

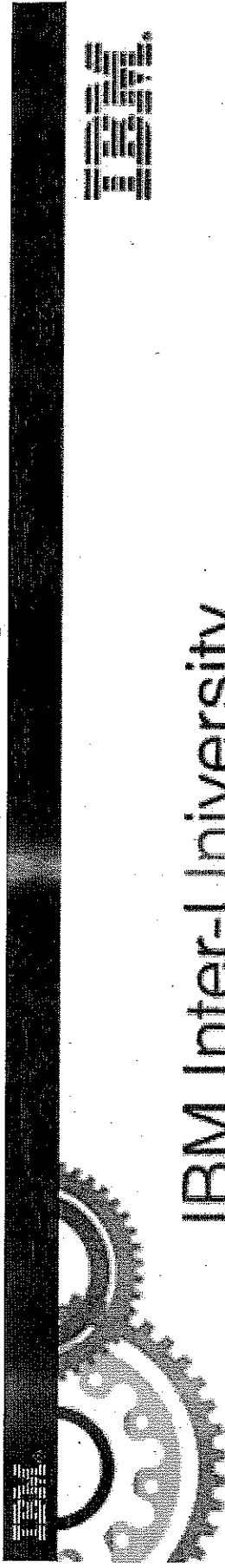
IBM Software Group Hong Kong

07 Jan 2012



IBM Inter-University Programming Contest 2011 Training

Chapter 0: Contest Briefing



IBM Inter-University
Programming Contest 2013

February 23, 2013 (Saturday)



Agenda

- Contest Rundown
- Overview of the contest technical scope
- Description on the contest PC setup and contest workflow
- Overview of the contest questions
- How to answer the questions

Contest Rundown

Date : Feb 23, 2012 (Saturday)

Time : 2:00 p.m. - 5:30 p.m.

(registration starts at 1:30 p.m.)

Venue : PQ604A, PQ604B and PQ604C on the 6/F of Core P, The
Hong Kong Polytechnic University, Hung Hom,
Kowloon, Hong Kong



Contest Rundown

1:30 - 2:00pm	Registration
2:00 - 2:15pm	Welcome Speech
2:15 - 4:15pm	Competition takes place
4:15 - 4:45pm	Marking
4:45 - 5:30pm	Award Presentation



Prize

Champions	▪ HK\$30,000# Cash Award ▪ Champion Trophy ▪ Three-month Summer Internship Program at IBM@
First runner ups	▪ HK\$15,000# Cash Award ▪ 1st runner up Trophy
Second runner ups	▪ HK\$ 9,000# Cash Award ▪ 2nd runner up Trophy
All Contestants	▪ IBM Trendy Backpack ▪ IBM Participation Certificate
The Champion University*	▪ Champion Trophy

#The Cash Award is for the whole team.

* The university with the most points of all their teams.

@ Winners must be Hong Kong resident or have a "No Objection Letter" (NOL) issued by Immigration Department.

Contest Rules (1)

- The contest has a duration of 2 hours.
- One PC and one terminal will be provided for each team.
- A set of questions will be given to each team to be completed within 2 hours.
- The contest is an open book contest. Contestants could bring in their reference books for the contest.
- Internet Browsing NOT allowed.
- Inter-Team Communication NOT allowed.
- ONLY Intra-Team Communication allowed.
- All the questions and related schema are provided to the students at the beginning of the contest. Question sheet is provided in hardcopy form.
- Once a team completes a question, the result is submitted to the judge. A time is recorded as the submission time. Then the judge will evaluate the submitted answer. In case the validation fails, the team will be notified and feedback will be provided to the team.

Contest Rules (2)

- For programming questions only, each team can have THREE chances to submit the answer of each question:
 - Each time the team submits an answer, the judge records the submission time and runs a stored procedure to check the answer. If the answer is correct, they will be awarded points for the question. If the answer is incorrect, the contest system will send the answer back to the team and the team can then re-submit again up to three times.
 - Full points will be provided if the answer is correct.
 - Partial points might be given on programming questions.
 - For each question, the highest point obtained will be recorded as its final point.
- After the contest is over, the team which gets the most points wins. If several teams get the same number of points, the one with the earliest last submission time wins.
- The decisions of the judges will be final.
- IBM reserves the right to publish the photographs and/or names of all or any prize winners in any of its promotional materials and/or advertisements as it sees fit.

Technical Scope

- Overview on IBM mobile related application
- Overview on DB2 basic operations on distributed platform.
- Overview on Mobile interfaces
- Overview on web programming using Java, DB2, WorkLight
- Overview on Tivoli Endpoint Manager
- Overview on IBM Connection Solution
- Overview on Cognos Business Intelligence

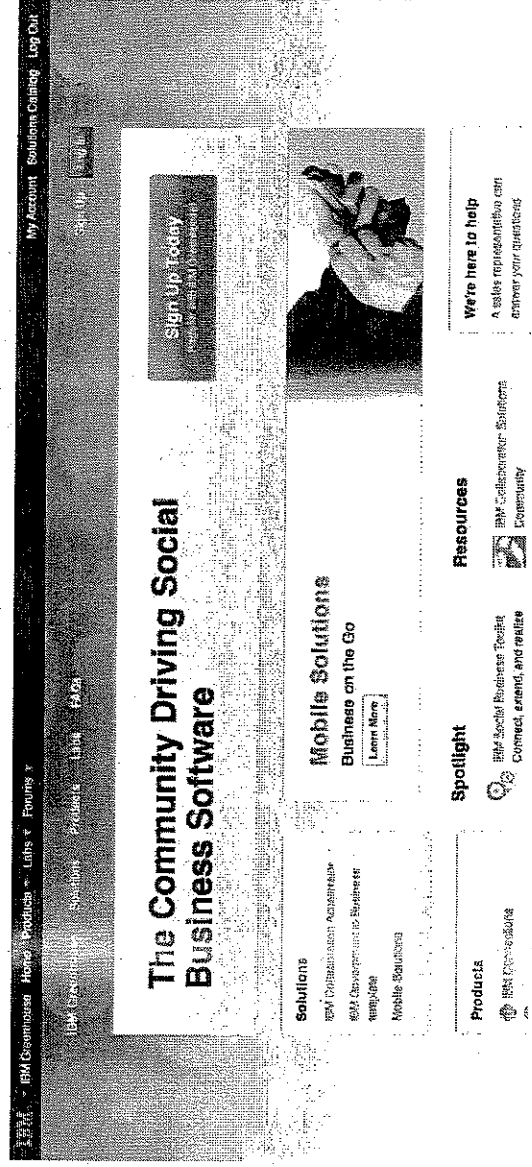
Pre-contest Communication

- All communication before the contest will be held at IBM Greenhouse

- <http://greenhouse.lotus.com/>

- Following material will be shared on this community

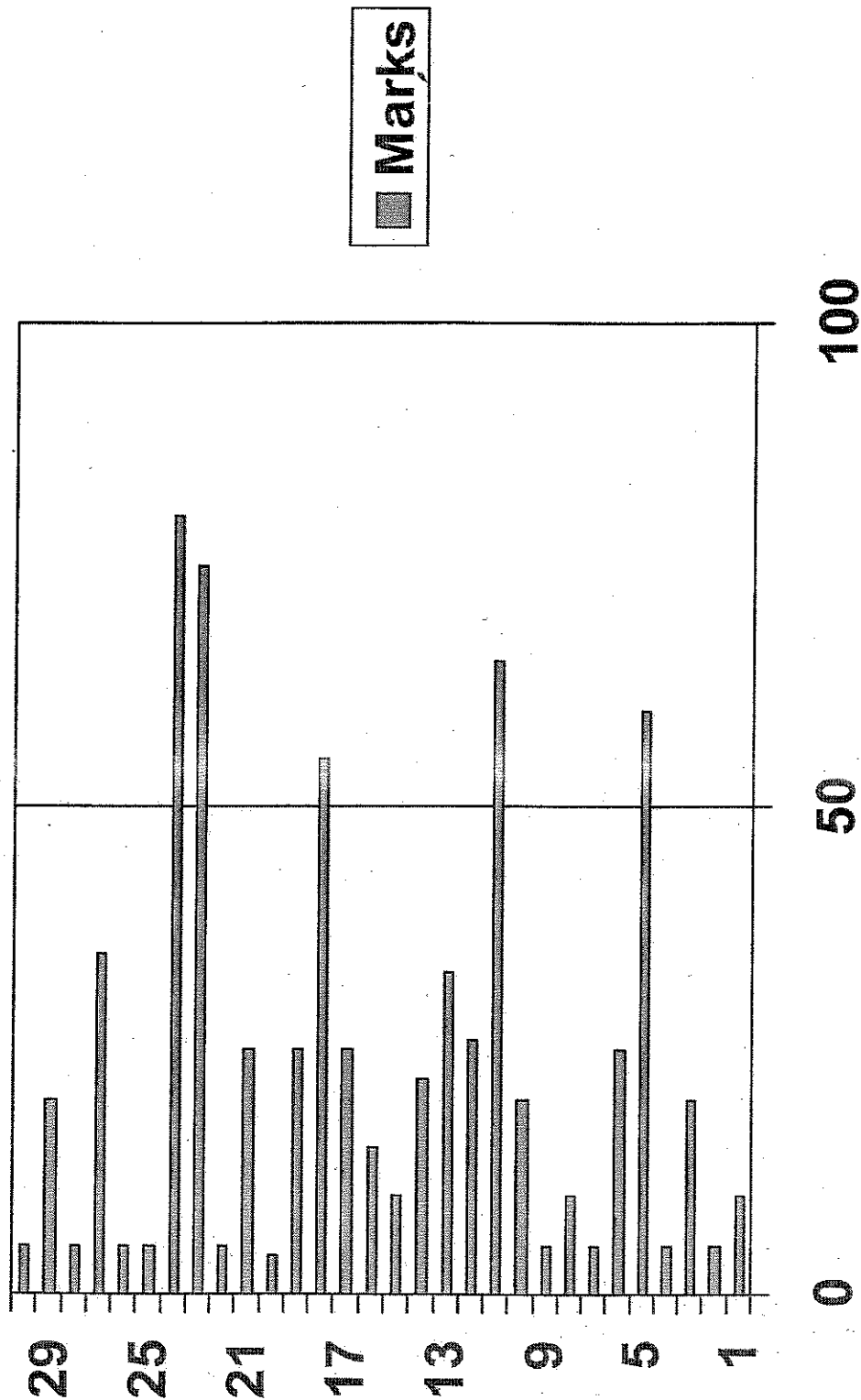
- Training Material
- Pre-contest Material
- Public Announcement
- Q&A



Contest PC Setup

- Networked student PC and Instructor PC (Similar configuration with the training material)
- One set of keyboard, mouse and a TFT flat screen

Team Scoreboard (will be refreshed every 15 mins)



Announcement

- Announcement will be published to the projector and by voice.

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CORPORATION
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MIDLAND AVENUE
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Question Overview

1/8/2013



Two Types of Questions

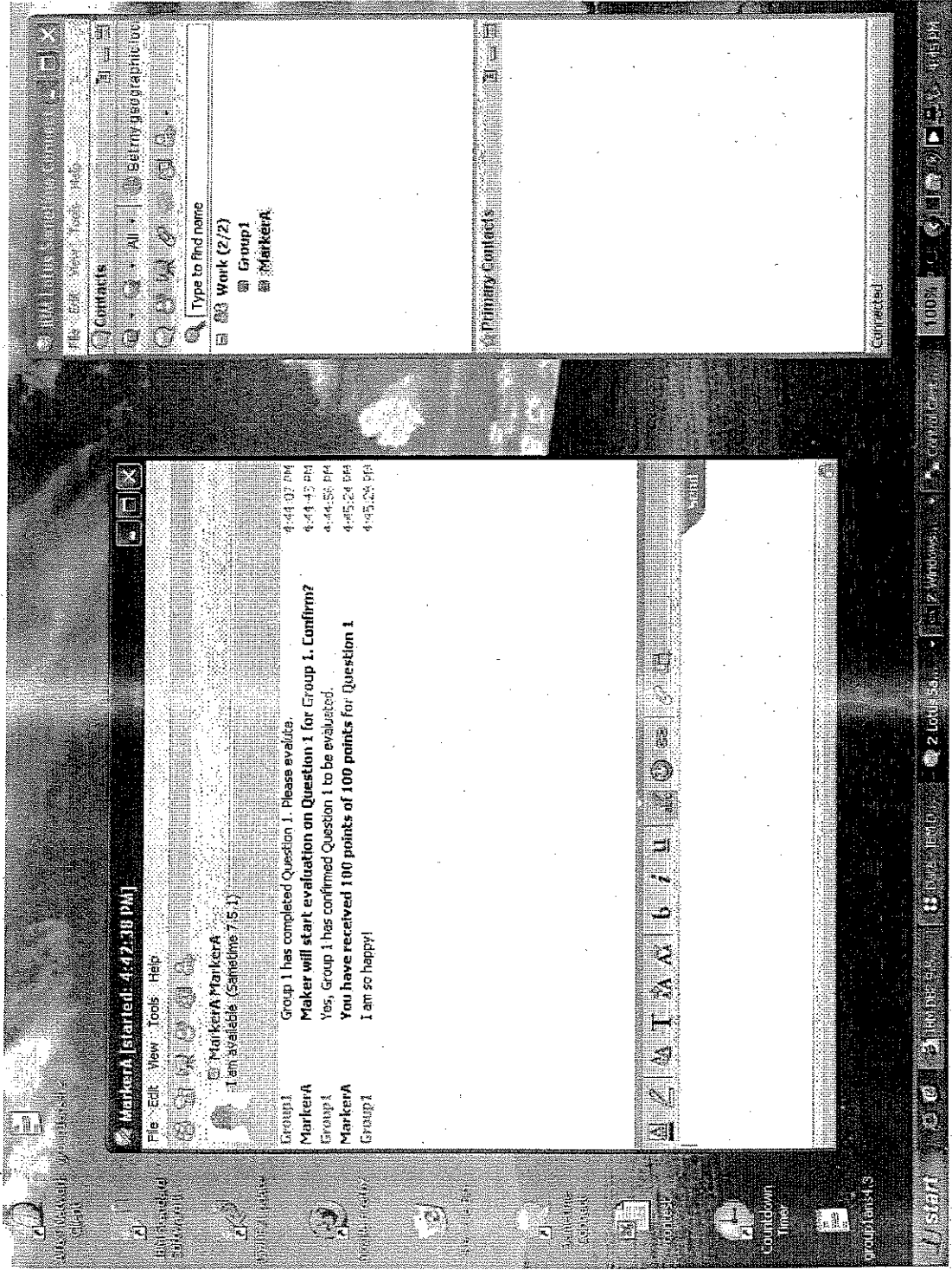
- Section 1 : Multiple Choices
 - Choices of A, B, C and D
 - Can only submit all the answers **ONCE**
- Section 2 : Programming Questions
 - Need to perform programming work
 - Answer will be submit to judge in the format according to the question instructions
 - Judge will check the correctness of the answer by running your program
 - Can submit answers up to three times

Distribution of Points

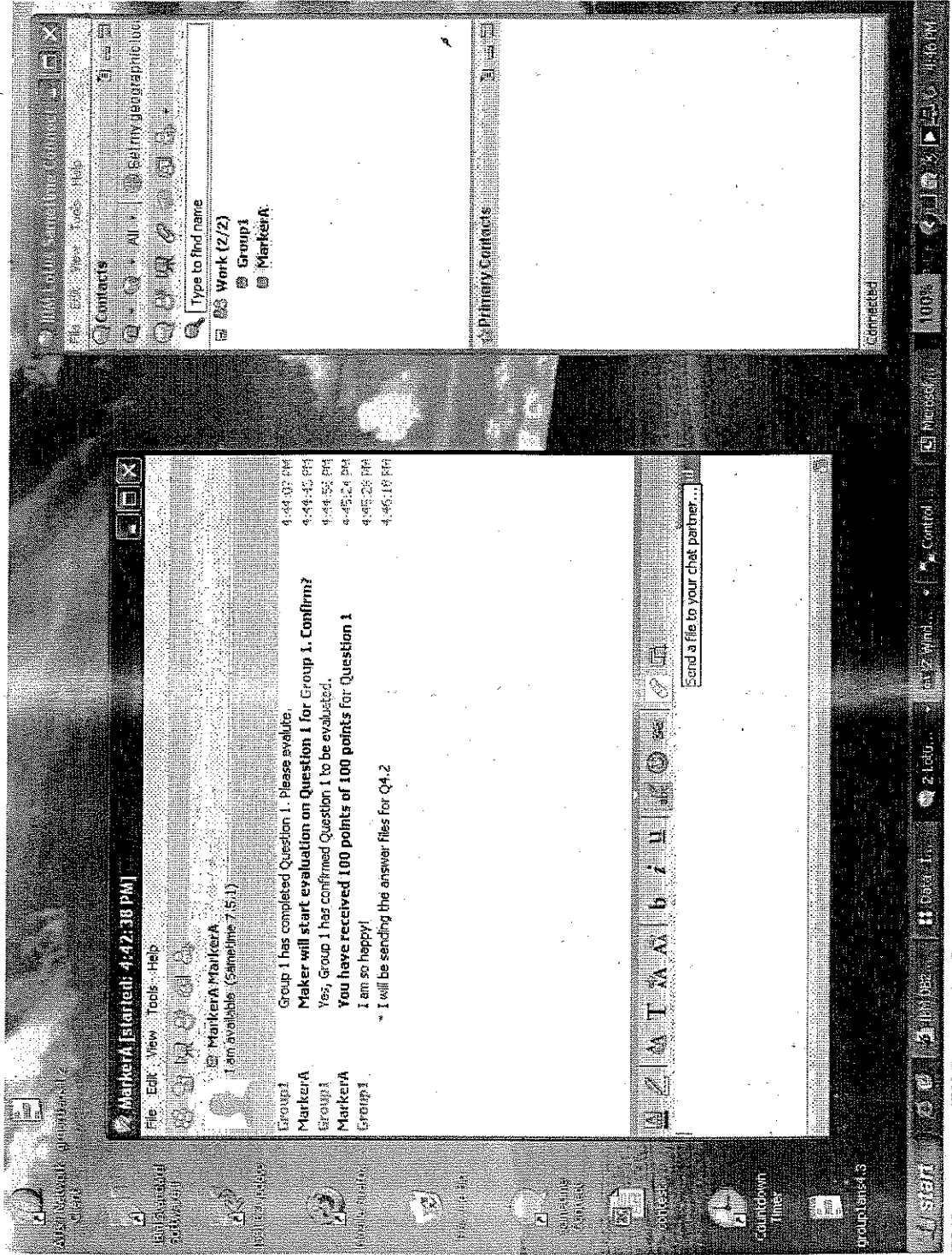
Question Number	Difficulty (* to *****)	Point
1.1	*	10
1.2	*	10
1.3	*	10
1.4	*	10
1.5	*	10
1.6	**	20
1.7	**	20
1.8	*	20
1.9		20
1.10		20
Section 1 Total		150
2.1	***	80
2.2	****	200
2.3	**	80
2.4	***	130
2.5	*	80
2.6	*	80
2.7	****	200
Section 2 Total		850
Grant Total		1000

Sample Points

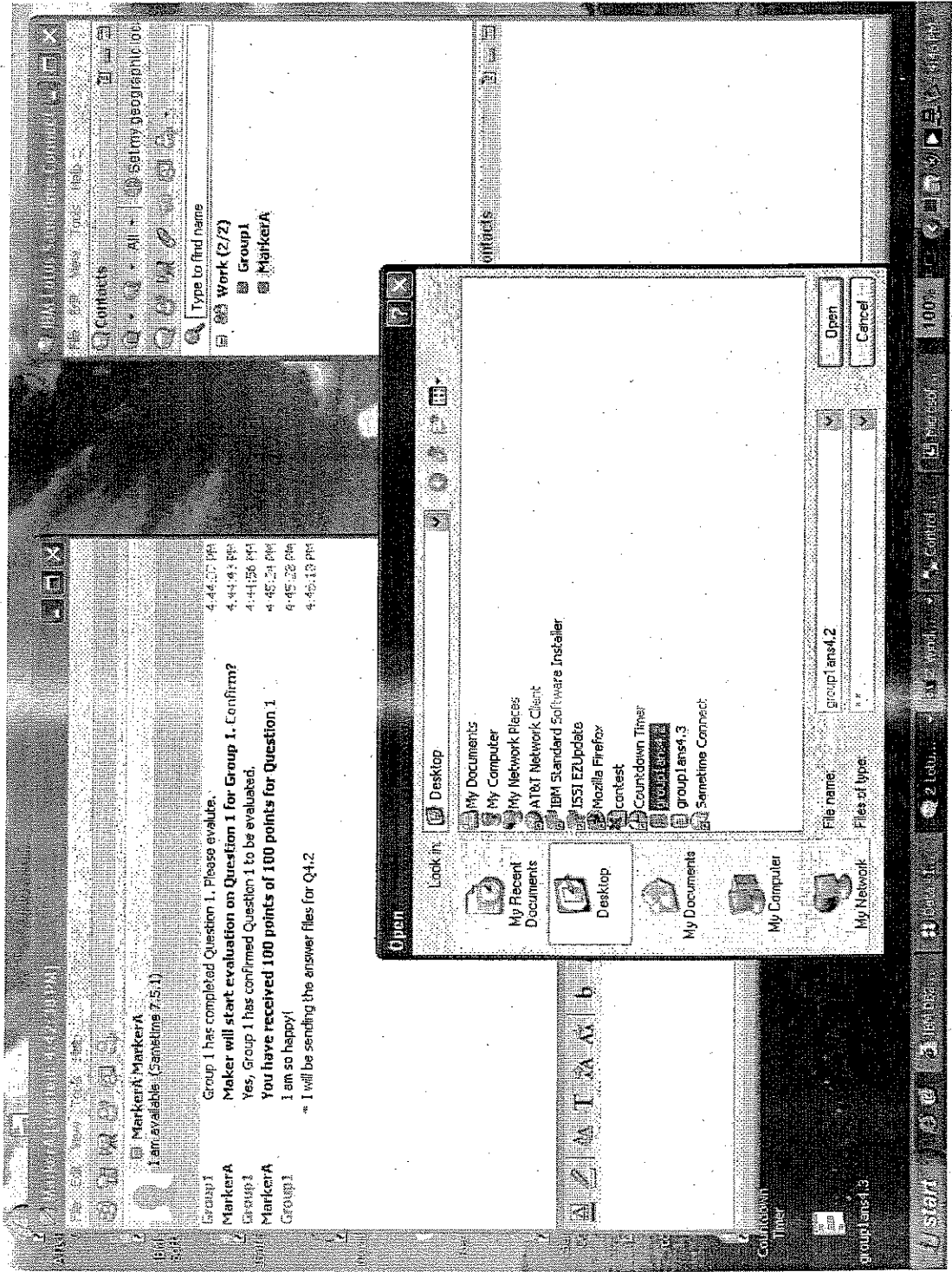
Using Sametime to Submit Answers (1)



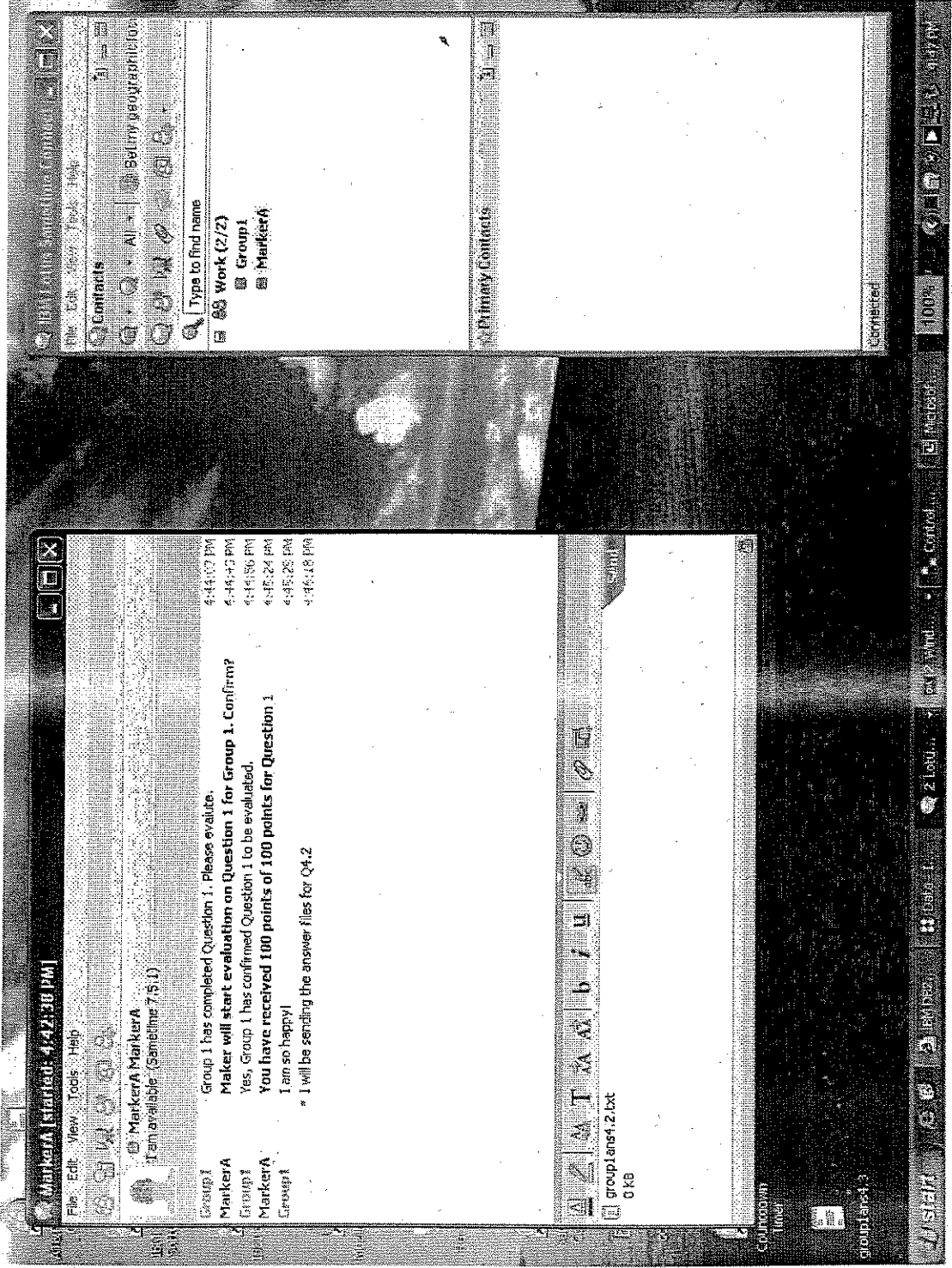
Using Sametime to Submit Answers (2)



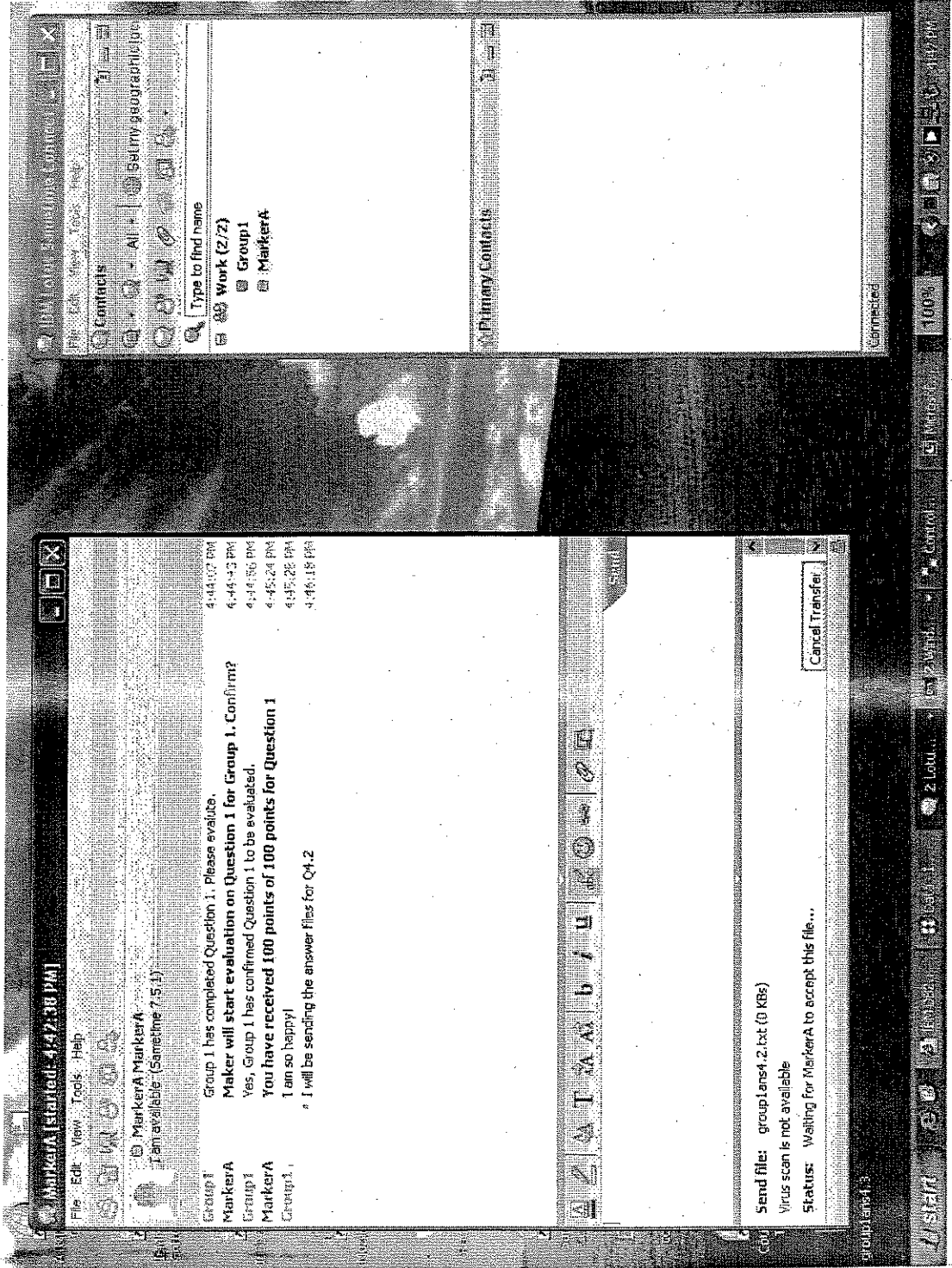
Using Sametime to Submit Answers (3)



Using Sametime to Submit Answers (4)



Using Sametime to Submit Answers (5)



Using Sametime to Submit Answers (6)

The screenshot displays the IBM Sametime application window. The title bar reads "MarkerA [started: 4:42:38 PM]". The menu bar includes "File", "Edit", "View", "Tools", and "Help". The main chat area shows a conversation with "MarkerA" who is "Available (Sametime 7.5.0)". The chat history includes:

- Group 1: Group 1 has completed Question 1. Please evaluate.
- MarkerA: Maker will start evaluation on Question 1 for Group 1. Confirm?
- Group 1: Yes, Group 1 has confirmed Question 1 to be evaluated.
- MarkerA: You have received 100 points of 100 points for Question 1
- Group 1: I am so happy!
- Group 1: I will be sending the answer files for Q4.2
- Group 1: C:\Documents and Settings\jib2-admin\workspace\group1\ans4.2.txt: File transfer completed. :)

On the right side of the chat window, there is a "Send" button and a "Close Section" button. Below the chat area, a status bar shows:

- Send file: group1ans4.2.txt (0 KBs)
- Thus scan is not available
- Status: MarkerA has received this file.

The bottom of the screen shows the Windows taskbar with the clock at 4:47:30 PM on 1/8/2013. The system tray includes icons for "Ustream", "Countdown Timer", and "group1ans4.3".

