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Compete in
the Era of
SMART.

MobileFirst – Mobile Development & Runtime Challenges for Today and Tomorrow

Girish Dhanakshirur
WW Sr. Architect, Master Inventor, IBM Mobile Platform

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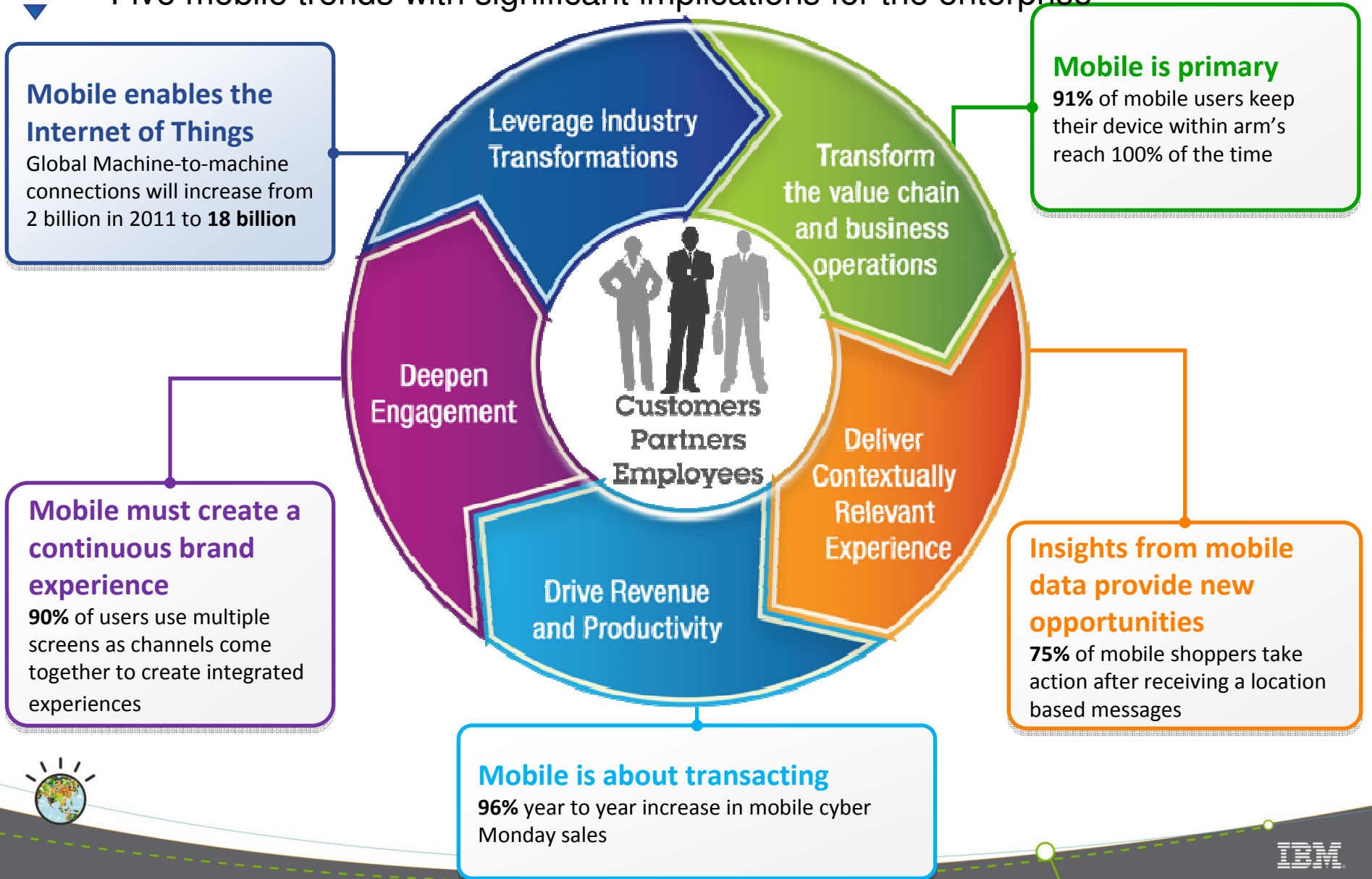the Era of
SMART.

Mobile Adoption Continues to Explode

41% CAGR
**Wearable
Wireless
Devices**

1 Trillion

**Connected
Devices**

**5.6
Billion**

**Personal
Devices Sold**

2013 ——————— **2014** ——————— **2015**

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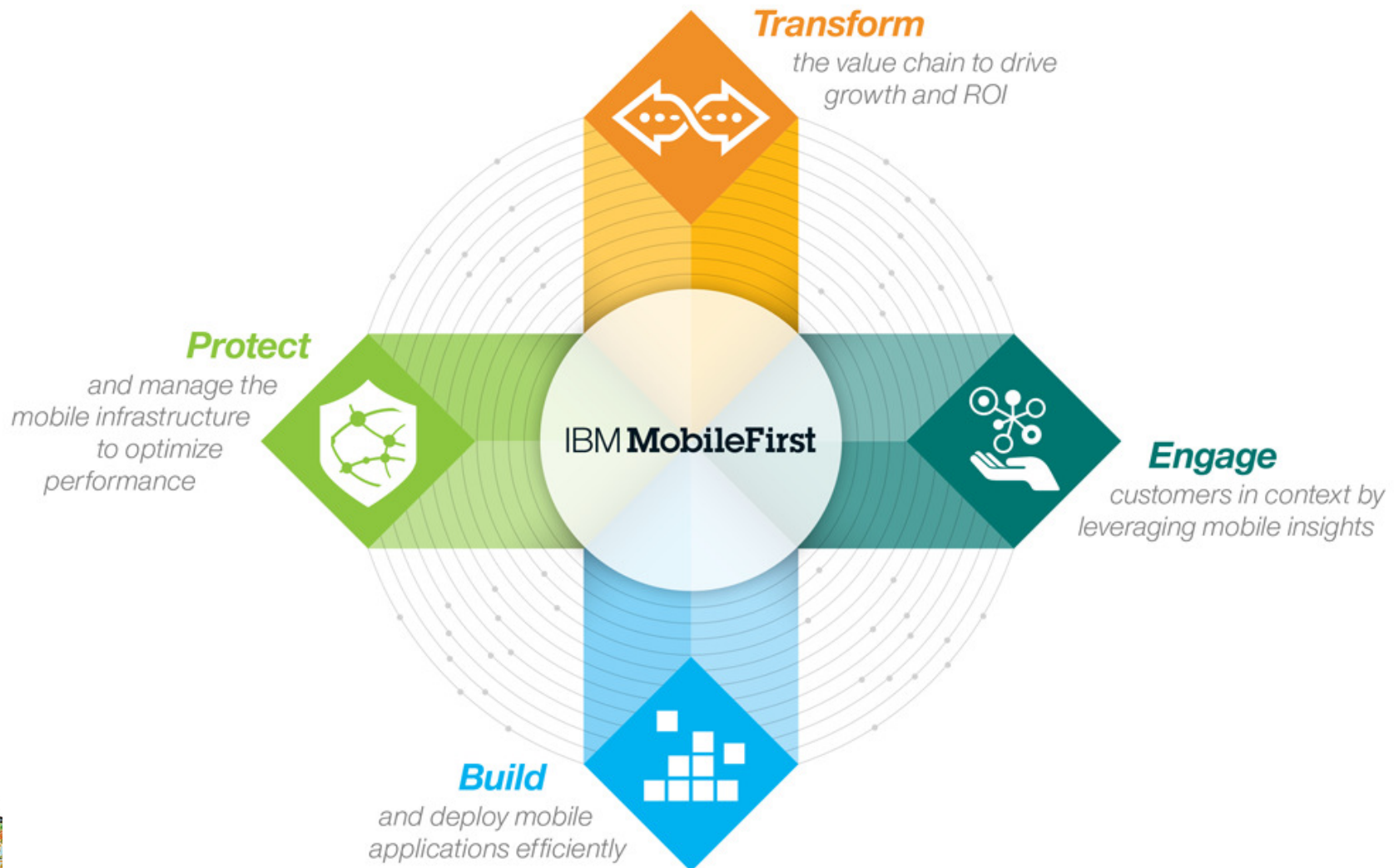## Five mobile trends with significant implications for the enterprise

