

Marko Jäntti

Leverage from
the EU
2007–2013

ICONS PANEL



UNIVERSITY OF
EASTERN FINLAND

ICONS PANEL

- **Topic: Information and Intelligent Systems; Current Trends**

- **Moderator**

Marko Jäntti, University of Eastern Finland, Finland

- **Panelists**

- Tamer Nassef, Misr University for Science and Technology, ECTI Co., Egypt
- Fabrice Mourlin, UPEC University, France
- Tomasz Hyla, West Pomeranian University of Technology, Poland
- David Musliner, SIFT, USA

University of Eastern Finland

- Focus areas
 - Forests and the Environment
 - Health and Well-being
 - New Technologies and Materials
- 15,000 students and 2,800 members



IT Service Management



Customer

Applications

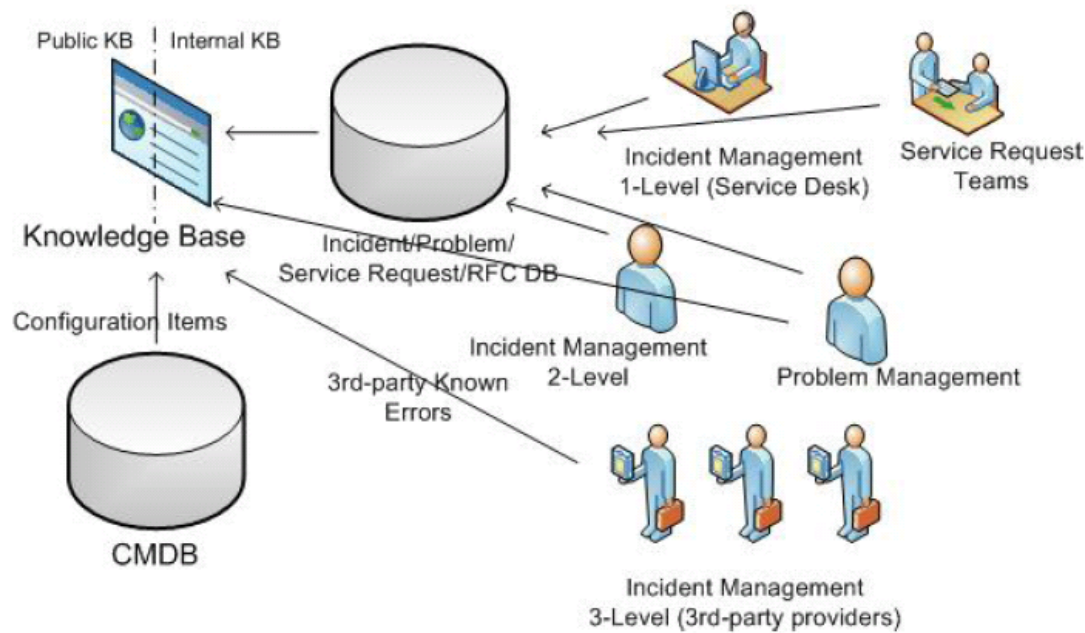


Information systems

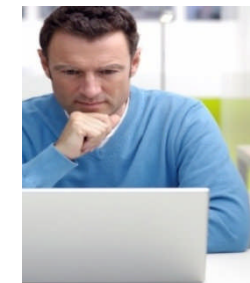
Data

Connections

- Database services
- Server services
- Application services
- Data network services
- Service desk services
- Cloud services

