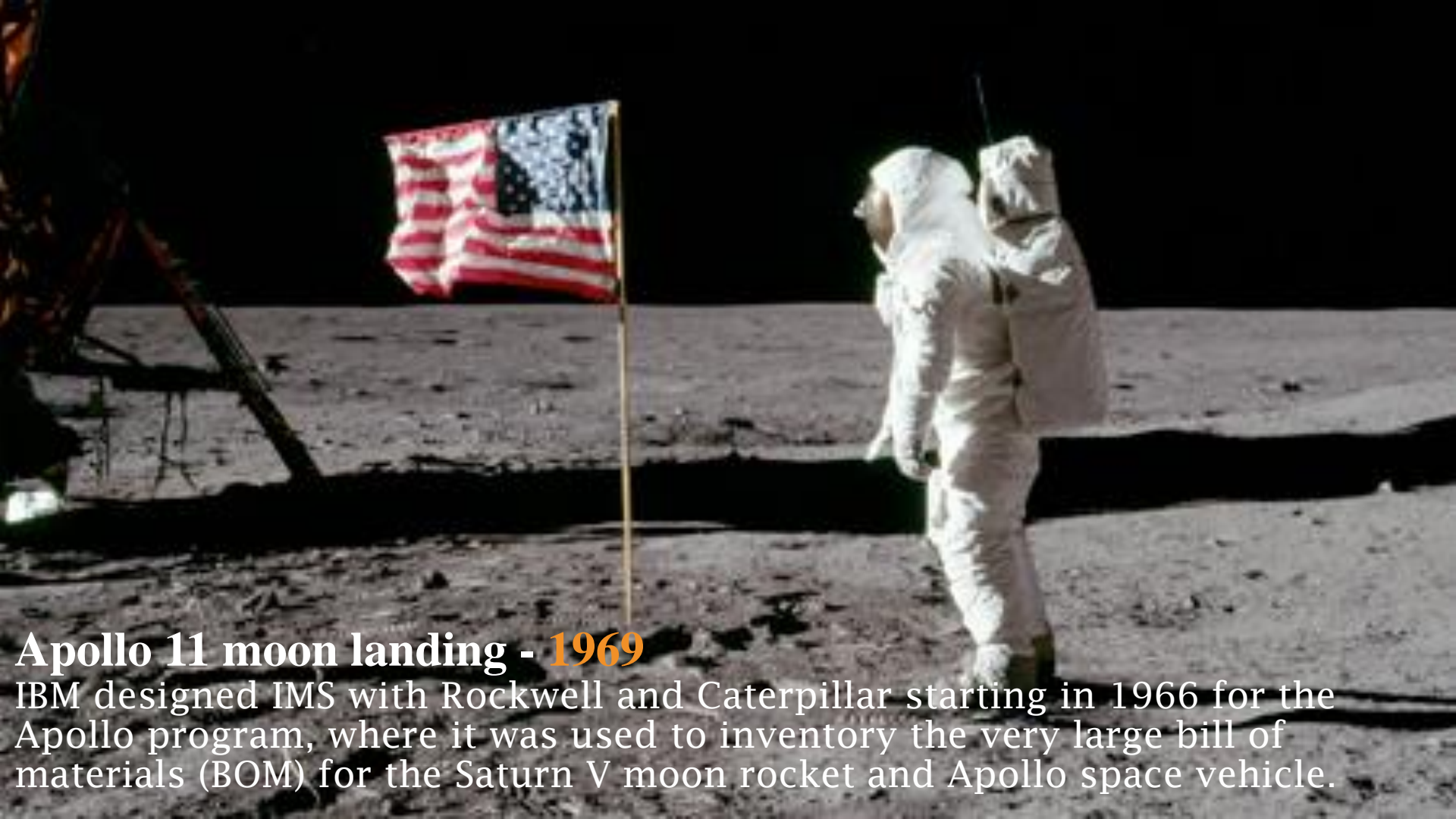


Innovating with IMS

Centering your enterprise for growth


Steve Mink
Former IMS developer and leader
Current World Wide z Analytics Client Success
19 Mar 2015





Apollo 11 moon landing - 1969

IBM designed IMS with Rockwell and Caterpillar starting in 1966 for the Apollo program, where it was used to inventory the very large bill of materials (BOM) for the Saturn V moon rocket and Apollo space vehicle.



First National Bank, South Africa - 2014

Providing upward mobility for Africa through critical mobile financial services to Africa's unbanked 80 percent, relying on the mainframe and IMS for performance, scalability and reliability.

Recent milestones

**100K
IMS**

IMS 13
celebrating
45 years

IBM

Speed & scalability

- 117,292 TPS: 800% increase over IMS 12
- Increased workload throughput by 130%

Affordability

- 10% CPU savings for traditional workload
- 62% CPU savings for Java workload
- Value Unit Editions for IMS DB and IMS TM

Simplicity

- Deliver IMS apps and data to mobile and cloud developers in a secure, governed, and optimized way
- Dynamic database management

*145 clients and partners already on
IMS 13*

IBM Mainframe50:
Making the Extraordinary Possible
April 8, 2014 | New York City

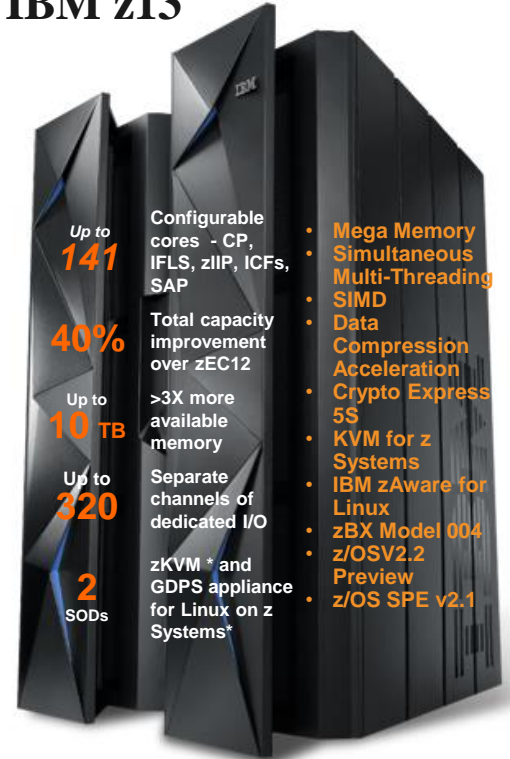
Industry Milestones

| | | | | | | | | | | | |
|--|---|--|---|------------------------------------|---|---|---|--|----------------------------|---|---|
| 1954 SAGE Airline Reservation System | 1956 Mails Security Administration System | 1967 Building Spreadsheets The Apollo II Mission | 1973 IBM Real Time Inventory Tracking | 1975 BTR DCP Bank Trading | 1979 LPC Initial Transaction Processing | 1980 CICS Hugon - First Supported IBM Banking System | 1983 4731 Request Handling Member A Class Ship ATA | 1994 CompuLink Data Center Approach to Pricing Optics | 2000s Mobile Banking | 2008 Microscale Smart Grid MTRC Fuel Natural Gas Energy Grid | 2013 Peak Customer Time to Value Time to Profit |
|--|---|--|---|------------------------------------|---|---|---|--|----------------------------|---|---|

Technology Milestones

| | | | | | | | | | | |
|---|---|--|-----------------------|----------------------|--------------------------------------|--|--|-------------------------------|---|---|
| Time Sharing Structured Code of Computing | IBM 9000 - A 32-Bit Control System | Magellan Range Technology Cloud Data Solutions | Sublotout Business | VM Virtualization | Business Intelligence with SOI | FRCS - Financial Corporate e-work | DEEP Enterprise Modeling System | Open Source with Linux* | Stream Computing - Cloud Driven on the Fly | Rebuild Computing with IBM zEnterprise* |
|---|---|--|-----------------------|----------------------|--------------------------------------|--|--|-------------------------------|---|---|

IBM z13



Up to
141

Configurable
cores - CP,
IFLS, zIIP, ICFs,
SAP

40%

Total capacity
improvement
over zEC12

Up to
10 TB

>3X more
available
memory

Up to
320

Separate
channels of
dedicated I/O

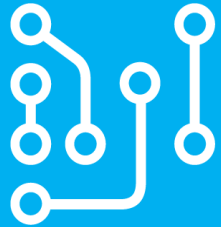
2
SODs

zKVM* and
GDPS appliance
for Linux on z
Systems*

- **Mega Memory**
- **Simultaneous Multi-Threading**
- **SIMD**
- **Data Compression Acceleration**
- **Crypto Express 5S**
- **KVM for z Systems**
- **IBM zAware for Linux**
- **zBX Model 004**
- **z/OSV2.2 Preview**
- **z/OS SPE v2.1**