Mobile enables the Internet of Things
Global Machine-to-machine connections will increase from 2 billion in 2011 to **18 billion**

Mobile is primary
91% of mobile users keep their device within arm's reach 100% of the time

Mobile must create a continuous brand experience
90% of users use multiple screens as channels come together to create integrated experiences

Insights from mobile data provide new opportunities
75% of mobile shoppers take action after receiving a location based messages

Mobile is about transacting
96% year to year increase in mobile cyber Monday sales

Leverage Industry Transformations

Transform the value chain and business operations

Deepen Engagement

Customers Partners Employees

Deliver Contextually Relevant Experience

Drive Revenue and Productivity

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Our strategy: Enable enterprises to put an integrated approach in place to capitalizing on the mobile opportunity

Transform
the value chain to drive
growth and ROI

Protect
and manage the
mobile infrastructure
to optimize
performance

IBM MobileFirst

Engage
customers in context by
leveraging mobile insights

Build
and deploy mobile
applications efficiently

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Adding mobile capabilities to our portfolio

IBM MobileFirst Platform

ENHANCED

IBM Worklight V6.2 Explore available back-end services and automatically generate integration code

NEW

IBM Mobile Quality Assurance Open Beta Optimize mobile apps through consolidated view of customer feedback and metrics

ENHANCED

IBM Rational Test Workbench 8.5.1 Automate testing of native, hybrid, and HTML5 mobile apps

ENHANCED

IBM UrbanCode Deploy plugin for IBM Worklight Accurately deploy Worklight apps to test or production environments

IBM & Partner Applications

NEW

Xtify Leverage push notification services to provide marketing offers to customers based on context and location

ENHANCED

IBM Connections 4.5 Always have the latest file versions on your mobile device

ENHANCED

IBM Maximo Anywhere 7.next Achieve greater enterprise asset management flexibility with IBM Worklight mobility

Center diagram

Strategy & Design Services

Industry Solutions

Banking | Insurance | Retail | Transport | Telecom | Government | Healthcare | Automotive

IBM & Partner Applications

Application & Data Platform

Management | **Security** | **Analytics**

Devices ◆ Network ◆ Servers

Cloud & Managed Services

Development & Integration Services

IBM MobileFirst Analytics

ENHANCED

IBM Tealeaf CX Mobile 8.8 Identify and remove user experience obstacles that cause lost sales

NEW

The Now Factory Analytics on mobile usage for service providers

IBM MobileFirst M...

ENHANCED

IBM SmartCloud A... Performance Mana... Identify performance ... they impact end users...

IBM MobileFirst Security

NEW

Trusteer Ensure tr...

ENHANCED

IBM Security Acc... appliance

Cloud & Managed Services

ENHANCED

IBM Cloud Mobile Managed Services Let IBM build and maintain your mobile application portfolio from the cloud

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What organizations are talking about when they think MobileFirst

How to leverage mobility to advantage our organization?

Engagement

Applications

Security and Management

Conversation focus: *frequency of interaction, customer sat, conversion rate, differentiated experience, brand, employee efficiency*

Conversation focus: *front end development, runtime, testing, continuous delivery, integrated management, securing app contents*

Conversation focus: *BYOD, secure mobile access, transactions, applications and data*

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Key Challenges

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Overcoming mobile adoption obstacles

Requirements for Mobile Management and Security:

Business Span of Control

High   **Low**

Corporate Owned Assets	Employees w/BYOD	Task/Temp Workers	Business Partners	Consumer Transactions
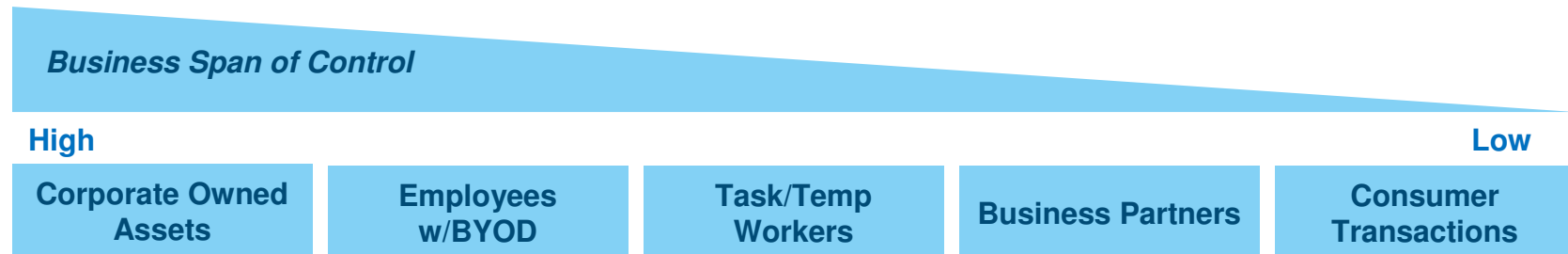
IBM MobileFirst Security Solutions:

Mobile Device Management

Containers – App Wrapping and SDKs

Secure Transactions
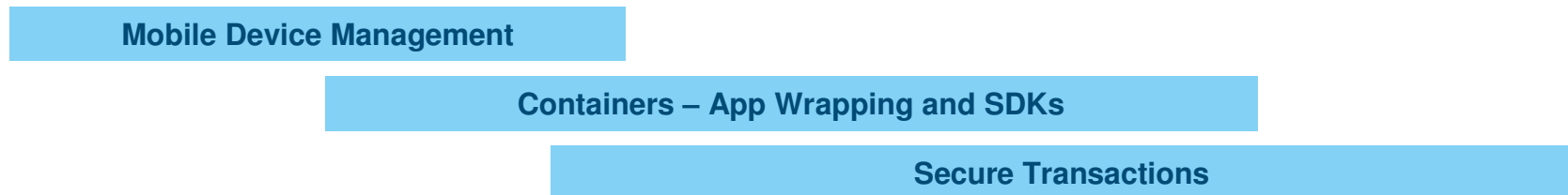
Enterprise Needs:
• Integrated mobile technology offering for secure devices, access and transactions
• Alternative consumption models: Cloud or on premise deployments
• Enabling self service
• Complete solution delivered as service

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Welcome to the fast paced world of mobile: What's going on out there?