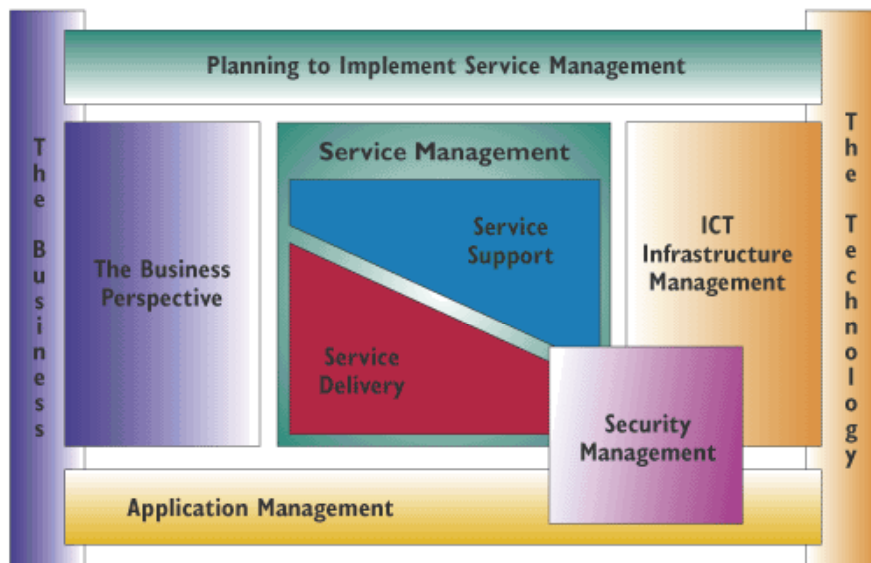


Service Desk

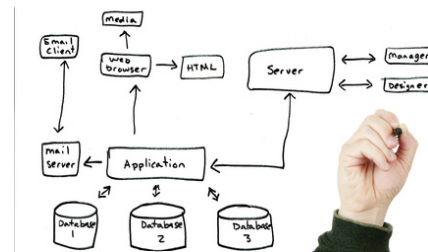


Support Specialist

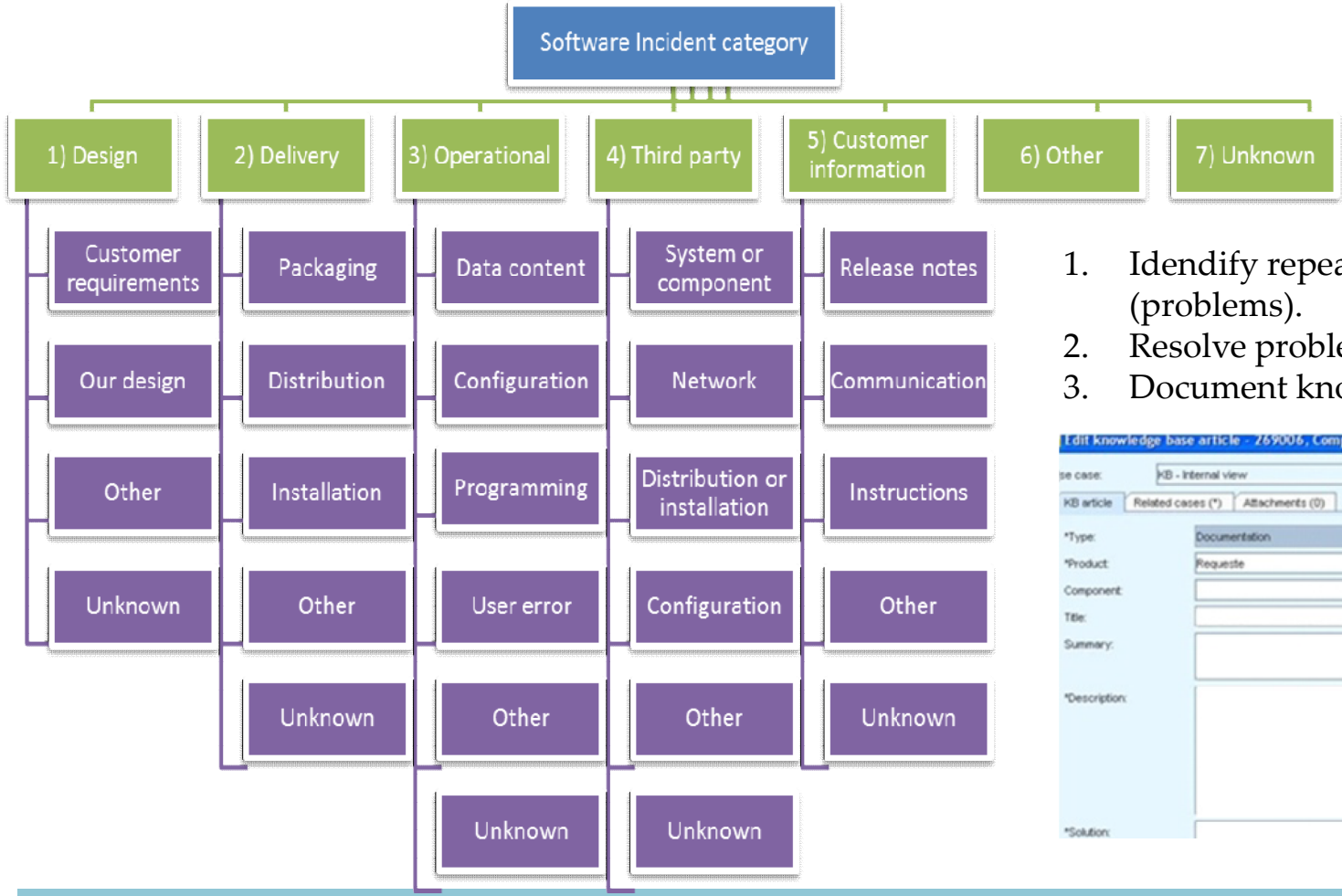
Best practices for IT service management