There are three important shifts fundamentally changing IT

Data



Data is becoming the world's new natural resource

Cloud



The emergence of cloud is transforming IT and business processes into digital services

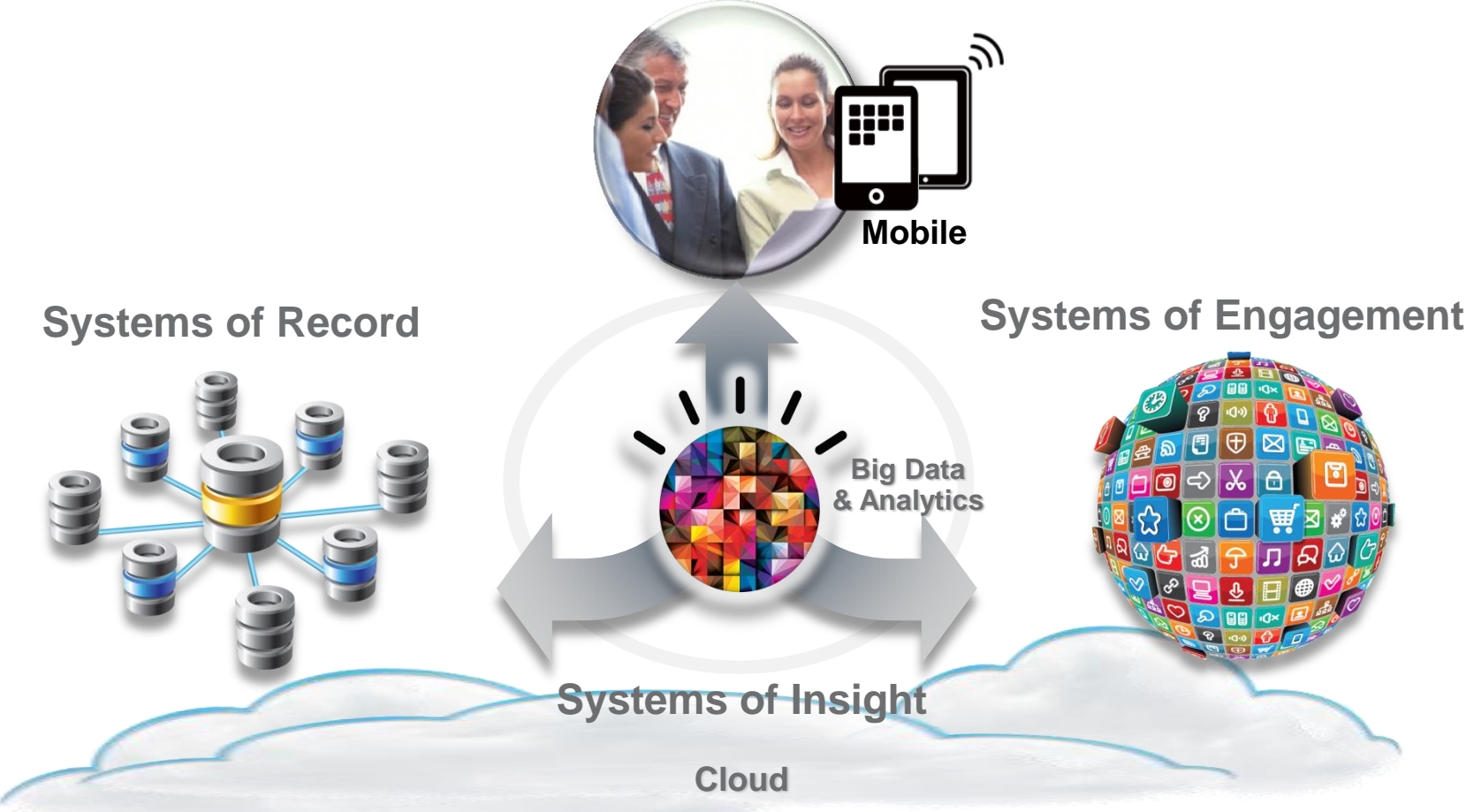
Engagement



Social. Mobile. Security. Empowering people with knowledge, enriching them through networks and changing expectations.



Business and industries are being transformed by these shifts

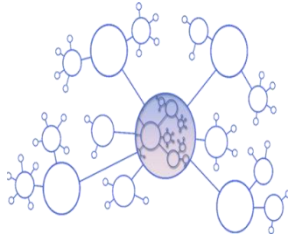


IMS Product Strategy is aligned with these shifts

Strategic Intent



- Continue to deliver the IMS Value Proposition
- Superior performance, reliability, availability and serviceability
- Minimize cost per transaction



- Innovate and extend the value of your IMS investment



- Expand and empower the IMS talent population

Investment

- Core Capabilities
 - Reduce path length, contention, I/O...
 - Reduce planned outages
 - More dynamic capabilities
- Data & Analytics
 - Accelerate time to insight
- Cloud/Mobile
 - Rapidly enable/control cloud & mobile access to IMS resources
- Open interfaces & Java
- Modern tooling for administrators, developers and DBAs



Leaders are optimizing & innovating with IMS...

Systems Management

Performance

TCO

Database Management

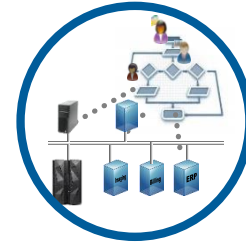
Scalability

Tx Management

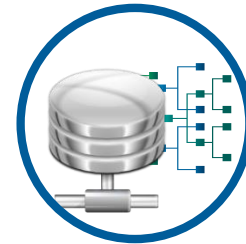


IMS Tools

- Complete Database Management
- Optimize IMS Performance
- Accelerate IMS upgrades



SOA and Open Integration



Open Database



Mobile Access



Business Analytics



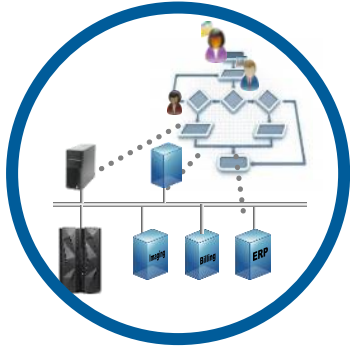
Application Modernization

Optimize

Innovate



Delivering value to their businesses



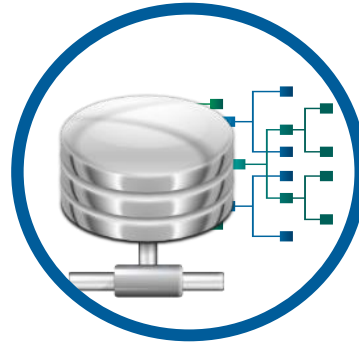
SOA and Open Integration

Who: A large bank in AP

What Business Need: reduce fraud through smarter transaction processing

Solution: enable IMS application to call, in-line, to an enterprise fraud and anti-laundering solution

Benefits Delivered: 65% response time improvement with a simplified architecture



Open Database

Who: A large insurance client

What Business Need: Easier Access to IMS Data

Solution: IMS Open Database infrastructure

Benefits Delivered: Easy access to IMS data using SQL from any platform
Helps to drive open standards and open technology into IMS



Application Modernization

Who: IT Service Provider for banks

What Business Need: Evolve their core banking processes

Solution: Promoted the use of Java on z/OS, especially Java and COBOL interoperability hosted by IMS

Benefits Delivered: Skills, rapid development, reduced application logic & complexity

Support business growth and innovate with IMS

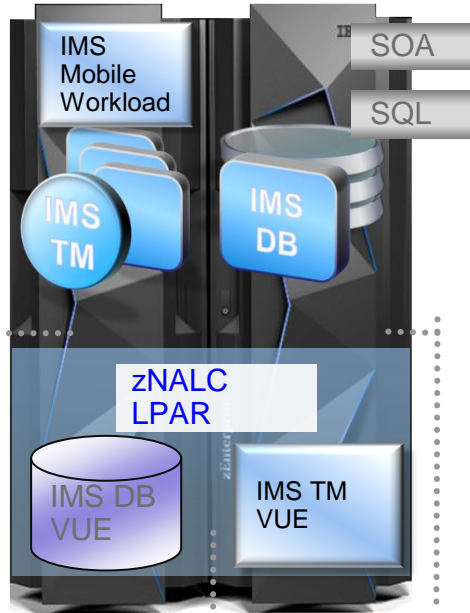
Mobile Workload Pricing (MWP)

can reduce the cost of growth for mobile transactions processed by programs such as CICS®, IMS™, and DB2® for z/OS.