World-Wide Smartphone Sales (Thousands of Units)
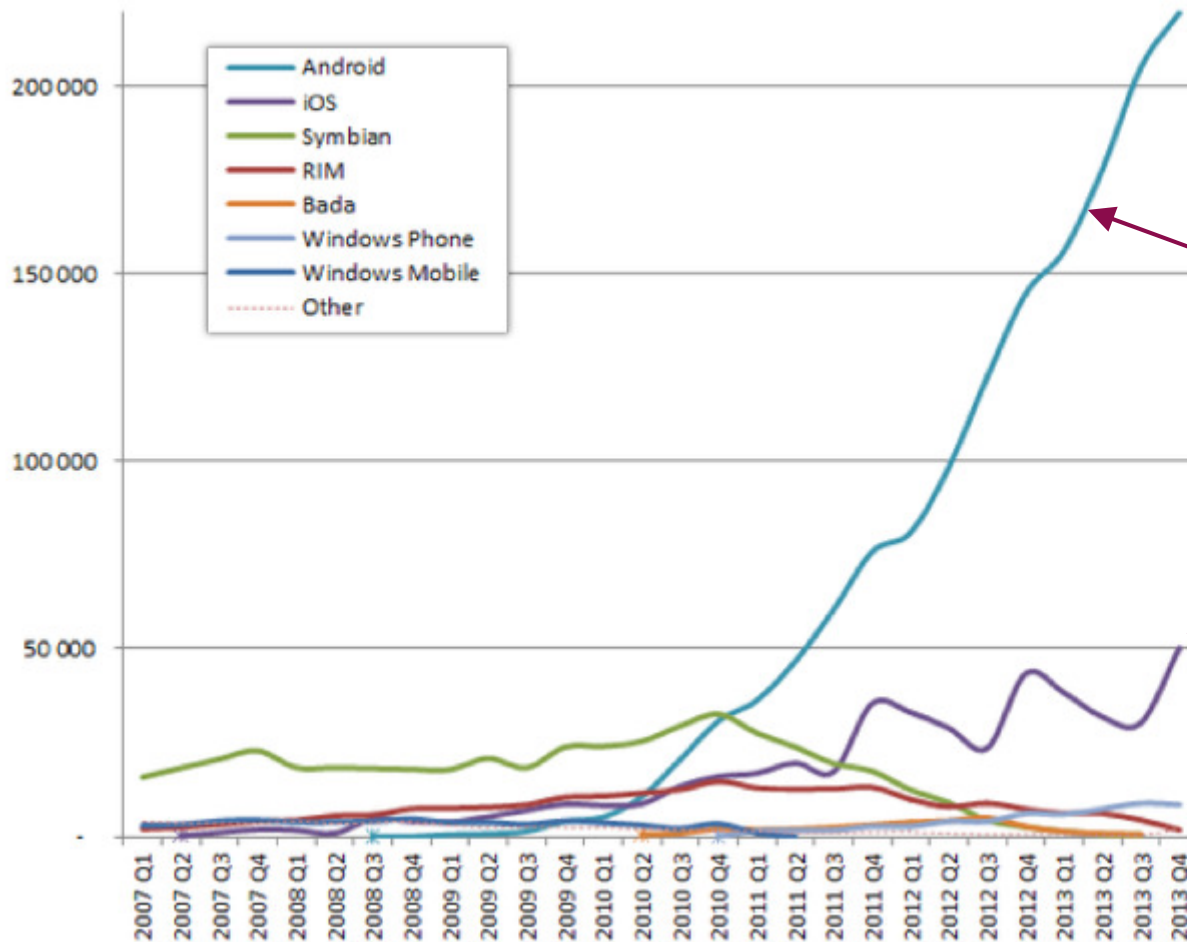
Android: Whoa!

iOS: Growth is tied to the product release cycle. Plot the linear best fit in your head

Others: Volumes still small, But decent growth

Source: Wikipedia

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Unprecedented access, but at the cost of dealing with fragmentation

Brand fragmentation in the Android market is immense, but Samsung still leads
the charge with 47.5 percent of the market share.
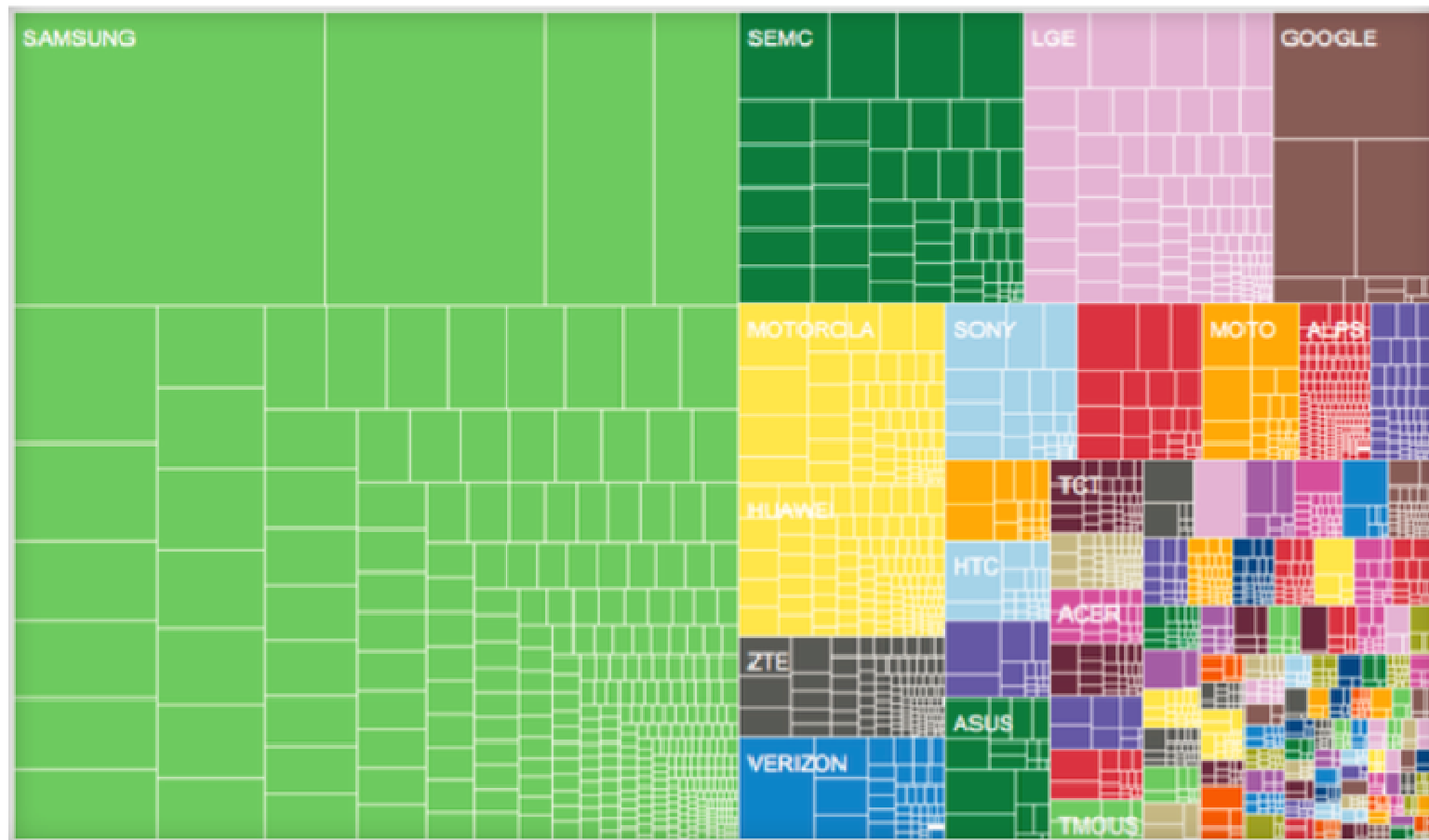
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Android: Lots of market share but slow penetration of new technology

Version	Codename	API	Distribution
2.2	Froyo	8	1.1%
2.3.3 – 2.3.7	Gingerbread	10	17.8%
3.2	Honeycomb	13	0.1%
4.0.3 – 4.0.4	Ice Cream Sandwich	15	14.3%
4.1.x	Jelly Bean	16	34.4%
4.2.x		17	18.1%
4.3		18	8.9%
4.4	KitKat	19	5.3%
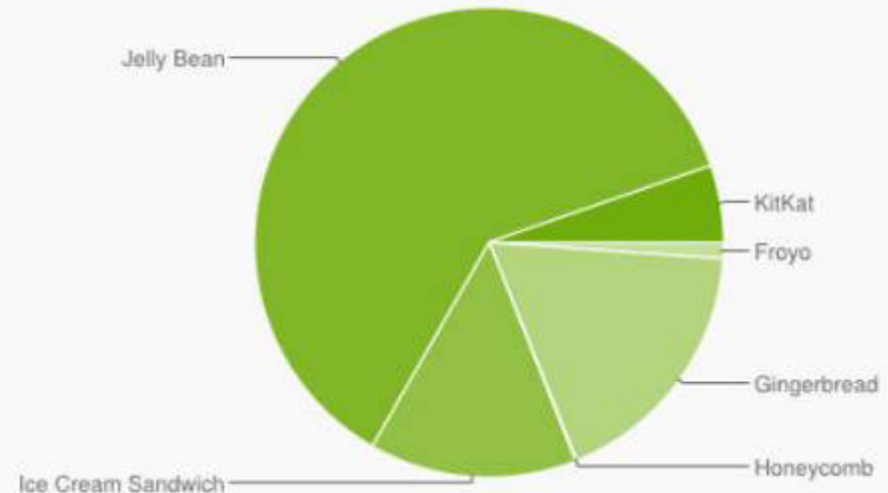
*Data collected during a 7-day period ending on April 1, 2014.
Any versions with less than 0.1% distribution are not shown.*