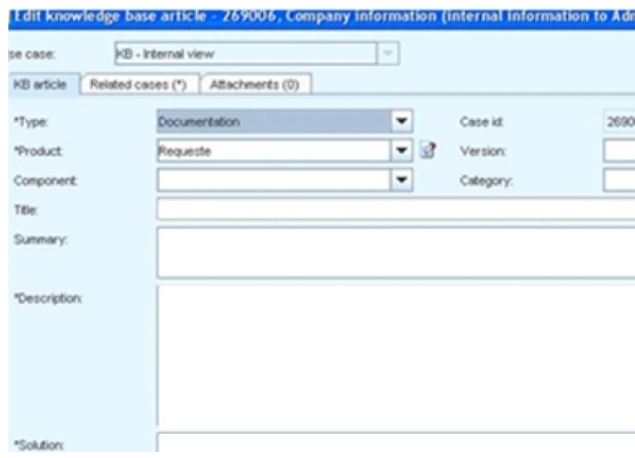
Source: Office of Government Commerce



Process improvement work in practice



1. Identify repeating incidents (problems).
2. Resolve problems
3. Document known errors



Panel questions

1. Are information systems enough for future IT industry? Current trends?
2. How to transition from information systems to service systems?
3. What makes the IT world more "intelligent"?



Thank you!!!

Questions, comments?

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David Musliner – SIFT

- Global 2011 direct cyber-attack costs plus remediation: >\$350B. 2013 certainly >\$500B.
- Including intellectual property theft: >>\$1T.
 - Described by General Michael Hayden, former head of the NSA, as “largest transfer of wealth in the history of mankind.”
- Smart and semi-smart people use weak tools to make vulnerable software.
- Other smart and semi-smart people use powerful tools to find and exploit those software vulnerabilities.

David Musliner – SIFT

- More powerful tools for building invulnerable software.
- Intelligent systems for active cyber defense.
 - Find and fix or shield the vulnerabilities before the badguys.
 - We have *a lot* more computing power than they do.
- SIFT's Fuzzbuster project.
 - In 18 hours on a single processor, found & shielded 12 Linux bugs.
 - Crashed Google's Chromium browser thousands of times.
 - ...
- DARPA Cyber Grand Challenge.



The Ninth International Conference on Systems ICONS 2014



An Introduction to Medical Informatics

Tamer M Nassef

**Misr University for Science and Technology
ECTI.
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Define Medical Informatics

Medical informatics is a **scientific/systematic** field of study that deals with the **acquiring, storage, retrieval, and processing of medical, biological and associated data, information and knowledge** for the purpose of **problem solving and decision making**



Computerized Medical Records

Computer-Aided Instruction

Medical Software Security

Veterinary Informatics

Telemedicine

Medical Informatics

Nursing Informatics

Policy Making

Physician Order Entry Systems

Medical Expert Systems

Medical Software Engineering

Health Information Networks

Clinical Information Systems



Why Medical Informatics

- Why is proper management of medical data important ?
 - Patient health record
 - Administrative purposes
 - Research and knowledge discovery
 - Legal issues
 - And the list goes