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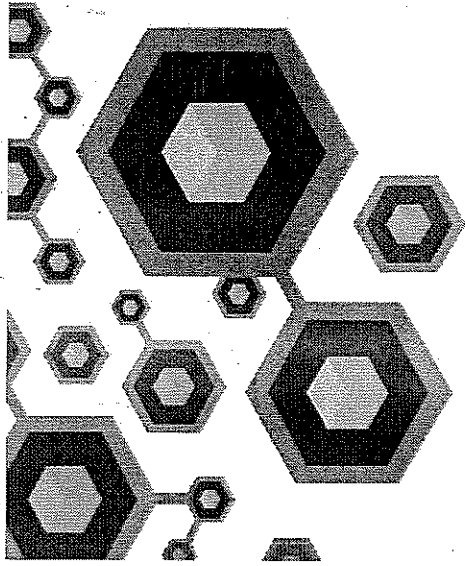
Agenda

- 9:15am - 9:30am: Introduction, contest environment walkthrough
- 9:30am – 10:30am: IBM Connection with LAB
- 10:30am - 11:30am: IBM Cognos with LAB
- 11:30am - 12:30pm: IBM Big Fix with LAB
- 12:30pm – 2:00pm: Lunch
- 2:00pm - 2:30pm: Rational
- 2:30pm - 3: 30pm: IBM WorkLight with LAB
- 3:30pm - 4:30pm: IBM DB2 with LAB

QUESTIONS & ANSWERS



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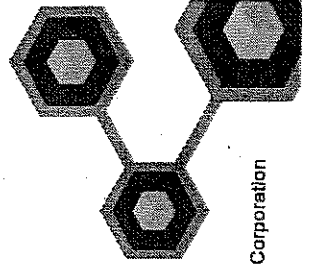
IBM Business Analytics is a leading provider of analytics solutions, helping organizations make data-driven decisions. It includes a wide range of tools and services, from data integration and cleansing to advanced analytics and reporting. IBM Business Analytics is designed to be easy to use and integrate with existing systems, making it a valuable asset for any organization looking to improve its performance.

IBM Business Analytics

Delivering a positive experience with customer analytics

Alex Hung – Client Technical Professional

Business Analytics software

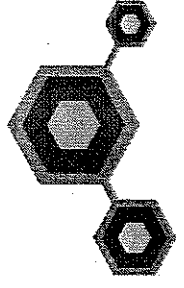


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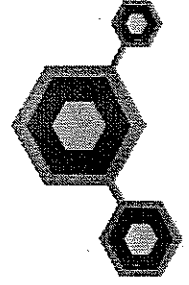
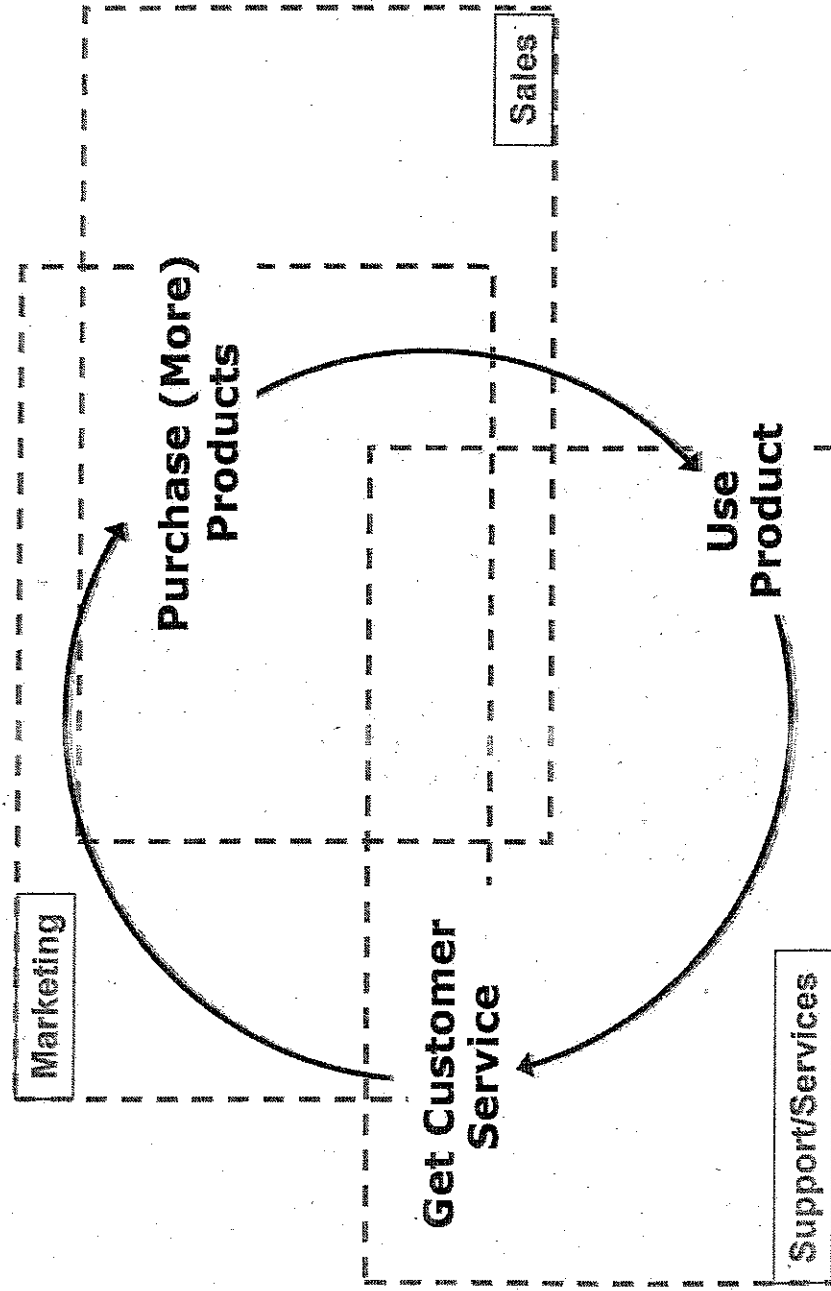
Session objectives

■ In today's session we will cover:

- The Crisis: The Age of the Empowered Consumer
- The Course of Action: Use of analytics to better understand and focus on customers
- The Conclusion: How organizations are using customer analytics to gain advantage



Consumer Experience Framework – 10 years ago

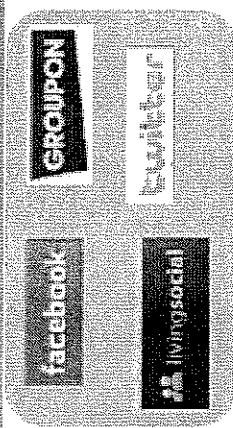


The consumer has taken charge...



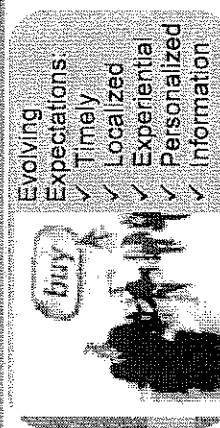
Customers have lost confidence in institutions

- 76% of customers believe companies lie in advertisements
- Growing trust gap in many consumer focused industries



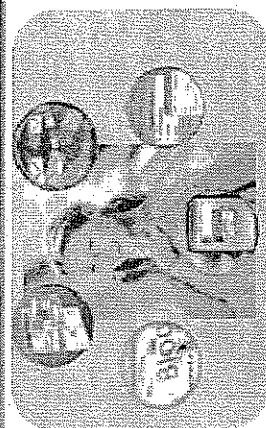
Technology is changing how customers interact

- Social media changed purchaser influence; opinions viewable instantly
- Mass customization and personalization of products and services



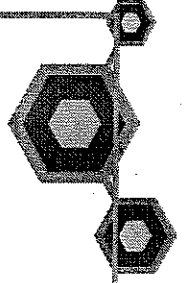
Expectations have changed

- Focus is on value, transparency and accountability
- Customers want to be seen holistically across the enterprise

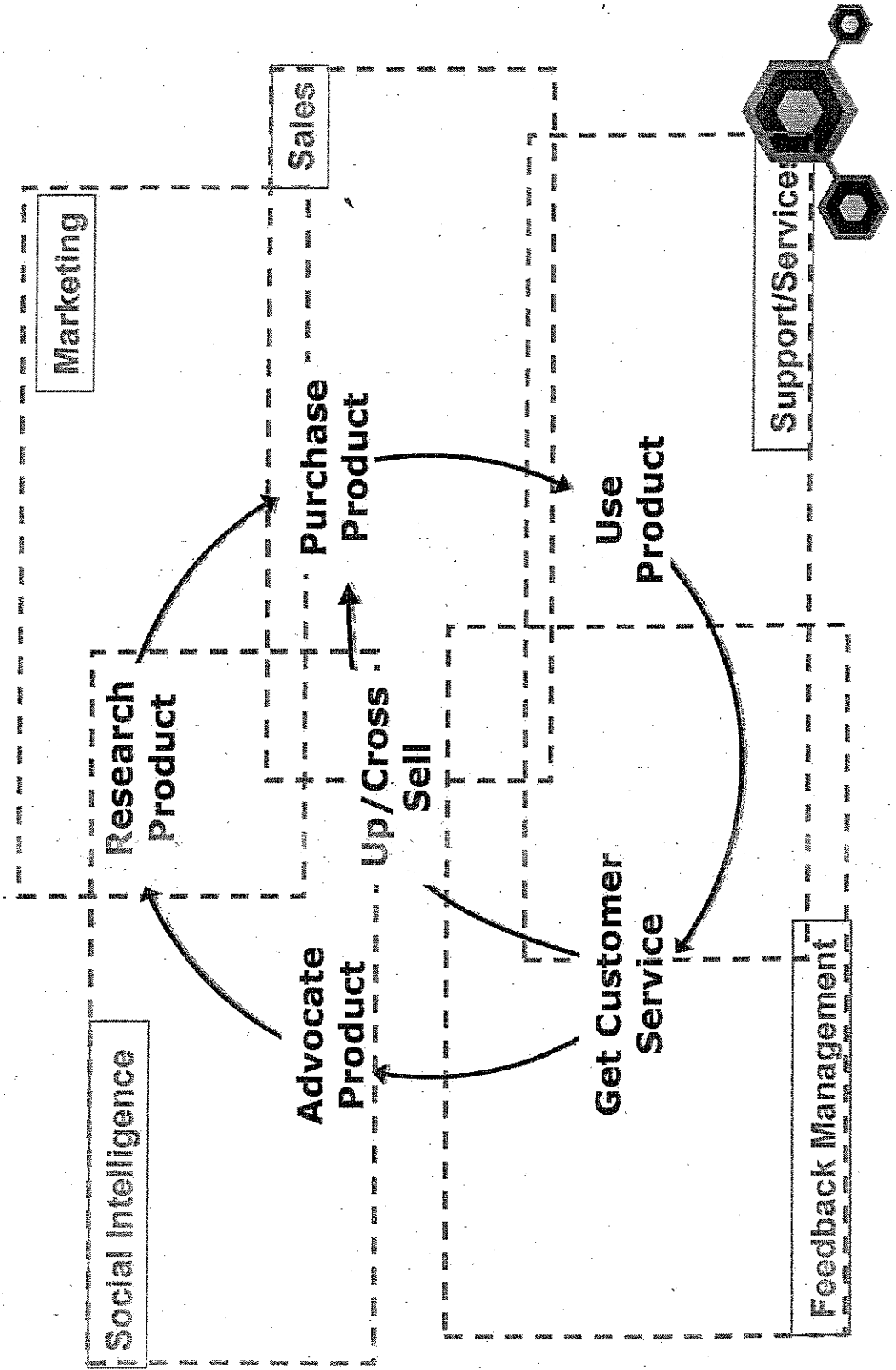


Institutions need to rediscover their customers

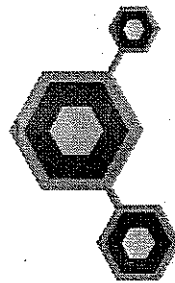
- Consumers are experiencing brands in new ways though new channels
- Micro-targeting: the move beyond 1 on 1 is accelerating



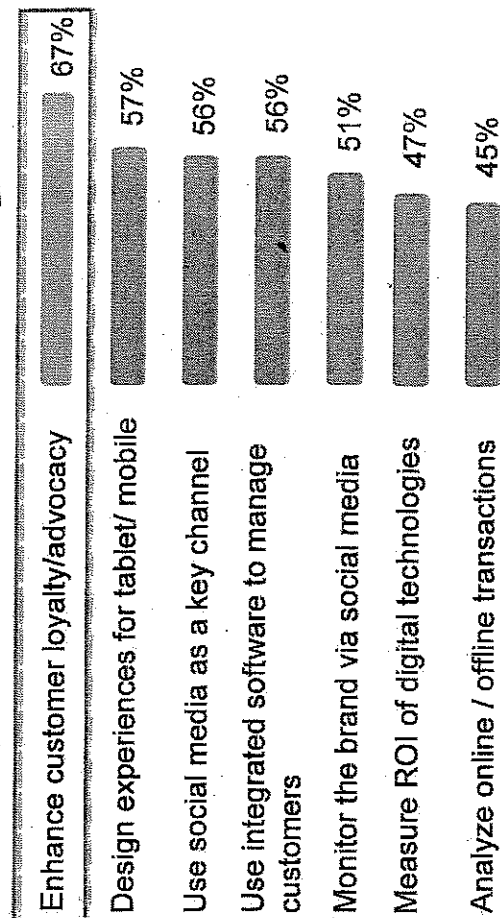
Customer Experience Framework today



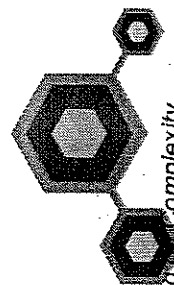
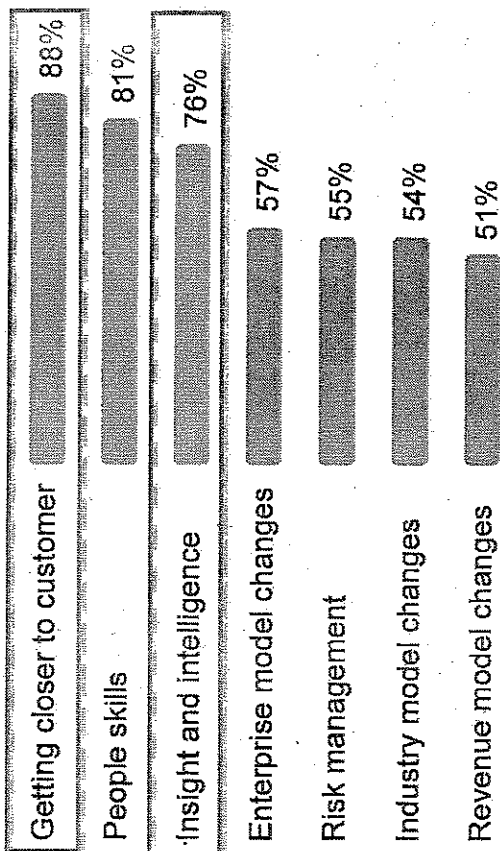
THE COURSE OF ACTION



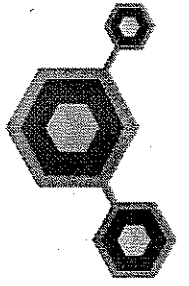
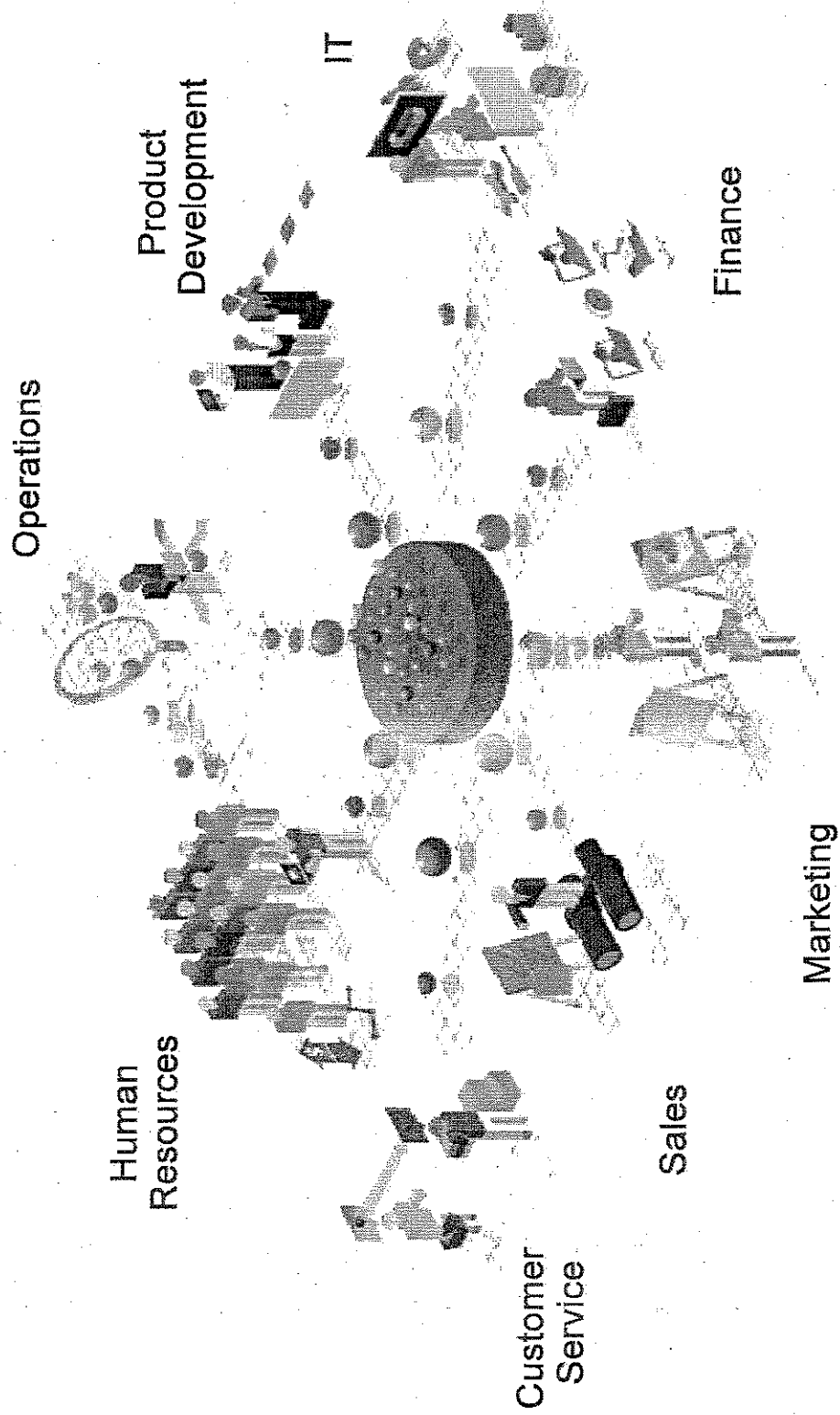
CMO 5 Year Focus Toward Digital



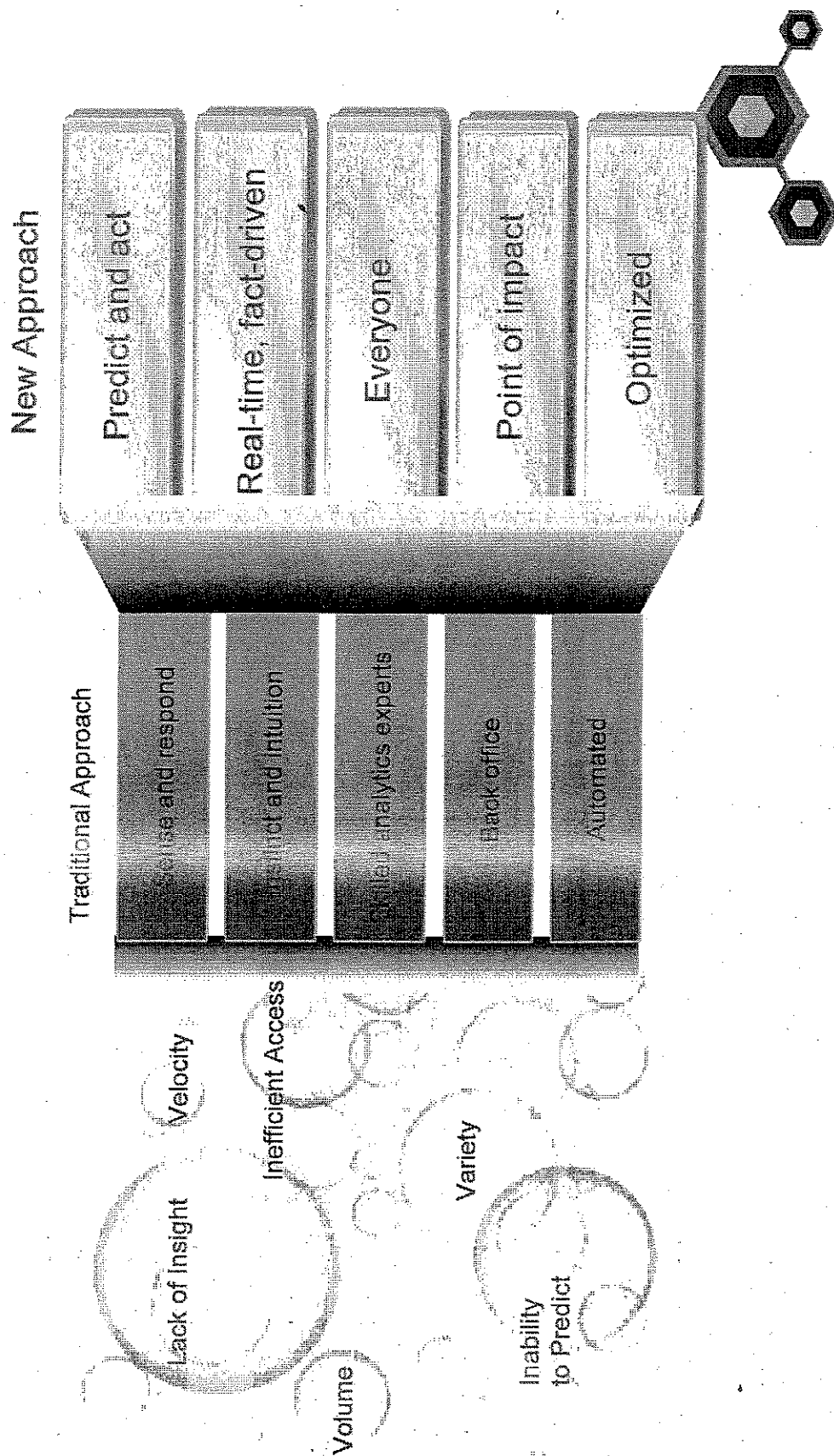
CEO Focus Over Next 5 Years



The customer experience is an enterprise responsibility



New business challenges create a need for analytics



Data at the heart of customer analytics

High-value, dynamic - source of competitive differentiation

Interaction data

- E-Mail / chat transcripts
- Call center notes
- Web Click-streams
- In person dialogues

Attitudinal data

- Opinions
- Preferences
- Needs & Desires
- Market Research
- Social Media

360 degree



Customer View

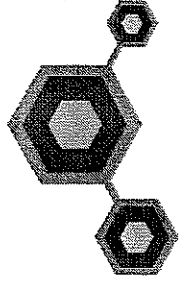
Descriptive data

- Attributes
- Characteristics
- Self-declared info
- (Geo)demographics

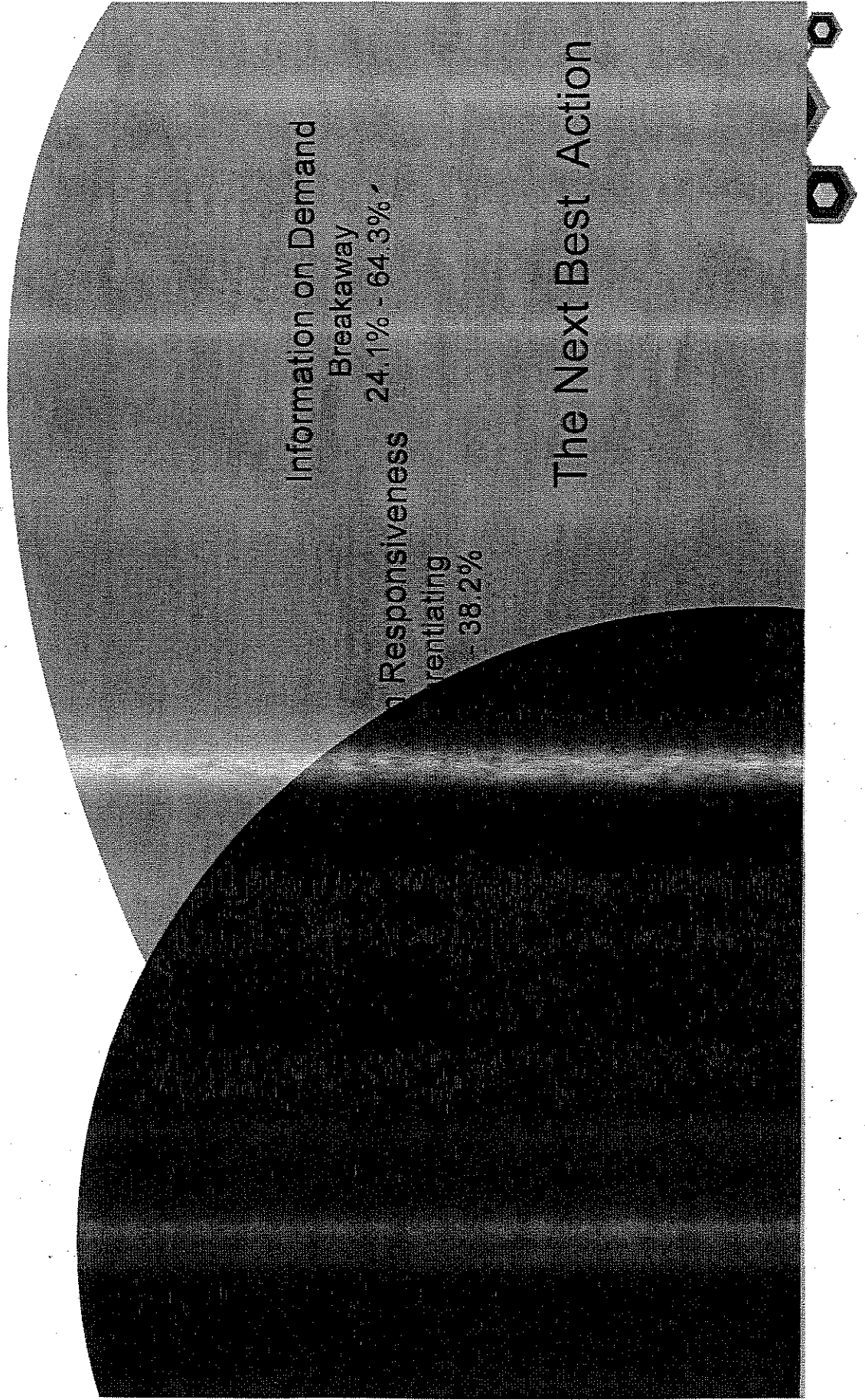
Behavioral data

- Orders
- Transactions
- Payment history
- Usage history

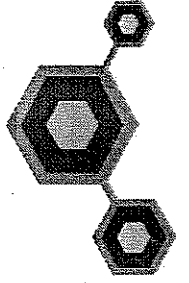
"Traditional" - CRM Mentality



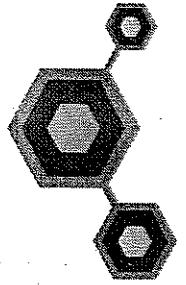
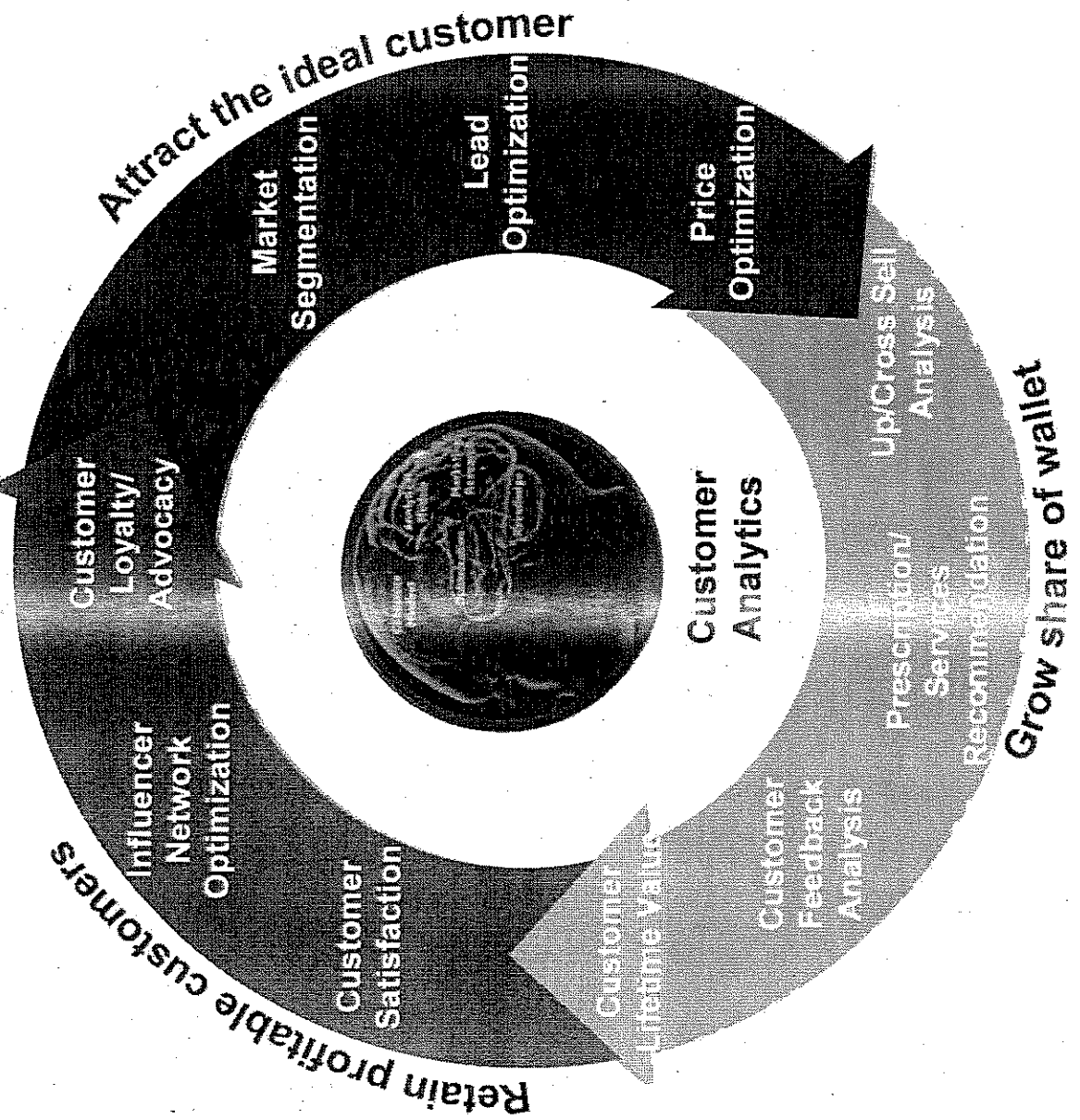
Customer analytics maturity model



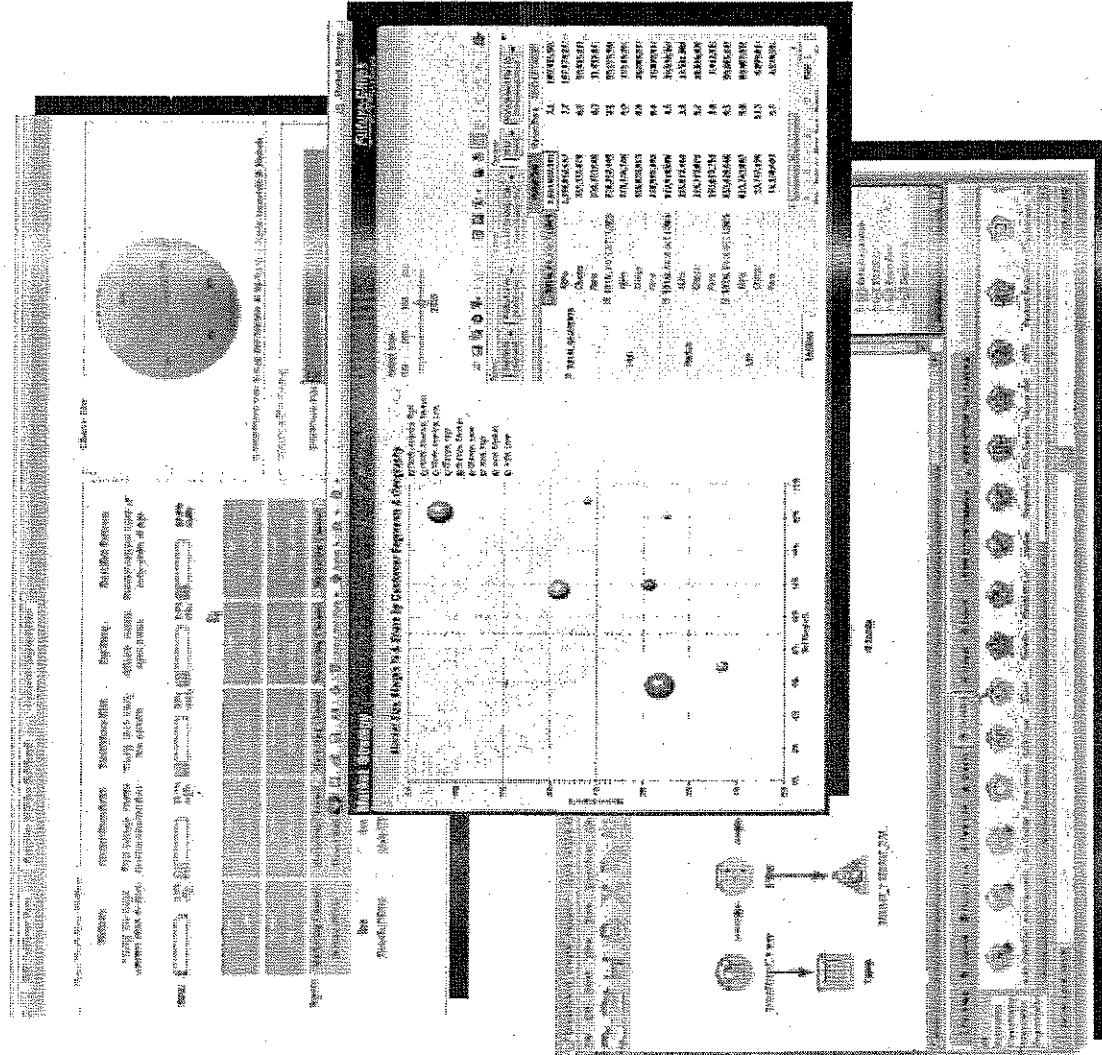
THE CONCLUSION



Customer experience framework – From the enterprise viewpoint



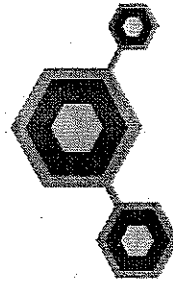
Customer insight & acquisition



Measure marketing performance through reporting

Optimize marketing budgets aligned with goals

Build accurate customer segments to determine the right offer, time, place, channel, etc...