Up to **60%** reduction in incremental growth from mobile transactions

z Systems Collocated Application Pricing (zCAP)

For new applications, new workloads priced as if in a dedicated environment while technically integrated in LPARs with other workloads



zIIP Enablement

can help free-up general computing capacity and lower overall total cost of computing for select data and transaction processing workloads

Up to **22%** GP savings for DRDA (SQL)
Up to **8%** GP savings for SOAP (SOA)

Country Multiplex Pricing

Unprecedented flexibility to move and run workloads anywhere and to migrate to new hardware - eliminating duplicate sub-cap peaks and sysplex aggregated pricing rules

IMS DB and TM Value Unit Editions (VUE)

Introduces a new one-time-charge pricing metric specifically for new workloads like data sharing to enable new analytics workloads, new IMS Open Database for Java or SQL workloads, new mobile applications, new Java applications, etc.



Announcing the z13

Mainframes account for **68%** of production workloads, but only **6%** of IT spend

- Mobile Test Drive
- IBM Mobile Center
- Enterprise Ready M
- US Mobile ISV part
- Enterprise Compilers
- Urban Code 6.1.1
- CICS TS v5.3 Open Be
- Rational Test Workbench
- Mobile Application Throw down
- BPM and Monitor v8.5.6 for Linux on z Systems
- IBM Integration Bus v10
- IBM zSecure Audit Reporting SSE
- Java 8

Mainframe organizations demonstrate an average of **35%** lower IT Cost of Goods; and computational growth roughly **3x** more economically efficient

- Cloud Manager w Openstack v4.2
- Optimized WebUI for z Systems*
- Hybrid cloud connect test drive

Up to **56%** better throughput on z13 and Java8 than Intel Haswell for IBM middleware solutions

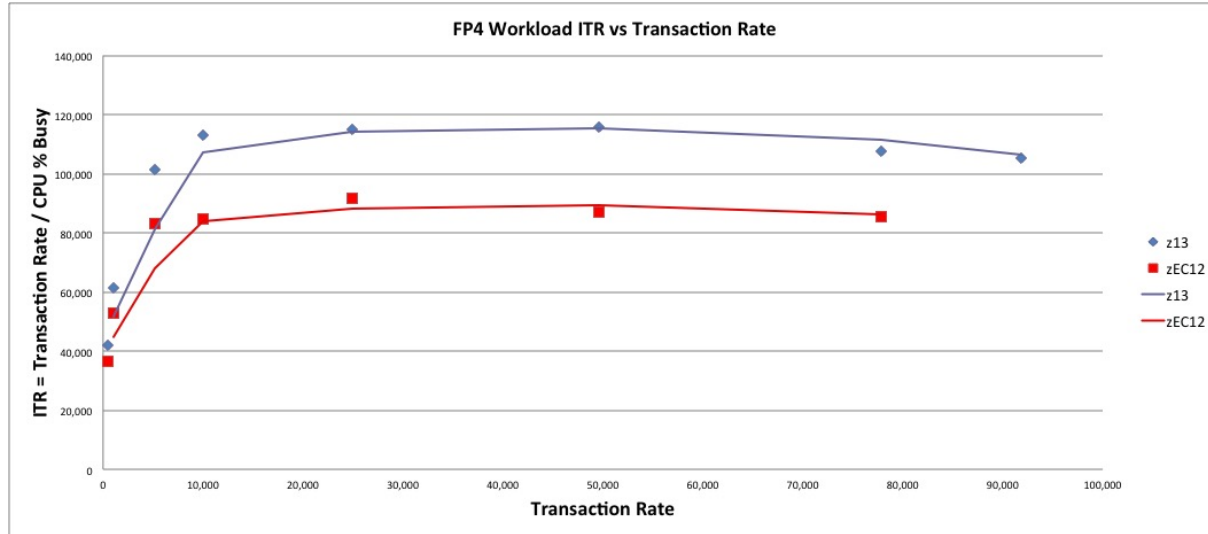
Analytics

- IBM DB2 Analytics Accelerator
- CPLEX Optimizer for z/OS
- IBM DB2 BLU for Linux on z Systems
- IBM InfoSphere System z Connector for Hadoop
- IBM SmartCloud Analytics + Log Analysis z/OS Insight Packs

Skills

- Master the Mainframe Country Contests
- Master the Mainframe World Championship in 2016
- New Jobs Board/Connector
- MOOCs available on line, all the time

IMS 13 Fast Path Performance on z13



15-34% throughput improvement
over IMS 13 on equivalent EC12 using an IBM internal high volume fast path workload

Optimize and Innovate with IMS

2014 Key Deliveries

- IMS TM VUE** - Enables clients to expand new workloads in IMS through an alternative pricing option
- IMS Mobile Feature Pack** - Easily extend IMS reach to cloud and mobile – 20+ clients in/starting POC
- IMS IDAA POT** - Accelerate analysis of IMS Data with IDAA

IMS 14 – QPP began January 2015

Optimize and extend the value of your IMS investment in the era of Data, Cloud & Engagement

- *Simplified, standards-based management and integration for hybrid cloud, analytics, mobile, and big data*
- *Improved IMS TCO and Qualities of Service*

“With IMS as our core orchestration and business logic execution layer, we have **true 24/7 service capability** and the ability to manage growth without worrying about scalability.”

- Jay Prag, CIO Hogan Channels, FNB



IMS processes **the world's** transactions

117,292
transactions per second,
powered by over 20% of
the IBM z/OS

50,000,000,000
secure transactions per day

IBM IMS: The world depends on it

Many of the largest corporations in the world rely on IBM Information Management System (IMS) to run their business. **Which, when you stop to consider it, is really your business.**

IMS Data and Analytics

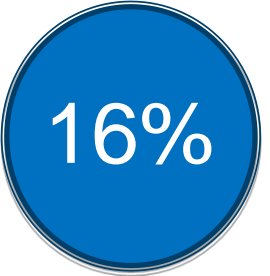
Leaders are leveraging data to outperform the competition

Optimize

Dramatically **“maximize yield”** on investments in standard electronic business practices



estimated **fraud loss** to healthcare



government **tax revenues lost** to non-compliance



typical banking regulation **non-compliance fine**

Innovate

Drive **top-line growth** via transformational new services



of marketers send **same content** to all subscribers



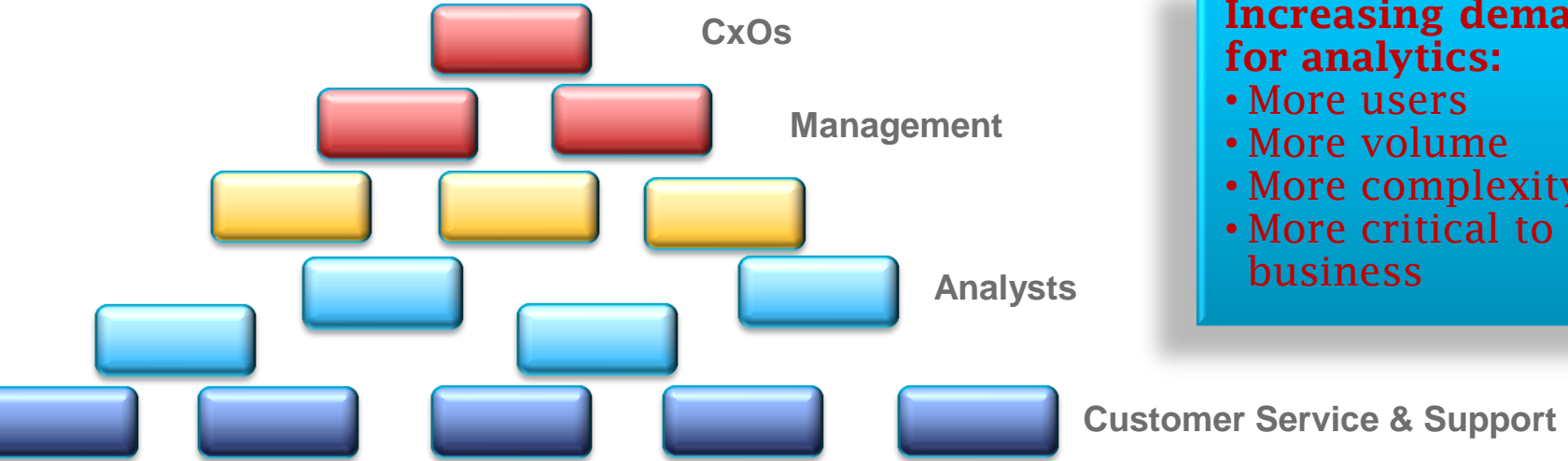
of businesses **“extremely satisfied”** with ability to use customer data for decisions



annual increase in **customer lifetime value** for firms that use engagement analytics