Source: Google Developer Stats

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Not to mention an explosion of different computing experiences

Screen Density & Display Capability by Device

	ldpi	mdpi	tvdpi	hdpi	xhdpi	xxhdpi	**Total**
Small	8.1%						8.1%
Normal		13.2%		33.7%	19.8%	12.5%	79.2%
Large	0.7%	4.4%	1.5%	0.6%	0.6%		7.8%
Xlarge	0.1%	4.2%		0.3%	0.3%		4.9%
Total	8.9%	21.8%	1.5%	34.6%	20.7%	12.5%	
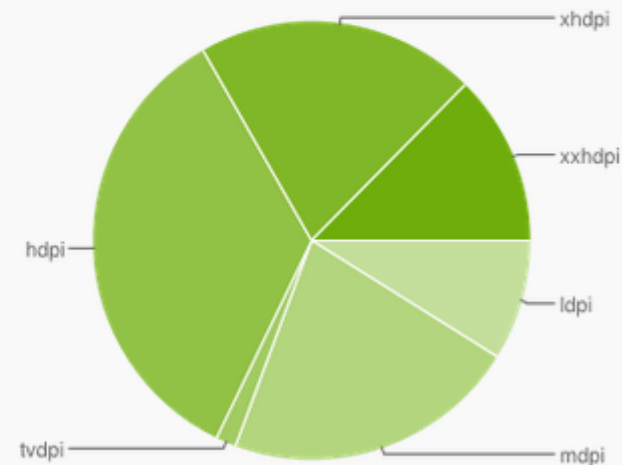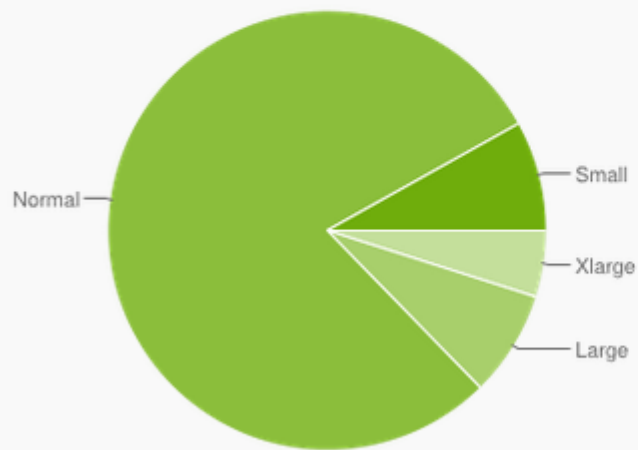
Data collected during a 7-day period ending on April 1, 2014.
Any screen configurations with less than 0.1% distribution are not shown.

Source: Google Developer Stats

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Even iOS suffers fragmentation in practice

3 months after the new iOS 7 goes live. Upgrade curve slows
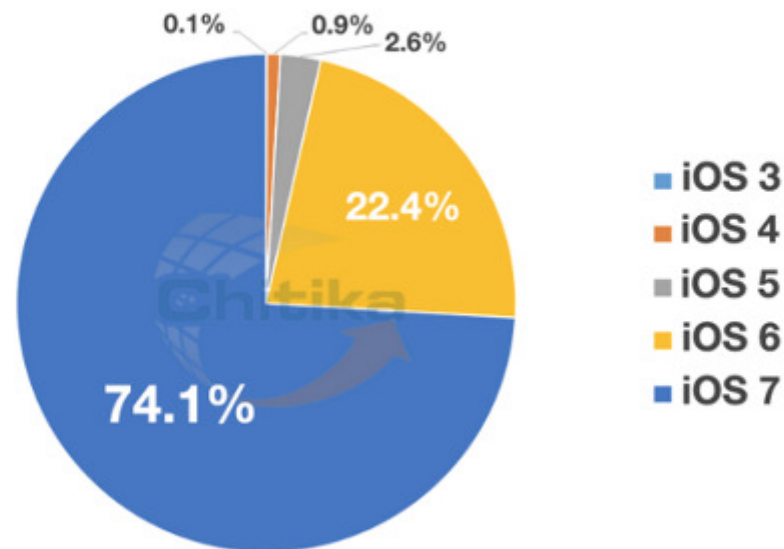
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Meanwhile, the evolution of tech marches on and continues to evolve the definition of what it means to be mobile

FireFox OS
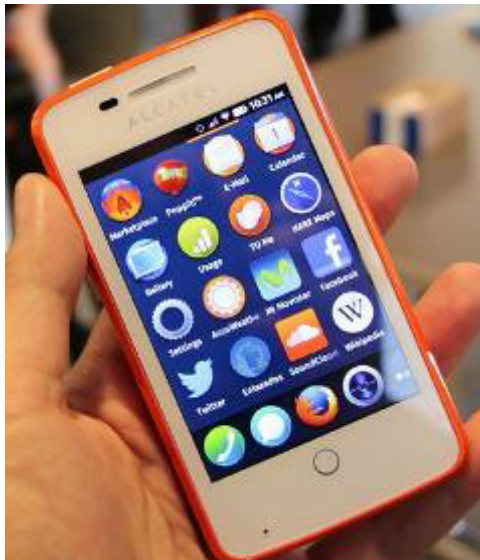
Wearables

The ultimate IoT controller

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Why mobile development is **different**

Mobile apps are different.

- **They are context-aware** –know where you are and what you are doing
- **They run on unstable networks–** interruption is the norm, not the exception
- **Smaller footprint –** More challenging to make compelling and easy to use
- **Always on –** An opportunity to deliver greater value

Management is different.

- Greater challenges of application **governance, distribution, and version management**

Development is different.

- **Faster development** cycles
- **More devices** to support, each with its own set of capabilities, OS and UI behaviors
- **More development approaches** to choose from – Web, HTML, Native

Security is different.

- **Greater risks** of exposing applications and data on small, light and always on portable devices
- **Greater authentication challenges** associated with content mashups

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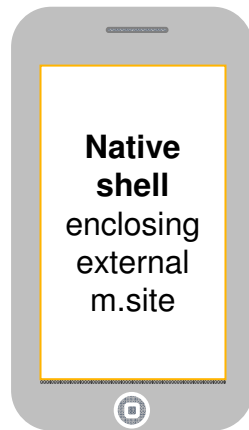
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A good mobile design changes the experience to be contextual

AirBnB as an example

Browse

Users explore the app
and search for rentals

Transaction

Users book or contact
the owner of a rental
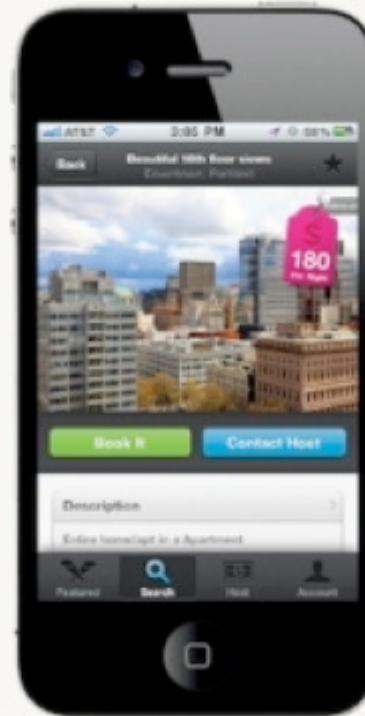
Opt-in Request