Insight & acquisition – Techniques & solutions

- **RFM Analysis**
 - Cheap (low overhead) way to segment a database of customers
 - *Example: determine the groups of people for a coupon marketing offer*
- **Segmentation**
 - Ability to find hidden clusters / groups of people
 - *Example: identifying the people that are likely to buy*
- **Reporting & Analysis**
 - Provide historical and current views of business operations
 - *Example: provide insight into how a current sales campaign is performing*
- **Planning & Forecasting**
 - What-if analysis to drive timely decision making
 - *Example: determine the optimal marketing plan based on a set budget*

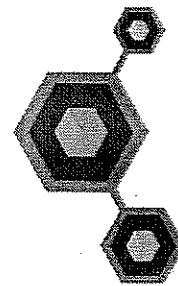
**Customer
Segmentation**

**Cross-Channel
Campaign Optimization**

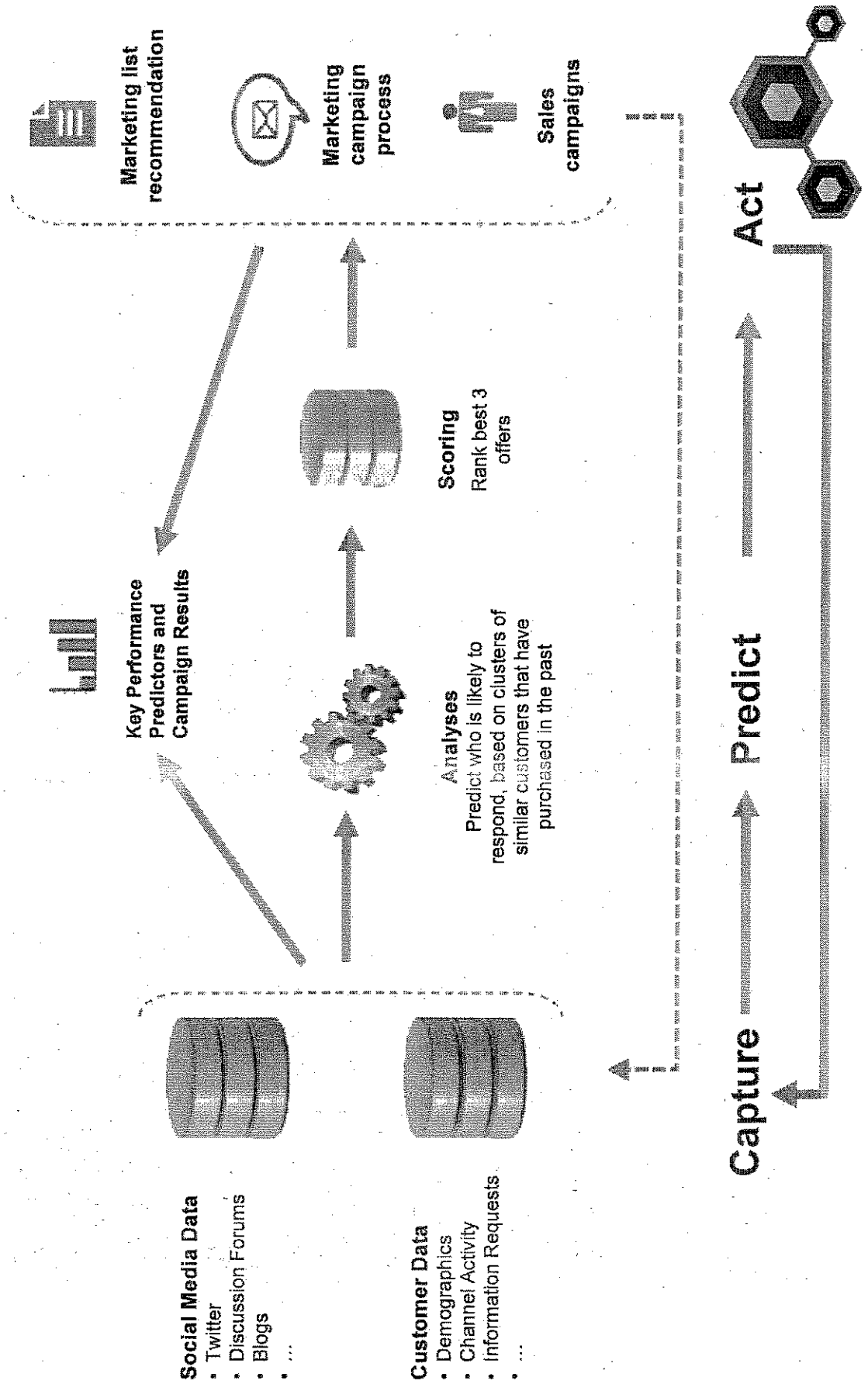
**Optimal Trigger
Marketing**

Lead Management

Budget Optimization



Customer insight & acquisition journey



Avis Europe

Uses predictive analytics to get more mileage from e-mail marketing campaigns



The Need

Avis Europe sends out more than 18 million e-mail offers each year to car rental customers and prospects across the UK, France, Germany, Italy and Spain. Getting the highest return on investment (ROI) for these marketing efforts depends on delivering personalized content. The company needed a way to gain deeper insight into customer data to better predict personal interests, improve customer retention and increase rental opportunities.

The Solution

Avis Europe selected a leading predictive analytics solution to research online activity and develop customer profiles. The solution enables the company to look at histories of "clicks" on its e-mails and combine that information with internal data to customize every e-mail an individual receives. For example, in the summer months, prospects between the ages of 25 and 35 might receive more offers to rent a convertible at special rates.

What Makes it Smarter

- Transforms one-size-fits-all marketing campaigns into highly personalized e-mail communications based on predictive analysis. The solution has enabled Avis Europe to boost revenue and ROI while cutting marketing costs by 50 percent.
- Captures and analyzes e-mail "clicks" from over 880,000 individual recipients.
- Addresses interconnected business objectives from across the organization to provide a competitive advantage in attracting and retaining customers.

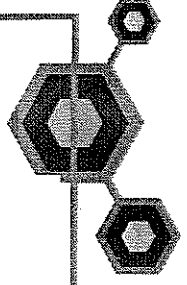
"The ability to identify and stay ahead of customers' ever-changing activities and needs is key to Avis' competitiveness in the market. We now have a much more clearly defined picture of every individual customer."

— Chris Parker, Direct Analytics Specialist, Avis Europe

Solution components:

- IBM® SPSS Predictive Analytics Software
- IBM Global Technology Services

AVIS.



[illegible]

Target customers with the correct offer, channel, & time

Personalize up-sell & cross-sell offers with social media data



Customer lifetime value – Techniques & solutions

Association

- Finding the things done in tandem
- *Example: market basket analysis: students curriculums, insurance policies that are bought together*

Classification

- Identifying the attributes that are causing something
- *Example: give the cascading predictive attributes of purchase behavior*

Scorecards & Dashboards

- Translate strategy into accountability & measure progress
- *Example: monitor the continued success of cross-sell campaigns*

Market Basket Analysis

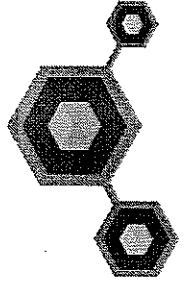
Next Best Offer

Prospect Assessment

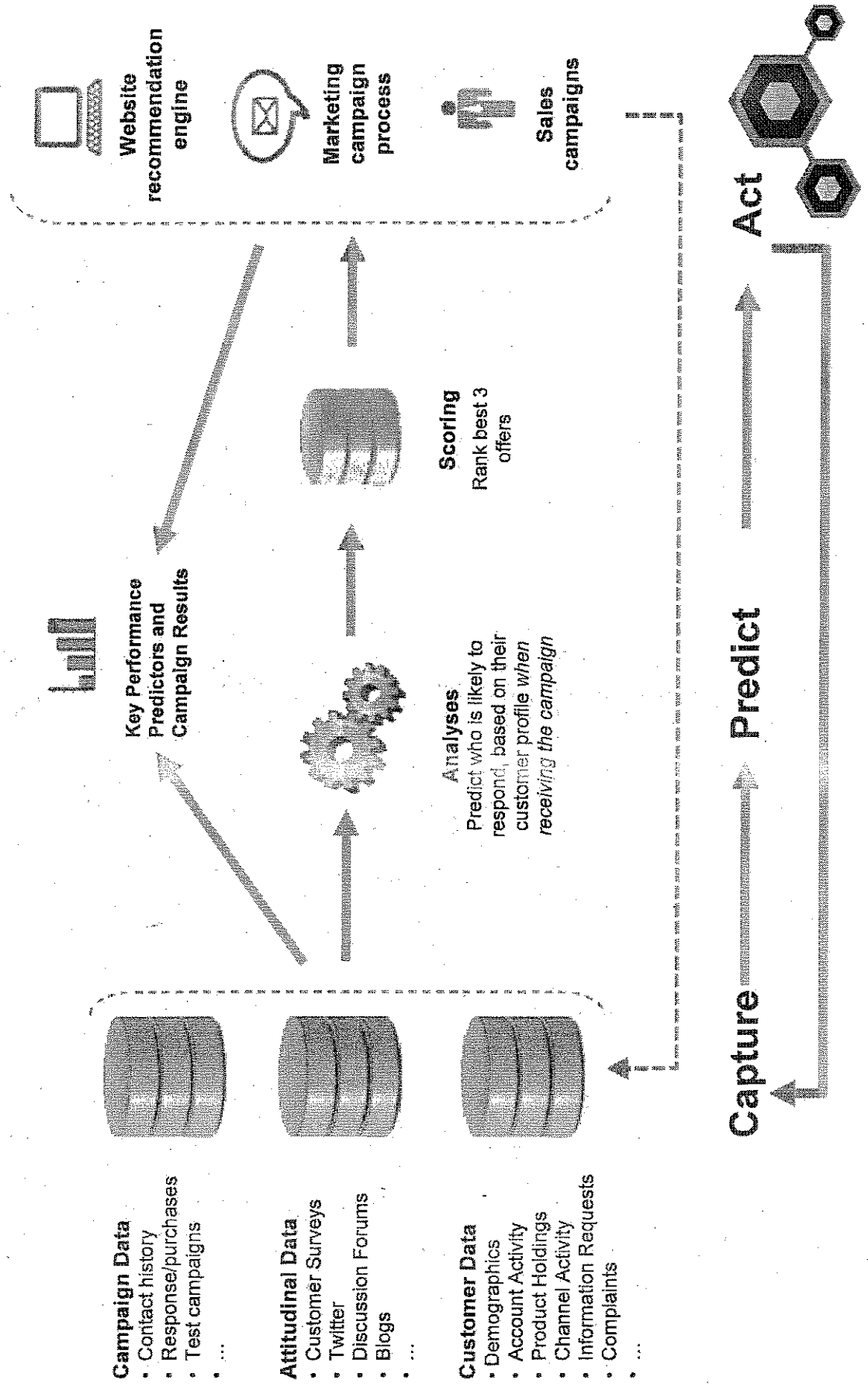
**Value pricing
Optimization**

**Buying Process
Optimization**

**Proactive Activation
Service**



Customer cross-sell journey



First Tennessee Bank

Leadership Series | Banking | North America

What if predictive analytics could bring science to Optimizing scarce marketing resources?

Banks today have more ways to communicate with customers, but this also made it harder for them to figure out where and how to most profitably commit their marketing resources.

The Opportunity

The banking market is defined by increasing competitive intensity and strategic challenges, not the least of which is how to optimally focus marketing resources. Banks offer a more diverse portfolio of services than before, and they do so over a wider range of channels. While this trend has given banks more latitude to compete, it has made formulating and modulating marketing strategies, tactics and programs considerably more complex. To optimize how they invest in them, banks need to continually measure their effectiveness, learn what works and adapt over time.

What Makes It Smarter

Leveraging predictive analytics, First Tennessee Bank is combining a granular understanding of the needs of customer segments with real P&L data to optimize its marketing spend, focusing on programs that deliver the highest ROI. First Tennessee's model relies on constantly updated customer account information, enabling it to detect changes in service consumption patterns and preferences. Blending customer segment profiles with profitability data enables First Tennessee to identify and target the most attractive segments. Its predictive analytics provides the basis to shift marketing resources from lower performing programs to those with the highest ROI.

Solution Components

- IBM SPSS® Modeler
- IBM SPSS® Statistics
- IBM Cognos® Customer Analytics

Real Business Results

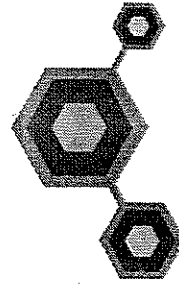
- 600% overall return on its investment through more efficiently allocated marketing resources
- 3.1% increase in marketing response rate through more accurate targeting of offers to high-value customer segments
- 20% reduction in mailing costs and 17% reduction in printing costs due to the ability to target the most attractive segment for specific offers



powering your dreams™

"Our aim was to shift from the 'marketing-as-an expense' mindset to the idea that marketing is a true profit driver."

-- Dan Marks
Chief Marketing Officer



Customer satisfaction & loyalty

Call Center

Customer Profile

Customer Data

Customer History

Customer Segments

Customer Journey

Customer Feedback

Customer Retention

Customer Churn

Customer Lifetime Value

Customer Satisfaction

Customer Loyalty

Customer Engagement

Customer Advocacy

Customer Referrals

Customer Reviews

Customer Ratings

Customer Comments

Customer Questions

Customer Answers

Customer Suggestions

Customer Complaints

Customer Praises

Customer Criticisms

Customer Recommendations

Customer Warnings

Customer Alerts

Customer Notifications

Customer Updates

Customer Changes

Customer Deletions

Customer Restorations

Customer Archiving

Customer Backup

Customer Recovery

Customer Migration

Customer Integration

Customer Interfacing

Customer Networking

Customer Collaboration

Customer Communication

Customer Interaction

Customer Relationship

Customer Connection

Customer Linkage

Customer Association

Customer Affiliation

Customer Membership

Customer Participation

Customer Involvement

Customer Commitment

Customer Dedication

Customer Devotion

Customer Loyalty

Customer Fidelity

Customer Allegiance

Customer Devotion

Customer Dedication

Customer Commitment

Customer Involvement

Customer Participation

Customer Affiliation

Customer Association

Customer Linkage

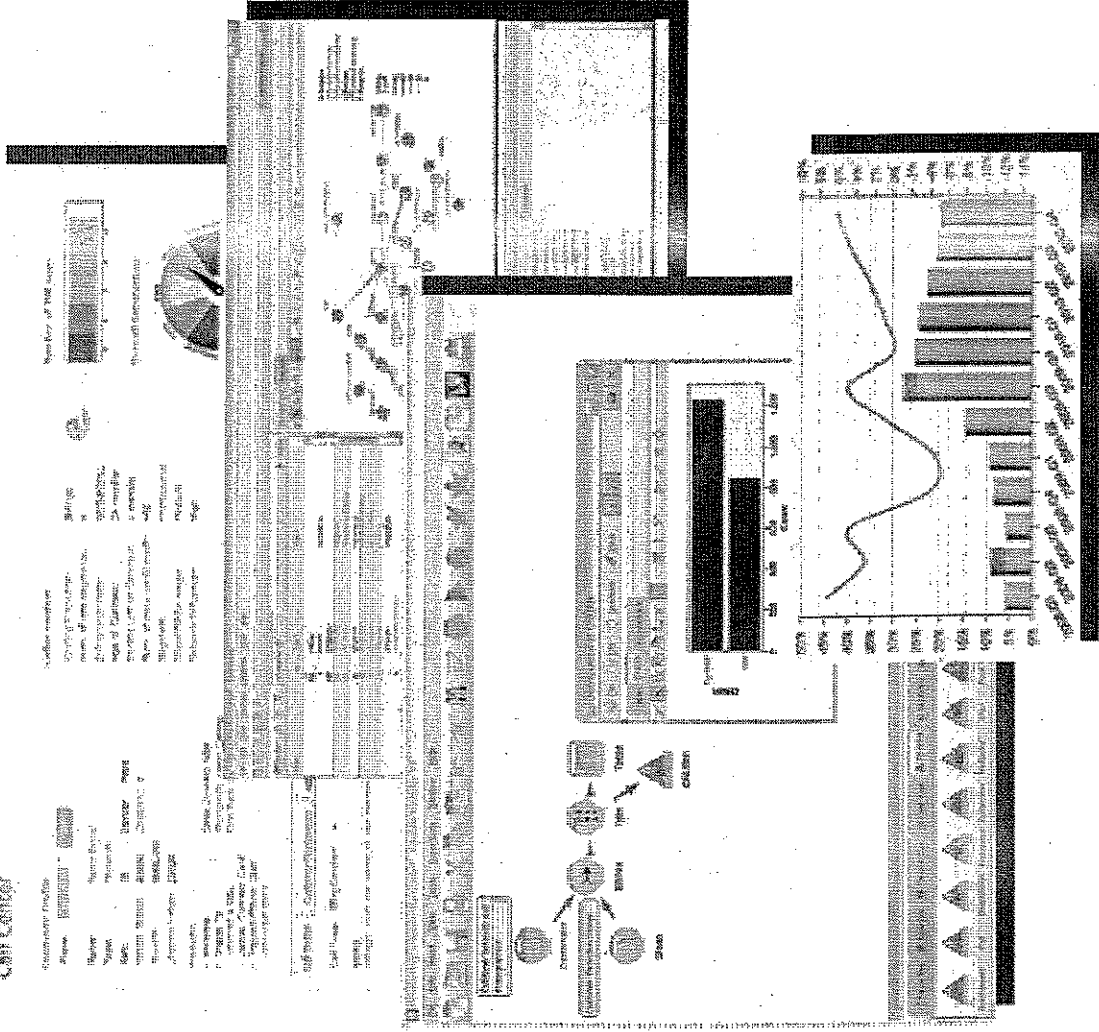
Customer Connection

Customer Relationship

Customer Interaction

Customer Communication

Customer Collaboration



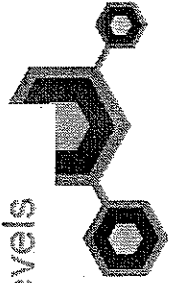
Detect & mitigate customer issues during interactions

Understand causal factors for satisfaction / dissatisfaction

Incorporate sentiment from social media, surveys, etc...

Retain valuable customers by identifying defection probability

Continually monitor & track customer service levels



Customer satisfaction & loyalty – Techniques & solutions

Net Promoter Score

- Survey technique to determine customer satisfaction
- *Example: a question to determine whether a customer is a promoter detractor*

Sentiment Analysis

- Taking unstructured data and put it into an organized, structured format
- *Example: sentiment analytics for customer satisfaction in surveys & social media*

Anomaly Detection (outliers)

- Finding data points that are statistically significant in their difference from others
- *Examples: understand the best performing customer group / comment that doesn't fit / behavior that doesn't follow the norm*

Brand Monitoring

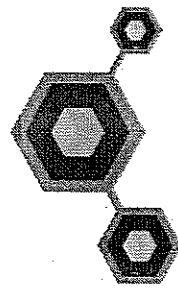
Social Feedback Analysis

Competitive Value Assessment

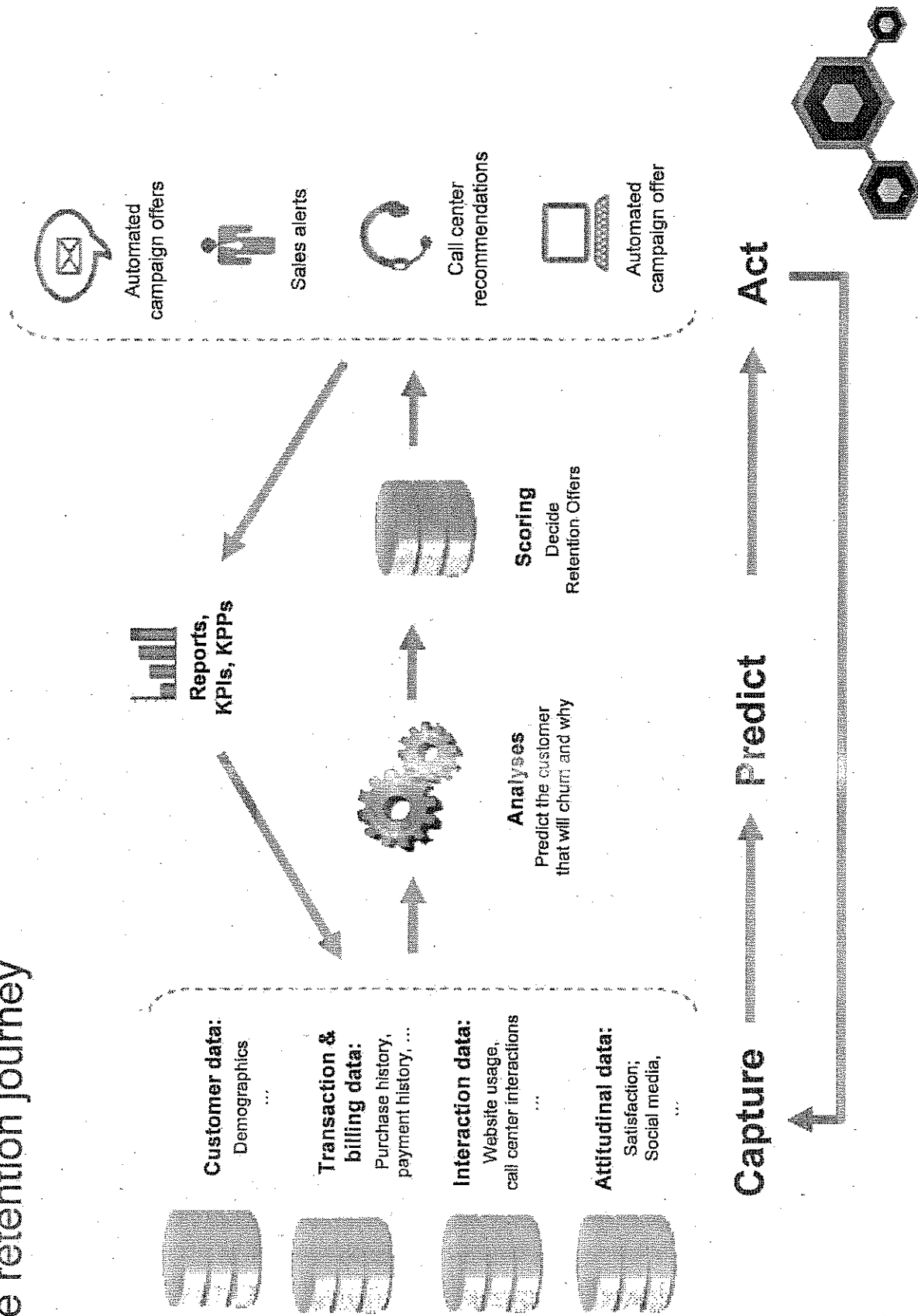
Loyalty Value Assessment

Customer Dialog Management

Retention Risk Management



The retention journey



XO Communications

What if predictive analytics could reduce customer churn?

To improve its small business retention rate, a U.S. telecommunications company is using predictive analytics to anticipate voluntary customer defections.

The Opportunity

XO Communications needed to identify which of its small business customers were at the highest risk of switching to a competitor.

What Makes it Smarter

Understanding critical data is key to identifying risk factors. XO Communications deployed an IBM SPSS predictive analytics solution that evaluates more than 500 variables for predicting customer defections within 90 days. That allowed the Customer Intelligence team at XO to build an accurate regression model keying on the 25 most relevant variables. Using this information, the client service managers can then proactively prioritize outbound calls to at-risk accounts.

Solution Components

- IBM SPSS® Statistics and Modeler

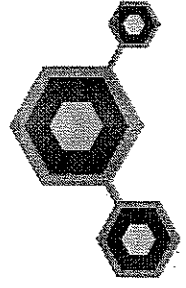
Real Business Results

- 60 percent improvement in revenue retention rates
- Realizing millions of dollars in annualized revenue protection
- Fewer client services managers are needed for the same level of risk coverage

XO Communications

"By enabling our client services managers to prioritize their proactive outbound calls – basically, a 'health check' on the customer – we can cover more risk with our existing Client Services team. It's been a very successful business model for us and has helped us organize our resources better."

-- Trent Taylor, Director
Customer Intelligence, XO Comm.



BBVA - Banco Bilbao Vizcaya Argentaria

What if your bank could measure and manage its reputational risk on social media and Internet sites?

- This global bank implements a customer insight solution that helps it measure Internet sentiment about the bank, and enables it to challenge negative opinions, build on positive ones, and generally improve the bank's reputation

The Opportunity

As a leading bank in Spain and South America, and with a presence in the USA, BBVA has been working for several years to strengthen the BBVA brand around the world. Monitoring and assessing reputational risk – negative sentiment about the bank that may become widely disseminated and impact the bank's business reputation – is a key element of the bank's global strategy. The bank set out to implement its "Global Vision on Reputational Risk," to standardize and deploy a single tool for the entire BBVA Group, where the branches work with the same sample, report template and methodology to determine sentiment toward the bank as expressed via the Internet, and to measure reputational risk. The ultimate goal of the project was to enable the bank to detect, assess, and respond to threats to its reputation before they could become a significant problem for the bank.

What Makes it Smarter

Banks cannot control what is posted about them on the Internet and social media sites, but they must be aware of and respond to such postings to reduce their reputational risk. This global bank has implemented an automated consumer insight solution to monitor and measure the impact of Internet sentiment about BBVA – whether customer postings in social media (Twitter, boards, Facebook, blogs, etc.), the voice of the experts in postings about BBVA and its competitors, or the mention of BBVA in news sites – to detect possible risks to BBVA's reputation. BBVA can now listen to the voice of its clients and what they think about the bank's services, publicity campaigns, new products, customer service, and president's statements, from a totally new viewpoint. Insights derived from the analytical tool give BBVA the opportunity to meet reputational challenges or continue to build on positive results. For example, the bank can respond to negative (or positive) sentiment by focusing its communication strategies on particular Internet sites, countering (or backing up) the most outspoken authors on Twitter, boards and blogs.

Solution Components

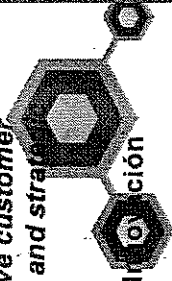
- IBM Cognos Consumer Insight
- IBM Global Business Services (GBS): GBS BAO; GBS CRM; GBS Strategy and Change
- IBM Industry Solutions: FSS: Banking - Front Office Optimization - Customer Insight

Real Business Results

- Provides precise analysis on the global positioning of BBVA over the Web; for example, the global positive sentiment in Q2 2011 has increased by more than 1% and the negative sentiment has been reduced by 1.5%
- Improves global monitoring allowing analytics on results; for example, the number of mentions of the different BBVA brands was similar to the top large global banks in the first half of 2011.
- Improves reliability when comparing results among branches/countries

"Knowing what our customers think about us is essential to implementing effective customer service strategies, new products and strategic goals."

– Carlos Pérez Beruete,
Director, Identidad Corporativa e Imagen



Benefits for IBM customer analytics solutions

Unparalleled Consumer Experience

- Drives personalized engagement across multiple touch points
- High customer satisfaction and loyalty, advocates, results in increased revenues

Optimizing Customer Interactions

- Generates the right offer at the right time, in the right place
- Attract the ideal customer and maximizes customer lifetime value

Customer Analytics

360° View of the Consumer

- Aligns the capacity to deliver with the propensity to buy
- Goes beyond traditional 1:1 interactions

Capabilities



Reporting & Analysis



Scorecarding & Dashboarding



Forecasting & Planning



Predictive Analytics

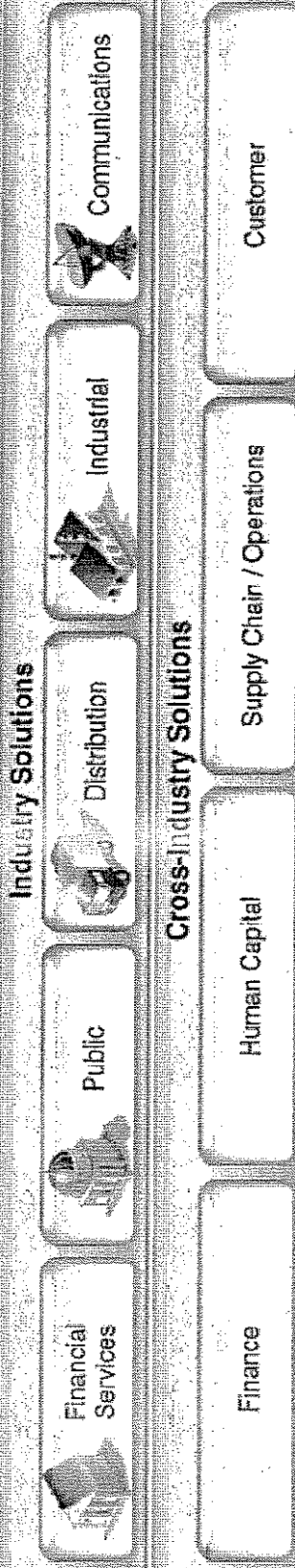


Social / Sentiment Analysis



Decision Management

Business Analytics & Optimization Solutions



Business Analytics



Information Management and Governance



Workload Optimized Systems

Business Intelligence

Business Analytics

Predictive & Advanced Analytics

Financial Performance & Strategy Management

Governance, Risk & Compliance

Analytic Applications

• Full breadth of BI for every decision-maker

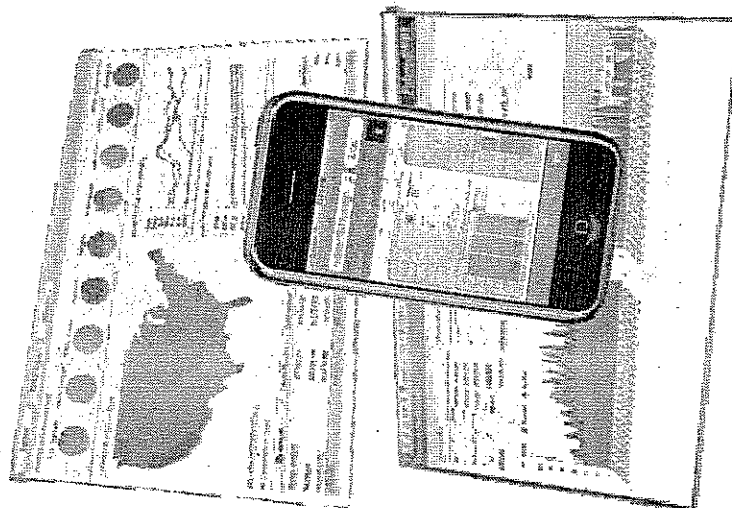
- Query, reporting, analysis, scorecards and dashboards
- Delivered where, when and how needed

• Revolutionary way to work with BI

- Unified workspace with built-in collaboration
- View of all time horizons: past, present & future
- Easy progression from viewing to exploration to more advanced analysis

• Free to answer critical business questions

- Answer "how am I doing", "why", and "what should I be doing?"
- Ensure organization-wide insight and alignment



COGNOS

Predictive & Advanced Analytics



• Full breadth of predictive analytics

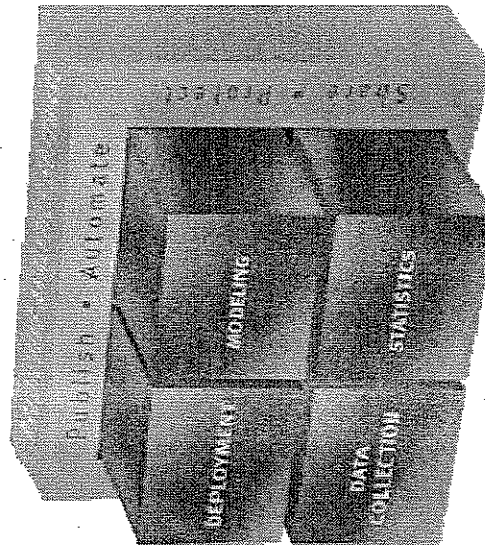
- Data collection, statistics, data mining, predictive modeling, deployment services...