Medical Informatics Solutions

- Databases
- Information Retrieval
- Internet
- Computer programs



Medical Informatics Solution

- 3D- Imaging
- Other examples of medical informatics applications



Ultimate goal is to improve the quality
of health care, research and education
in medicine and health



Personalized Medicine

- Genomic medicine
- Manage greater quantities of data and more complex data over time





The Ninth International Conference on Systems ICONS 2014



Thank You

Information and Intelligent Systems: Current Trends

Fabrice Mourlin
LACL (CNRS EA 4219)
UPEC University
PRES Paris-Est– France

ICONS 2014

The Ninth International Conference on Systems
February 23 - 27, 2014 - Nice, France



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General context



- Labs: L.A.C.L. Labs Algorithm Complexity Logics
 - Team: P.C.S. Parallel and Communicating System,
 - Manager: Prof. C. Dima
 - Work group: Mobile Communicating System
 - Members: **Fabrice Mourlin**
 - Cyril Dumont (PhD Student)
 - Charif Mahmoudi (PhD Student)
 - Brahim Foura (PhD Student)
 - Guy-lahlou Djiken (PhD Student)(co-supervised by Prof. Fotso)
 - Industrial Projects:
 - **MobileSim**: numeric computing based on mobile agents system with **ESI-Group**
 - **MobilePlanner**: distributed planning manager with **Agent/OS**.

Quantity of Data

Air Bus A380

- 1 billion line of code
- each engine generates 10 TB every 30 min

640TB per
Flight

Twitter Generates approximately 12 TB of
data per day

New York Stock Exchange 1TB of data
everyday

storage capacity has doubled roughly every
three years since the 1980s

Data Quantity

Our Data-driven World

- Science
 - Data bases from astronomy, genomics, environmental data, transportation data, ...
- Humanities and Social Sciences
 - Scanned books, historical documents, social interactions data, new technology like GPS ...
- Business & Commerce
 - Corporate sales, stock market transactions, census, airline traffic, ...
- Entertainment
 - Internet images, Hollywood movies, MP3 files, ...
- Medicine
 - MRI & CT scans, patient records, ...

Importance of Big Data

- Government

In 2012, the Obama administration announced the Big Data Research and Development Initiative:

84 different big data programs spread across six departments

- Private Sector

- Walmart handles more than 1 million customer transactions every hour, which is imported into databases estimated to contain more than 2.5 petabytes of data

- Facebook handles 40 billion photos from its user base.

- Falcon Credit Card Fraud Detection System protects 2.1 billion active accounts world-wide

- Science

- Large Synoptic Survey Telescope will generate 140 Terabyte of data every 5 days.

- Large Hardon Colider 13 Petabyte data produced in 2010

- Medical computation like decoding human Genome

- Social science revolution

- New way of science (Microscope example)



Importance of Big Data

- Job

- The U.S. could face a shortage by 2018 of 140,000 to 190,000 people with "deep analytical talent" and of 1.5 million people capable of analyzing data in ways that enable business decisions. (McKinsey & Co)
- Big Data industry is worth more than \$100 billion growing at almost 10% a year (roughly twice as fast as the software business)

- Technology Player in this field

- Oracle
 - Exadata
- Microsoft
 - HDInsight Server
- IBM
 - Netezza

Some Challenges in Big Data

- Big Data Integration is Multidisciplinary
 - Less than 10% of Big Data world are genuinely relational
 - Meaningful data integration in the real, schema-less and complex Big Data world of database and semantic web using multidisciplinary and multi-technology method
- The Billion Triple Challenge
 - Web of data contain 31 billion Rdf triples, that 446million of them are RDF links, 13 Billion government data, 6 Billion geographic data, 4.6 Billion Publication and Media data, 3 Billion life science data
 - BTC 2011, Sindice 2011
- The Linked Open Data Ripper
 - Mapping, Ranking, Visualization, Key Matching, Snappiness
- Demonstrate the Value of Semantics: let data integration drive DBMS technology
 - Large volumes of heterogeneous data, like link data and RDF