A compelling value exchange
prompts the opt-in
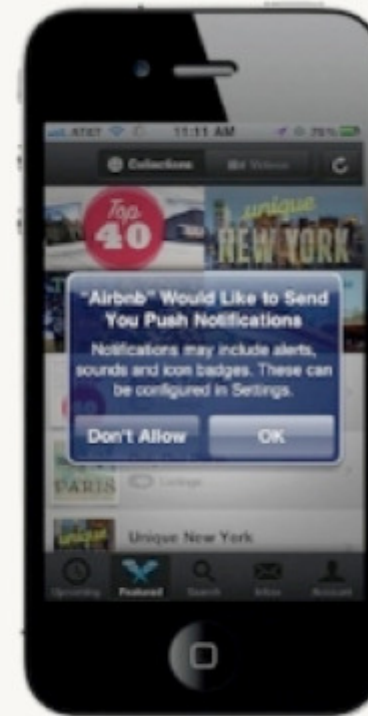
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Mobile apps go deeper than front-end UI

Short time to market

Web? Hybrid? Native?

teamwork

Industrialize app dev

Integrate with SDLC

Front-end app development

30%
of the value and effort is visible (mobile UI)

70%
of the value and effort lies under the surface

App responsive-ness

Efficient and flexible push notifications

Track and leverage location

Offline availability

B2E app distribution

User engagement

Operations

Manage and enforce app versions

Track problems that affect UX

Ensuring continued support in a quick-changing landscape

Security

User authentica-tion

Malware detection

Push security upgrades

Data protection

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Spectrum of mobile app development approaches

Pure web   *Hybrid*   *Pure native*

| **Mobile web site** (browser access) | **Native shell** enclosing external m.site | **Pre-packaged** HTML5 resources | **HTML5 + native UI** | **Mostly native,** some HTML5 screens | **Pure native** |
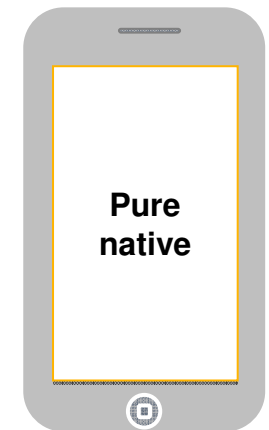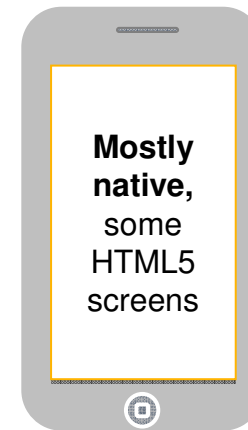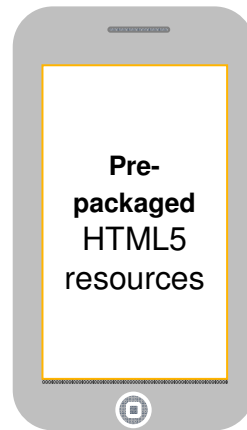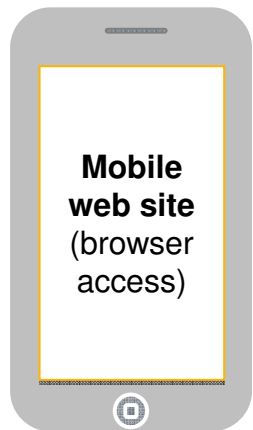
Web-native continuum

• HTML5, JS, and CSS3 (full site or m.site) • Quicker and cheaper way to mobile • Sub-optimal experience	• HTML5, JS, and CSS • Usually leverages Cordova • Downloadable, app store presence, push capabilities • Can use native APIs	• As previous • + more responsive, available offline	• Web + native code • Optimized user experience with native screens, controls, and navigation	• App fully adjusted to OS • Some screens are multi-platform when makes sense	• App fully adjusted to OS • Best attainable user experience • Unique development effort per OS, costly to maintain

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IBM Worklight Foundation 6.2: Main Components

Development

Worklight Studio

Leading tools for cross-platform hybrid, native and mixed-hybrid development that maximize code reuse, speed up development, and promote team work

Run Time

Operational Console
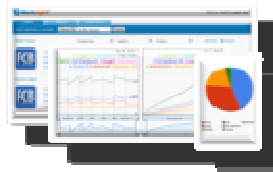
UI for app deployment, management, and version enforcement, real-time operational analytics, push notifications

Worklight Server
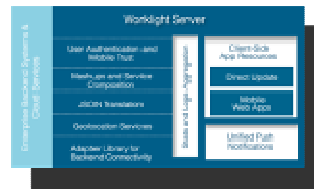
Gateway for mobile user engagement, security, analytics, and application control

App Runtime

Client APIs available for **native**, **hybrid**, and **web** apps

Worklight App Center

A non-MDM, cross-platform, private mobile app store tailored to the needs of development team or as an enterprise store

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Cross platform application runtime

- **Push notification:** mapping users & devices to the right delivery channel

- **Analytics data capture:** captures client-side usage data to support operational [included], experience, and business intelligence analytics

- **Geo-location:** location data & triggers for GPS aware apps

- **Encrypted storage:** Local encrypted store that can be accessed offline

- **Data synchronization:** Synchronize data items that we accessed or modified offline against REST services. The local store may be encrypted

- **App security framework:** Cross application SSO, authenticity checking, etc.

- **App container management:** Remote disable and direct update

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Challenges to delivering an engaging Mobile experience

Range of Devices	Pace of Innovation	Protect Perimeter	Backend Integration	Scale & Latency
How to cost-effectively support range of popular device platforms?	How to restless reinvent and enhance Mobile experience faster?	How to secure the boundary without disrupting the Mobile experience?	How to integrate Mobile activities into existing back-end processes and data?	How to deliver the responsiveness that Mobile users expect at Internet scale?
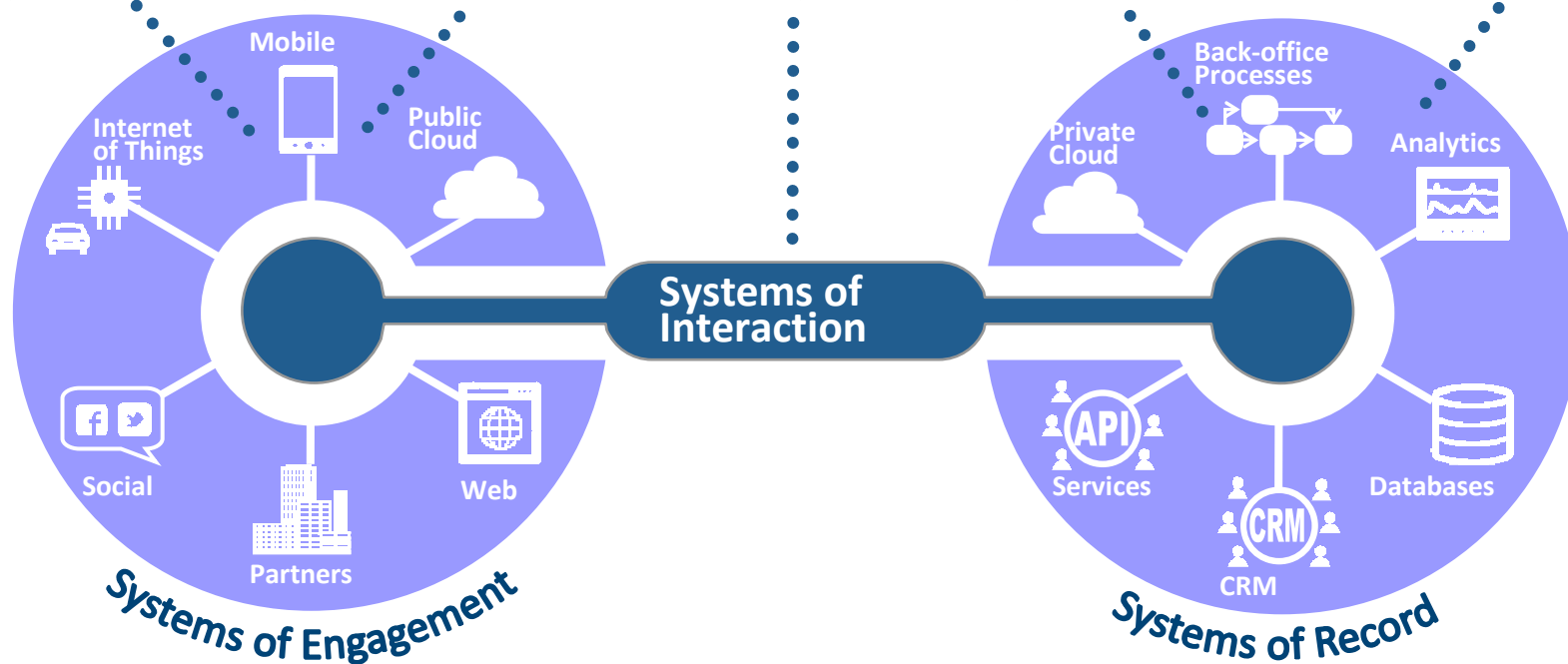
Mobile

