

- Infrastructure
 - Build new mobile first infrastructure with protocols designed for pushable devices & long connection.
 - Prepare for the backend high scalability
- Performance
 - Eliminated HTML5(webview), 100% native and cross platform layer corelib C++
 - Flat design
- Data Transfer/Storage
 - Reduce Poll->Push, Https; Json...=> Binary
 - Jpeg, PNG -> webP
 - Transfer less data, less often.
 - Measure & adjust client behavior to network quality
- Battery
 - Optimized behavior with Cell Radio/Device FSM
 - Use tool for profiling ARO, multi-meter
- Fragmentation
 - Categorize android with different apk sizes: Cut by API level, heap, screen size, and CPU architecture.

Grow the Team

- Hiring & Mentoring
 - Hire product/design people from oversea.
 - Recruit & train fresh engineer from University.
 - Scale a team of 20 to 60 engineers in two years.
- Decentralize functional groups vs Centralize codebase
 - 7 product verticals teams with their own engineers (core, communication, community, social, relationship, business...)
 - Build a common core codebase/framework

Experiment and Iterate Quickly

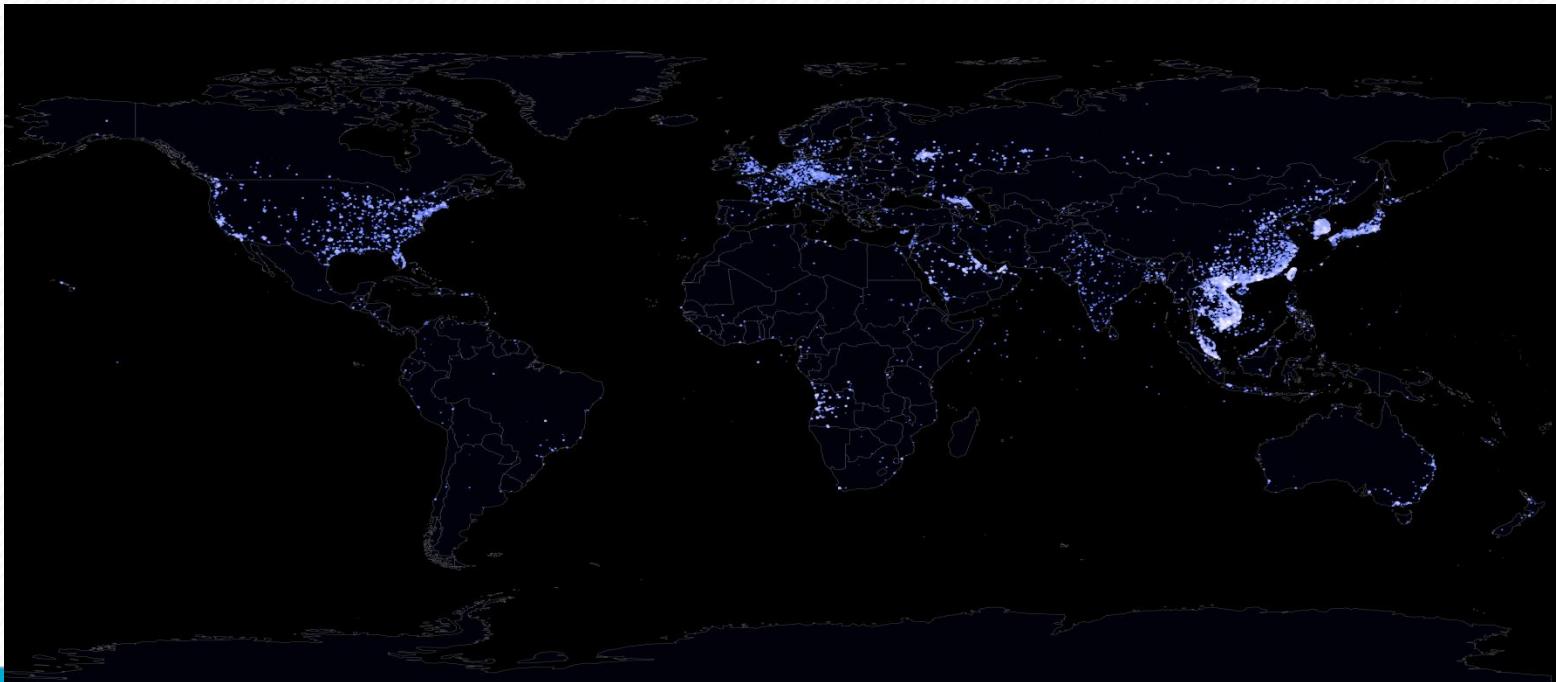
- Optimize for users usage patterns
 - Loop: Feed Back – Data Analyze – Improve
 - Release every 2-3 weeks.
- Feature Experiment and Quality Test before public
 - 2-5k early alpha adopters
 - 50-100k early beta adopters

Monitoring

- Monitoring \geq testing
 - Speed and QoS real-time monitoring
 - Log RTT, Fail, Load...
 - Crash analytics
 - Tap analytics
- Mining
 - Spam detection
 - Retention/Engagement improvement

We are just beginning

- Expect to integrate more useful utilities
- To connect the Vietnamese over the world
- Learn and improve everyday



Thank you!