• Putting prediction in hands of the business

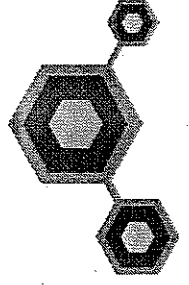
- Decision Management

• Driving better business outcomes

- Attract and retain more profitable customers
- Detect and prevent fraud
- Improve resource allocation



SPSS



Business Analytics software

IBM
Business Analytics
Software
IBM
Business Analytics
Software
IBM
Business Analytics
Software



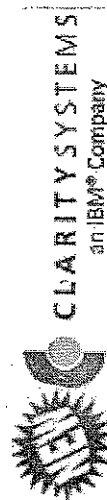
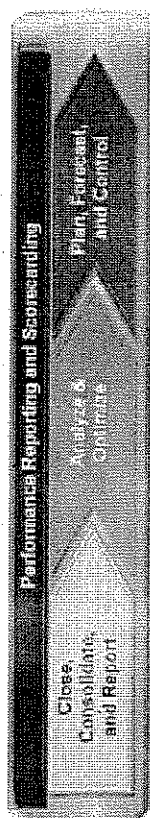
▪ Simplify, structure, and automate dynamic and sustainable FP&SM practices

▪ Monitor and analyze business performance against targets

▪ Plan, forecast and control enterprise resources aligned with corporate objectives

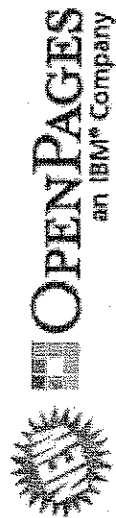
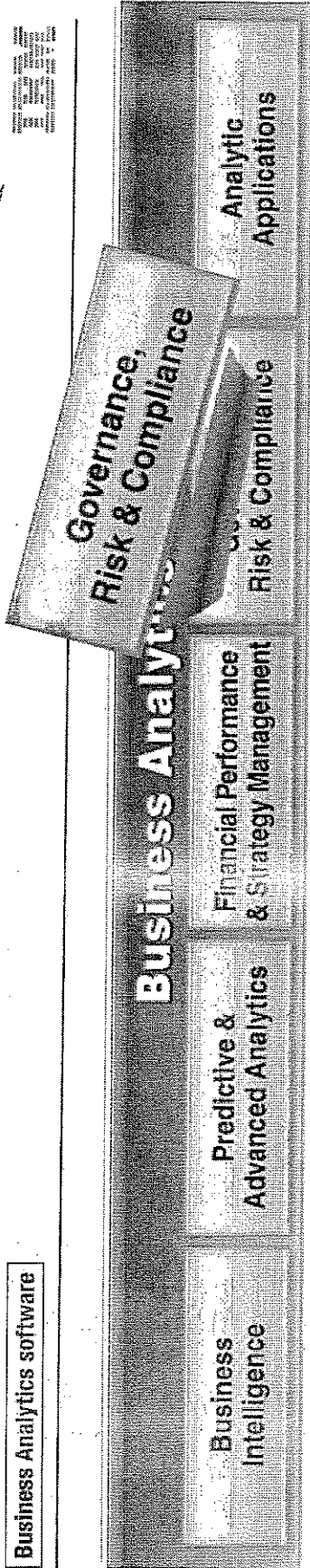
▪ Close the books, consolidate results and report financial performance with confidence.

Financial Performance and Strategy Management

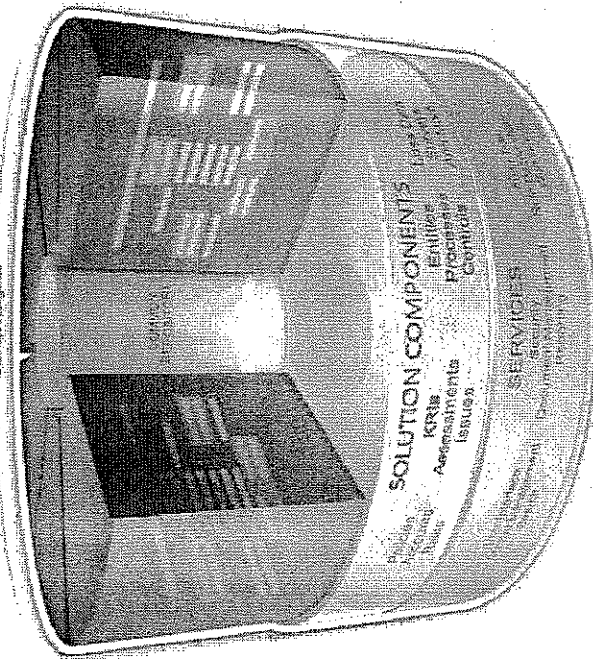


COGNOS





CommandCenter™



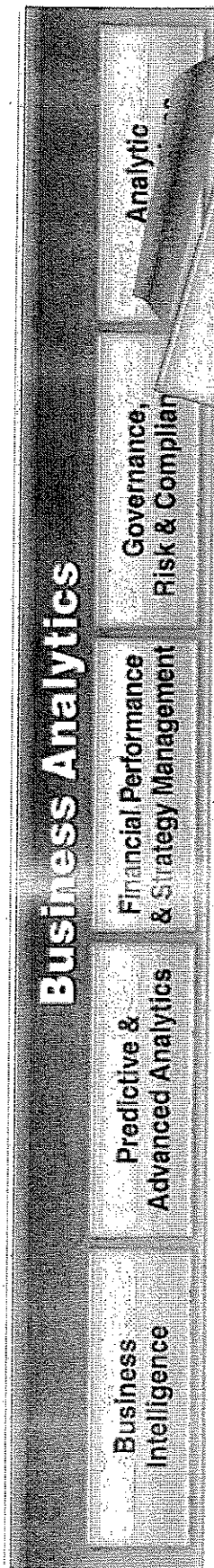
Enterprise requirements

- CIO has to manage multiple datamarts and point solutions for risk and compliance data
- CRO cannot get aggregate risk exposure position
- CCO cannot ensure regulatory compliance, adapt to change or manage regulator interaction

Unifies enterprise-wide risk and compliance initiatives into a single management system

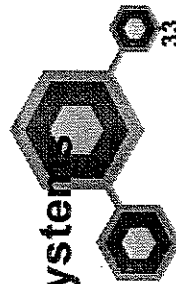
- provide visibility into risk exposure and to facilitate compliance management

Provides synergy with Information and IT Governance, Risk Management and Security

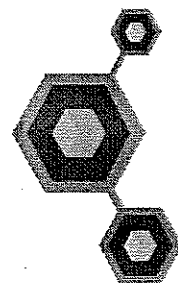


- Ready-made packaged reporting and analyses based on the best practices
- Encompasses a comprehensive portfolio
 - Workforce, customer, finance & supply chain
- Adaptable & extensible
 - Adaptive Application Framework
- Source data from multiple transaction systems

COGNOS

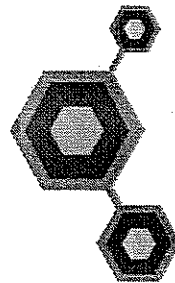


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10/20/00	RECEIVED	25.00	75.00
10/25/00	PAYROLL	50.00	25.00
10/30/00	RECEIVED	25.00	50.00
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CMS AND HIGH LEVEL BUSINESS SERVICES



Why Reports as a Service?

- Simplified programmatic access to Cognos content, allows **pervasive integration** of content into other applications
- Customers have a large investment in applications built on Cognos tools. Customers invests a lot of effort/time/money in developing and administering their applications.
- Encourage standardization (and "stickiness") based on Cognos content. The same content can be used in many different contexts.

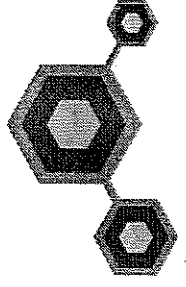
Key Values: Make it easy to leverage Cognos Customers Applications to be more flexible and to become pervasive in their business



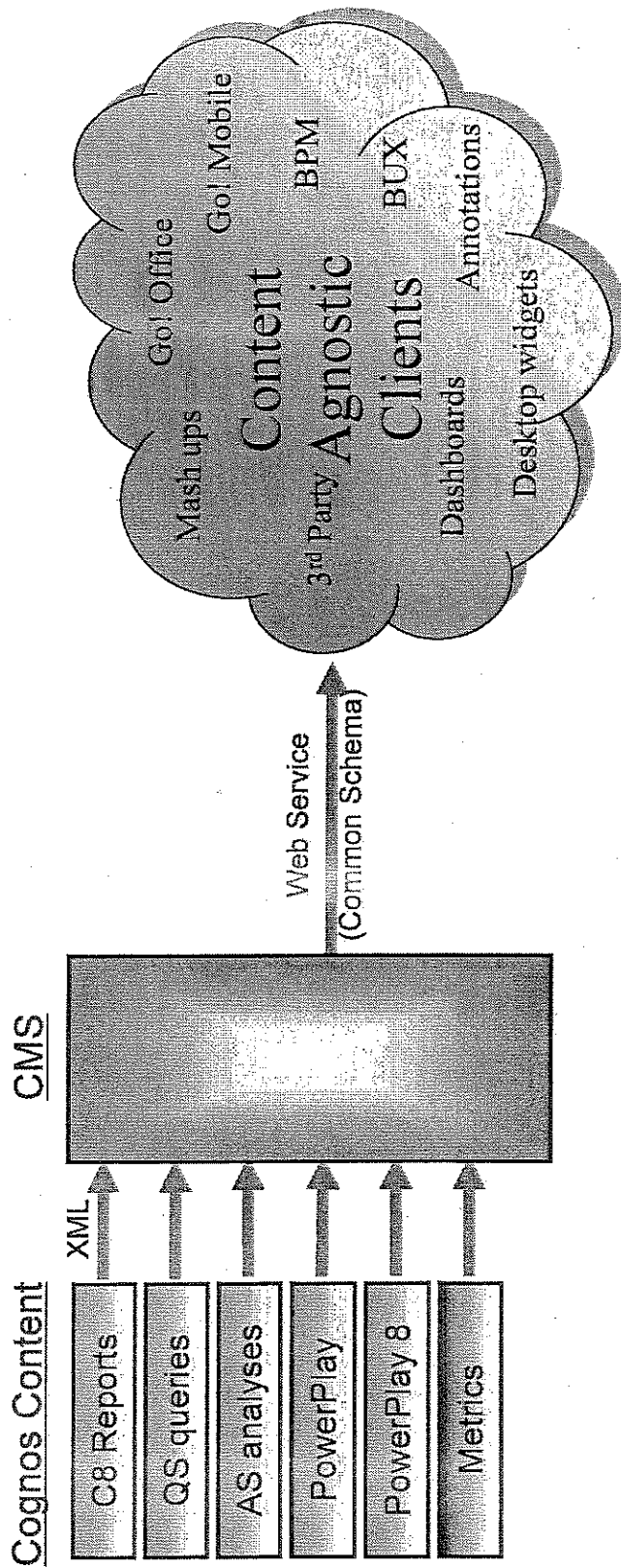
What is CMS (and what it is not)

Cognos Mashup Service (CMS) provides web services for the applications people build with Cognos.

- What it's not:
 - Cannot author with CMS, only access existing BI content
 - It's not a replacement for the Cognos platform/framework SDK
- What's its useful for:
 - Use of Cognos BI beyond the core environment by easily presenting BI data in new environments and applications. (embedded corporate/custom apps, mashups-etc.)
 - Alternate renderings (Flash, 3rd-party charting engines)
 - Using BI in business logic (e.g. BPM workflow processes)

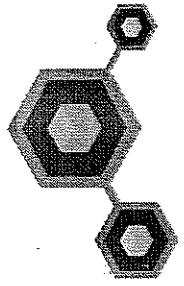


Cognos Mashup Service

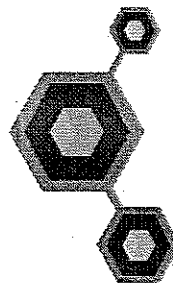
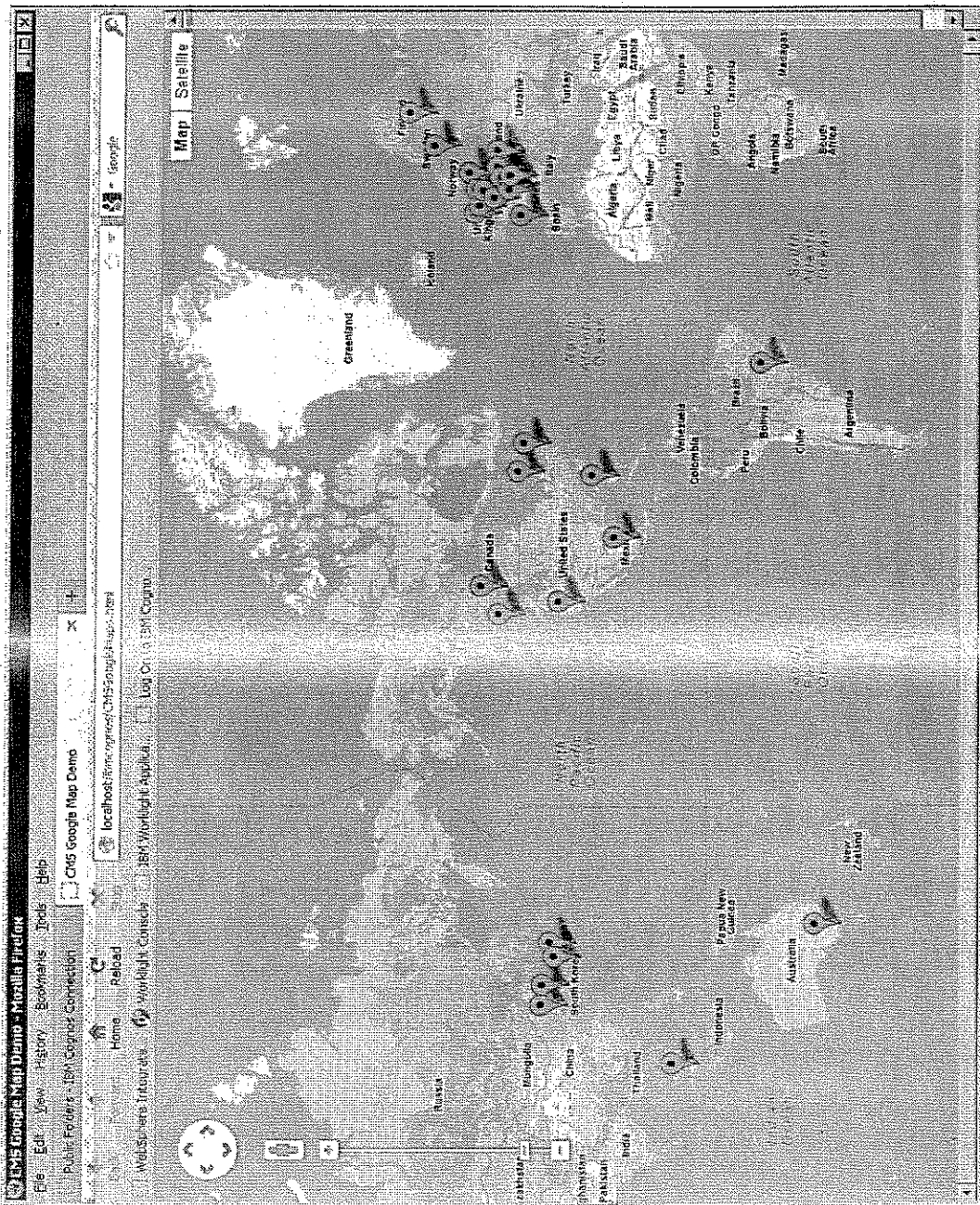


A consistent normalized schema/format across all Cognos applications

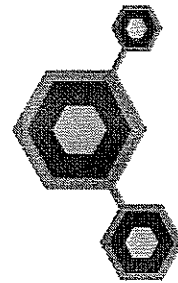
- Standard view of Cognos content from various content providers
- Client proxy apps can process "generic" content for specific client usage



Training Lab Material – Integrate with Google Map



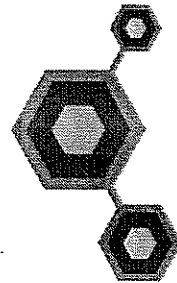
Thank You



Trademarks and notes

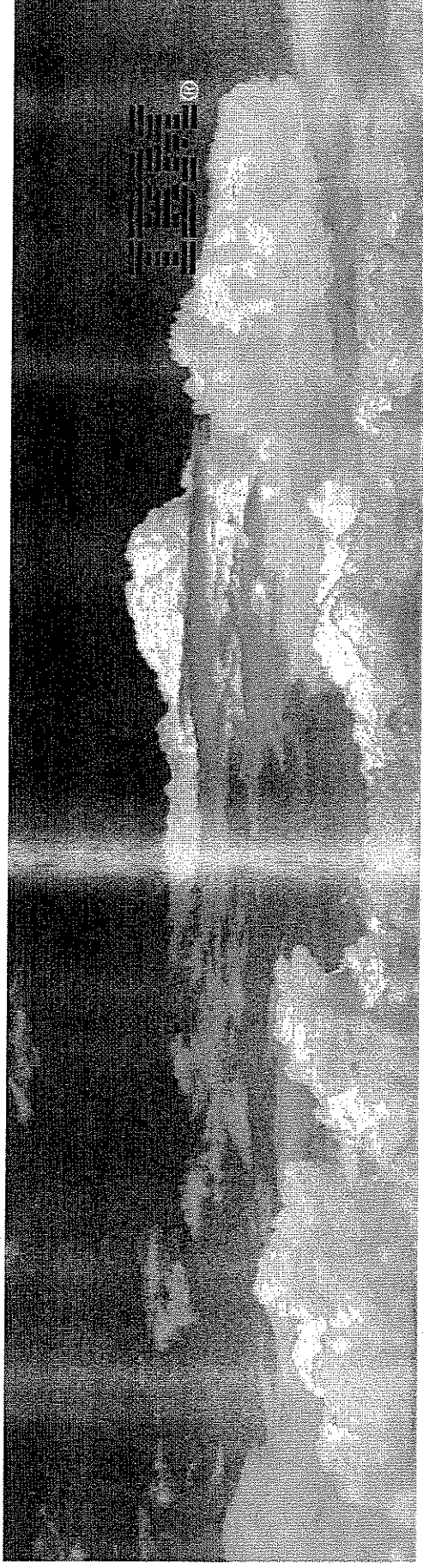
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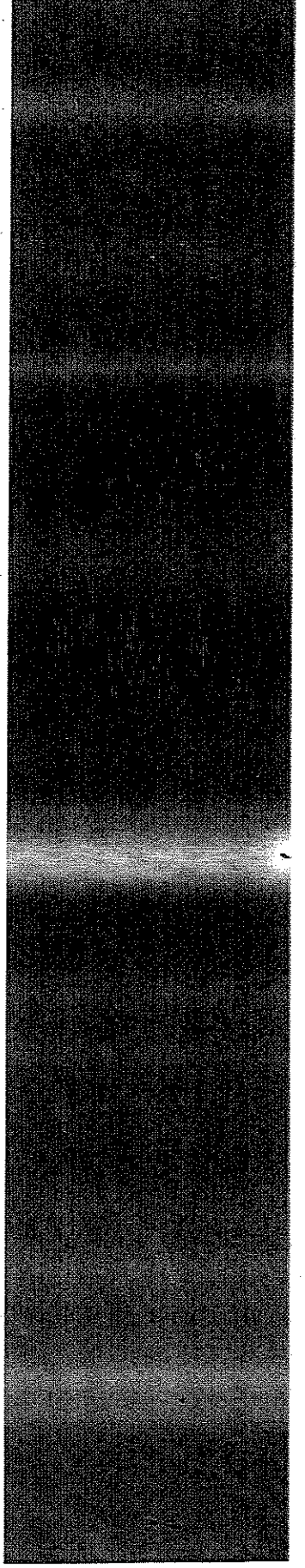
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IBM Endpoint Manager

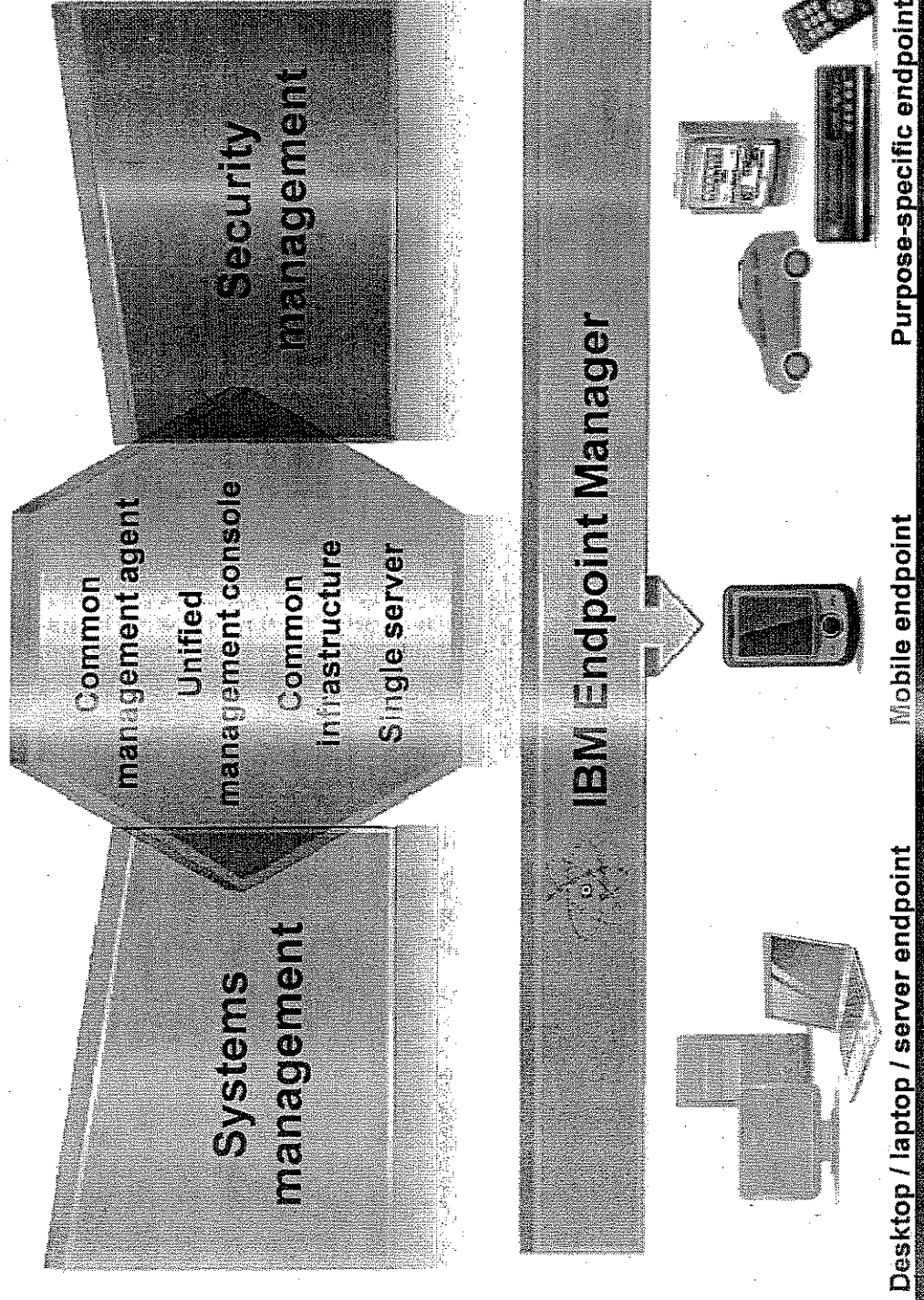
- Configuration and Security Compliance

Gary Woo
Client Technical Professional
garywoo@hk1.ibm.com



IBM Endpoint Manager: unifying operations and security

Managed = Secure



Solution Sets

Tivoli Endpoint Manager

Network Discovery, Global Properties Inventory, Custom Fixlets, Wake-on-LAN, n-Tier Relay Architecture, Dynamic Bandwidth Throttling
SOAP APIs for integration with Service Desk, CMDB, SIEM, GRC, and other IT management, security, and compliance solutions



Lifecycle Management



Patch Management

Hardware, Software,
Configuration Inventory

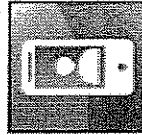
Software Distribution

OS Deployment

Remote Control



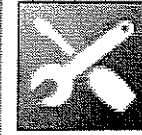
Software Use Analysis



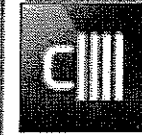
Mobile Devices



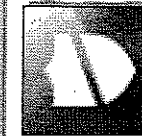
Power Management



Patch Management



Security and Compliance



Core Protection



Patch Management

Security Configuration
Management

Vulnerability Assessment

Compliance Analytics

3rd Party Endpoint
Protection Management

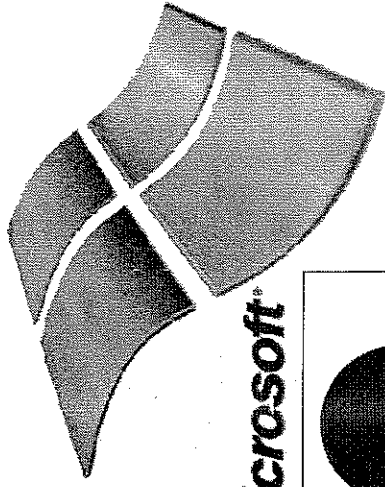
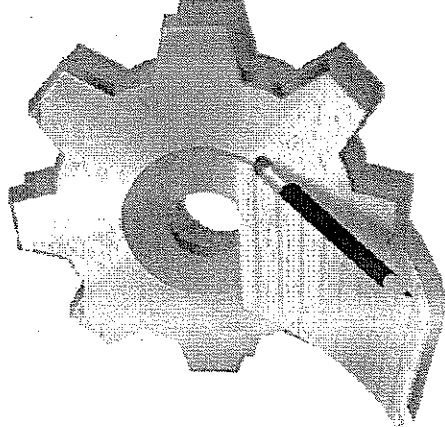
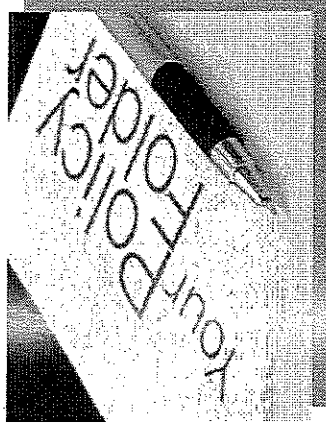


Anti-Malware
Firewall

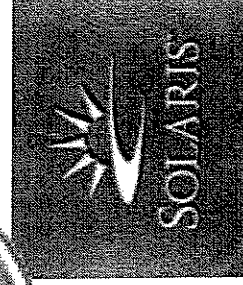
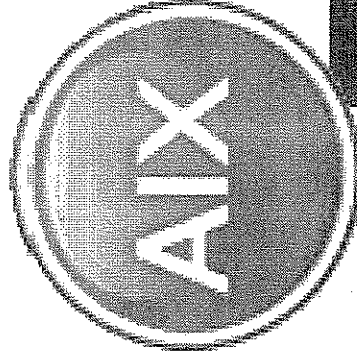
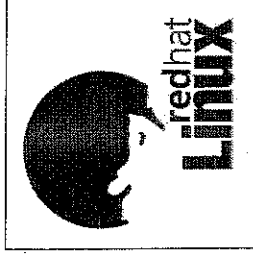
Add on: Data Loss Prevention & Device Control

Security Configuration Policies

- **Password policy**
 - Enforcing Password policy
- **Account policy**
 - Unnecessary accounts
 - Configuring the Super account
 - Configuring local group member lists
- **OS policy**
 - High-risk services
 - Enforcing file shares policies
 - Enforcing directory policy
 - Enforcing network configuration
- **Security audit**
 - Enforcing log management
 - Enabling security event auditing
 - Setting the security options
- **Access right policy**
 - Restricting access
 - Setting defined user rights assignment
- **Miscellaneous**
- **Company-wise policy**
- **Application Configuration**



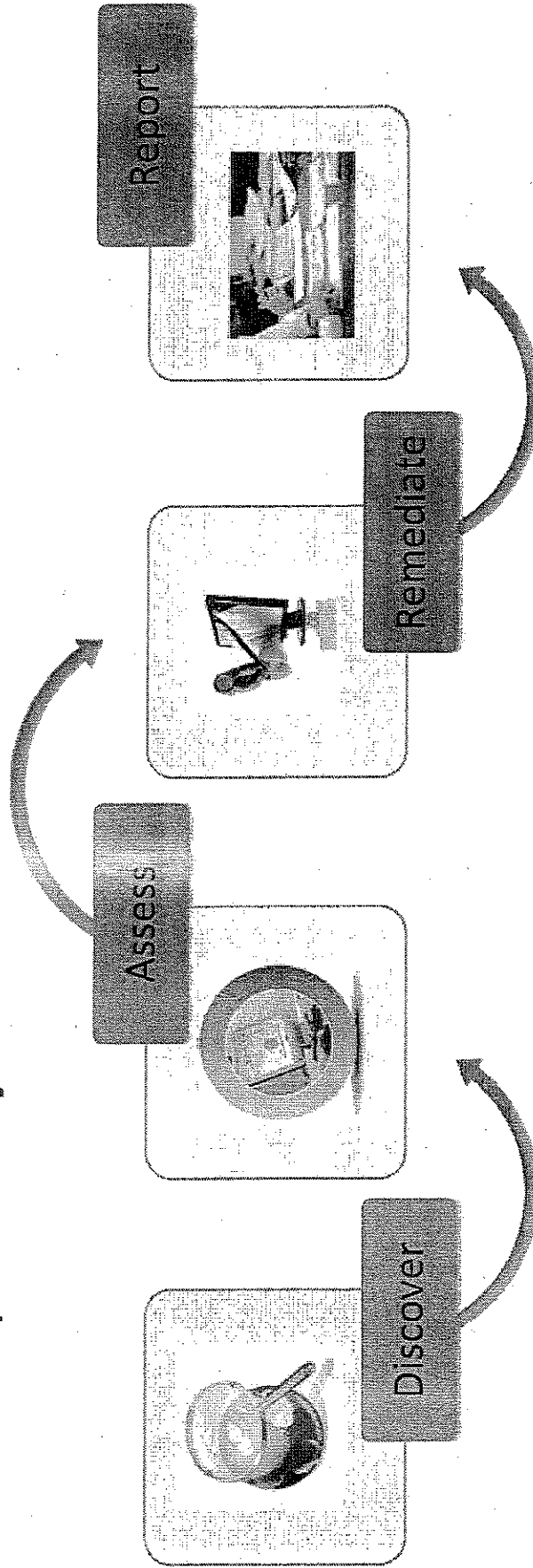
Microsoft®



Importance of configuration & security compliance automation

		Manual	IBM TEM
Security & Configuration	Compliance Check	Trust Base, might have errors	Accurate with Evidence
	Auditing	45 mins per machine	30 mins for all machines
	Remediation	2 hours per machine	30 mins for all machines
	Reporting effort	5 days	Built-in reporting tools
	Human errors	Yes	No
	Instant Report	No	Yes
	New Policy	Maintain development team to build new policy	Instantly available from IBM laboratory and delivery through cloud Server
Cost	Security checking for 6000 Endpoints	755 mandays to complete a single audit	Continuous Compliance

The Compliance Cycle



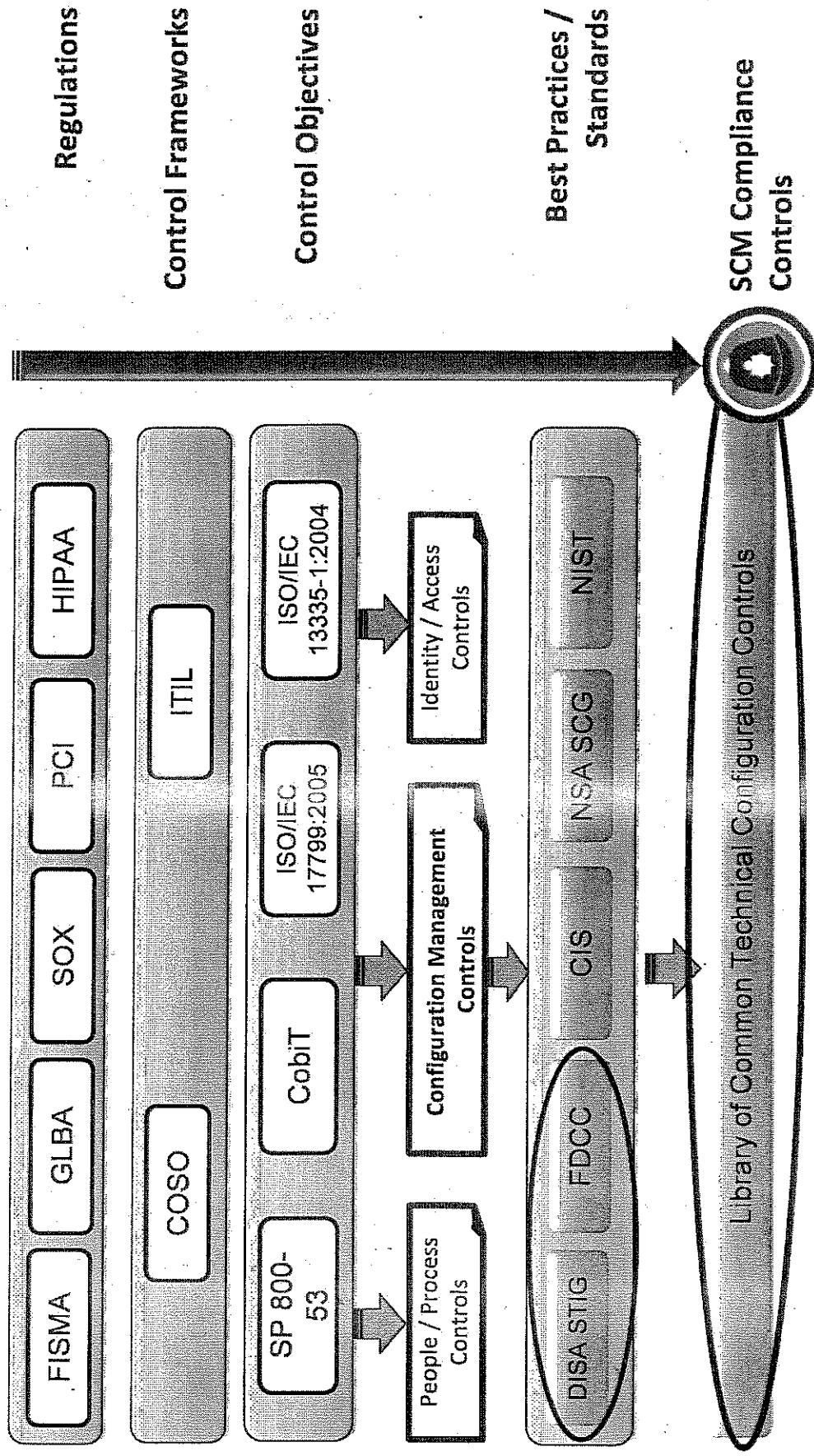
insightexpress[®]
Research for the Right Reasons[™]

A new study shows that about 80 percent of workers still bring their work laptops home. (See Reinforce Workers Still Living Dangerously, Cisco Study, 2012.)