Internet of Things

Public Cloud

Social

Partners

Web

Systems of Interaction

Private Cloud

Back-office Processes

Analytics

API Services

CRM

Databases

Systems of Engagement

Systems of Record

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Introducing Codename: BlueMix

A rich set of mobile ready APIs that you can mix and match to power your App
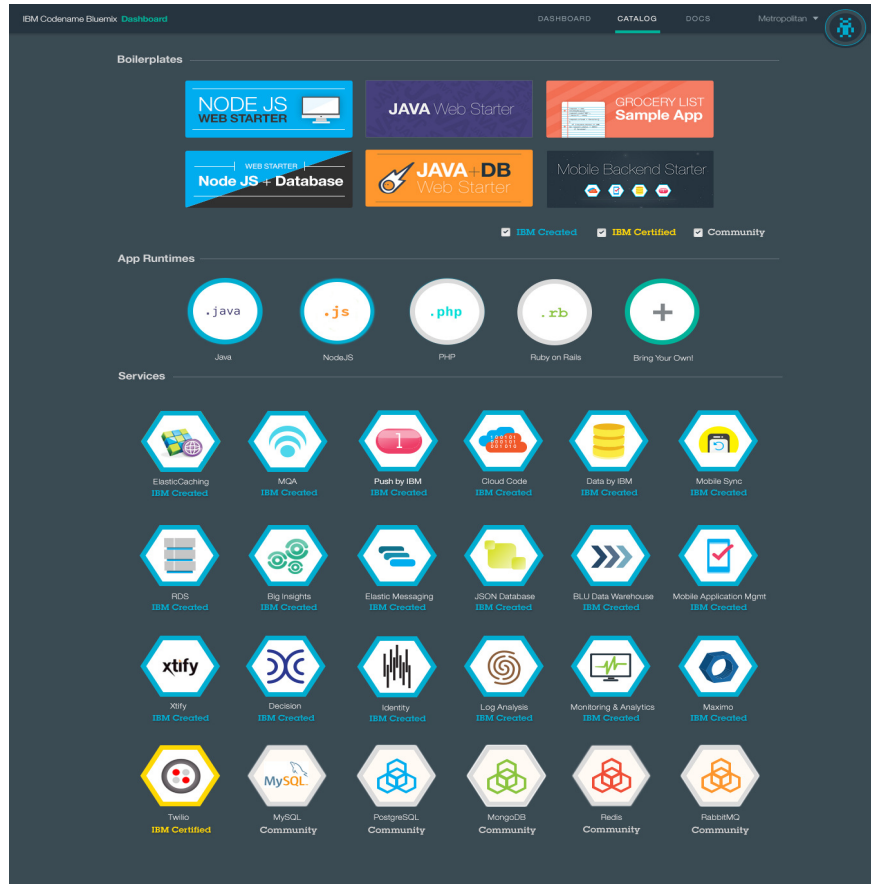
API Catalog

A catalog of developer friendly APIs (IBM & third party) with mobile SDKs, that can be composed into new and existing mobile apps. Configure and manage through the BlueMix portal.

Run Code

The developer can chose from multiple language runtimes or bring their own. Just upload your code and go.

Store Data

he developer can store data in the cloud as a service easily without needing to administer the databases.

Cloud Integration

Build hybrid environments. Connect to on-premises systems of record plus other public and private clouds. Expose your own APIs to your developers.

Built on IBM SoftLayer

Runs on top of IBM's leading infrastructure as a service.

Categories

Mobile | Web | Inte-gration | Data | Big Data & Analytics | and More

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Bringing a breadth of Cloud APIs to mobile

- ✓ Data Cache
- ✓ Session Cache
- ✓ Elastic MQ
- ✓ Rules
- ✓ RabbitMQ
- ✓ Redis
- ✓ RapidApps
- ✓ RedisLabs (P)
- ✓ SendGrid (P)
- ✓ CloudAMQP (P)
- ✓ BlazeMeter (P)
- ✓ Load Impact (P)
- ☑ Workflow

- ✓ Continuous Integration
- ✓ Git Hosting
- ✓ Web IDE
- ✓ Agile Planning and Tracking
- ✓ Monitoring and Analytics
- ☑ Continuous Delivery Pipeline
- ☑ New Relic (P)

- ✓ SQL Database
- ✓ MongoDB
- ✓ MySQL
- ✓ PostgreSQL
- ✓ Cloudant JSON Database
- ✓ ClearDB (P)
- ✓ ElephantSQL (P)

- ✓ Push
- ✓ Mobile Data
- ✓ Mobile Quality Assurance
- ✓ Twilio (P)
- ✓ Travel Boundary (P)
- ✓ Validate Address (P)
- ✓ Reverse Geocoding (P)
- ✓ Geocoding (P)
- ☑ Location

- ✓ Time Series Database
- ✓ Internet of Things

☑ Square (P)

Web & App

Internet of Things

Data Management

Mobile

Commerce

DevOps

Big Data

Security

Runtimes

- ✓ Liberty for Java
- ✓ Node.js
- ✓ Ruby
- ✓ Auto Scaling (Liberty)
- ☑ Zend PHP (P)

Integration

Watson

Analytics

- ✓ Cast Iron Live
- ✓ Cloud Integration Service

☑ Watson Analytics

- ✓ BLU Analytics Acceleration

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A closer look at the mobile specific services…

Shared Mobile Backend with Data and Security *(SDKs for iOS, Android and JavaScript)*

.js

Server-side Code
Host mobile and web applications and accelerate development time of server side scripts by leveraging the mobile app template and SDK. Powered by Node.js

Mobile Data
Enhance your mobile apps through simple to use SDKs to save shared data in a scalable, managed database as a service. Powered by Cloudant.

Push

Create and schedule push notifications for iOS and Android devices to engage users when they aren't using the app. User tagging enables the user to select desired push topics.

Mobile Application Security
Provides a basic app security framework - enabling the developer to block access to apps on specific devices.

Promote customer engagement, quality, and feedback

Mobile Quality Assurance
Instrument apps to capture tester and live-user experiences, including context-aware crash log and in-app bug reports, in-app user feedback and insightful and metrics.