More users across – and beyond - the organization want access to analytics



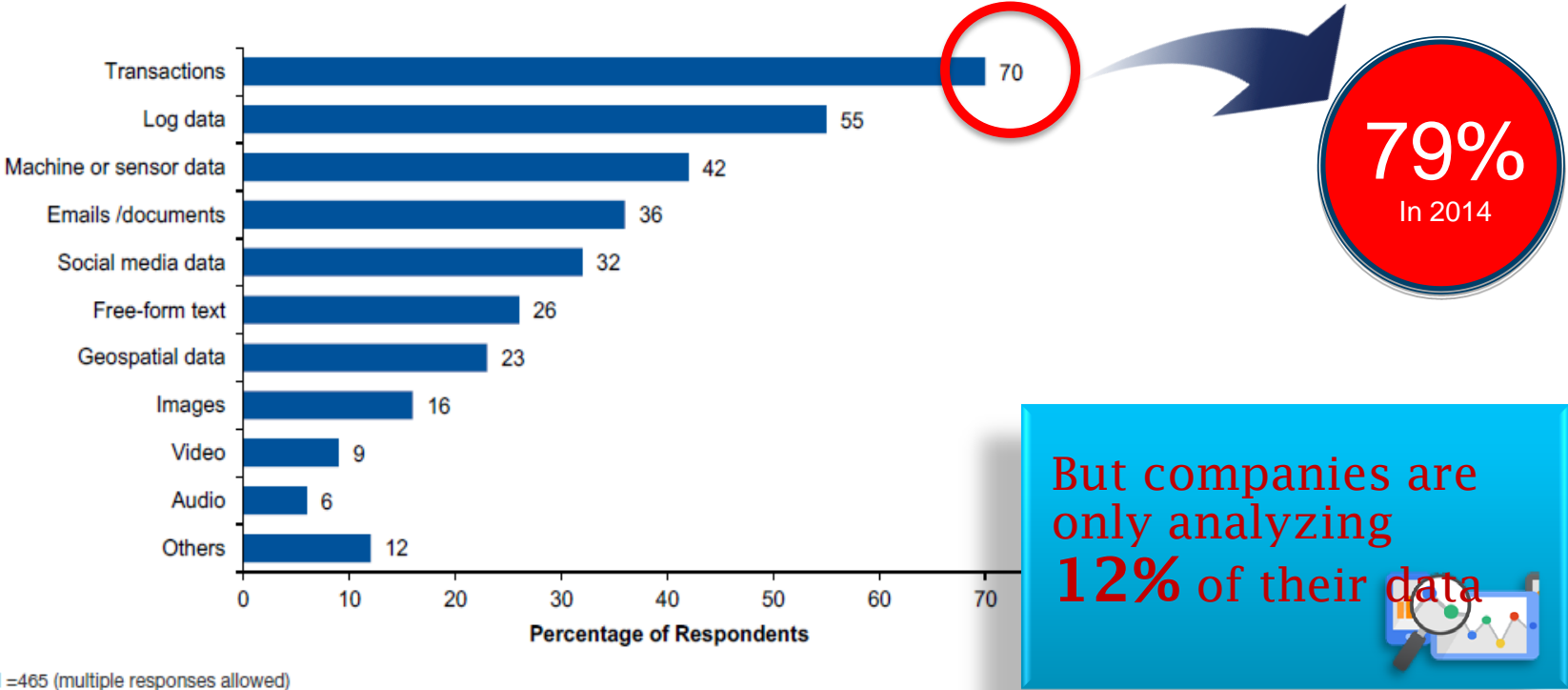
Increasing demands for analytics:

- More users
- More volume
- More complexity
- More critical to the business

Customers



The Analytics Starting Point is Transactional/Operation Data

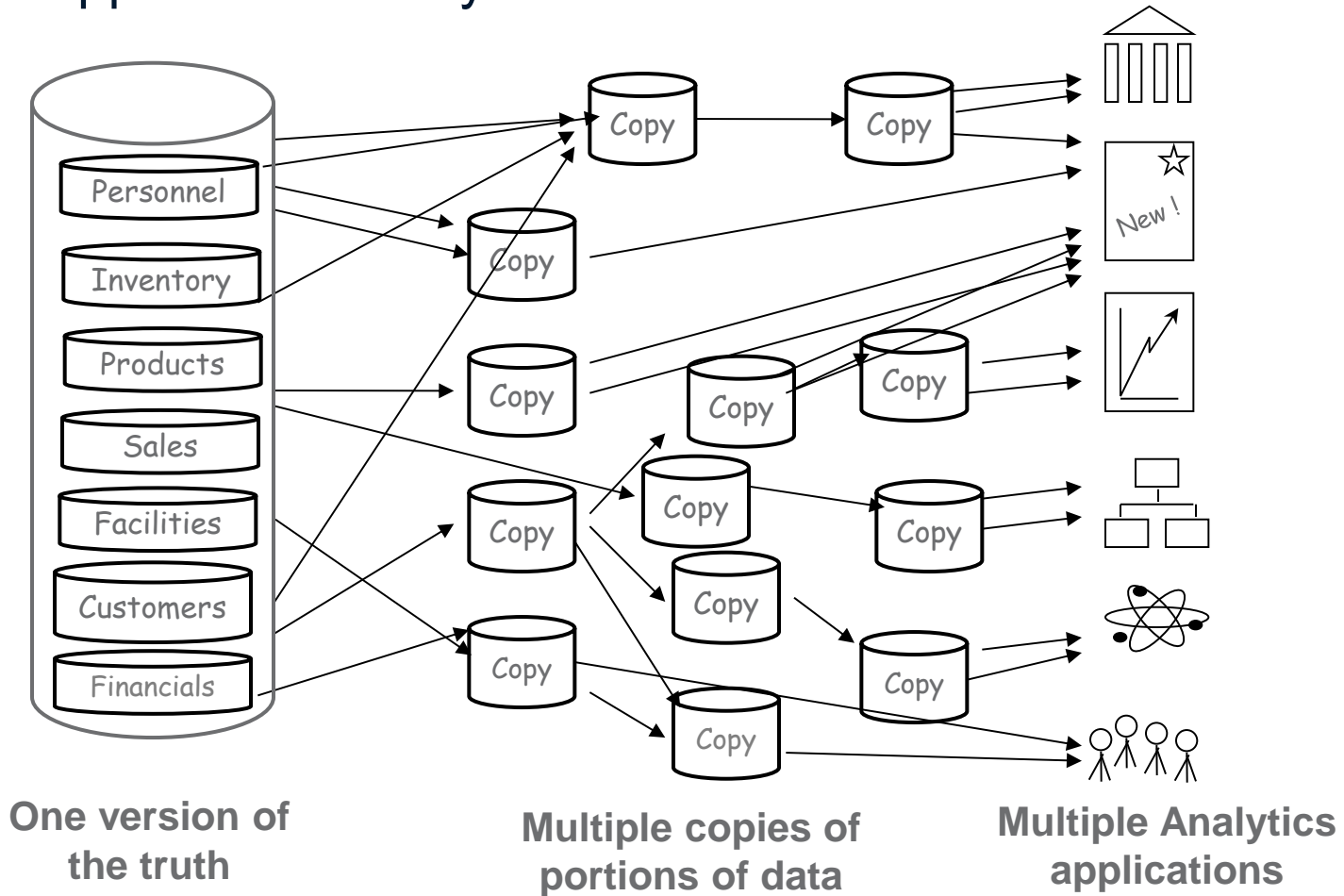


Source: Gartner (September 2013)