The new study indicates that users frequently download unauthorized data and applications to their work machines for personal use. About 80 percent of employees use their company-issued PCs for personal email, and about half use their work PCs for personal Web research and online banking.

More than half of end users have changed the security settings on their company-issued laptop to view restricted websites, even though they knew it was against company policy. About 35 percent say it is "none of the company's business" if they have changed the security settings on their computer, the study says.

Compliance Model





Maximum password age does not meet minimum requirements.

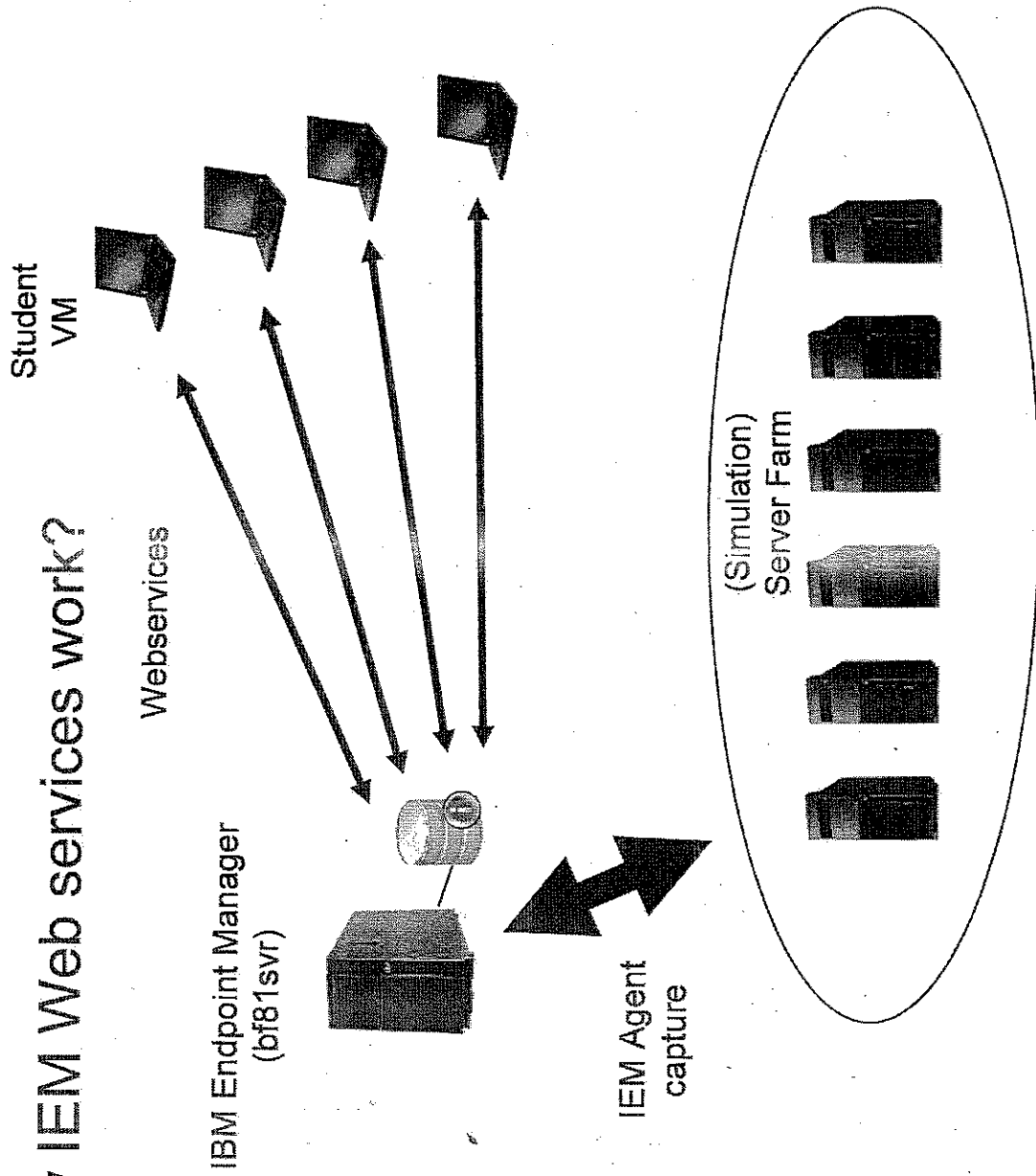
The longer a password is in use, the greater the opportunity for someone to gain unauthorized knowledge of the passwords. Further, scheduled changing of passwords hinders the ability of unauthorized system users to track passwords and gain access to a system.

Programming contest Lab

- **IBM Endpoint Manager (IEM) Captured**
 - Configuration & Security Compliance
 - App Store database is running
- **IEM provides Web Services API to get above results**
- **Worklight call Web Services to get XML result.**
- **Worklight extract result data from XML**
- **Worklight program continue while both results are “Yes”**



How IEM Web services work?



What are the key functions provided by IEM? ***

- **Systems Lifecycle Management**
 - Hardware/Software software inventory
 - Software distribution
 - Patch deployment
 - Operating System provisioning
 - Remote control
- **Endpoint protection**
 - Anti-virus & malware protection
 - Firewall
 - Device Control
 - Data loss prevention
- **Power Management**
 - Power consumption reporting
 - Power schem management
 - Wake-on-LAN
- **Mobile Device Management**
 - Device Management
 - Device Security
- **Security Configuration Compliance**
 - Configuration compliance
 - Security Compliance

What Worklight modules are required? ***

■ **Worklight® HTTP Adapter**

- Works with RESTful and SOAP-based services
- Can read structured HTTP sources, for example RSS feeds
- Allows sending a GET or POST HTTP request and retrieves data from the response headers and body
- Is easily customizable with simple server-side JavaScript
- Enables optional server-side filtering
- Retrieved data can be in XML, HTML, JSON, or plain text formats

Worklight how to call Web Services?

■ Create an HTTP Adapter

Worklight Adapter
Create a new adapter.

Project name: BigFix Training

Adapter type: HTTP Adapter

Adapter name: BigFixAdapter

☐ Create procedures for offline JSON store

Retrieves JSON data with:
Add JSON data with:
Replace JSON data with:
Remove JSON data with:

Cancel Finish

Worklight how to call Web Services?

▪ Configure the adapter with XML

- Connectivity Settings
 - Set protocol to HTTP or HTTPS
 - Set HTTP domain to domain part of HTTP URL
 - Set TCP Port

```
<connectivity>  
  <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">  
    <protocol>http</protocol>  
    <domain>bigfix</domain>  
    <port>8089</port>  
  </connectionPolicy>  
  <loadConstraints maxConcurrentConnectionsPerNode="2" />  
</connectivity>
```

Worklight how to call Web Services?

■ Configure the adapter with XML

– Procedures Declaration

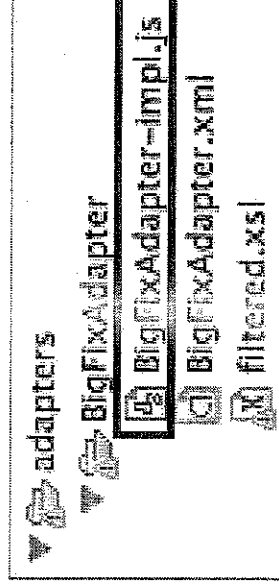
```
<wl:adapter name="BigFixAdapter"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:wl="http://www.worklight.com/integration"
  xmlns:http="http://www.worklight.com/integration/http">

  <displayName>BigFixAdapter</displayName>
  <description>BigFixAdapter</description>
  <connectivity>
    <connectionPolicy xsi:type="http:HTTPConnectionPolicyType">
      <protocol>http</protocol>
      <domain>bigfix</domain>
      <port>8089</port>
    </connectionPolicy>
    <loadConstraints maxConcurrentConnectionsPerNode="2" />
  </connectivity>

  <procedure name="getServerStatus"/>
</wl:adapter>
```

Worklight how to call Web Services?

- **Implement procedures in JavaScript**
 - Procedures are implemented in the adapter JavaScript file



Worklight how to call Web Services?

■ **Implement procedures in JavaScript**

- The service URL is used for procedure invocation
- Some parts of the URL are constant; for example, <http://example.com/>. They are declared in the XML file
- Other parts of the URL can be parameterized, that is, substituted at runtime by parameter values provided to the Worklight Procedure

Worklight how to call Web Services?

- **Implement procedures in JavaScript**
 - URL parts that can be parameterized are:
 - Path elements
 - Query string parameters
 - Fragments

`http://example.com/rest/customers?custid=12`

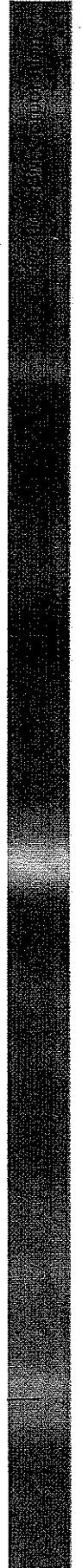
Query string

Path elements



Worklight how to call Web Services?

■ **Implement procedures in JavaScript**

- The procedure name in the JavaScript file must be the same as in the XML file
 - The required invocation parameters are method, path, and returnedContentType
 - The procedure can be parameterized at run time
- 

Worklight how to call Web Services?

■ Implement procedures in JavaScript

```
<connectivity>
  <connectionPolicy xsi:type="http">
    <protocol>http</protocol>
    <domain>bigfix</domain>
    <port>8089</port>
  </connectionPolicy>
  <loadConstraints maxConcurrentCom
</connectivity>

<procedure name="getServerStatus"/>
```



```
function getServerStatus() {
  var input = {
    method : 'get',
    returnedContentType : 'xml',
    path : 'cgi-bin/IEM4.cgi'
  };
  return WL.Server.invokeHttp(input);
}
```

The procedure XML file

The procedure JavaScript file



Worklight how to call Web Services?

- **Implement procedures in JavaScript**

- To invoke an HTTP request, use the `WL.Server.invokeHttp` method
 - Provide an input parameters object
- 

Worklight how to call Web Services?

■ Implement procedures in JavaScript

- You must specify:
 - The HTTP method: GET or POST
 - The returned content type: XML, JSON, HTML, or plain
 - The service path
 - The query parameters (optional)
 - The request body (optional)
 - The transformation type (optional)

```
function getServerStatus() {  
  var input = {  
    method : 'get',  
    returnedContentType : 'xml',  
    path : 'cgi-bin/IEM4.cgi'  
  };  
  return WL.Server.invokeHttp(input);  
}
```

Worklight how to analysis XML?

- **Invoking a procedure from the application**
 - The *invocationData* object - passing data to the server
 - The *options* object

WL.Client.invokeProcedure(invocationData, options)

Worklight how to analysis XML?

- **Invoking a procedure from the application**
 - create an *invocationData* object
 - The *invocationData* object is used to provide invocation configuration and procedure parameters
 - It consists of a JSON block of properties

```
var invocationData = {  
    adapter: 'BigFixAdapter',  
    procedure: 'getServerStatus',  
    parameters: {}  
};
```


Worklight how to analysis XML?

▪ Invoking a procedure from the application

- create an *InvocationData* object
- The *InvocationData* object contains the configuration and procedure name
- It consists of a JSON block

adapter (mandatory)
A string that contains the name of the adapter as specified in the adapter <wl:adapter> element

```
var invocationData = {  
  adapter: 'BigFixAdapter',  
  procedure: 'getServerStatus',  
  parameters: []  
};
```

Worklight how to analysis XML?

■ Invoking a procedure from the application

- create an *invocationData* object
- The *invocationData* object is used to provide invocation configuration and procedure (mandatory)
- It consists of a JSON block

Procedure name as defined in the XML file

```
var invocationData = {  
  adapter: 'MyFixAdapter',  
  procedure: 'getServerStatus',  
  parameters: []  
};
```

Worklight how to analysis XML?

■ Invoking a procedure from the application

- create an *invocationData*
- The *invocationData* object is used for the configuration and procedure name
- It consists of a JSON block

parameters (mandatory)
An array of parameters passed to the back-end JavaScript procedure. Leave empty if no parameters are required.

```
var invocationData = {  
  adapter: 'myAdapter',  
  procedure: 'getServerStatus',  
  parameters: []  
};
```

Worklight how to analysis XML?

- **Invoking a procedure from the application**
 - The *invocationData* object - passing data to the server
 - The *options* object

`WL.Client.invokeProcedure(invocationData, options)`

Worklight how to analysis XML?

- **Invoking a procedure from the application**
 - define success and failure behaviors in the options object

```
var options = {  
    onSuccess: getSuccess,  
    onFailure: getFailure  
};
```

Worklight how to analysis XML?

- Invoking a procedure from the application
 - define failure and success behaviors in the options object

```
var options = {  
  onSuccess: getSuccess,  
  onFailure: getFailure  
};
```

The function to be invoked on successful completion of the asynchronous call. The response typically contains the following properties:

- *InvocationContext*: The *InvocationContext* object which was originally passed in the options object, or undefined if no *InvocationContext* object was passed
- *status*: The HTTP response status
- *invocationResult*: An object that contains the data returned by the invoked procedure, and additional information about the procedure invocation

Worklight how to analysis XML?

- **Invoking a procedure from the application**
 - define failure and success behaviors in the options object

```
var options = {  
  onSuccess: onSuccess,  
  onFailure: onFailure  
};
```

The function to be invoked on failure

Includes both server-side errors, and client-side (such as server connection failure or timed out calls). The response typically contains the following properties:

- *invocationContext*
- *errorCode*: An error code string. All error codes that can be returned are defined as constants in the *WL.ErrorCode* object in *worklight.js*.
- *errorMessage*: This message is for developer use only, and is not displayed to the user. It is not translated to the user's language.
- *status*: The HTTP response status.

Worklight how to analysis XML?

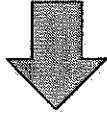
■ Invoking a procedure from the application

```
function getServerStatus() {  
    var invocationData = {  
        adapter: 'BigFixAdapter',  
        procedure: 'getServerStatus',  
        parameters: []  
    };  
  
    var options = {  
        onSuccess: getSuccess,  
        onFailure: getFailure  
    };  
  
    WL.Client.invokeProcedure(invocationData, options);  
}  
  
function getSuccess(data) {  
    WL.Logger.debug('Server status retrieve success');  
}  
  
function getFailure(data) {  
    WL.Logger.debug('Server status retrieve fail');  
}
```


Worklight how to analysis XML?

■ Invoking a procedure from the application

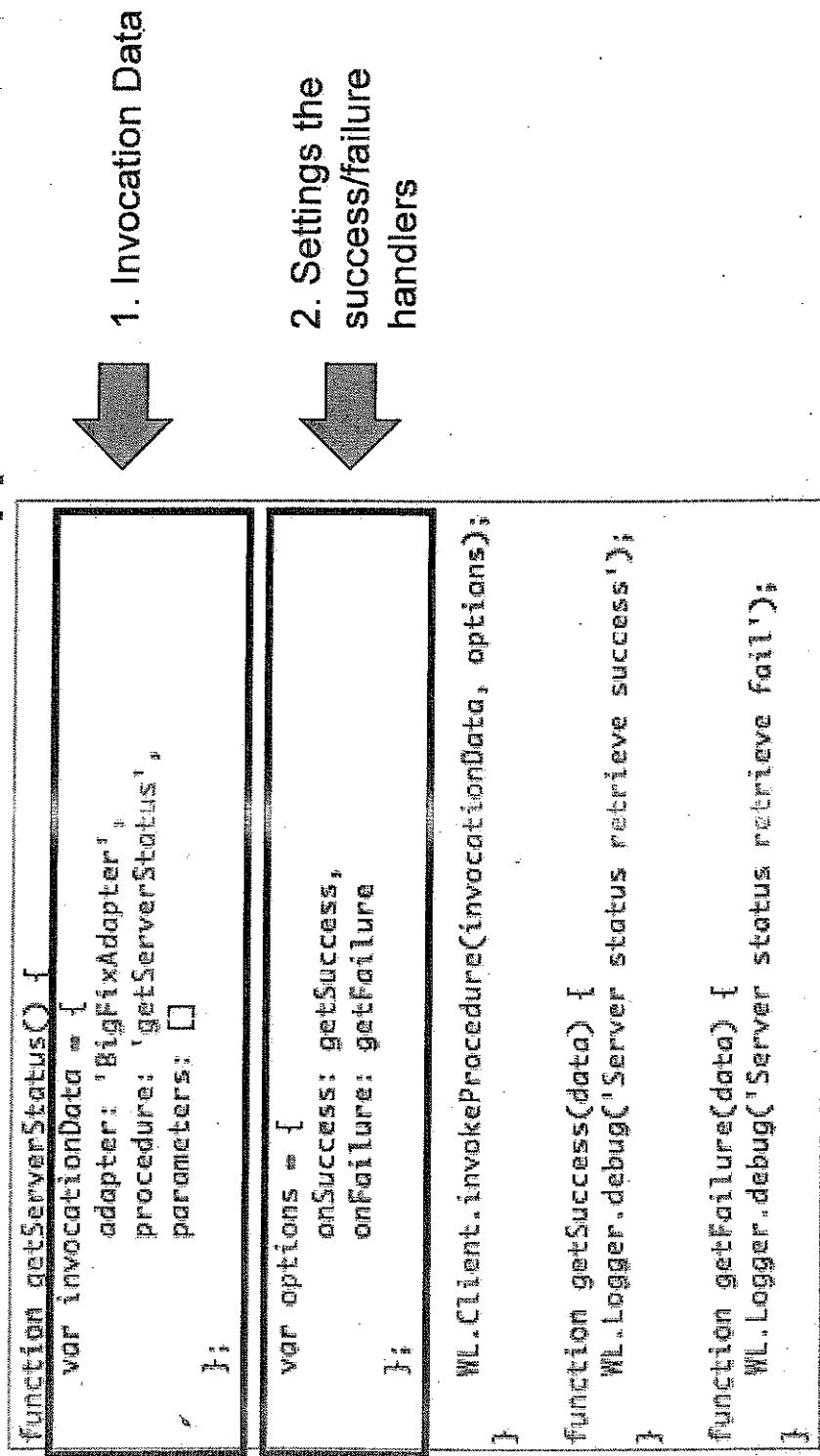
```
function getServerStatus() {  
    var invocationData = {  
        adapter: 'BigFixAdapter',  
        procedure: 'getServerStatus',  
        parameters: []  
    };  
  
    var options = {  
        onSuccess: getSuccess,  
        onFailure: getFailure  
    };  
  
    WL.Client.invokeProcedure(invocationData, options);  
}  
  
function getSuccess(data) {  
    WL.Logger.debug('Server status retrieve success');  
}  
  
function getFailure(data) {  
    WL.Logger.debug('Server status retrieve fail');  
}
```



1. Invocation Data

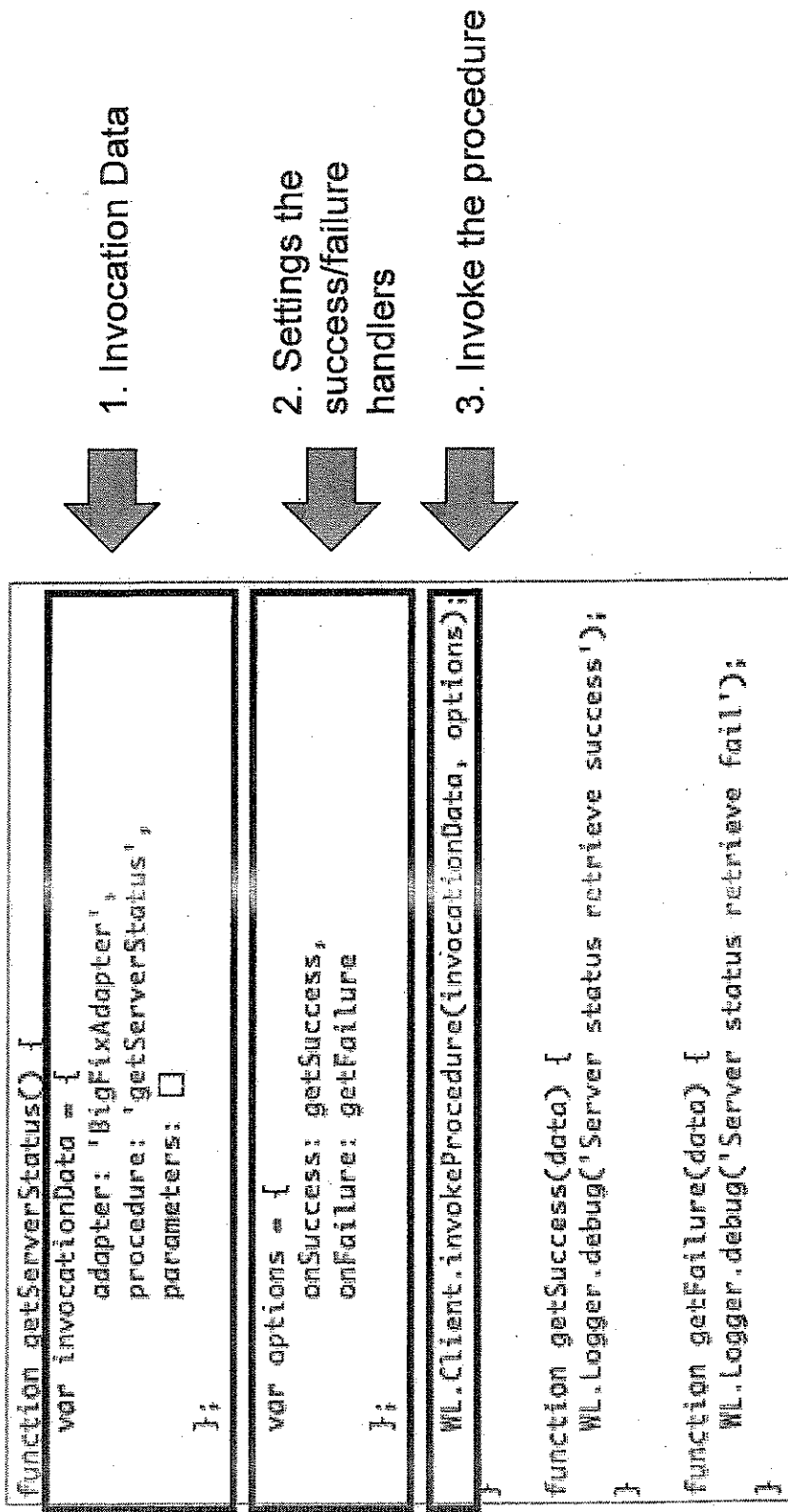
Worklight how to analysis XML?

■ Invoking a procedure from the application



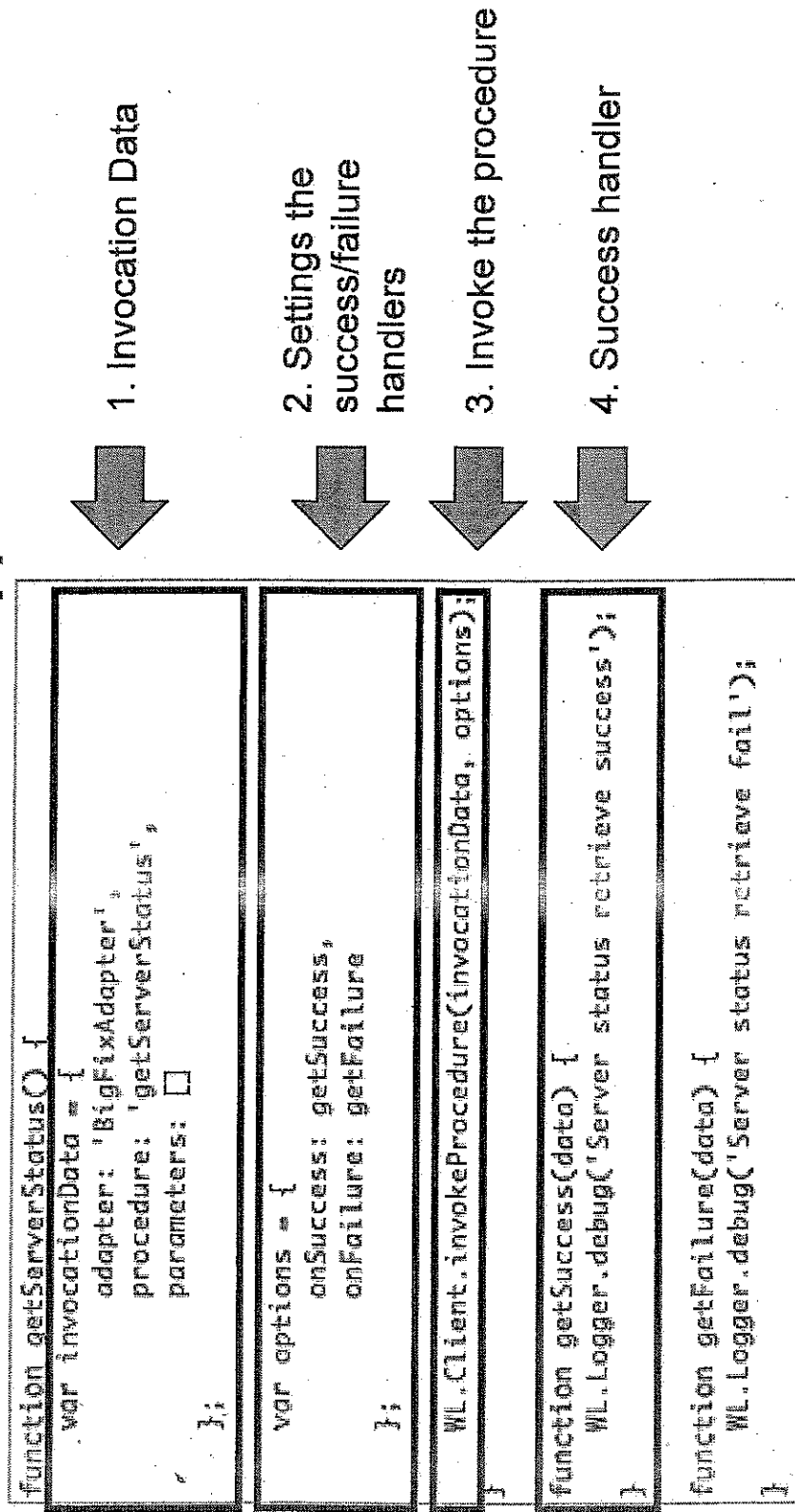
Worklight how to analysis XML?

■ Invoking a procedure from the application



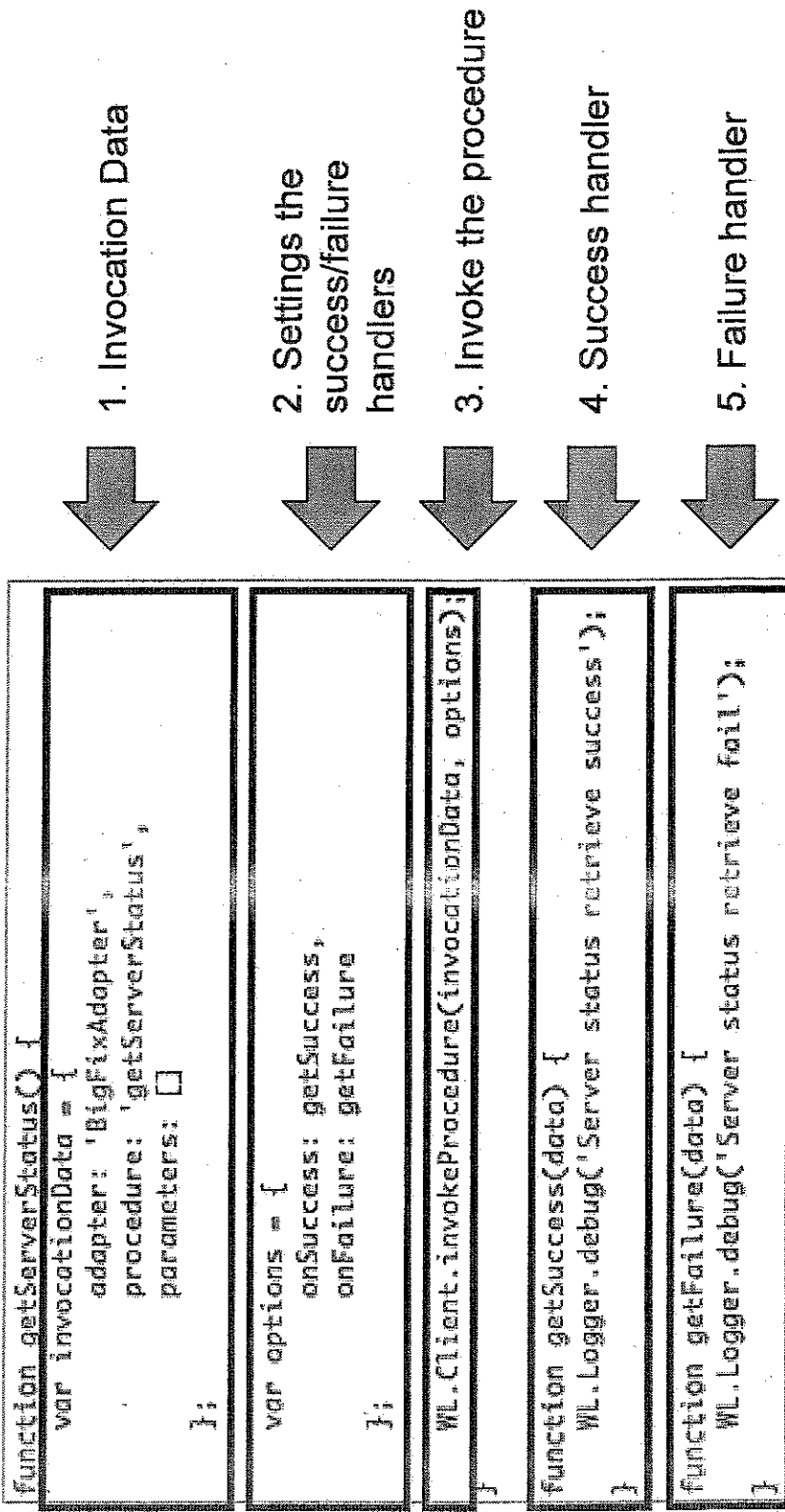
Worklight how to analysis XML?