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IBM/Apple Partnership

1. Mobile First for iOS
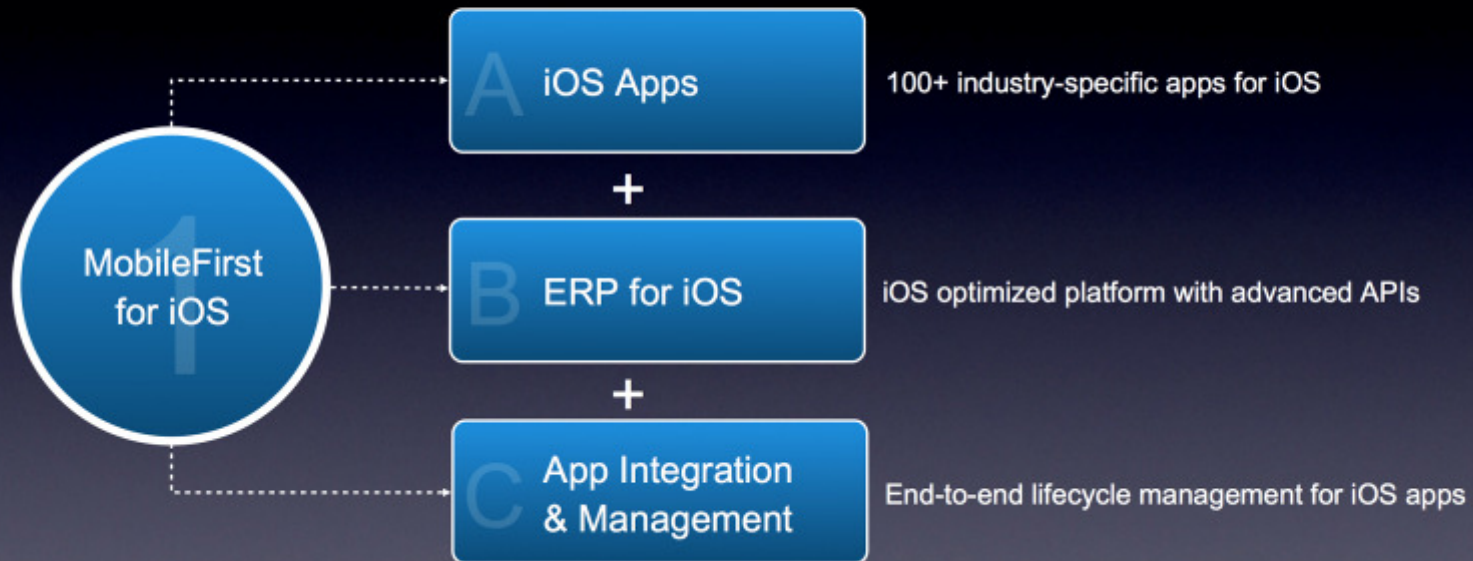
MobileFirst for iOS

A — iOS Apps — 100+ industry-specific apps for iOS

+

B — ERP for iOS — iOS optimized platform with advanced APIs

+

C — App Integration & Management — End-to-end lifecycle management for iOS apps

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The next generation of mobile applications

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Business drivers

- New ways to create consumer value and make organizational processes more efficient

    - Engage with customers and provide added-value services (not just transactions)

    - Make use of context, history, and profiles to customize and drive the right interactions

- Examples:

    - Augmented reality for in-store shopping

    - Urban planning based on insight into behaviors and locations

    - Smart home controls

    - Utility consumption monitoring

    - Real-time notification of suspicious financial activity

    - Restaurant recommendations based on schedule, location, context, and friends

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TOP 5
CONNECTED APPS
PROJECTED BY 2020

→ **Car**
→ **Clinical**
    monitoring
→ **Security**
→ **Assisted living**
→ **Pay as you drive**
    insurance

#IBMMobile

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New interaction driven by mobile multi-modal features

Camera

Vision

Eye tracking

Context

Touch / Haptics

Speech recognition

Text spoken

Transactions

Location

No wires

Motion

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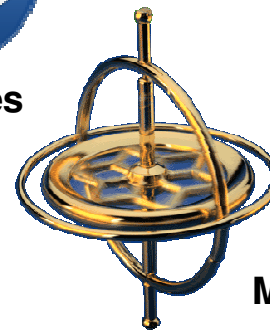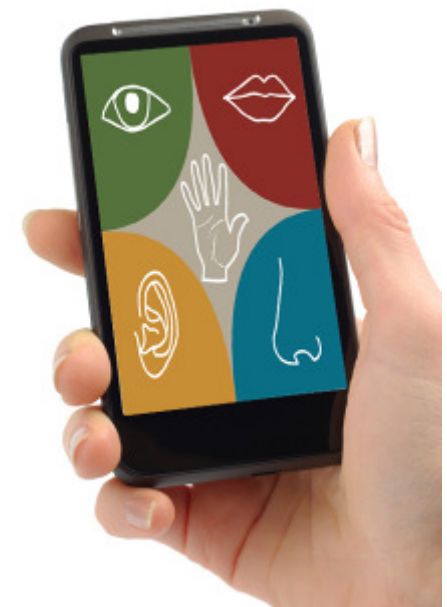
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Emerging technical pattern

- Enterprises view of its customers
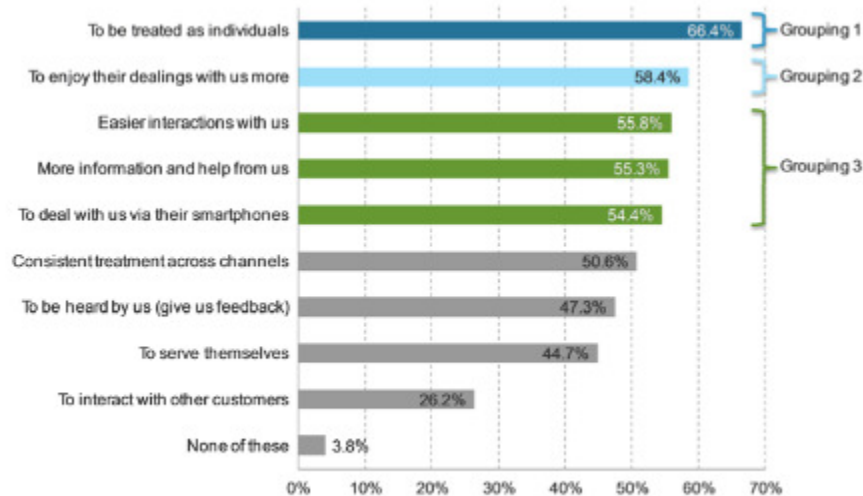
- New Patterns to help "Me" era
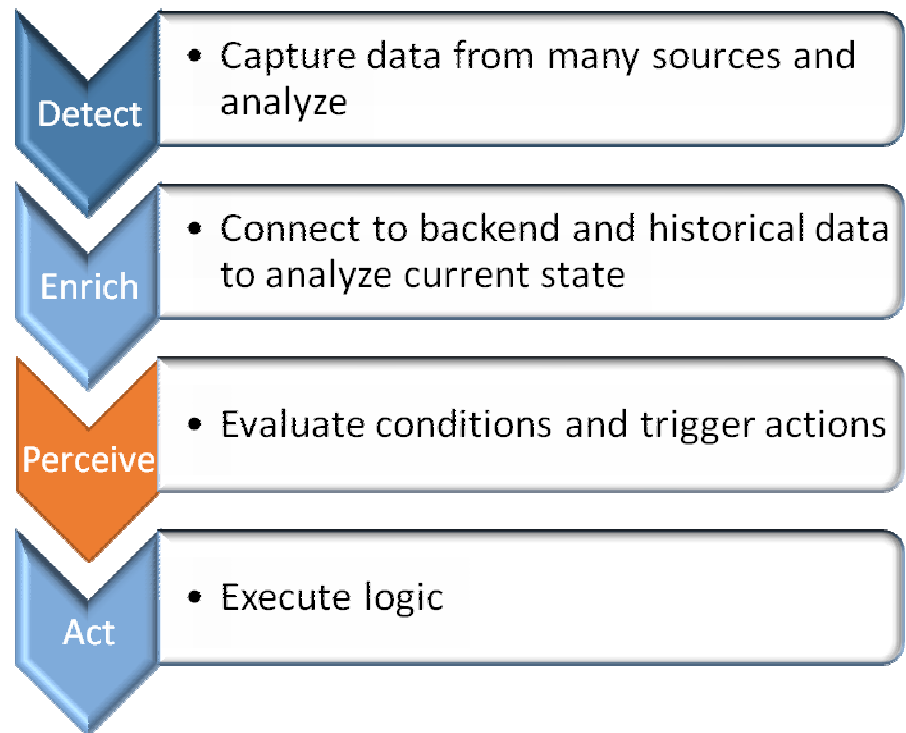
Detect • Capture data from many sources and analyze

Enrich • Connect to backend and historical data to analyze current state

Perceive • Evaluate conditions and trigger actions

Act • Execute logic

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Example: Car insurance

- Insurance company wants to prevent theft or damage of luxury cars

  - **Location**: Driver parks on a street with history of theft

  - **Context**: Notification is automatically sent to driver

  - **Personalized recommendations**: App includes a free coupon to park in garage 2 blocks away and instructions on how to get there