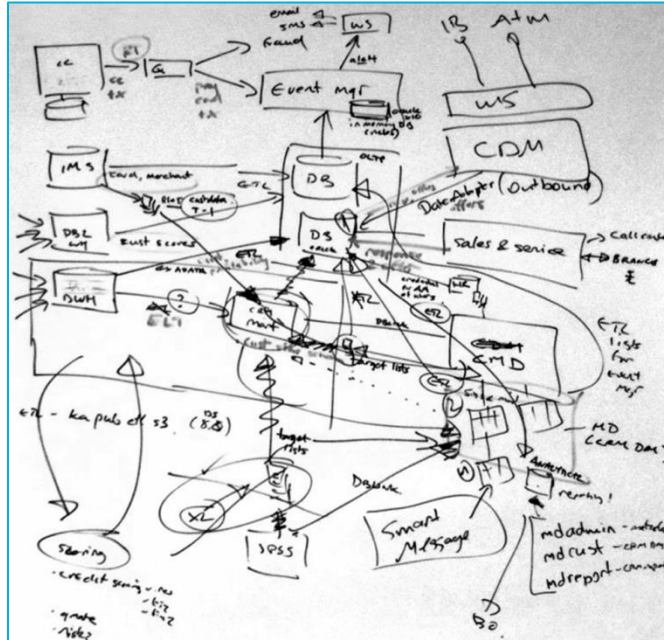
Gartner research note "Survey Analysis - Big Data Adoption in 2013 Shows Substance Behind the Hype" Sept 12 2013
Analyst(s): Lisa Kart, Nick Heudecker, Frank Buytendijk



Traditional approach to analytics...



Resulting in...



- Significant complexity
- Analytics latency
- Lack of synchronization
- Data duplication
- Excessive costs

Clients report using 30-40% of System z processing just to move data



IBM zEnterprise and IBM DB2 Analytics Accelerator (IDAA)



DB2 Analytics Accelerator and DB2 for z/OS

A self-managing, hybrid workload-optimized database management system that runs each query workload in the most efficient way, so that each query is executed in its optimal environment for greatest performance and cost efficiency



IDAA Use Cases with IMS Data



Make better decisions faster

Large volume reporting of combined IMS and DB2 assets



Better understand your customers

Leverage full breadth of transactional data for analytics



Trust your data

Ensure consistency of data relationships between IMS and DB2

IBM Software Group
Technical White Paper
August 2014

Accelerate business insights with IMS transactional data

Introduction
IBM System z® servers are home to 90 percent of the world's data, a large part of which is Information Management System (IMS) transactional data. IMS applications and data continue to form the core of the world's critical online transaction processing (OLTP) workloads. IMS data on System z servers is widely viewed as the single version of the truth, from which data marts and warehouses are populated.

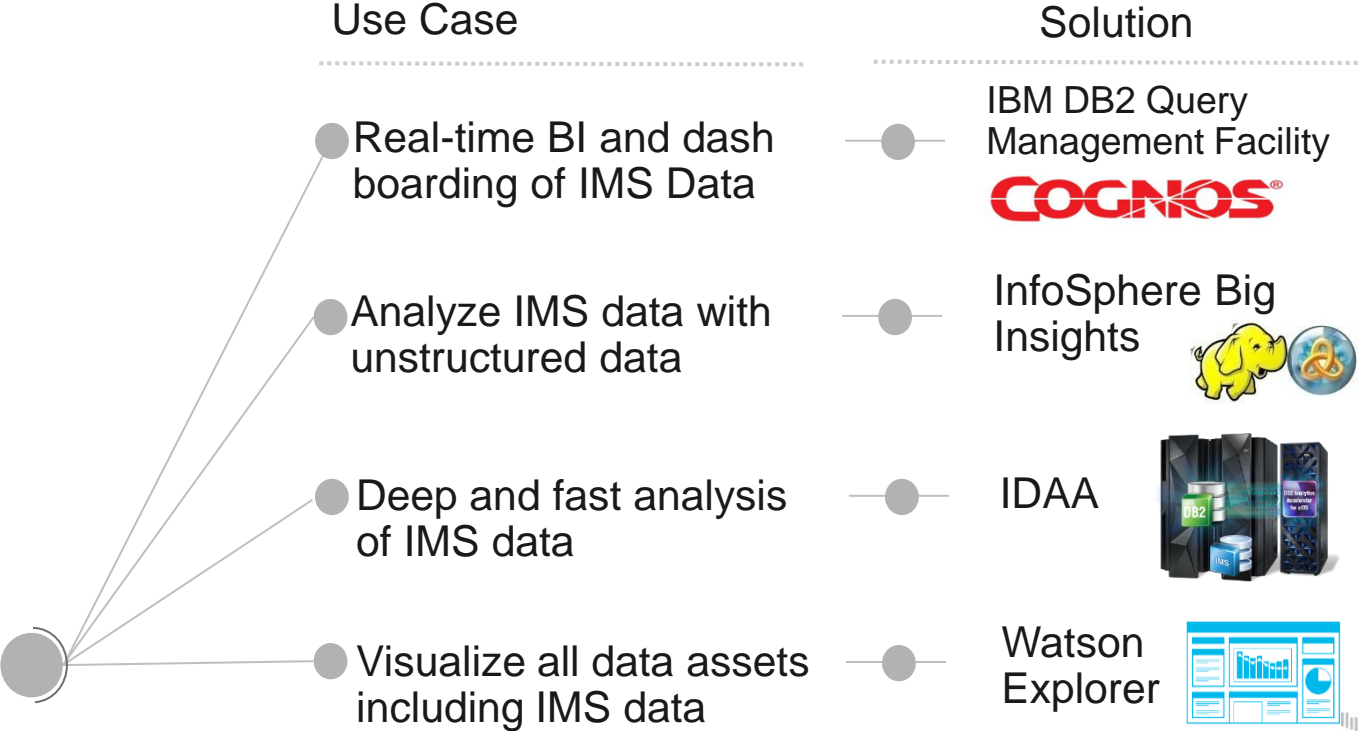
IBM Accelerator for IMS and DB2

| Table Name | Table Type | Table Size | Table Rows | Table Columns | Table Indexes | Table Statistics |
|-------------|-------------|------------|------------|---------------|---------------|------------------|
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
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| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |
| ACCELERATOR | ACCELERATOR | 100 MB | 1000000 | 10 | 1 | 1 |

Get Started Today!

- Technical Whitepaper and "how-to" guide available [here](#)
- Demo available on YouTube

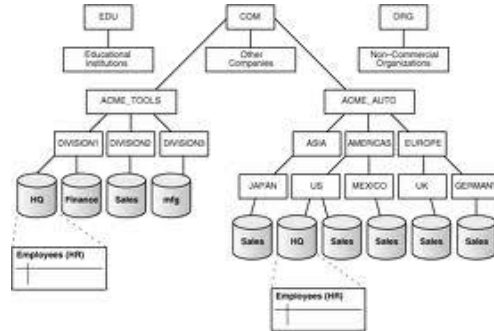
IMS supports a range of analytics solutions today



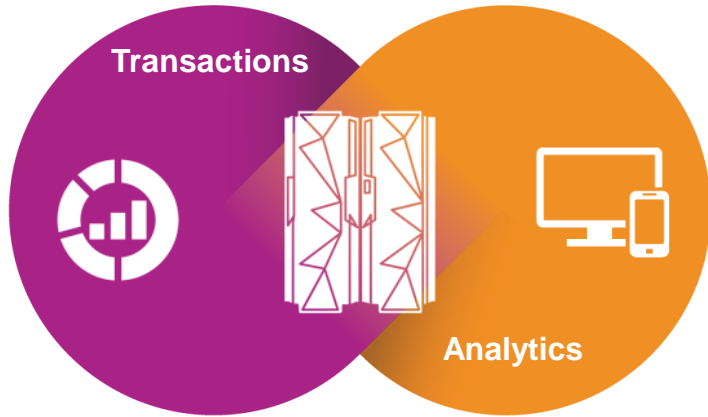
IBM DB2 Query Management Facility support for IMS

- **Increase the value of your IMS investment**

- JDBC Open Data Access to IMS in a managed environment
- Users graphically construct ad-hoc IMS queries
- Create reports and dashboards that draw directly from IMS data
- Roll out web-based graphical content that blends IMS data with relational and multi-dimensional data sources
- Incorporate IMS data within federated queries
- QMF's JDBC workloads are zAAP eligible



...and we'll continue to integrate analytics with core transactions



- Right-time insight at point of impact
- Increased business agility
- Improved data governance and security
- Reduced infrastructure cost and complexity

72%

greatest value will come from analyzing transactional data

55%

of enterprise applications need mainframe to complete transactions

IMS Cloud and Mobile

Cloud and Mobile enables innovation that creates new business opportunities

Apps Everywhere

With more mobiles than humans and ¼ of the world on social networks, apps drive more successful business outcomes.