Implementation of Big Data

Platforms for Large-scale Data Analysis

- **Parallel DBMS technologies**
 - Proposed in late eighties
 - Matured over the last two decades
 - Multi-billion dollar industry: Proprietary DBMS Engines intended as Data Warehousing solutions for very large enterprises
- **Map Reduce**
 - pioneered by Google
 - popularized by Yahoo! (Hadoop)

Implementation of Big Data

MapReduce

- Overview:
 - Data-parallel programming model
 - An associated parallel and distributed implementation for commodity clusters
- Pioneered by Google
 - Processes 20 PB of data per day
- Popularized by open-source Hadoop
 - Used by Yahoo!, Facebook, Amazon, and the list is growing ...

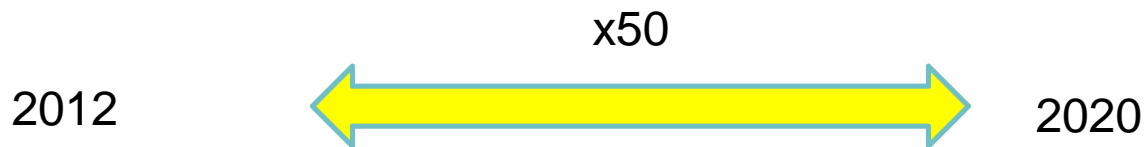
Parallel DBMS technologies

- Popularly used for more than two decades
 - Research Projects: Gamma, Grace, ...
 - Commercial: Multi-billion dollar industry but access to only a privileged few
- Relational Data Model
- Indexing
- Familiar SQL interface
- Advanced query optimization
- *Well understood and studied*

Zetta-Byte Horizon

1 ZB = 10000000000000000000000 bytes
= 1000^7 bytes
= 10^{21} bytes
= 1000 exabytes
= 1 billion terabytes.

- As of 2009, the entire World Wide Web was estimated to contain close to 500 exabytes. This is a half zettabyte
- the total amount of global data is expected to grow to 2.7 zettabytes during 2012. This is 48% up from 2011



Wrap Up

References

1. B. Brown, M. Chui and J. Manyika, "Are you ready for the era of Big Data?" McKinsey Quarterly, Oct 2011, McKinsey Global Institute
2. C. Bizer, P. Bonez, M. L. Bordie and O. Erling, "The Meaningful Use of Big Data: Four Perspective – Four Challenges" SIGMOD Vol. 40, No. 4, December 2011
3. D. Boyd and K. Crawford, "Six Provation for Big Data" A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society, September 2011, Oxford Internet Institute
4. D. Agrawal, S. Das and A. E. Abbadi, "Big Data and Cloud Computing: Current State and Future Opportunities" ETDB 2011, Uppsala, Sweden
5. D. Agrawal, S. Das and A. E. Abbadi, "Big Data and Cloud Computing: New Wine or Just New Bottles?" VLDB 2010, Vol. 3, No. 2
6. F. J. Alexander, A. Hoisie and A. Szalay, "Big Data" IEEE Computing in Science and Engineering journal 2011
7. O. Trelles, P Prins, M. Snir and R. C. Jansen, "Big Data, but are we ready?" Nature Reviews, Feb 2011
8. K. Bakhshi, "Considerations for Big data: Architecture and approach" Aerospace Conference, 2012 IEEE
8. S. Lohr, "The Age of Big Data" The New York times Publication, February 2012
10. M. Nielsen, "A guide to the day of big data", Nature, vol. 462, December 2009



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**Access to sensitive data
using mobile devices.
*Current problems
solutions and trends***

ICONS 2014, Nice, France

Trends

- **Mobile market is growing rapidly...**
- **More and more data is stored in our mobiles:**
 - Sensitive data – our private or business information
 - Private messages
 - Location information
 - Passwords, credit card numbers
 - Files:
 - Business contracts
 - Confidential documents
 - Private pictures, videos
 - **That's a lot !!!**
- **How we use our mobiles?:**
 - In different locations including public transport?
 - Mobile is usually always with us
 - We store data using cloud drives
 - At work we use smartfons and tablets:
 - to read docs
 - to run a many apps