■ Invoking a procedure from the application



Worklight how to analysis XML?

■ Invoking a procedure from the application



Worklight how to analysis XML?

■ Invocation Result

- A JSON object that contains the data and additional information about the procedure invocation is returned
- The Object is returned to a corresponding success/failure handler

BigFix	Object { ComputerName="BF815VR", SetCompliance="Yes", DBRunning="Yes" }
errors	[]
info	[]
isSuccessful	true
responselheaders	Object { ETag="2c520d4-9f-4d28e6051b800", Date="Sat, 05 Jan 2013 18:0
responseID	"11"
statusCode	200
statusReason	"OK"
warnings	[]

Worklight how to analysis XML?

■ Invocation Result

The *isSuccessful* property is set to:

- *true* if the procedure invocation succeeded (even if no data was retrieved)
- *false* otherwise

BigFix	Object { ComputerName="BF81SVR", SecCompliance="Yes", DBRunning="Yes" }
errors	[]
info	[]
isSuccessful	true
responseHeaders	Object { Etag="2c520d4-9f-4d28c6051b880", Date="Sat, 05 Jan 2013 18:6
responseID	"11"
statusCode	200
statusReason	"OK"
warnings	[]

Worklight how to analysis XML?

■ Invocation Result

Records

An array of records retrieved from the back-end system. Each array entry is an object that contains the fields of the single record. If the procedure call returns no records, an empty array is returned.

BigFix	Object { ComputerName="8F81SVR", SecCompliance="Yes", DBRunning="Yes" }
errors	[]
info	[]
isSuccessful	true
responseheaders	Object { ETag="2c52bd4-9f-4d28e6051b880", Date="Sat, 05 Jan 2013 18:0
responseID	"11"
statusCode	200
statusReason	"OK"
warnings	[]

Worklight how to analysis XML?

▪ Invocation Result

Error/Warn/Info Messages

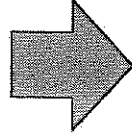
Optional arrays of strings that contain messages. If no messages are provided, these objects are NULL.

BigFix	Object { ComputerName="BF81SVR", SecCompliance="Yes", DBRunning="Yes" }
errors	[]
info	[]
isSuccessful	true
responseHeaders	Object { ETag="2c520d4-9f-4d28e6051b880", Date="Sat, 05 Jan 2013 18:41:11" }
responseID	200
statusCode	"OK"
statusReason	[]
warnings	[]

Worklight how to analysis XML?

■ Invocation Result

```
function getSuccess(data) {  
    WL.Logger.debug('Server status retrieve success');  
    if (data.invocationResult.BigFix.length > 0) WL.Logger.debug(data.invocationResult.BigFix);  
}
```



BigFix	Object { ComputerName="BF81SVR", SecCompliance="Yes", DBRunning="Yes" }
ComputerName	"BF81SVR"
DBRunning	"Yes"
SecCompliance	"Yes"

IBM Software Group



Introduction to Disciplined Agile Delivery

Agile and Disciplined Agile Delivery Overview



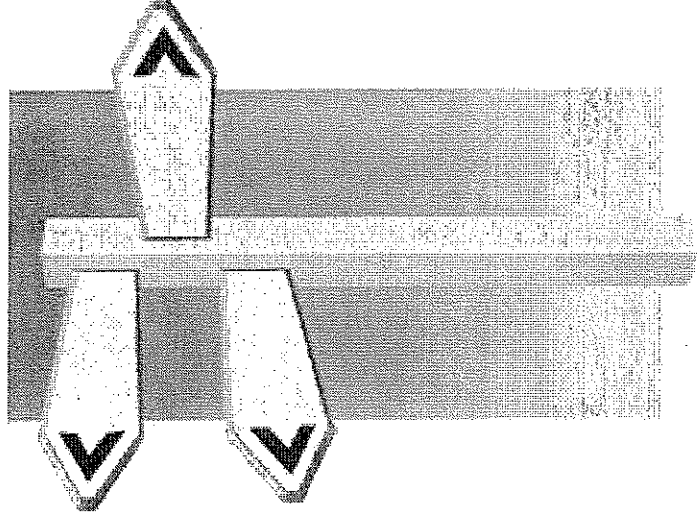
IBM agility@scale™

Rational software

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Agenda

- *Introduction to agile
- The agile process
- Adoption and success rate statistics



*=Current topic

Agile values

We value

Individuals
Interactions

Working
Software

Customer
Collaboration

Responding
to Change

over

Processes
and Tools

Comprehensive
Documentation

Contract
Negotiation

Following
a Plan

While there is value in the items on the right, we value the items on the left more.

Agile principles

1. Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
4. Business people and developers must work together daily throughout the project.
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
6. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.

(Continued...)

Agile principles (continued)

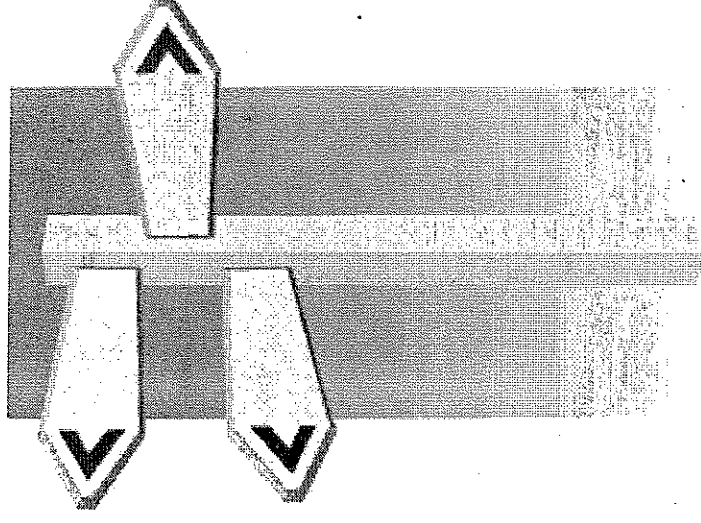
7. Working software is the primary measure of progress.
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
9. Continuous attention to technical excellence and good design enhances agility.
10. Simplicity – the art of maximizing the amount of work not done – is essential.
11. The best architectures, requirements, and designs emerge from self-organizing teams.
12. At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

What is agile?

- Agile is a highly collaborative, evolutionary, quality focused approach to software development.
- How agile is different:
 - ▶ Focus on collaboration
 - ▶ Focus on quality
 - ▶ Focus on working solutions
 - ▶ Agilists are generalizing specialists
 - ▶ Agile is based on practice, not theory

Agenda

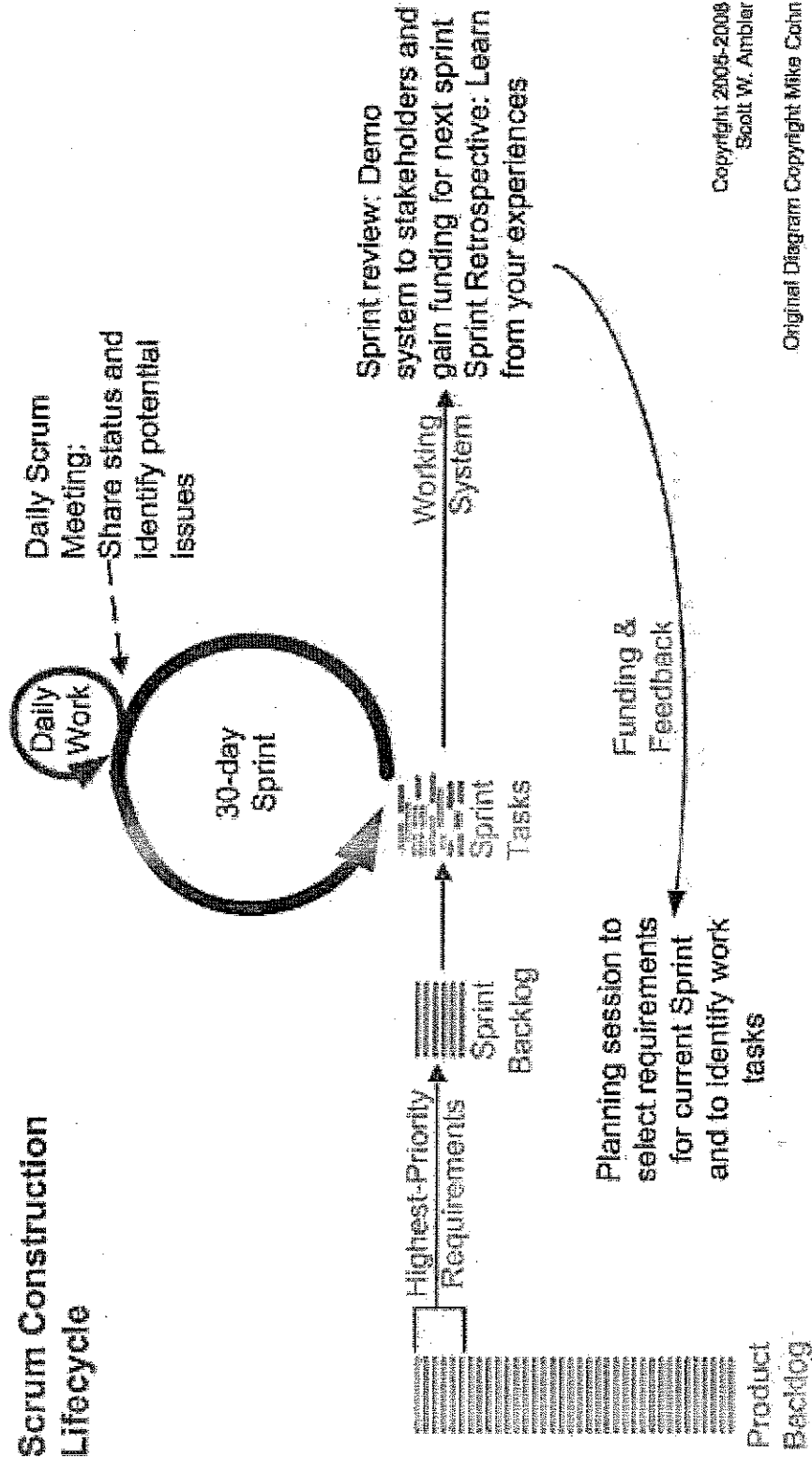
- Introduction to agile
- ***The agile process**
- Adoption and success rate statistics



*=Current topic

Scrum

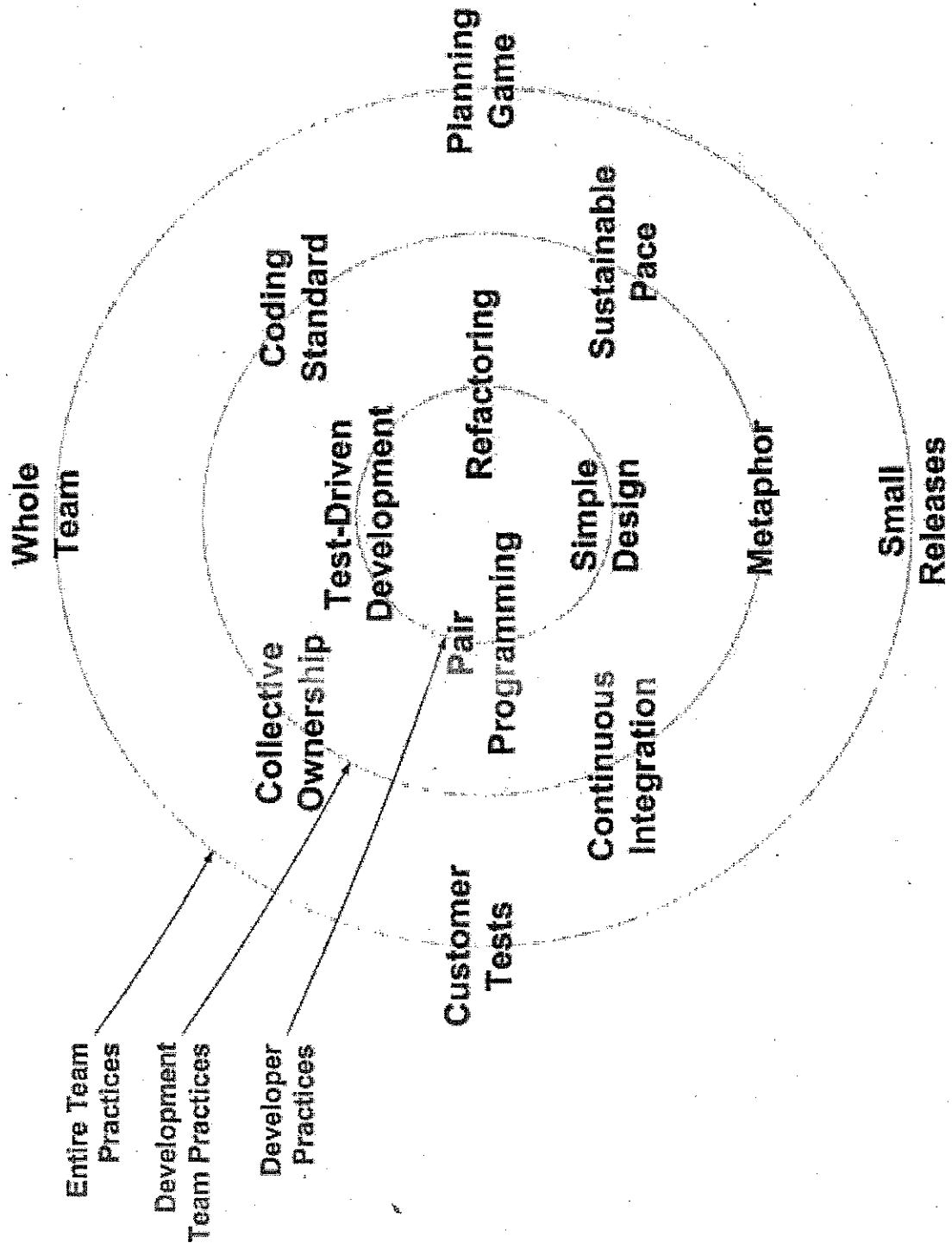
Scrum Construction Lifecycle



Copyright 2005-2008
Scott W. Ambler

Original Diagram Copyright Mike Cohn

Extreme Programming (XP)

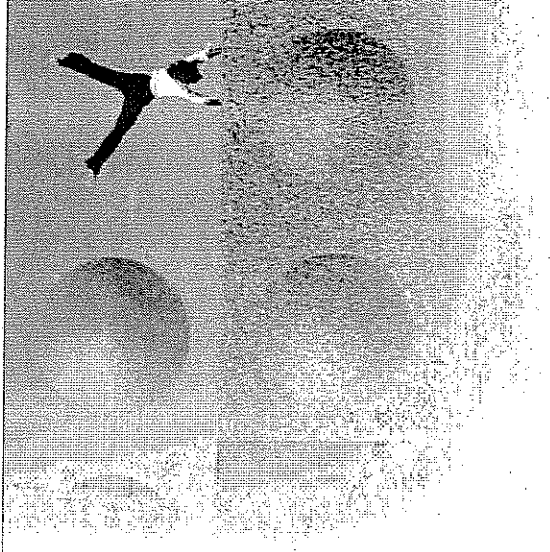


What is disciplined agile?

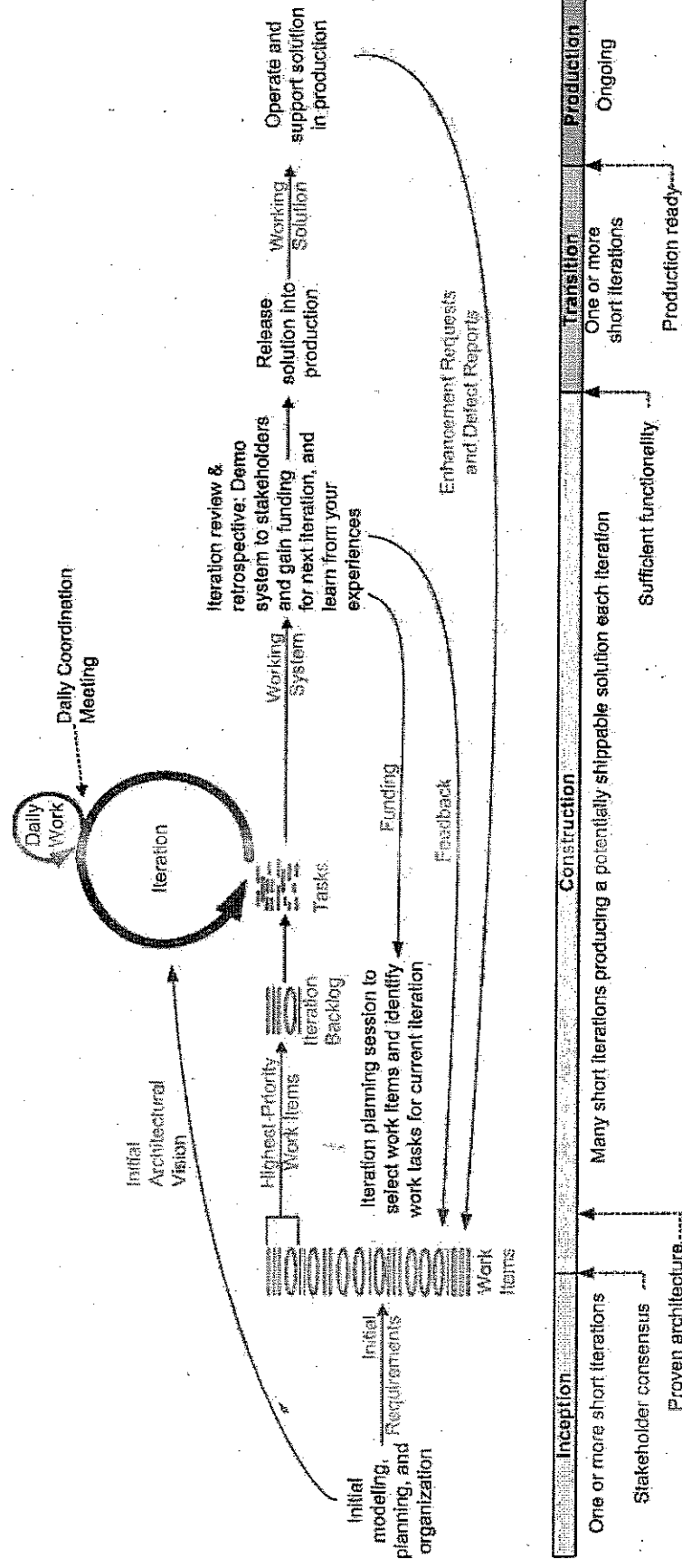
Disciplined agile delivery is an evolutionary (iterative and incremental) approach that regularly produces high quality solutions in a cost-effective and timely manner via a risk and value driven lifecycle.

It is performed in a highly collaborative, disciplined, and self-organizing manner within an appropriate governance framework, with active stakeholder participation to ensure that the team understands and addresses the changing needs of its stakeholders.

Disciplined agile delivery teams provide repeatable results by adopting just the right amount of ceremony for the situation which they face.



The disciplined agile lifecycle



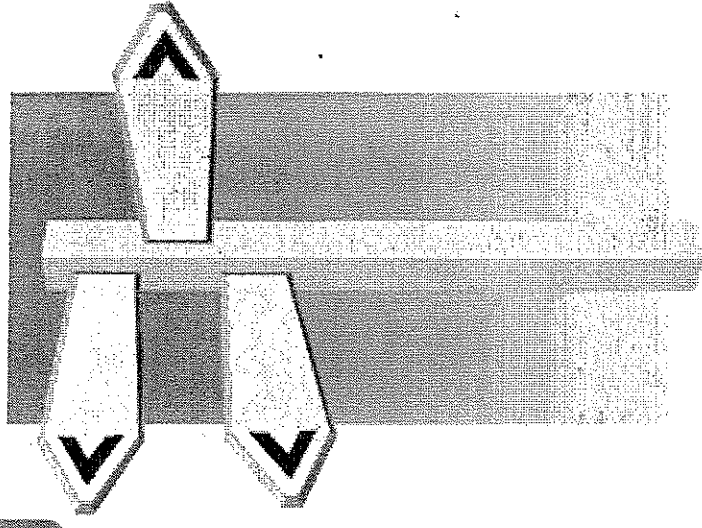
Tower of Babel: Agile terminology

Disciplined Agile	XP	Scrum	Other
Team lead	Coach	Scrum master	Project manager
Iteration	Iteration	Sprint	Timebox
Daily stand up meeting	Daily stand up	Scrum Meeting	Coordination meeting
Retrospective	Retrospective	Sprint retrospective	Reflection meeting
Product owner	Customer	Product owner	Stakeholder representative
Team Member	Extreme programmer	Team member	Developer
Iteration review	-	Sprint review	-

Important: Each agile method has its own terminology. It is highly unlikely that the industry will ever standardize the terminology.

Agenda

- Introduction to agile
- The agile process
- ***Adoption and success rate statistics**



*=Current topic

Agile has gone mainstream

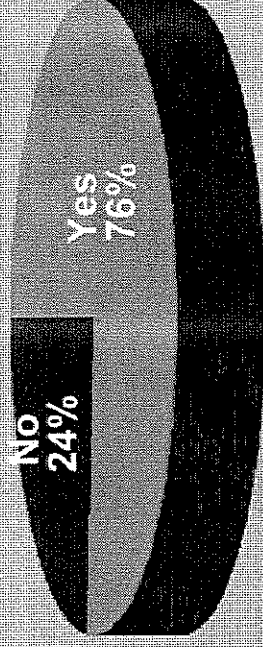
"Thirty-five percent of respondents have projects or pilots underway, and *only 12 percent do not see a fit* for agile processes in their organizations.

The fact that 88 percent of these organizations (one-third of which have over 10,000 employees) are using or evaluating agile processes proves that agile processes have truly hit the mainstream."

- Excerpt from "And the Agile Survey Says..."
Agile Journal, March 6, 2006

Third-party research suggests even wider adoption

Have you adopted any agile techniques?



Source: State of the IT Union Survey, Dr. Dobb's Journal, July 2009

Why are organizations adopting agile strategies?

- Agile teams have an average success rate of 70% compared with 66% for traditional/waterfall teams
- Agile teams produce higher quality work, are quicker to deliver, are more likely to deliver the right functionality, and more likely to provide greater ROI than traditional teams
- Detailed results online at www.ambyssoft.com/surveys/

Source: Dr. Dobb's Journal (DDJ) 2008 Project Success Survey¹⁶



Improving capacity: Head count per product

Process improvement efforts have improved IBM Software Group (SWG) Capacity (HC per product)

2003	2004	2005	2006	2007	2008
------	------	------	------	------	------

Improving bottom-line growth

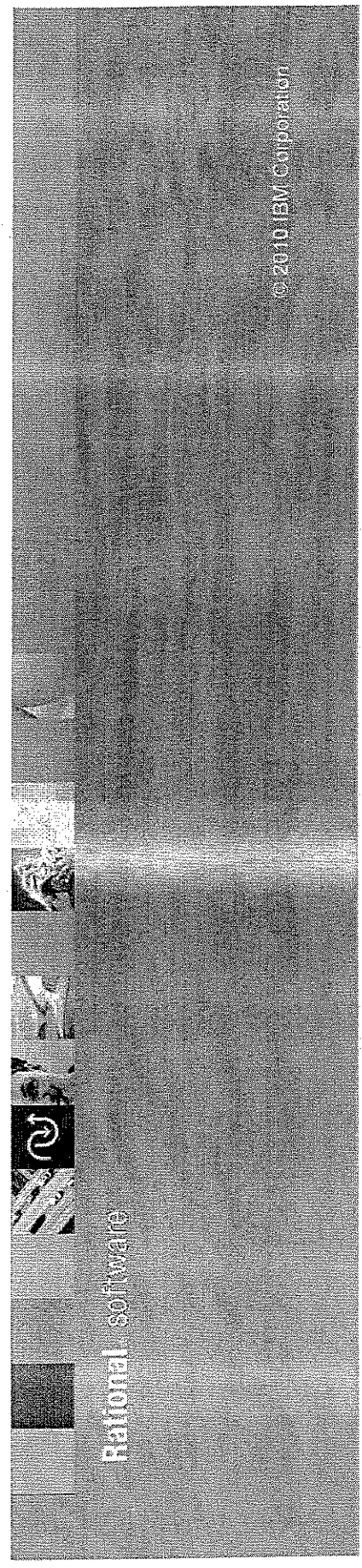
*Process improvement activities have steadily increased
IBM Software Group productivity revenue by headcount*

2003	2004	2005	2006	2007	2008
------	------	------	------	------	------



IBM Software Group

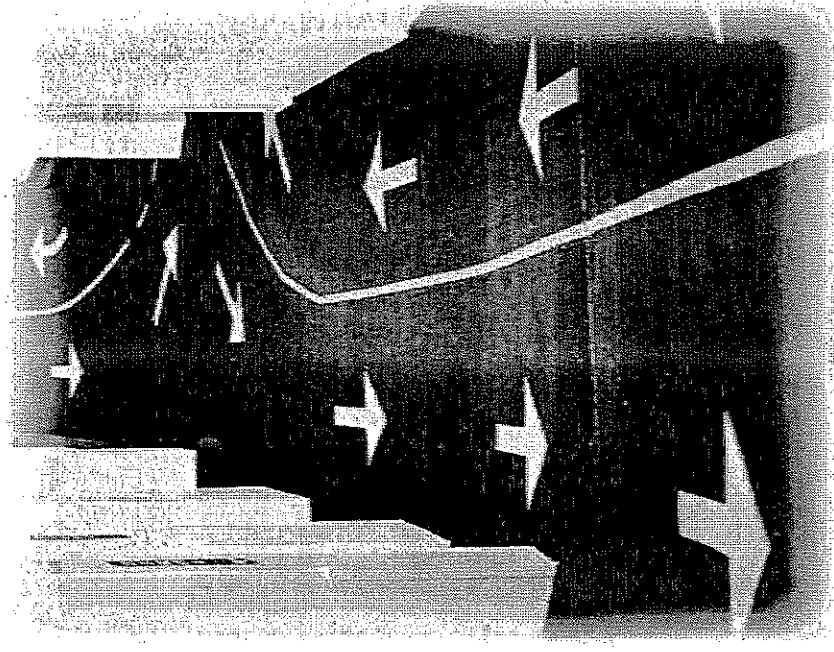
Additional Reading



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Addressing misconceptions about agile

1. Agile teams write documentation
2. Agile teams model
3. Agile requires greater discipline than traditional approaches
4. Agile teams do more planning than traditional teams, but it's just in time (JIT)
5. Agile is more predictable than traditional development
6. Agile scales very well
7. RUP can be as agile as you want to make it
8. Agile is not a fad, it is being adopted by the majority of organizations
9. Agile can do fixed price, but it's still poor practice to do so



The rights of everyone

- To be treated with respect.
- To produce and receive quality work at all times based on agreed-to project standards and principles.
- To estimate the activities you are actively involved with, and to have those estimates respected by others.
- To be provided adequate resources (time, money, and so on) to do the job that's been asked of you.
- To determine how your resources will be invested. For people funding the project that means how the funds will be spent and, for people working on the project (that is, investing time), what tasks they choose to work on.
- To be given the opportunity to gain the knowledge pertinent to making the project a success. Business people will likely need to learn about the underlying technologies and techniques, and technical staff to learn about the business.
- To have decisions made in a timely manner.
- To be provided good-faith information in a timely manner. Sometimes this is just the best guess at the time, and that's perfectly all right. This includes but is not limited to business information (such as prioritized requirements and detailed domain concepts), as well as technical information (such as designs and detailed technical concepts).
- To own your organization's software processes, following and actively improving these processes when needed.

The responsibilities of everyone

- To produce a system that best meets your needs within the resources that you are willing to invest in it.
- To be willing to work with others, particularly those outside your chosen specialties.
- To share all information, including work in progress.
- To actively expand your knowledge and skill set.

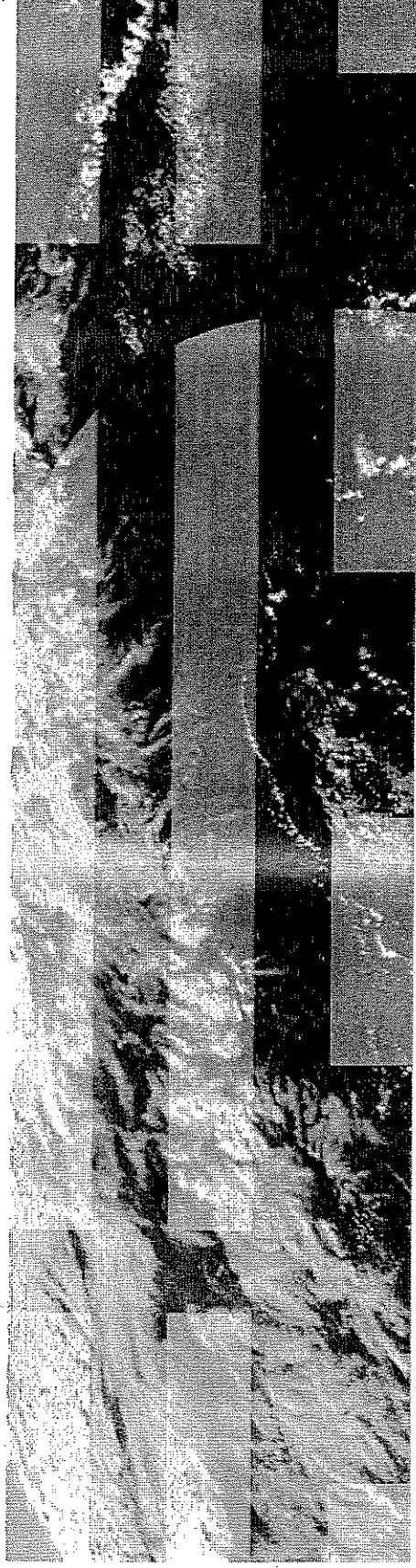
Disciplined agile core principles

- “Fits just right” process
- Continuous testing and validation
- Consistent team collaboration
- Rapid response to change
- Ongoing customer involvement
- Frequent delivery of working solutions





Introduction to Application Development with Worklight



Mobile handset dominance is difficult to predict

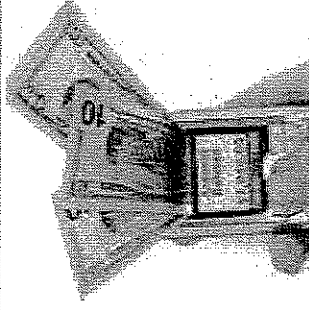
1995 Palm

500,000 units sold in 6 mths.
70% market share



2001 Nokia

40% Market share of all
mobile phones



2008 RIM

Fastest growing stock: 55%
of smartphones: 77% 3Yr
CAGR (19.7% share in 10/11)



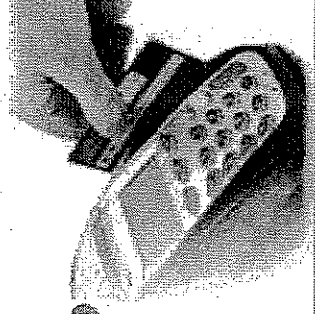
2011 Apple

Most valuable company in
the world: 27.3% of
US smartphones



2013+ Android?

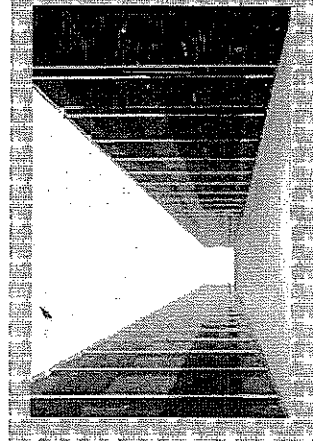
Has 43.7 of the US
smartphone market 10/11



Mobile Apps – Top Challenges



Creating rich, yet cost-effective mobile apps
in a fragmented technological landscape.