81%

of Mobile Leaders say mobile fundamentally changed their businesses

Experience Matters

Always-connected, socially-networked customers expect a delightful, seamless, and personalized experience across all interactions with a business.



\$235B

The amount of mobile payment transactions this year, alone.

Cloud
Makes it possible



Apps today can be stitched together quickly with pre-built assets. Cloud makes the API economy possible.

APIs - the building blocks for apps

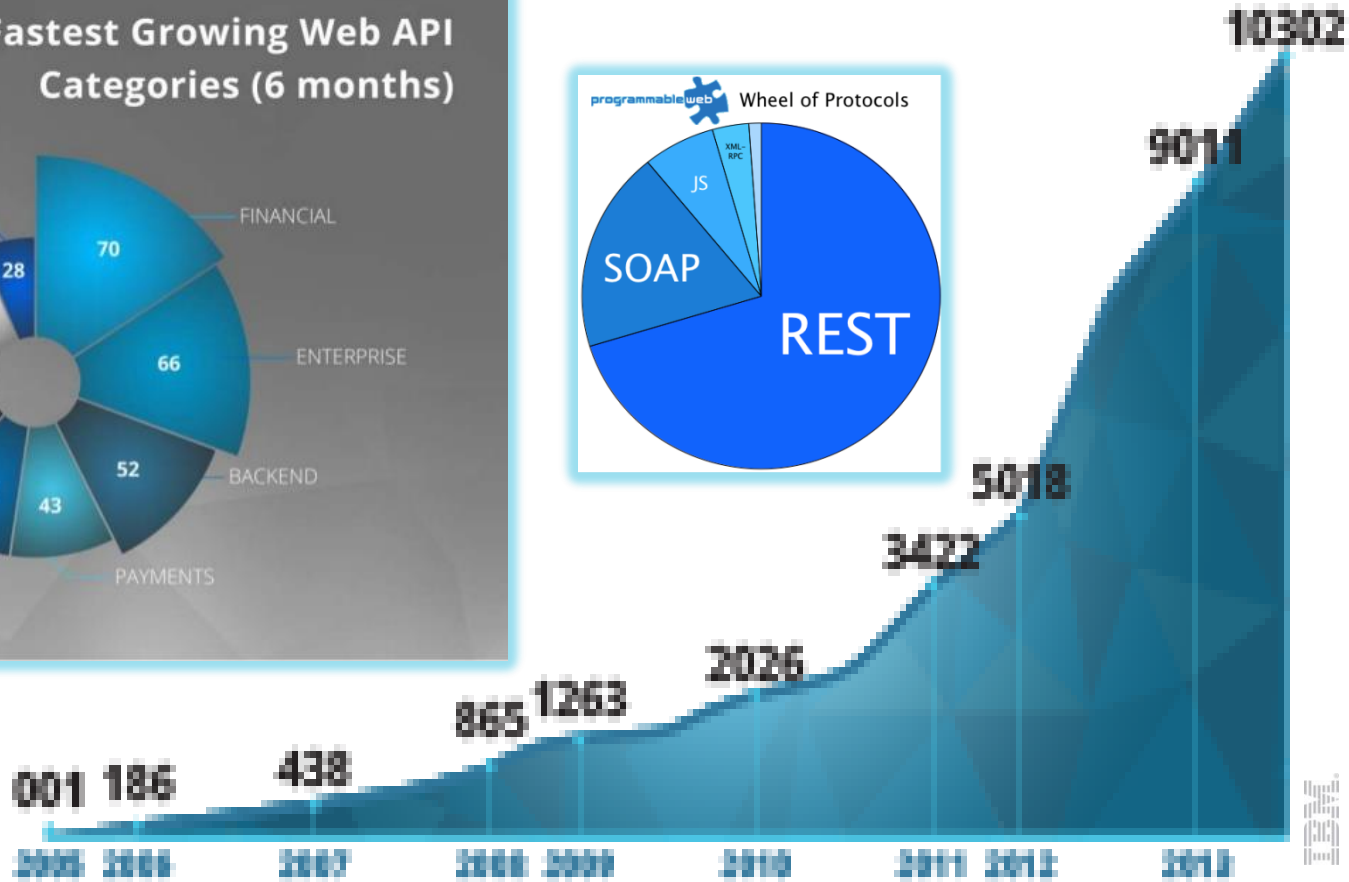
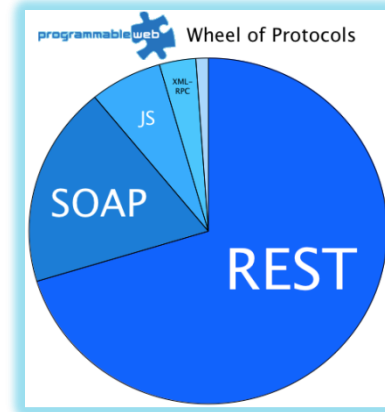
Application Programming Interface

The **“API economy”** has changed how developers think about building apps, and how organizations deploy software in the cloud

Bank Externalized Services

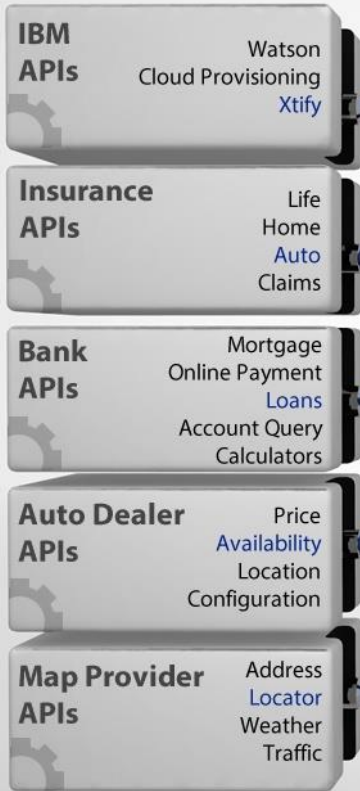


This isn't just about "social"...



API Economy

Mobile App Assembly



Mobile App Assemblers
Developers & Partners



Cars.com recently valued at \$2.5B

New Customers



Providers

Consumers



App development is about speed and choice



Integrating new applications with Systems of Record data and applications is critical

