An Exploration of the Handset Technology Landscape

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Smartphones are the future?

“Unlike old-fashioned “dumb” phones or even feature phones, smartphones can accommodate sophisticated financial services in a user-friendly way.” (McKinsey)

“Android devices can provide access to data from device sensors, apps, and the OS.” (FSP)

Pew: “Adults Who Report Owning A Smartphone in Emerging Economies”
Smartphone sales in Africa

- Feature phone share
- Smartphone share

Data: International Data Corporation
Smartphone sales in Africa didn't overtake feature phones in 2016

- Feature phone share
- Smartphone share

Data: International Data Corporation
Research Questions

1. Is the focus of DFS on smartphones sufficient?
   a) What does the handset landscape look like?
   b) What do we mean by smartphone, feature phone, etc.?

2. What are the processes of application development, installation, distribution, and use on feature phones?
Outline

1. Term-setting and classification
2. Application Development Process
3. Feature phone app platforms
Pew Research Study on Smartphones, 2015:

“Q72: Some **cellphones are called "smartphones" because they can access the internet and apps.** Is your cellphone a smartphone, such as an iPhone, a Blackberry …?”
Is this a smartphone?

- It has
  - Only LTE access
  - An app store*
  - Wifi
  - A voice assistant
  - A front and rear camera

- But it looks like
Handsets Attributes

- Battery life (mAh)
- Data access (2, 3, 4 G)
- Multimedia ability (video, camera)
- Input mode (keypad, keyboard, touch)
- How they run apps
- Operating System (OS) type
Classification of Operating Systems

Basic
• Proprietary
• Runs off of firmware
• Not “smart”

Smart
• Has an app store
• Is one of
  • Android (83%)
  • iOS (15%)
  • Windows Mobile (1%)
  • BlackBerry
  • Tizen
  • Sailfish OS (IDC)
What about feature phone operating systems?
Classification of Handsets

- Basic
- Feature
- **Smart feature**
- Entry-level smartphone
- Advanced smartphone
Outline

1. Term-setting and classification
2. Application Development Process
3. Feature phone app platforms
Examples

**SMS**  As receipts, M-Pesa

**USSD**  M-Pesa (Tanzania)

**IVR**  EcoBank

**SIM app**  M-Pesa (Kenya)

**Thin-sim**  Equity Bank (Kenya)

**Browser**  EcoBank

**Feature phone app**

**Smartphone app**  PayTM (India)
Bottlenecks

**USSD**  Functionality, Telco contracts

**SIM app**  Deployment, functionality

**Browser**  Data cost, security

**Feature phone app**  Deployment, engineering, functionality

**Smartphone app**  Reach, engineering
Costs

• Handset
  • Energy
  • Network
  • Hardware

• Application
  • MNO contract?
  • Developer time
The Technology Depends On:

• Who is the developer?
• Does application require multimedia?

• Does population have home electricity?
• What is population’s network coverage?
• What is distribution of handsets in population?
Probable DFS Paths

• Telco
  • USSD + sim toolkit + (optional) smartphone app, SMS

• Bank
  • Smartphone app + (rarely) thin sim

• Startup
  • Smartphone app + (sometimes) USSD

• Desired
  • Feature phone app
Native Feature Phone Apps

• JavaME
  • Opera/Bemobi App Store or side-load
  • Compatibility issues

• Proprietary OS
  • MNO
  • Scalability issues
**Basic (Java ME)**

- **Phones Operable:** Some
- **Distribute:** Preinstalled,
- **Time to Learn:** 20 hours

**Smart (Android)**

- **Phones Operable:** Almost all
- **Distribute:** Google Play Store
- **Time to Learn:** 2 hours
<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic (Java ME)</th>
<th>Smart (Android)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 60</td>
<td>20 hours</td>
<td>2 hours</td>
</tr>
<tr>
<td>Phones Operable</td>
<td>Some</td>
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</tr>
<tr>
<td>Distribute</td>
<td>Preinstalled, Bemobi</td>
<td>Google Play Store</td>
</tr>
</tbody>
</table>
Opera/ Bemobi Mobile Store

- 6745 handset models run JavaME
  - Acer E200 to ZTE Yoigo F233
  - 136 makes
- 273 handset models run Symbian
SORRY. THIS SCREEN ORIENTATION IS NOT SUPPORTED
Outline

1. Term-setting and classification
2. Application Development Process
3. Feature phone app platforms
“A new software application designed for feature phones … OneApp expands the capabilities of these handsets to deliver new apps and services”
“MOBILE WALLET
Transactions made easy. Top off airtime, pay bills, buy tickets, or send money to a friend or family member—no more lines and no bank account needed!”
“MOBILE WALLET
Transactions made easy.
Top off airtime, pay bills, buy tickets, or send money to a friend or family member—no more lines and no bank account needed!”

RIP 2012
UPDATE: You won't be able to use WhatsApp on the following platforms for:

- Nokia Symbian S60 after June 30, 2017
- BlackBerry OS and BlackBerry 10 after December 31, 2017
- Windows Phone 8.0 and older after December 31, 2017
- Nokia S40 after December 31, 2018
- Android versions 2.3.7 and older after February 1, 2020
Is this a smartphone?

• It has
  • Only LTE access
  • An app store*
  • Wifi
  • A voice assistant
  • A front and rear camera

• But it looks like
Is this a smartphone?

$2.50

42GB DATA

Validity: 28 days

Free voice calls | Unlimited Data
Unlimited SMS | Jio Apps
<table>
<thead>
<tr>
<th>Brand</th>
<th>Q4 2016</th>
<th>Q4 2017</th>
</tr>
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<tbody>
<tr>
<td>JIO</td>
<td>-</td>
<td>26%</td>
</tr>
<tr>
<td>SAMSUNG</td>
<td>25%</td>
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</tr>
<tr>
<td>MICROMAX</td>
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<td>9%</td>
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<tr>
<td>NOKIA HMD</td>
<td>-</td>
<td>6%</td>
</tr>
<tr>
<td>OTHERS</td>
<td>55%</td>
<td>37%</td>
</tr>
</tbody>
</table>
Jio Phone

- Exemplifies continued demand for feature phones
- Easier development with HTML5
- Adoption despite no open app environment
- Data cost model
Future(s) of Open Platforms

1. Smartphones take over world
2. Jio-like phones are a viable middle and low end
3. ...d, use least common denominator
Open Questions

1. What is the handset distribution and usage data over time for various developing regions?

2. What policies will help create our desired world?
Open Questions

1. What is the handset distribution and usage data over time for various developing regions?

2. What policies will help create our desired world?
Questions?

1. We can’t abstract DFS from the devices
2. Handset classifications are conveniences
3. Consider app. development, deployment and cost