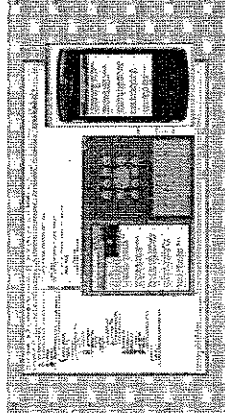


Connecting the enterprise back-end
services in a secure and scalable manner



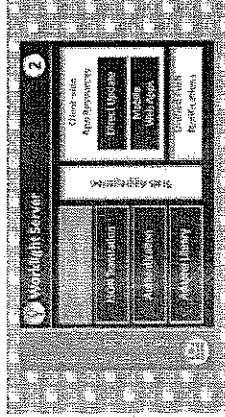
Security, visibility and governance

Worklight Overview



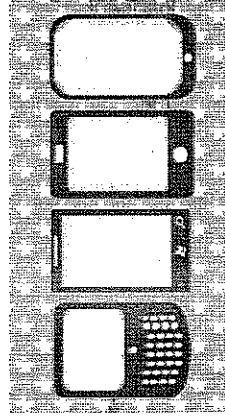
Worklight Studio

The most complete, extensible environment with maximum code reuse and per-device optimization



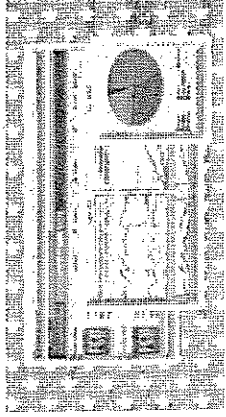
Worklight Server

Unified notifications, runtime skins, version management, security, integration and delivery



Worklight Runtime Components

Extensive libraries and client APIs that expose and interface with native device functionality



Worklight Console

A web-based console for real-time analytics and control of your mobile apps and infrastructure

Agenda

- **Worklight Studio and application basics**
- Visual Tooling and device simulation with Worklight Studio
- Developing Worklight Adapters
- Native build and test with device SDKs

Worklight Studio – based on standard, open technologies

Familiarity

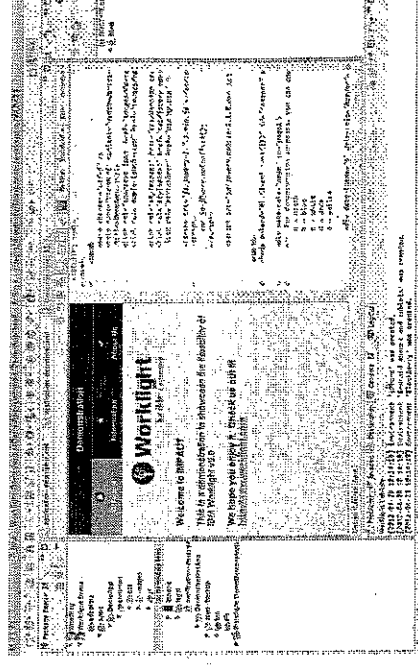
- Based on well-proven technologies like Eclipse, HTML5, CSS, JavaScript, JSON.
- Little training needed for current web developers.

Strength of an open Ecosystem

- New innovation available as soon as the standards contributors produce the tools and libraries.

Flexibility

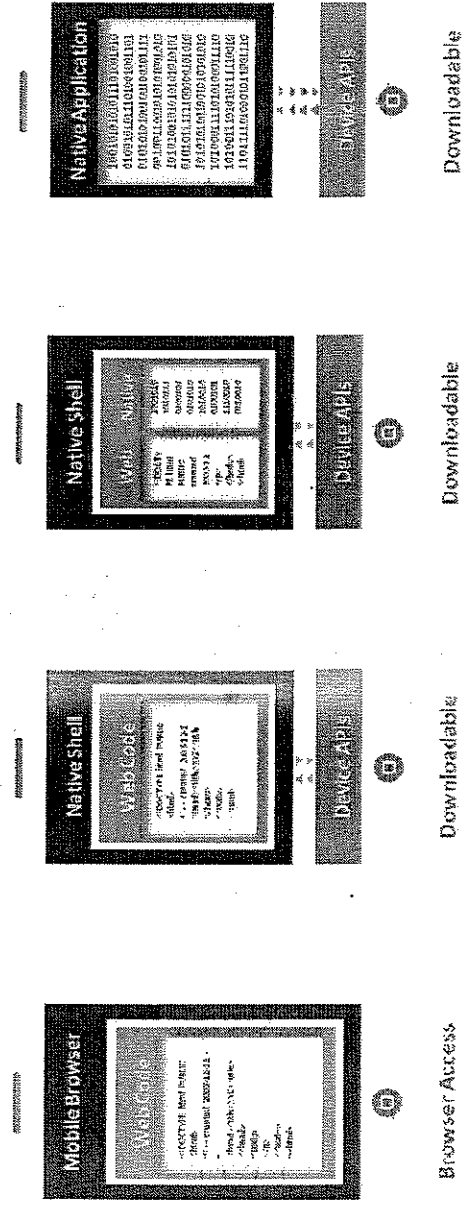
- Able to adapt to changes in prevalent technologies, switch as needed.
- Not tied to a proprietary, single-vendor strategy.

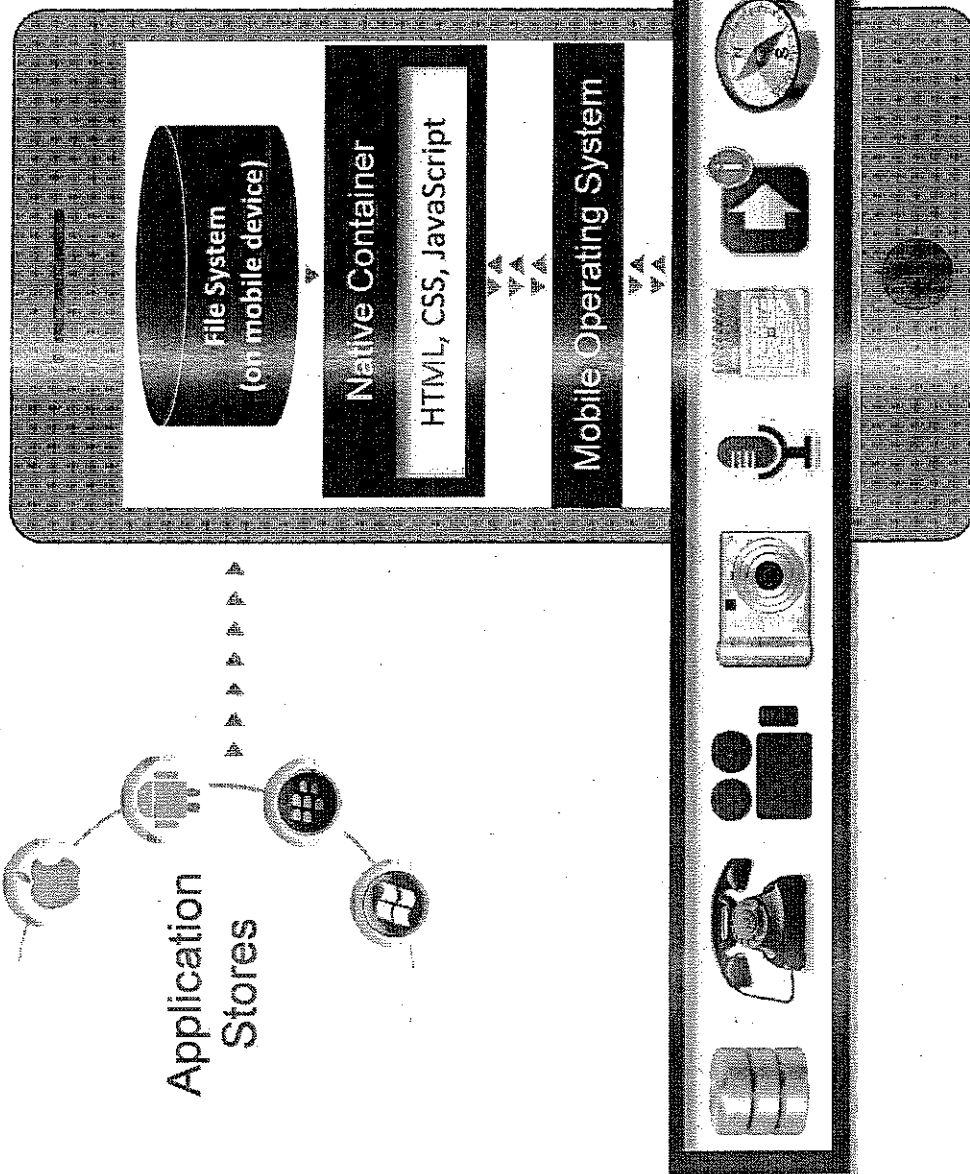


JavaScript Object Notation

Worklight Studio – multiple application architectures

- Mobile Web – server hosted HTML5, JavaScript, CSS, remotely accessed with an on-device web browser
- Hybrid – mobile web content with access to device features, packaged in a native device application and deployed on the device
- Mixed - hybrid + native pages in the same packaged mobile application
- Native – fully native applications leveraging Worklight's client API





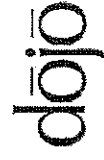
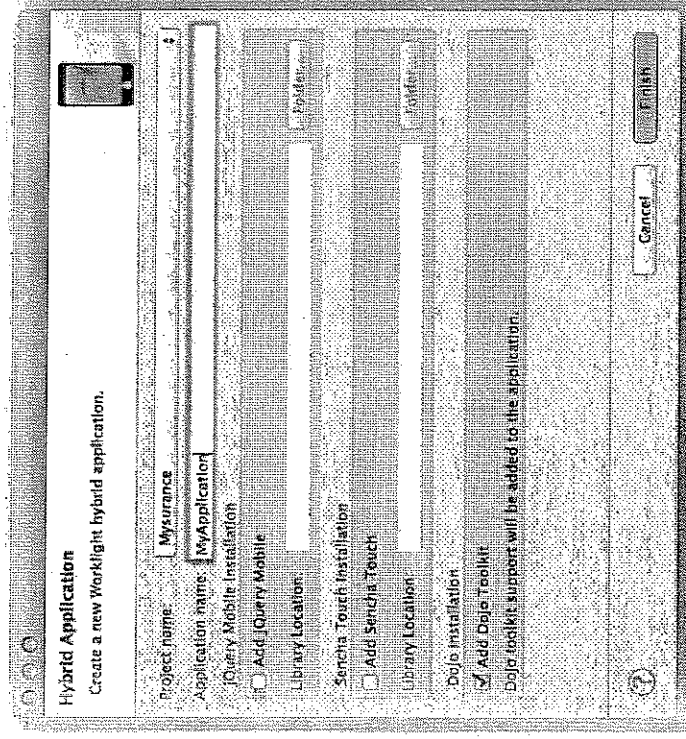
Combines best of both worlds:

Primarily written in HTML5, CSS, JS while allowing full access to device capabilities.

2019年12月10日

Worklight Studio – seamless integration with 3rd-party mobile tools

- Embedded Apache Cordova
 - Provides access to device features from a JavaScript API (formerly known as Phonegap)
- Optional Third Party tools
 - Simplified mobile programming models
 - Optimized mobile experience
 - Device-specific styling options
- Freedom of choice
 - Consistency with existing tool choices
 - Maximize existing skills
 - Options: choose none, one, multiple or bring-your-own



Worklight Studio – cross-platform code base

Common elements stored in the common folder

- HTML, JavaScript, CSS
- Worklight API usage
- 3rd party tools usage

Named Environment directories

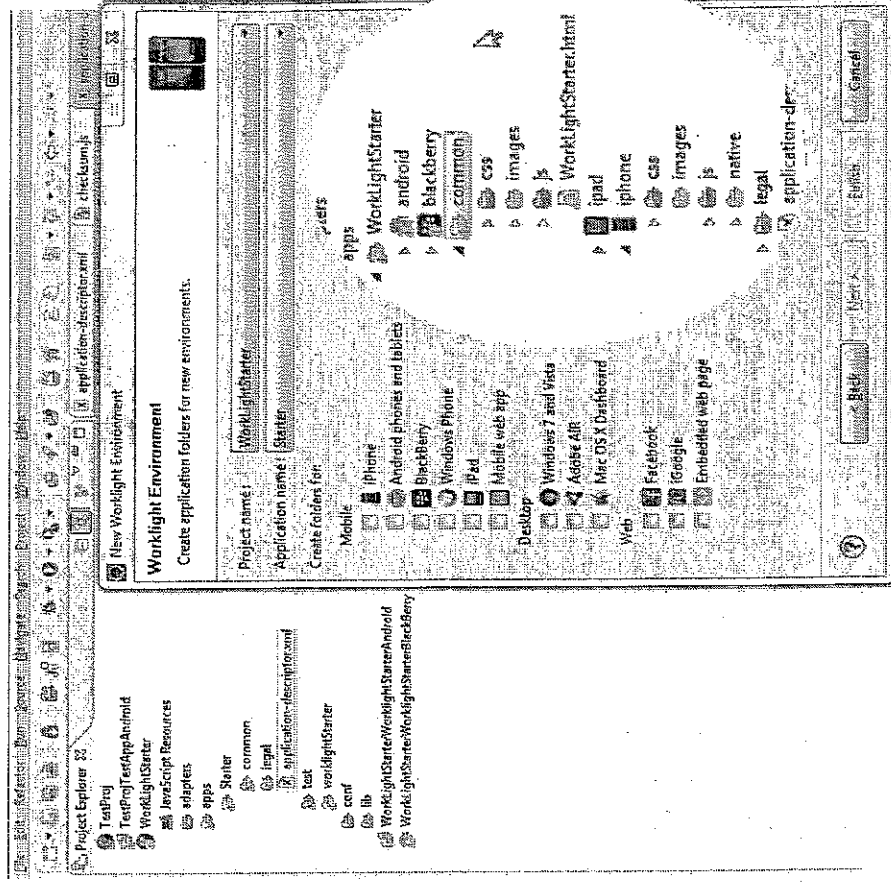
(android, blackberry, iphone, etc...)

•Generated as Environments are added to the project

•Platform-specific code

•Environment-specific user optimizations

- Over-ride default behaviors & styles
- Behavior and branding changes





Agenda

- Worklight Studio and application basics
- **Visual tooling and device simulation in Worklight Studio**
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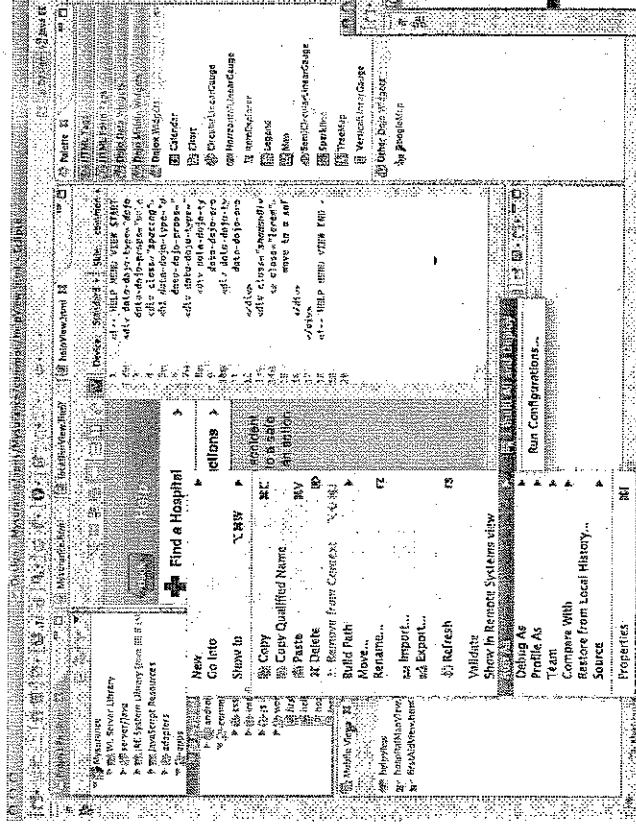
Worklight Studio - visual UI construction

The screenshot displays the Worklight Studio interface with three main panes highlighted by arrows and callouts:

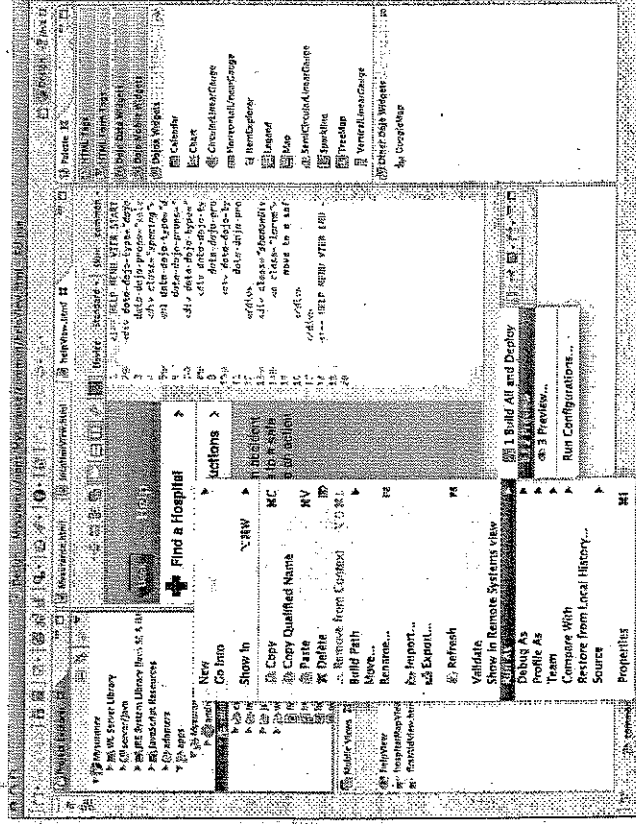
- Mobile Views** (left pane):
 - Select which view displays in design tab
 - Modify view properties
 - Create and delete mobile views
- Rich Page Editor** (center pane):
 - Source, Design and Split views
 - UI rendering using browser engine, synched with source pane
- Palette** (right pane):
 - Drag and drop visual elements into the Editor pane.
 - Offers HTML constructs and Dojo widgets

At the top right, a label **Worklight Design Perspectiv** with a small 'e' icon is visible.

Worklight Studio – build, package and test applications

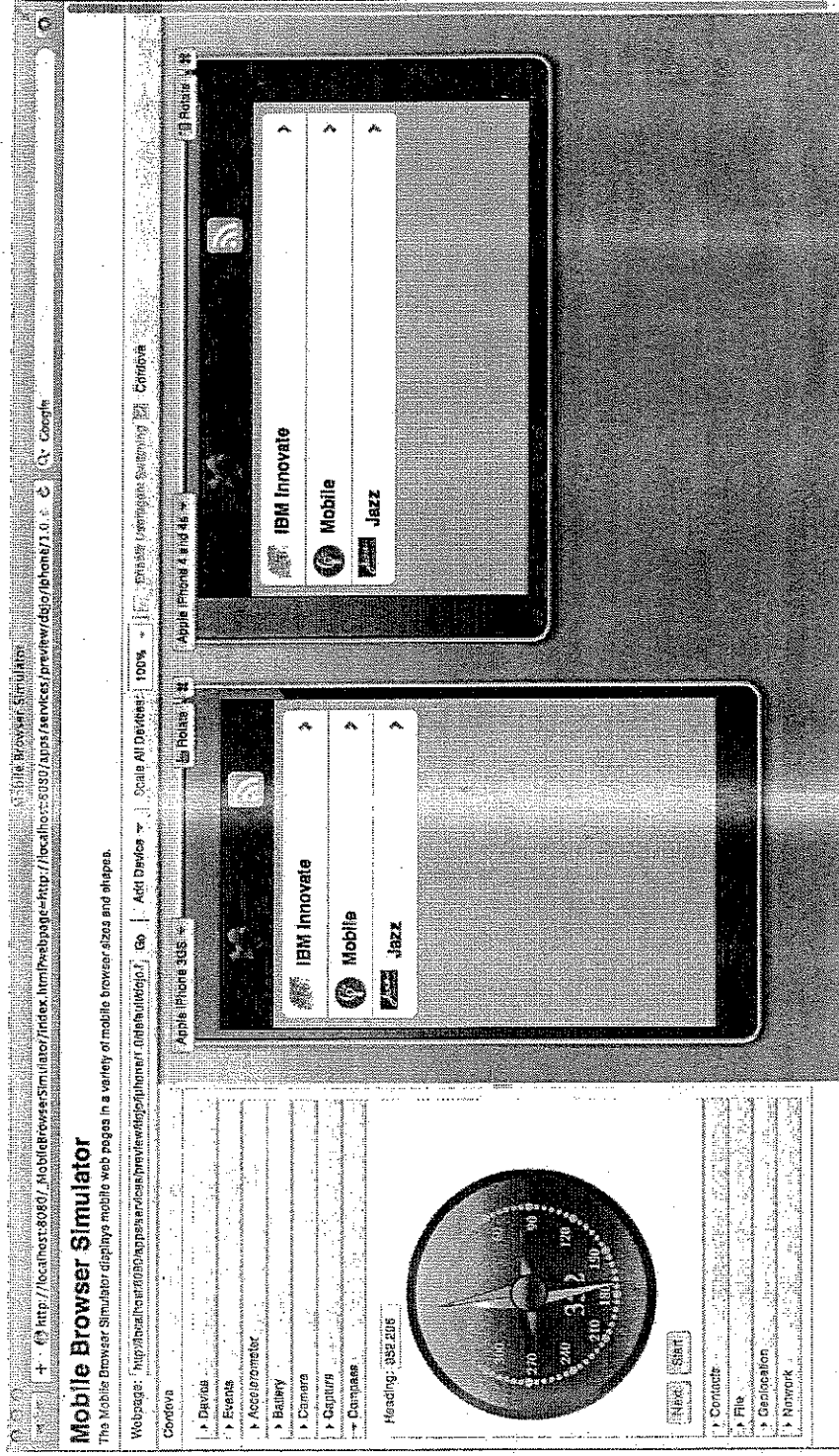


Build and Deploy
Package the Worklight Application
and deploy to Studio's lightweight
web container



Preview
Launch the Mobile Browser
Simulator for device-specific
rendering and testing

Worklight Studio – preview in Mobile Browser Simulator



- Perform device specific tests in the Mobile Browser Simulator, during development.
- Change device types, orientation, device settings (GPS loc, compass, etc...)
- Supports Cordova and Worklight client API

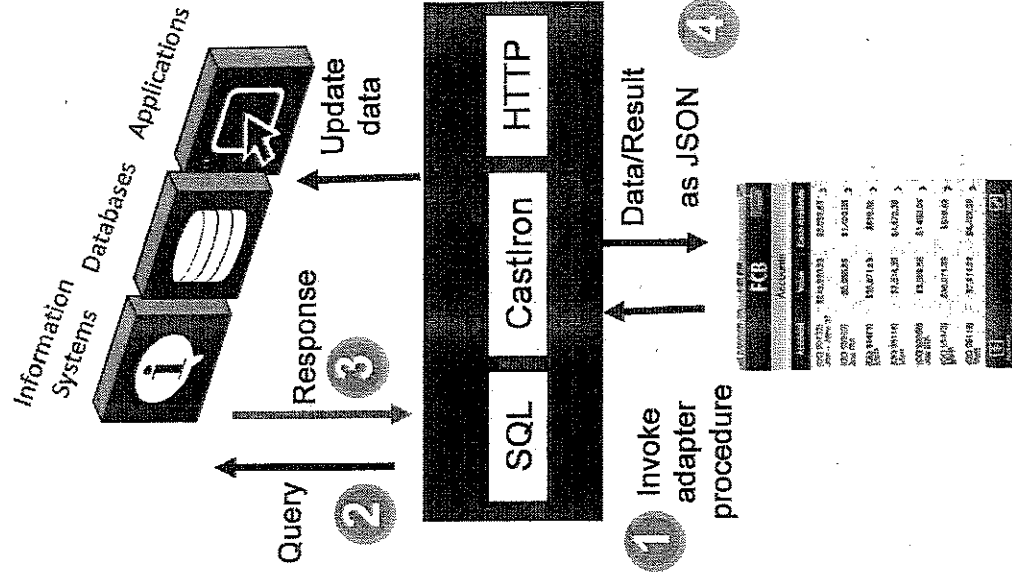


Agenda

- Worklight Studio and application basics
- Visual Tooling and Device Simulation in Worklight Studio
- **Developing Worklight Adapters**
- Native build and test with device SDKs

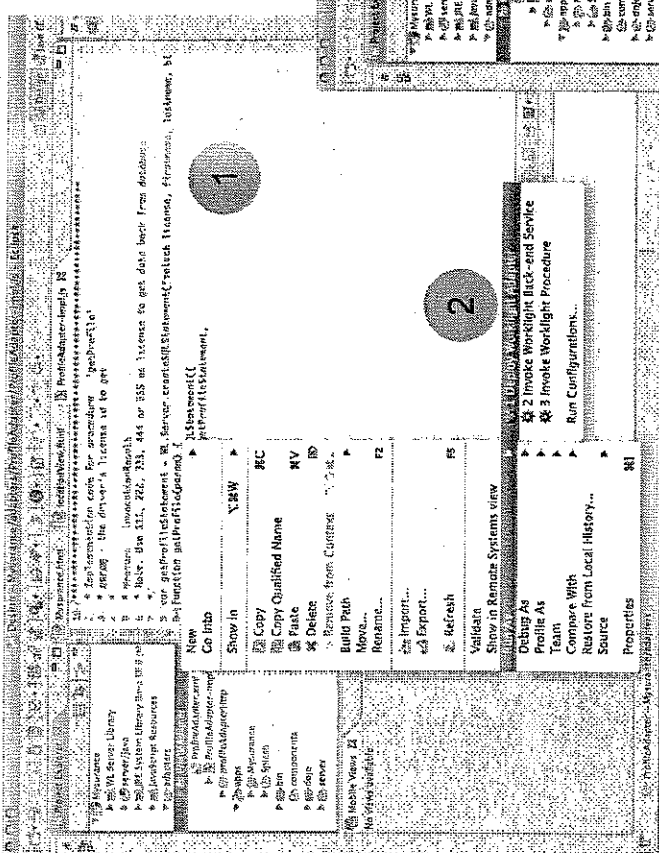
Worklight Studio - developing adapters

- An Adapter is a transport layer used by the Worklight Platform to connect to various back-end systems.
 - Executed on Worklight server
 - Implemented in JavaScript by default
 - Can be custom-coded in Java
 - Simple client-side JavaScript invocation model through Worklight client API
- Adapters are used for:
 - Retrieving information
 - Performing actions
- Out of the box Adapter support:
 - SQL Adapter
 - HTTP Adapter (supports both REST and SOAP)
 - Castlron Adapter (optimized for HTTP data exchange with Castlron integration appliance)



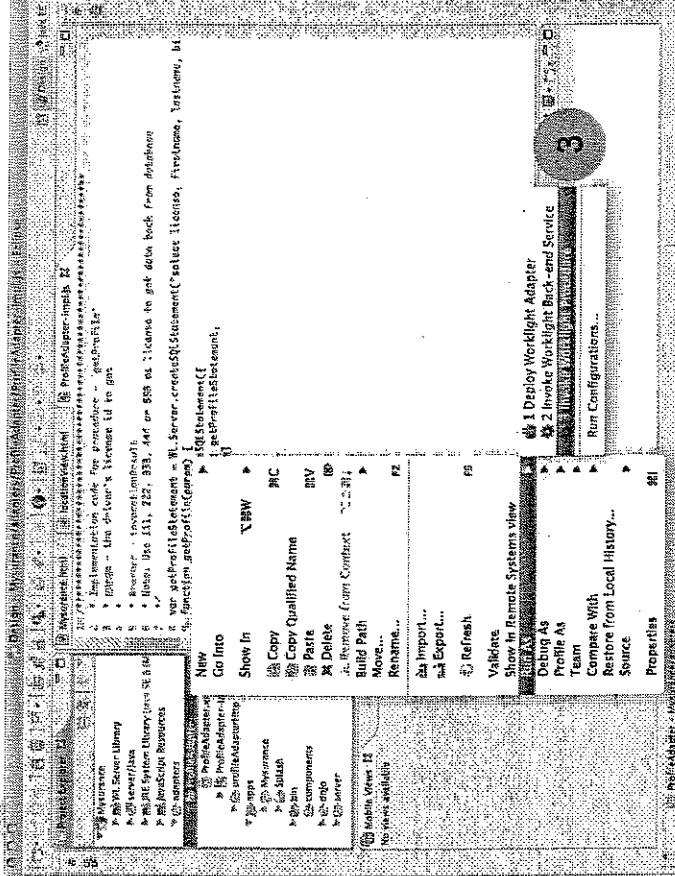
Worklight Studio - developing and testing adapters

(1) Implement Adapter procedures



(2) Deploy Adapter to embedded web container

(3) Invoke Adapter Procedure



Agenda

- Worklight Studio and application basics
- Visual Tooling and Device Simulation in Worklight Studio
- Developing Worklight Adapters
- **Native build and test with device SDKs**



Reference materials

IBM Worklight Developer Edition

<http://www.ibm.com/developerworks/mobile/worklight.html>

Getting Started

<http://www-01.ibm.com/software/mobile-solutions/worklight/library/>

Documents

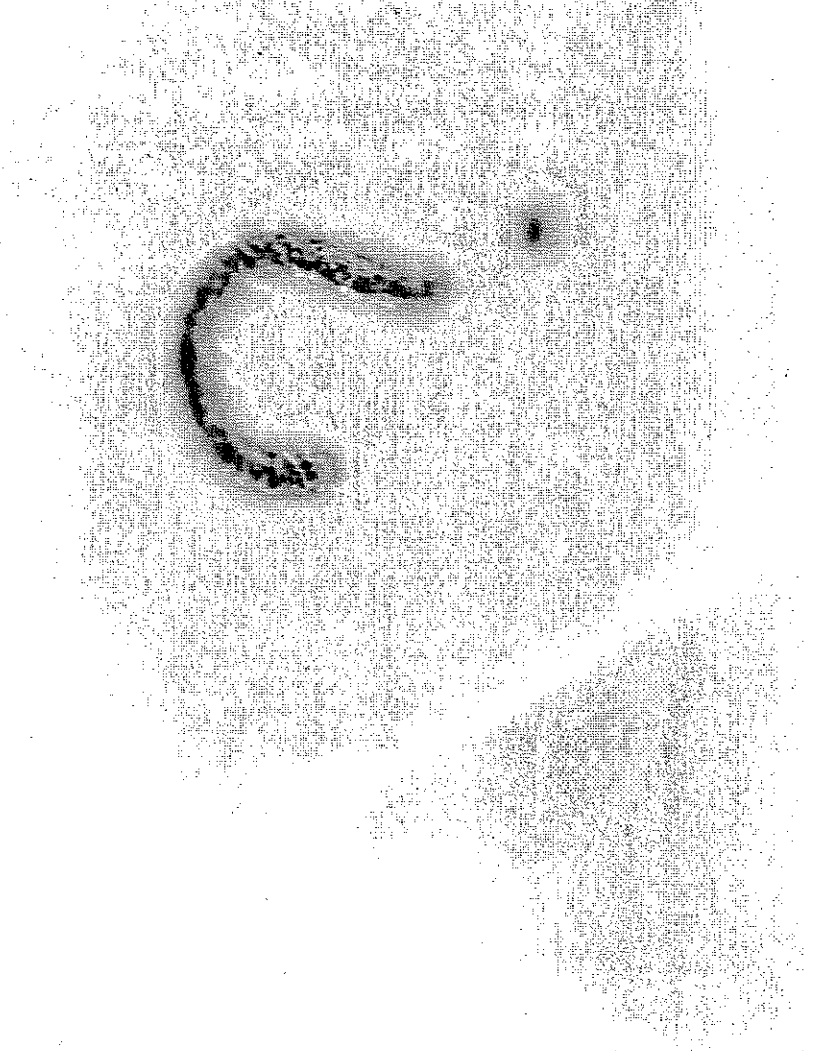
<http://pic.dhe.ibm.com/infocenter/wrklight/v5r0m5/index.jsp>

<https://www.ibm.com/developerworks/mobile/worklight/getting-started/current-documentation.html>