Problems

- 1. Use cloud of cloud services increases** – How we can control and trust „cloud providers” ?
- 2. Storing sensitive data without encryption on removable media such as a micro SD card**
- 3. Apps which:**
 - request access to personal data like SMS/MMS messages, contacts
 - have ability to make phone calls and send Premium SMS messages.
- 4. Mobile apps risk:**
 - trojan apps that the user is tricked into installing
 - errors in design or implementation that expose the mobile device data to interception and retrieval by attackers.
- 5. Constant tracking of user location** (GPS, IP based)
- 6. Using unsafe sensitive data transmission** (WiFi without encryption or WEP encryption)
- 7. Lost of smartphone / tablet**

Problems

Hardware and software is less and less under your control: is designed , developed, controlled by:

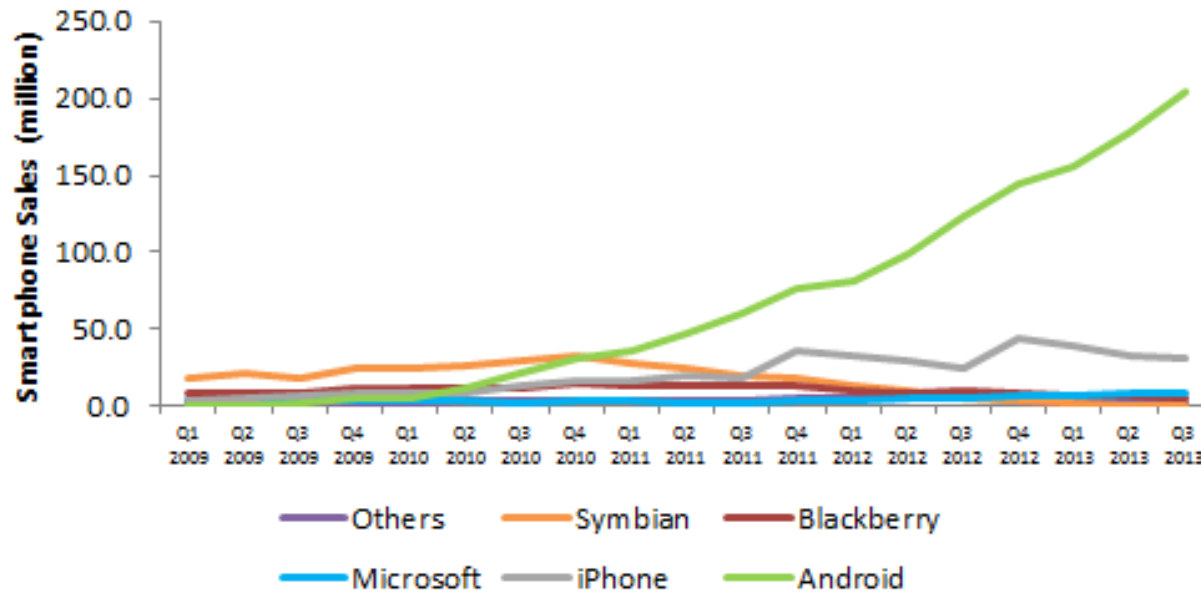
**„ ... a real nowhere Man,
Sitting in his Nowhere Land,
Making all his nowhere plans
For .. ”***

**Beatles – Nowhere Man Lyrics*

Solutions

- **Increase users knowledge about security**
- **Use mobile antivirus**
- **Rethink „BYOD” concept** – private and public mobiles
- **Use MDM systems for corporate users:**
 - they optimize the functionality and security of a mobile
 - To keep "BYOD" from translating to "bring your own disaster," IT needs MDM.
 - Functions such as policy enforcement and remote wipe are now standard (supported by Apple's iOS and Google's Android)
- **Use encryption for documents stored inside mobile device**
- **Use private clouds instead of public ones**
- **Application developers:**
 - Apple provides a Secure Coding Guide with iOS-specific
 - Google runs a Google Group for Android Security Discussions

Global Smartphone Sales by Platform - Q3 2013 (Gartner)



Tech-Thoughts ©

How the tablet market has grown