Core IT

IaaS

PaaS



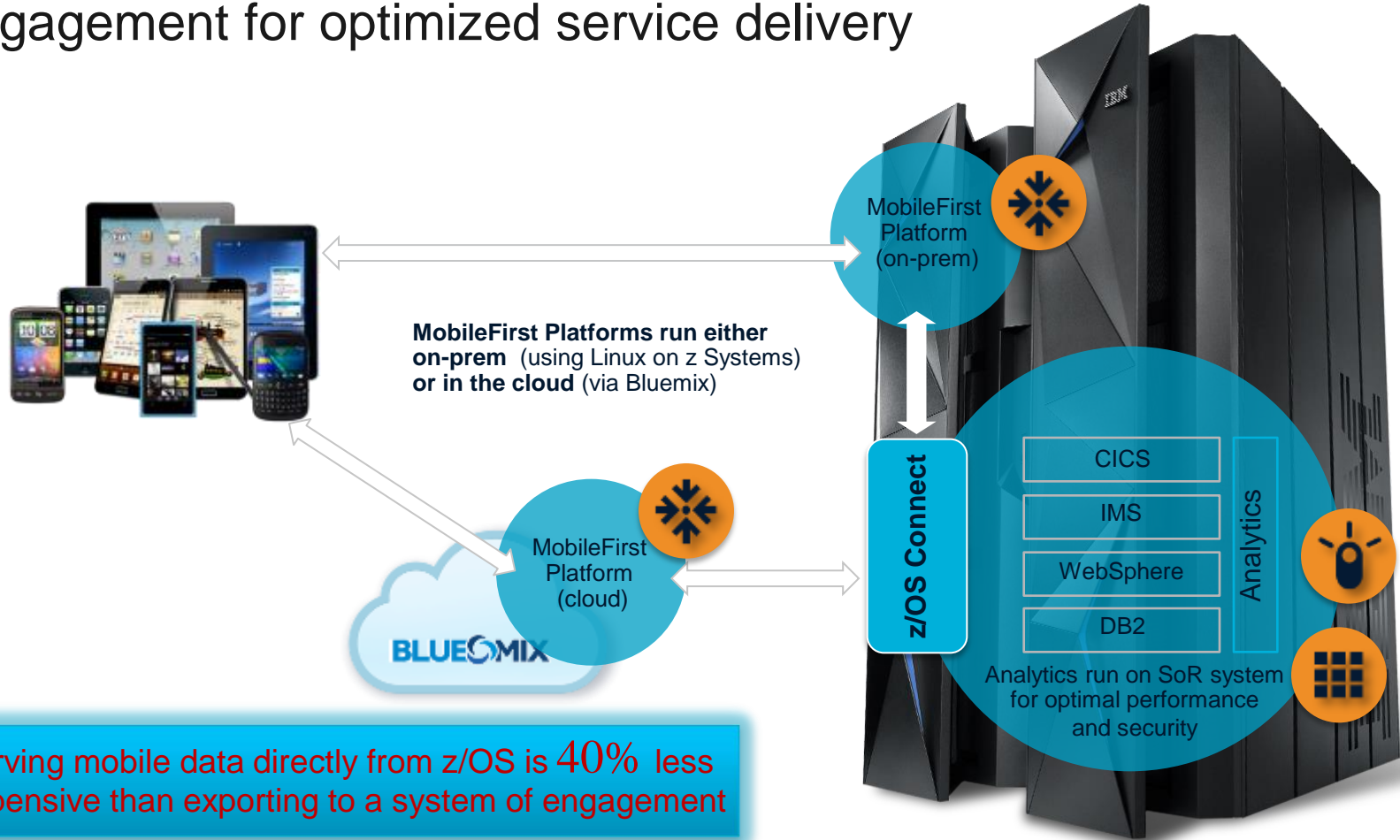
IBM SoftLayer

IBM Bluemix

91% of CIOs said new customer client-facing apps are accessing the Mainframe



z/OS Connect bridges Systems of Record with Systems of Engagement for optimized service delivery



Serving mobile data directly from z/OS is 40% less expensive than exporting to a system of engagement

IMS Cloud and Mobile Integration Available Today!

■ **IMS Mobile Feature Pack** (in IMS Enterprise Suite 3.1.1 – GA June 13, 2014)

Deliver IMS applications and data to mobile and cloud developers in a secure, governed, and optimized way via:

- An integrated platform that supports full discovery, modeling, enablement, and deployment of both IMS transactions and IMS data
- Built on z/OS Connect: the singular approach WebSphere, CICS, IMS, and DB2 for z/OS

34,925 TPS!

[IMS Mobile Feature Pack Performance Benchmark Available](#)

The screenshot displays the IMS Enterprise Suite 3.1.1 interface. A 'Specify Transaction Metadata' dialog box is open, showing the configuration for a transaction named 'IVTMO'. The dialog includes fields for 'Transaction name', 'Input message', and 'Output message'. The 'Input message' is set to 'IVTMO - INPUT' and the 'Output message' is set to 'IVTMO - OUTPUT'. The background shows the 'Mobile Transaction Service' configuration page with a table of transactions and a 'Properties' section.

| code | Message Name | Input message | Output message |
|-------|---------------|---------------|----------------|
| IVTMO | IVTMO - INPUT | IVTMO - INPUT | IVTMO - OUTPUT |



IMS User Interfaces & IMS Tools

Barriers to innovation

More than
70%

of budgets on average is spent on ops and maintenance – and this percentage is growing²

2/3
of companies

go over schedule on their project/ solution deployments³

IT complexity is
doubling

every two years at its current pace¹

“Our IT systems have become complex and difficult to manage, and as a consequence IT is increasingly finding itself in the position of being a barrier to innovation rather than an enabler of it.”

¹ Enterprise Systems Journal, “5 Best Practices for Reducing IT Complexity”

² IDC Analyst Matt Eastwood, IDC Directions Presentation, 2011

³ IBM Market Intelligence Time-To-Value Study, National Analysts, November 2011



Innovations in IMS user interfaces and IMS Tools



Trends

- New/evolving/growing applications and databases placing an increased demand on existing DBAs and Systems Programmers
- Environments getting more heterogeneous, more complex, more interconnected

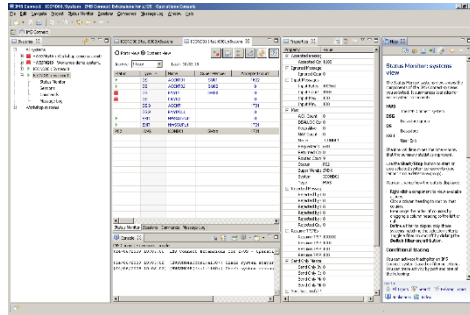
Our Focus

- Deliver an enhanced experience when working with IMS and maximize your IMS staff productivity
- Minimize TCO while achieving availability and performance goals for your mission critical applications

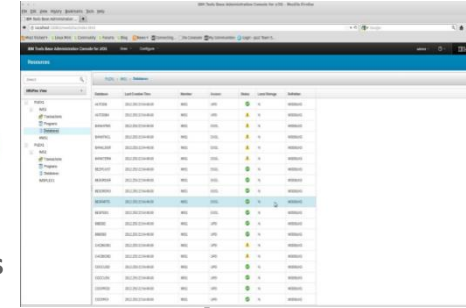


Innovations for developers and system administrators

IMS Explorer for Development (Eclipse)



IMS Explorer for Administration (Web Browser)



Developers



Administrators

ISPF

```
***** IMS *****
***** IMS Explorer Component List *****
***** Row 1 to 15 of 15 *****
*****
ImpName:  ILES1          Date:      07/05/08      More: >
SP server:  ILES1          Time:      09:35:40
*****
Enter 'p' to display statistics for the selected component
Enter 'i' to display SDC information for the selected component
Enter 'o' to produce an SDC map for the selected component
Enter 'm' to produce SDC Maps for the selected Component type across the plant
*****
CmD Id   Type Version /Component Subname  DBName  D-Iname  DLSName  Status
-----
IMZ1    IMS  9.1.0  ECPST21  IMZ1    DBRCNSA  DLIECSA  READY
DBRC  9.1.0  ECPST21  DBRCNSA  DBRCNSA  DLIECSA  READY
DBRC  9.1.0  ECPST21  DBRCNSA  DBRCNSA  DLIECSA  READY
CQ01    IMS  2.1.0  ECPST21  IMZ1EN  DBRCNSA  DLIECSA  READY
CQ02    CQS  1.4.0  ECPST21  CQ02F1  DBRCNSA  DLIECSA  READY
IMZ1EN  IM  1.2.0  ECPST21  IMZ1EN  DBRCNSA  DLIECSA  READY
SC110   IM  1.2.0  ECPST21  SC110   DBRCNSA  DLIECSA  READY
IMZ2    IMS  9.1.0  ECPST22  IMZ2    DBRCNSA  DLIECSA  IMZ1EN  READY
DBRC  9.1.0  ECPST22  DBRCNSA  DBRCNSA  DLIECSA  READY
DBRC  9.1.0  ECPST22  DBRCNSA  DBRCNSA  DLIECSA  READY
CQ02    CQS  1.4.0  ECPST22  CQ02F2  DBRCNSA  DLIECSA  READY
IMZ1EN  IM  1.2.0  ECPST22  IMZ1EN  DBRCNSA  DLIECSA  READY
SC120   IM  1.2.0  ECPST22  SC120   DBRCNSA  DLIECSA  READY
SC220C  SCI  1.2.0  ECPST22  SC220C  DBRCNSA  DLIECSA  READY
***** End of data *****
```



Mobile



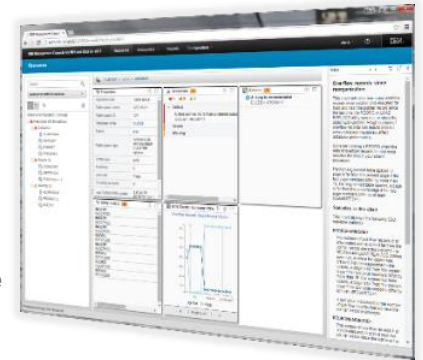
IMS Tools help you get the most from your IMS investment



Accelerate IMS upgrades, support new workload & optimize IMS performance

1. Quickly clone your IMS systems with the **IMS Cloning Tool**
2. Analyze, modify, and deploy IMS resources and parameters with the **IMS Configuration Manager**
3. Measure and compare IMS system performance with the **IMS Performance Analyzer**
4. Diagnose and pinpoint overall transaction performance issues with the **Transaction Analysis Workbench for z/OS**

-
- Deliver on your performance and high availability requirements with the **IMS Performance Solution Pack**



Complete Database Management

- Monitor, manage and maintain your IMS databases with the **IMS Database Solution Pack** and the **IMS Fast Path Solution Pack** including enhanced autonomies to better sense the health of your databases and take action for you
- Backup and restore your IMS databases with speed and confidence with the IMS capabilities with the **IMS Recovery Solution Pack**



IMS Tools Solution Packs

All with support for the latest
IMS version on Day 1 - QPP & GA!