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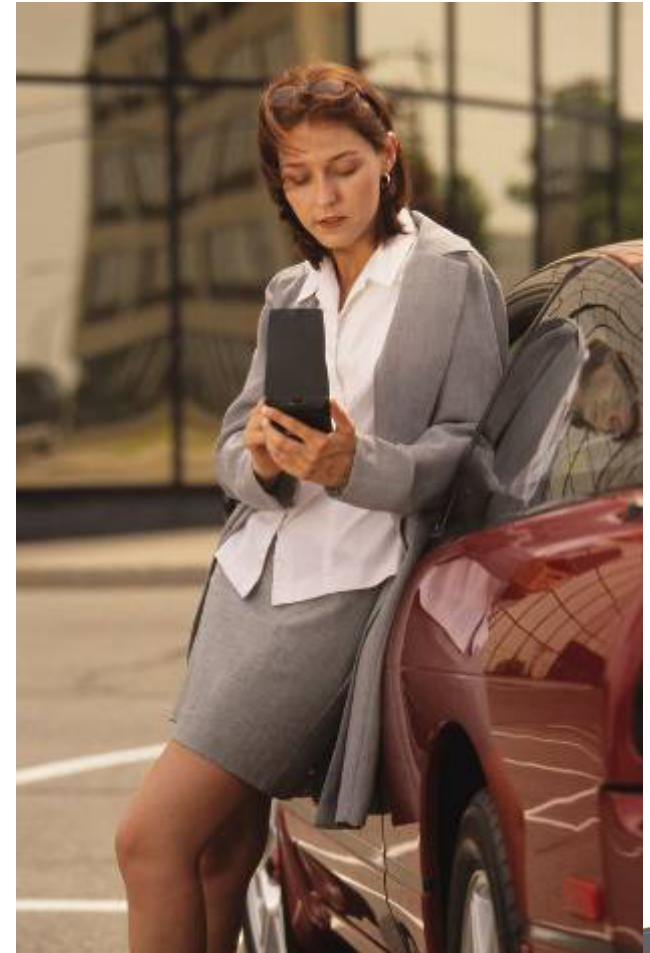
Example: Continuous verification and authentication

- Banks want to increase transactions
  - Less authentication = more transactions

- **Continuous verification:** Rich use of biometrics such as live face recognition, gestures, fingerprint

- **Passive verification:** Rich data analysis such as GPS, phone movement

- **Faster results:** Customers can perform transactions with minimal, if any, authentication
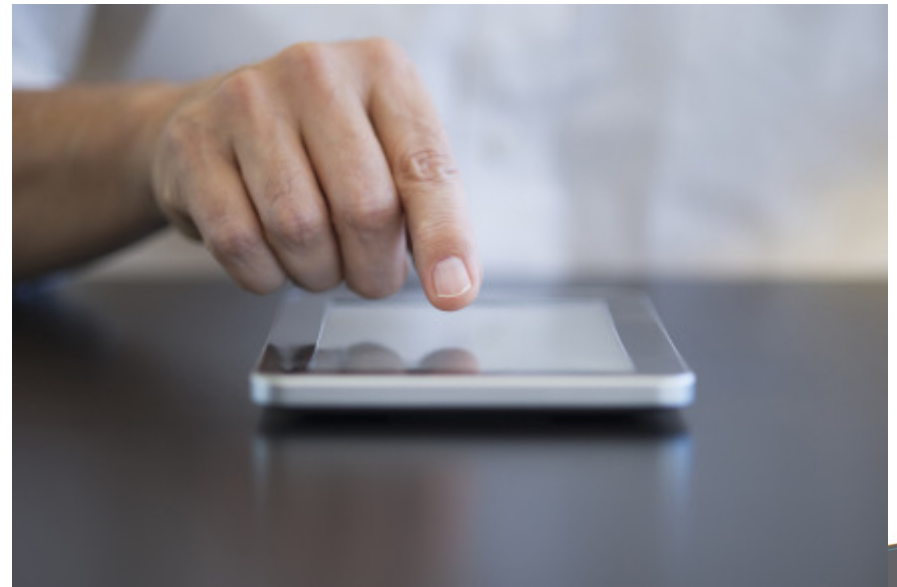
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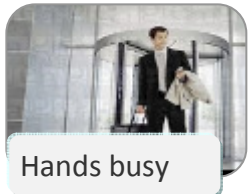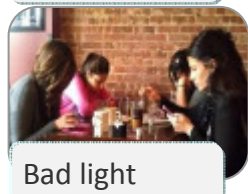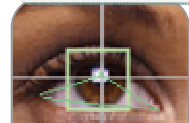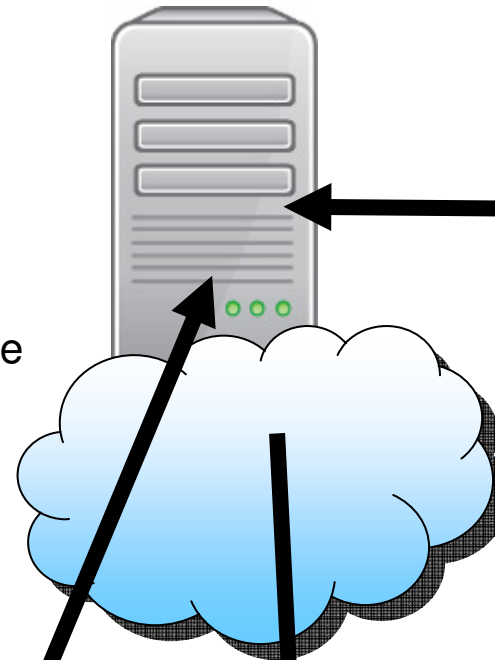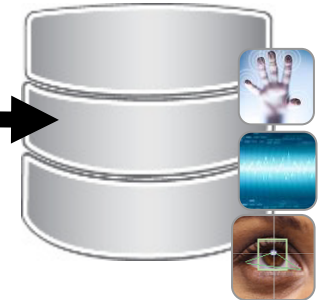
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Gartner has recognized IBM as a leader in the Magic Quadrant for **Mobile Application Development Platforms**

Magic Quadrant for Mobile Application Development Platforms
Ian Finley, Van L. Baker, Ken Parmelee, David Mitchell Smith, Ray Valdes, Gordon Van Huizen
Aug 7, 2013

"As unprecedented numbers of enterprises build mobile applications, the mobile application development platform market continues to grow and evolve rapidly."

This Magic Quadrant graphic was published by Gartner, Inc. as part of a larger research note and should be evaluated in the context of the entire report. The full report is available at
http://ibm.co/13TU2Dm

Figure 1. Magic Quadrant for Mobile Application Development Platforms

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Gartner has recognized IBM as a leader in the Magic Quadrant for
Application Services Governance

Magic Quadrant for Application
Services Governance
Paolo Malinverno, Daryl C. Plummer,
Gordon Van Huizen
August 8, 2013

*"The design, implementation,
publication, operation, maintenance
and retirement of those APIs and
services need to be governed and
managed carefully, which is what
'application services governance'
does."*

This Magic Quadrant graphic was published by Gartner, Inc. as part
of a larger research note and should be evaluated in the context of
the entire URL

Magic Quadrant for Application Services Governance

Source: Gartner (August 2013)

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Plenary 5: MobileFirst – Mobile Development & Runtime Challenges for Today and Tomorrow

Synopsis: Mobile technologies are revolutionizing our personal lives and transforming the way we do business. This talk addresses both the technology and business transformations taking place, and explains how they are encouraging organizations to rethink the way they do business. The ensuing changes affect the internal business processes related to employees and the external customer facing systems that use front office digitization. You will learn: About Mobile technical and business challenges, platforms, tools, advanced capabilities, and future directions in Mobile Technologies.

17:00 - 17:45	Plenary 5: MobileFirst – Mobile Development & Runtime Challenges for Today and Tomorrow	Girish Dhanakshirur	CBR

IBM.