IMS Database Solution Pack

- ❖ Autonomics
- ❖ IBM Administration Console

- ❖ DB Reorg Expert
- ❖ HP Unload
- ❖ HP Load
- ❖ HP Prefix Resolution
- ❖ Index Builder
- ❖ HP Image Copy
- ❖ HP Pointer Checker
 - IMS DB Repair Facility
- ❖ IMS Library Integrity Utilities



IMS Fast Path Solution Pack

- ❖ Autonomics
- ❖ IMS Administration Console

- ❖ HP FP Utilities
 - FP Advanced Utilities
 - FP Online Utilities
- ❖ IMS DB Repair Facility
- ❖ IMS HP Image Copy
- ❖ IMS Library Integrity Utilities



IMS Recovery Solution Pack

- ❖ IMS Administration Console

- ❖ DB Recovery Facility
- ❖ HP Change Accumulation
- ❖ HP Image Copy
- ❖ DRF Extended Functions



IMS Performance Solution Pack

- ❖ IMS Administration Console

- ❖ IMS Connect Extensions
- ❖ IMS Performance Analyzer
- ❖ IMS Problem Investigator



IMS Skills

Let's talk about skills...

810,000

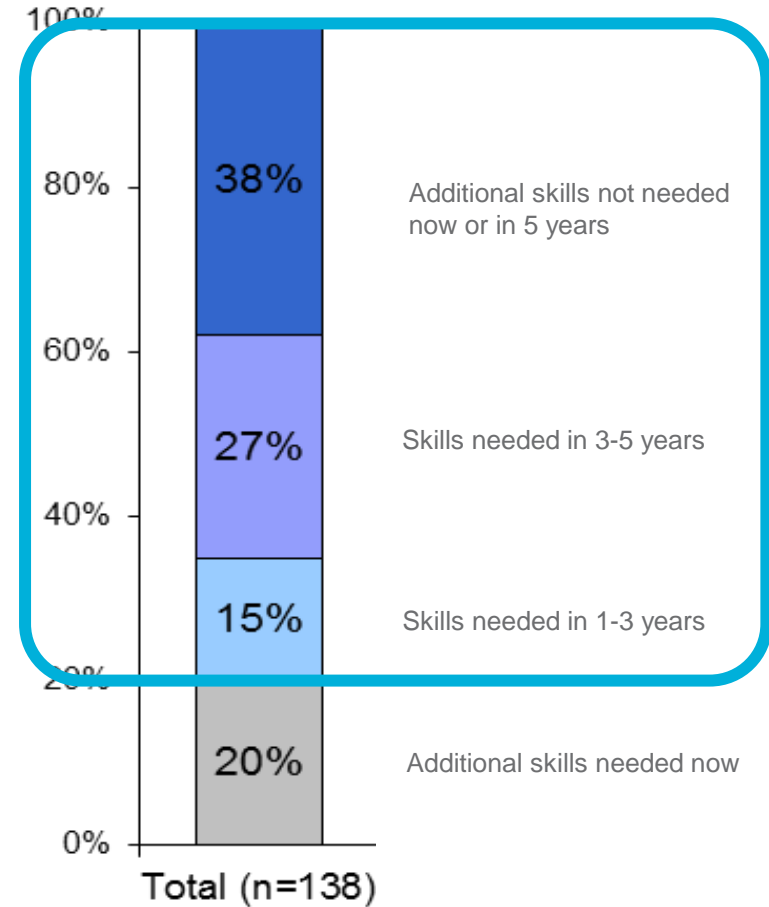
US government predicts that approximately 810,000 new and replacement administrative personnel will be needed across *all* platforms by 2020

37,000

IBM CPO projects 37,200 additional mainframe positions needed WW by 2020



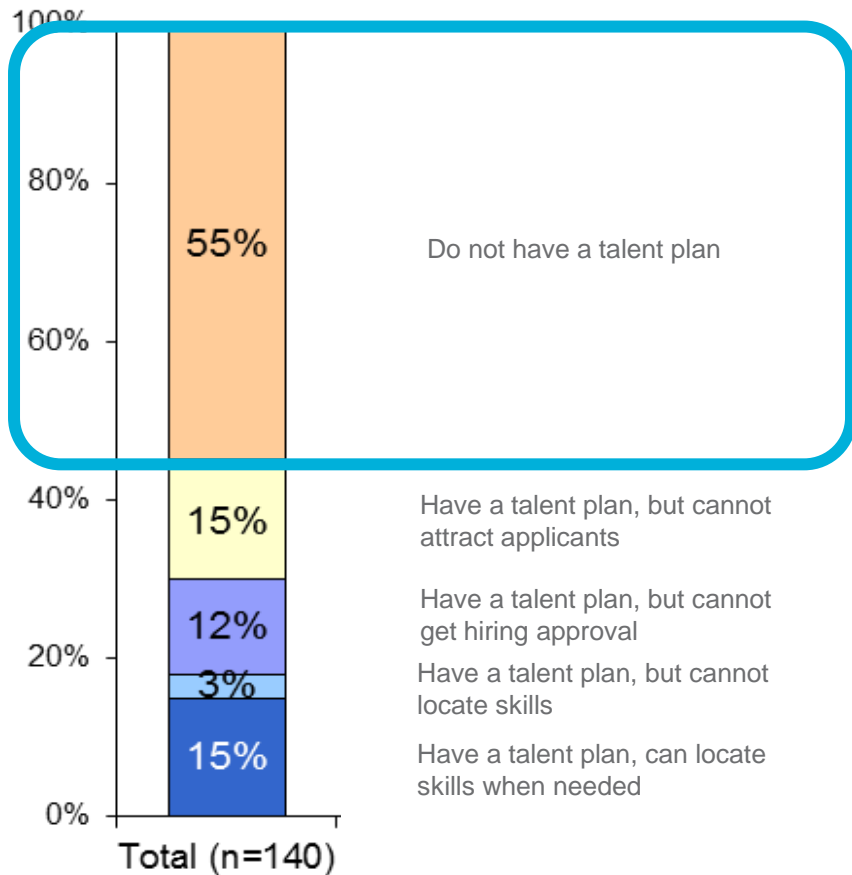
80% of System z customers don't have a skills issue now



Source: IBM's 2013 System z Tracker

**http://www.computerworld.com/s/article/9225099/Cobol_brain_drain_Survey_results?taxonomyId=154&pageNumber=1





55% of System z customers don't have a talent plan for mainframe skills

Source: IBM's 2013 System z Tracker

**http://www.computerworld.com/s/article/9225099/Cobol_brain_drain_Survey_results?taxonomyId=154&pageNumber=1



Through the Academic Initiative, IBM is working to train new developers and administrators

- Since its inception in 2003, the program has grown significantly benefiting schools, students, and clients
- Market place demand for enterprise systems resources over the last decade has remained strong
- Our clients have expressed continued interest in expanding the program to ensure a healthy ecosystem

Program Investment
\$10M+ over
in 10 years



Growth
64K+ Students
Over 1K Schools
in 70 countries



Job Candidates
Over 4,200
Job Seekers



Corporate Engagement
360+ companies
actively recruiting



Professional Connections
9 Communities



<http://www.ibm.com/university/systemz>



IBM zEnterprise Academic Initiative



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 - Locking
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 - And more...



“...every subject was successfully covered by the most appropriate expert. While I was there at SVL, the program was flexible enough so we could address certain topics which I personally identified, that would benefit me...”



IBMIMS@us.ibm.com



z Systems & IMS Skills – don't panic, *do plan!*



Attract

- Hire people and set the expectations
- Learn from them at least as much as you teach them!



Grow

- On-board and get productive
- Give them modern tools and processes



Retain

- Empower them to make a difference
- Continue to invest in the pipeline and train

How IBM can help...

IBM Academic Initiative

70 countries 1,400 universities 180,000 students



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User Groups

IBM Global Training
Providers

IMS Version 13
Technical Overview



Internships

IBM developerWorks®



StackExchange



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