Forum

<https://www.ibm.com/developerworks/forums/forum.jspa?forumID=2830>

Questions

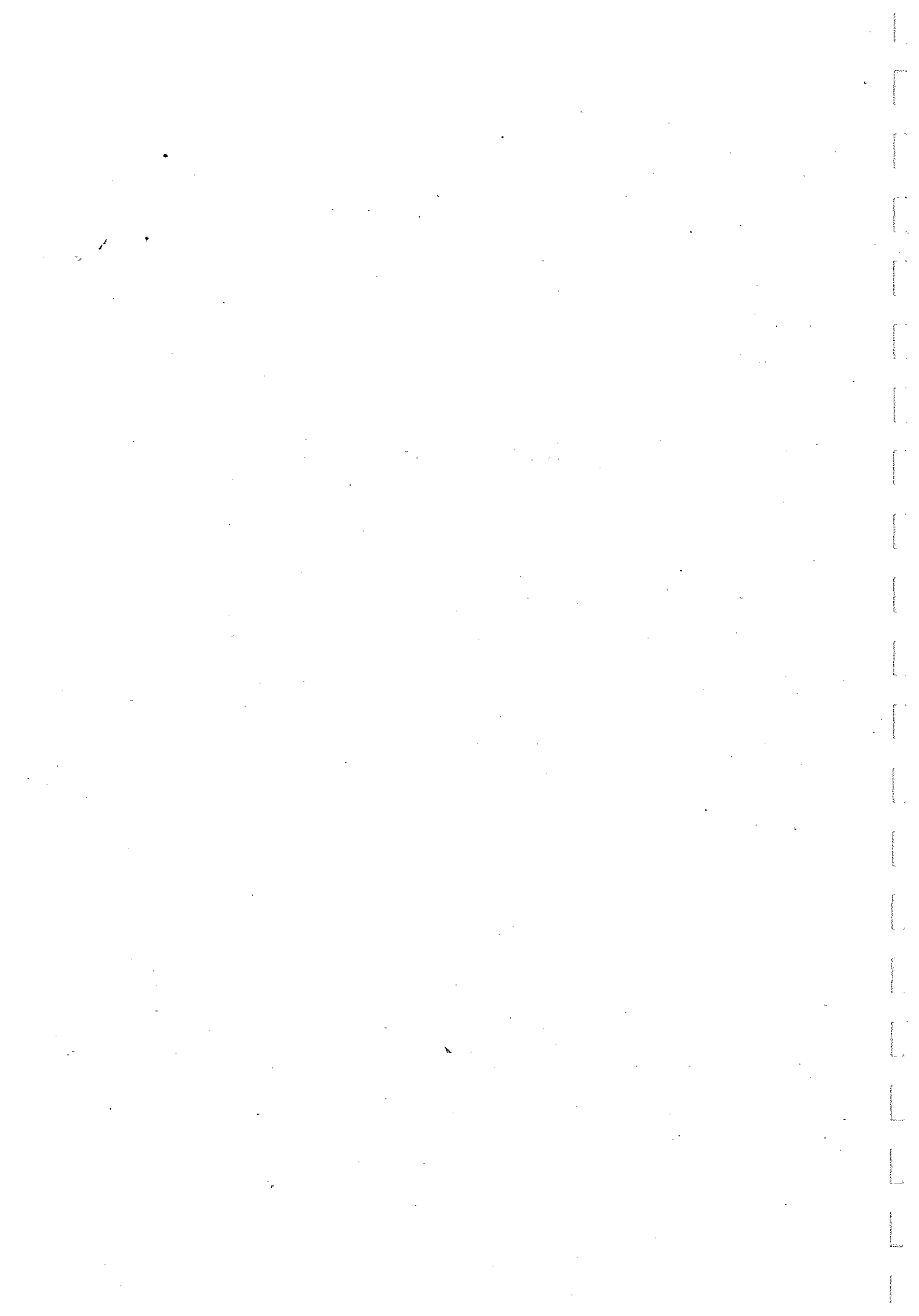




Grazie 多謝
ITALIAN
Merci ありがとう
FRENCH
Obrigado 多謝
BRAZILIAN PORTUGUESE
THANK YOU

Thank You

多謝 多謝
TRADITIONAL CHINESE
Gracias 多謝
SPANISH
Спасибо 多謝
RUSSIAN
Danke 多謝
GERMAN
شكرا 多謝
ARABIC

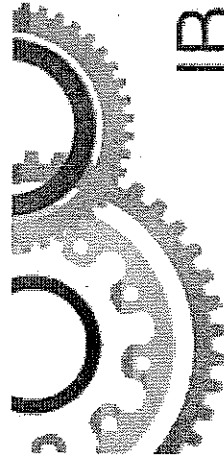


IBM Software Group Hong Kong

12 Jan 2013

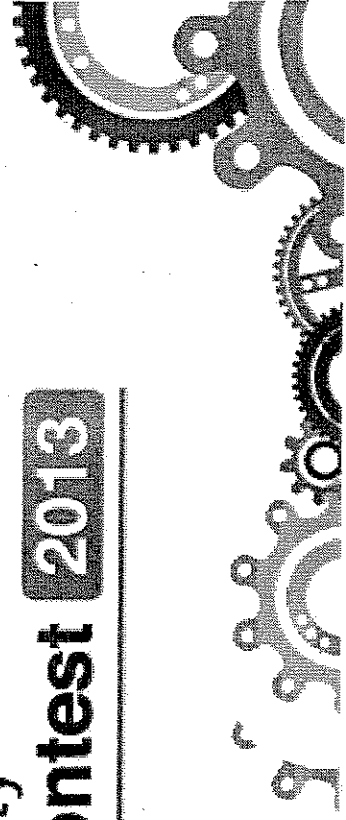


IBM Inter-University Programming Contest 2013 Training



IBM Inter-University
Programming Contest 2013

Feb 23, 2013 (Saturday)



Chapter Outline

- Tools to Access DB2
- DB2 Instances and Databases
 - Bufferpool
 - Tablespace
 - Schema
 - Data Type
 - Table
- Insert Statement
- Update Statement
- Delete Statement
- Select Statement
- Select Statement Options

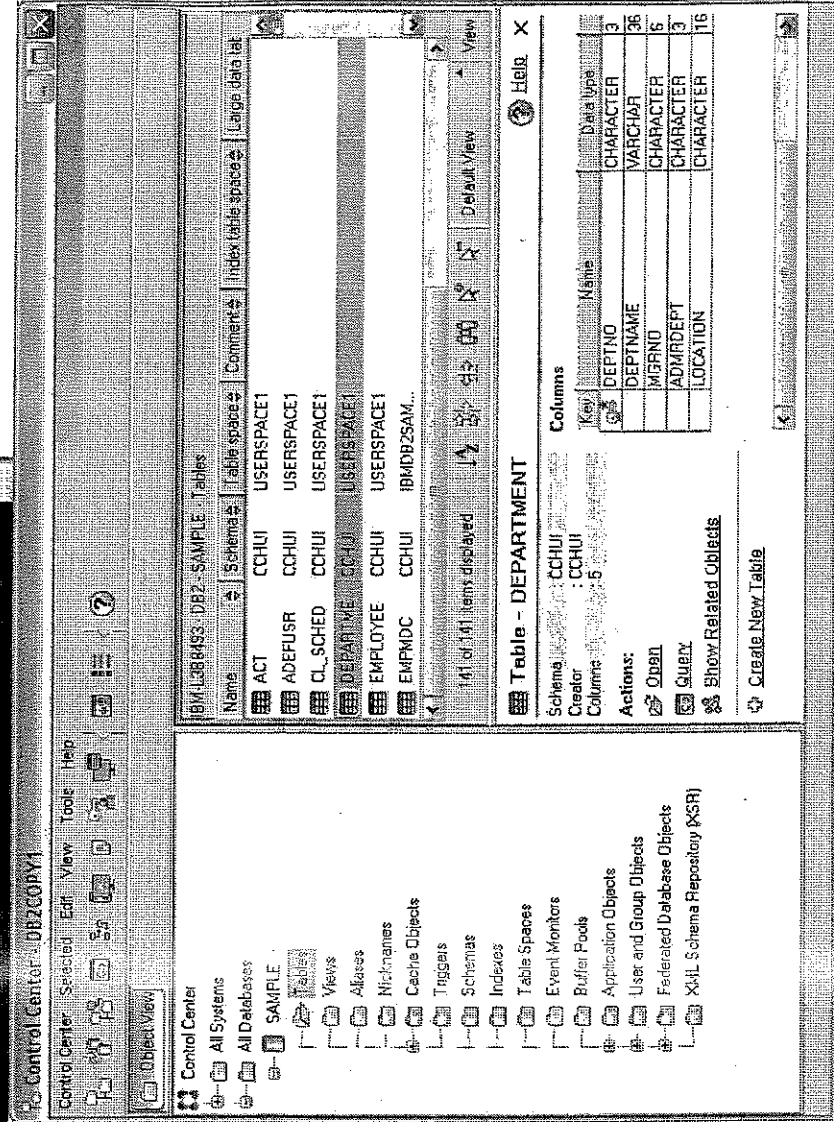
Tools to Access DB2

```

C:\>db2 connect to sample
Database Connection Information
Database server = DB2/NT 9.5.0
SQL authorization ID = CCHUI
Local database alias = SAMPLE

C:\>

```



Command Line Access

- DB2 Command Line Processor (CLP)
 - click on the DB2 Command Line Processor icon or enter db2 at a command prompt
 - an interactive input prompt appears:
 - db2 =>
 - no need to prefix commands with 'db2'
 - e.g. db2 => connect to sample
 - to end the interactive mode, enter quit
 - to disconnect from the database and terminate the DB2 backend process (db2bp), enter terminate
 - to execute OS commands, enter !<OS command>
- DB2 Command Line Window
 - click on the DB2 Command Window icon or from MS-DOS prompt, enter db2cmd
 - The command db2cmd is valid for Windows only
 - invoke the interpreter by prefacing commands and SQL with 'db2'
 - e.g. db2 connect to sample
 - e.g. db2 "select * from employee"
 - e.g. db2 -tvf createtab.db2
 - to end command line mode and terminate the DB2 backend process (db2bp), enter db2 terminate
 - all OS commands can be issued from the DB2 Command Window

Getting Help

- Obtain syntax and information for DB2 commands from the command line
 - db2 “?” list of all DB2 commands
 - db2 “? <db2-command>” get syntax help for a specific command
 - db2 “? sqlnnnn” “ get message and brief description of a specific SQLCODE
 - db2 “? db2nnnn” get message and brief description of a DB2 error code
- For example:
 - db2 “? catalog tcpip”
CATALOG [ADMIN] TCPIP NODE node-name REMOTE hostname
[SERVER service-name] [SECURITY {SOCKS}]
[REMOTE_INSTANCE instance-name] [SYSTEM system-name]
[OSTYPE os-type] [WITH "comment string"]

Command Line Options

- To list default command options

– LIST COMMAND OPTIONS

```

No. of retries to connect to backend      (DB2BQTRY) = 60
Request queue wait time (seconds)        (DB2RQTIME) = 5
Input queue wait time (seconds)         (DB2IQTIME) = 5
Command options                          (DB2OPTIONS) =
  
```

Option	Description	Current Setting
-a	Display SQLCA	OFF
-c	Auto-Commit	ON
-e	Display SQLCODE/SQLSTATE	OFF
-f	Read from input file	OFF
-l	Log commands in history file	OFF
-n	Remove new line character	OFF
-o	Display output	ON
-p	Display interactive input prompt	ON
-r	Save output to report file	OFF
-s	Stop execution on command error	OFF
-t	Set statement termination character	OFF
-v	Echo current command	OFF
-w	Display FETCH/SELECT warning messages	ON
-x	Suppress printing of column headings	OFF
-z	Save all output to output file	OFF

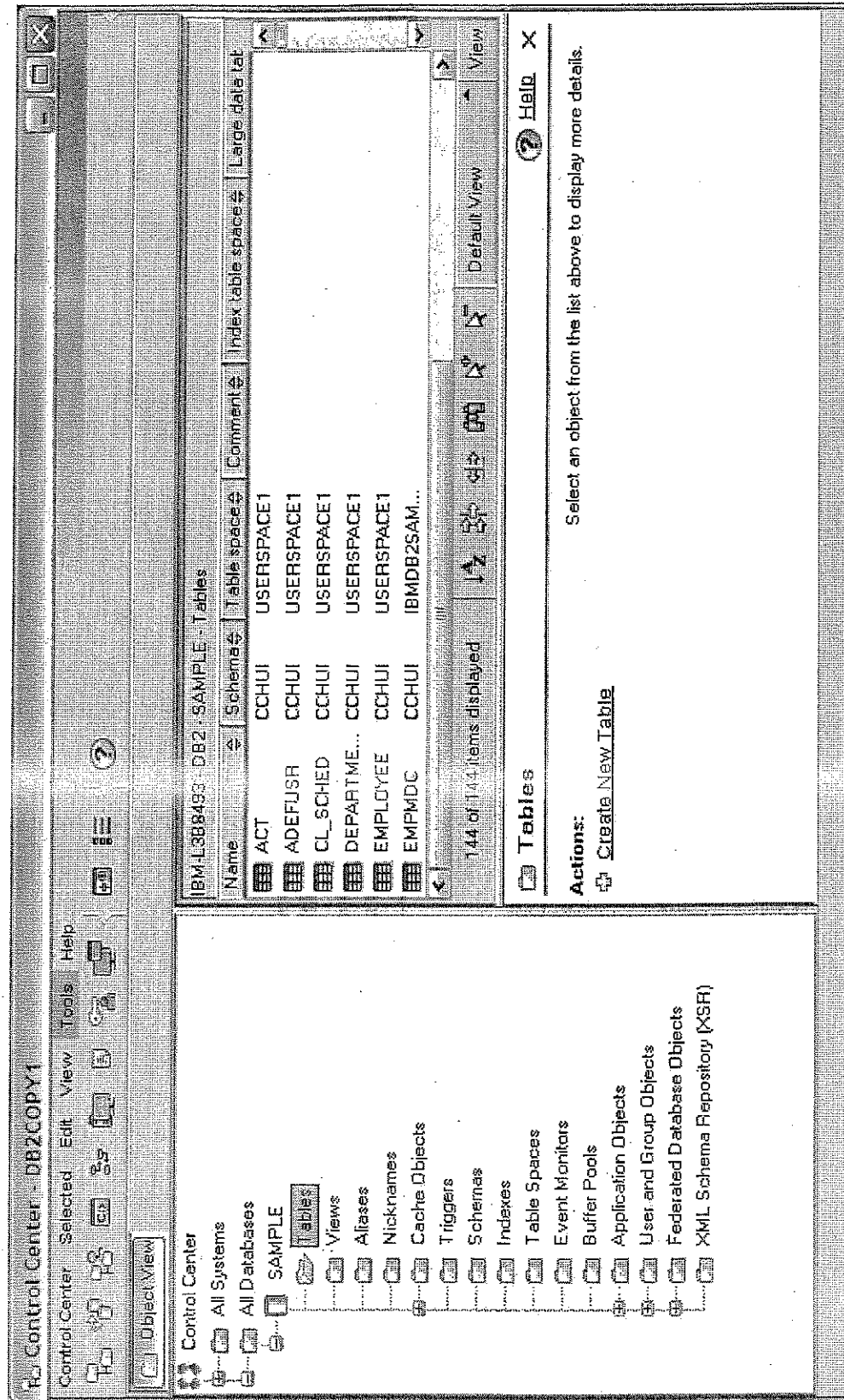
- To change default command options.

– For example, to turn auto-commit off: **set db2options=-c**

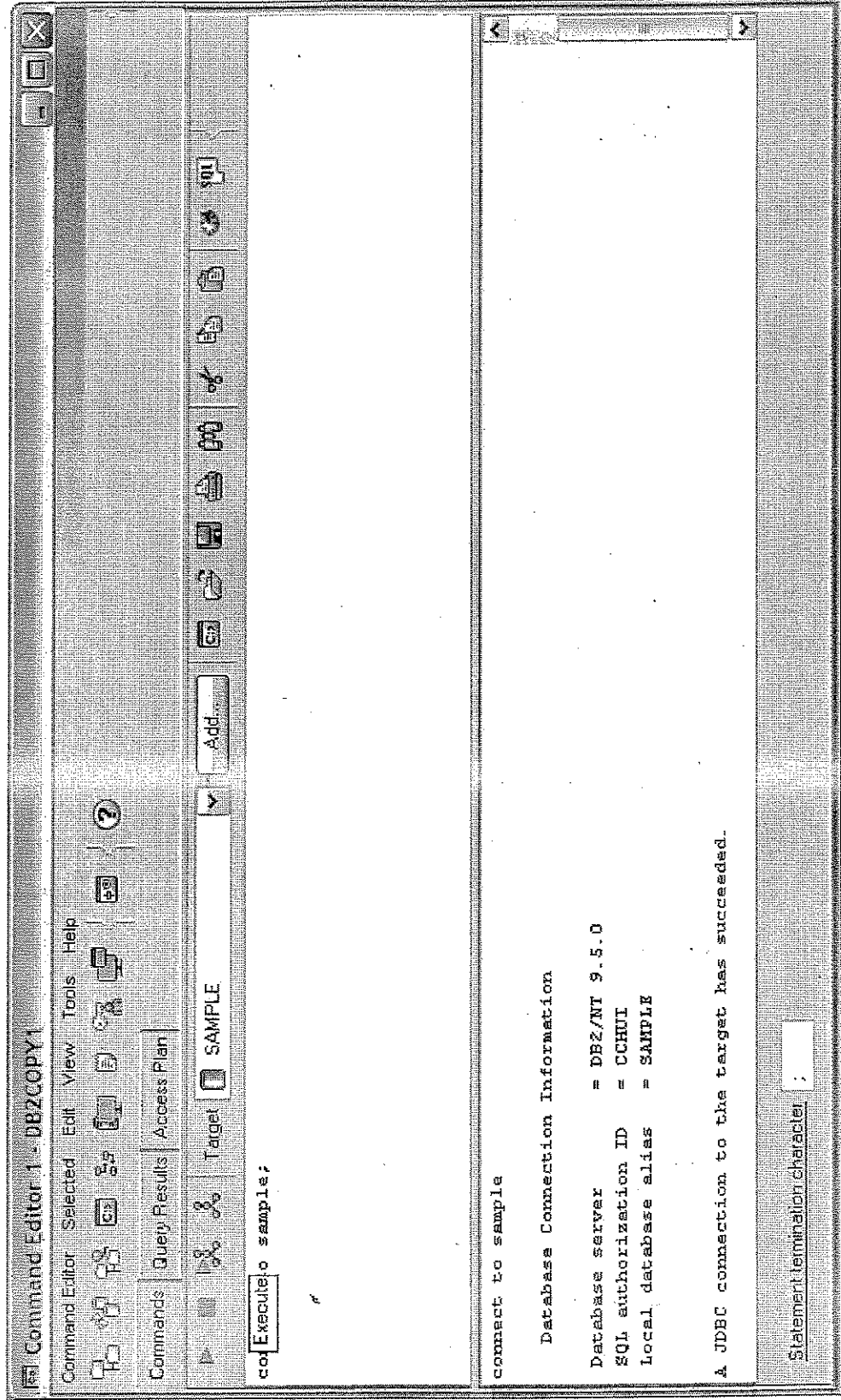
- To change command option for the current session

– For example, to save output to file: **UPDATE COMMAND OPTIONS USING z ON output.txt**

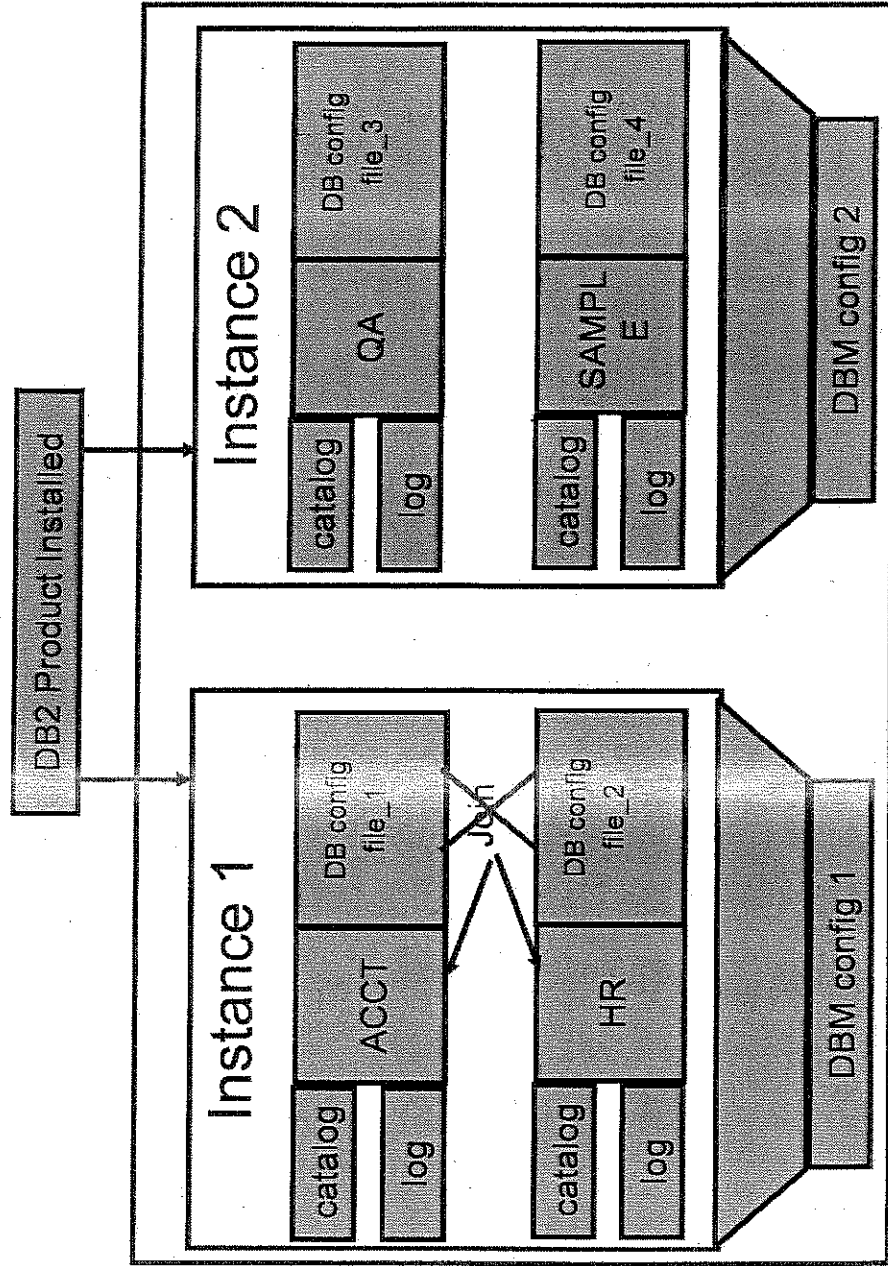
Control Center



Command Center



DB2 Instances and Databases



DB2 Instances

- A DB2 instance is a logical context in which DB2 commands and functions are executed
- An instance manages access to database files
- More than one instance can be defined on a server machine
- Each instance is independent of the others
- An instance is created on install by default
 - db2inst1 (UNIX)
 - DB2 (Windows)
- To start an instance
 - db2start
- Starts a remote instance
 - db2start REMOTE <instance name>
- Start the instance in quiesced mode for administration purposes
 - db2start ADMIN MODE
- Terminate all database connections and stop an instance
 - db2stop force

Managing DB2 Instances

- To create additional instances
 - `db2icrt -u <fenced user ID> <instance name>`
 - must specify fenced user ID for UNIX platforms
 - `db2icrt <instance name>`
 - for Windows platforms
- Terminate all database connections and drop an instance
 - `db2idrop -f <instance name>`
- To list existing instances defined in a server
 - `db2ilist`
- To update a DB2 instance for access to functions associated with installation or removal of certain product options or fix patches
 - `db2iupdt <instance name>`
- To migrate an existing instance, for UNIX platforms only
 - `db2imigr <instance name>`
- To create, drop, update, or migrate an instance, root or administrative access is required

Create a Database

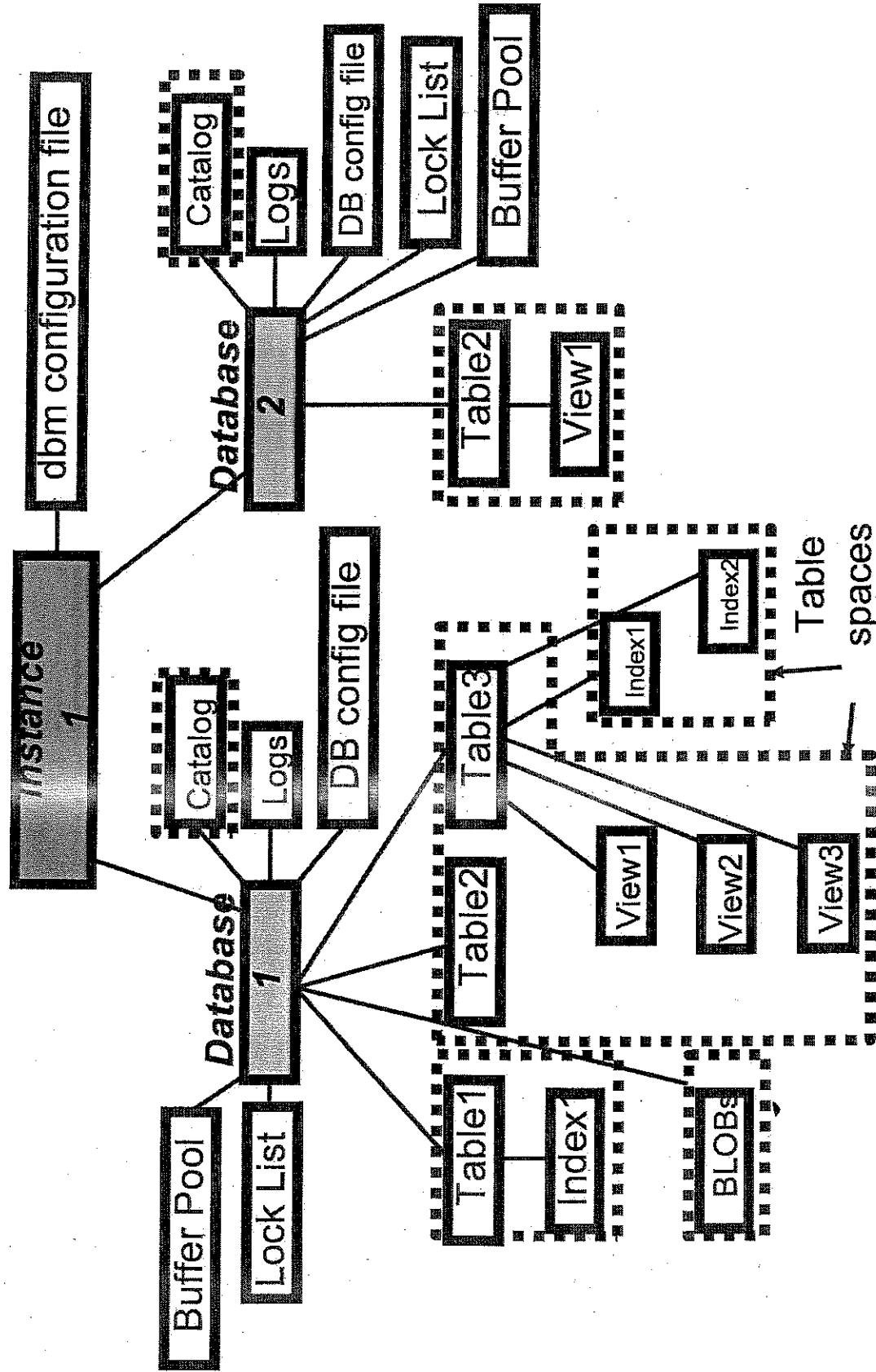
- Simplest format

CREATE DATABASE database-name

- More options:

```
CREATE DATABASE database-name
[AUTOMATIC STORAGE {NO | YES}]
[ON drive[{, drive}...][DBPATH ON drive]]
[ALIAS database-alias]
[USING CODESET codeset TERRITORY territory]
[PAGESIZE integer [K]]
[CATALOG TABLESPACE tblspace-defn]
[USER TABLESPACE tblspace-defn]
[TEMPORARY TABLESPACE tblspace-defn]
[AUTOCONFIGURE [USING config-keyword value [{, config-keyword value}...]]]
```

Database Object Hierarchy



Bufferpool

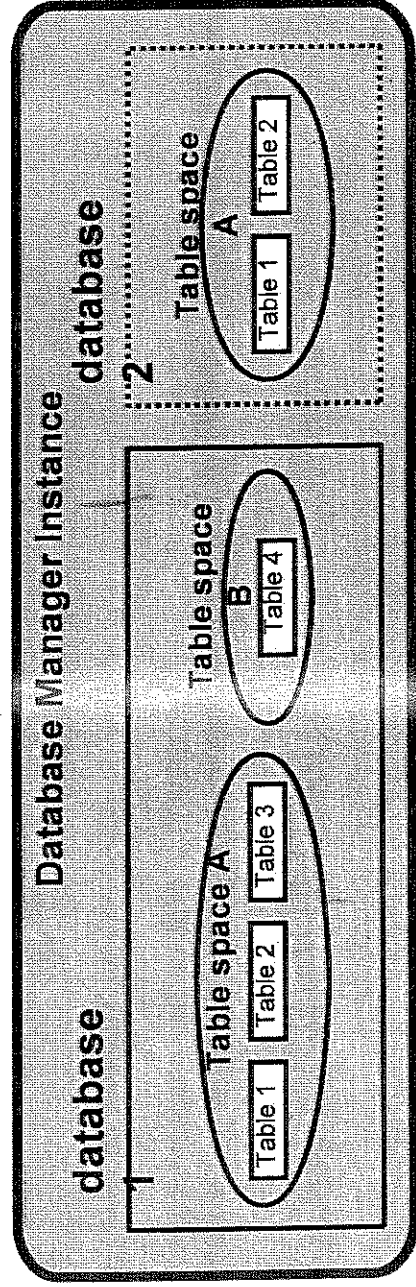
- Used to buffer data in memory to reduce the number of I/O operations to the physical database
- Keep often requested data/index pages in memory
- Keep infrequently accessed tables (e.g. random access into very large table) out of main memory
- Most data manipulation takes place in buffer pools, except for large objects and long field data
- IBMDEFAULTBP is the default bufferpool created with every database

Bufferpool Management

- Memory for the buffer pool is allocated when the database is activated or when the first application connects to the database
- Command to create buffer pool
 - CREATE BUFFERPOOL bpname IMMEDIATE SIZE sz PAGESIZE pgsz
 - CREATE BUFFERPOOL bpname DEFERRED SIZE sz PAGESIZE pgsz
- IMMEDIATE
 - Bufferpool be created immediately
- DEFERRED
 - Bufferpool be created when the database is reactivated
- Information stored in SYSIBM.SYSBUFFERPOOLS
- Alter size of a bufferpool
 - ALTER BUFFERPOOL bpname IMMEDIATE SIZE sz
 - ALTER BUFFERPOOL bpname DEFERRED SIZE sz
- Memory is allocated as soon as if the memory is available.
- If the memory is not available, the changed occurs when the database is reactivated
- If the size of the bufferpool is decreased, memory is deallocated at commit time

Tablespaces

- Table space is a logical grouping of tables and other objects in a database
- All database objects are stored within table spaces
- Two types of storage:
 - System Managed Space (SMS)
 - Database Managed Space (DMS)
- A table space is composed of one or more containers
- Data allocated by extents within containers
- Table spaces are either 4K, 8K, 16K or 32K pages
 - 4K is default size
 - Must be associated with a buffer pool with same page size



Default Tablespaces in a Database

- With a simple CREATE DATABASE command:
 - CREATE DATABASE sample
- Three SMS table spaces are created automatically in default locations:
 - SYSCATSPACE - system catalog tables
 - USERSPACE1 - default user data
 - TEMPSPACE1 - temporary data
- Can change table space storage type and explicitly specify the locations of the containers:

```
CREATE DATABASE sample
CATALOG TABLESPACE
MANAGED BY SYSTEM
USING ( 'c:\catdir1' );
USER TABLESPACE
MANAGED BY DATABASE
USING ( FILE 'c:\db2files\userbsp1 100, FILE 'c:\db2files\userbsp2 100 )
TEMP TABLESPACE
MANAGED BY SYSTEM
USING ( 'c:\temp space' );
```

Schema

- A schema is a collection of database objects such as tables, views, indexes, or triggers. It provides a logical classification of database objects
- How is a Schema name used?
 - Fully-qualified object name: "schemaname.tablename"
 - Can have multiple tables with the same name, but different schema names
 - eyerman.staff != jones.staff
- Reserved schema names
 - SYSCAT, SYSIBM, SYSSTAT, SYSFUN
 - Avoid schema names beginning with SYS
- If database object does not specify a schema name, table qualified with current authorization ID
- Alternate schema names can be specified using
 - SET CURRENT SCHEMA or SET CURRENT SQLID command
 - CREATE ALIAS <aliasname> FOR <tab/view name>
 - CREATE VIEW

System Schemas

- Created with every database and placed into the SYSCATSPACE table space
- SYSIBM
 - Base catalogs
 - Access not recommended
- SYSCAT
 - SELECT authority GRANTED to PUBLIC
 - Catalog Read-only Views
 - Recommended way to obtain catalog information
- SYSSTAT
 - Updateable Catalog Views - Influence the Optimizer
- SYSFUN
 - User-Defined Functions

System Catalog Tables and Views

Schema: Table = SYSIBM View = SYSCAT

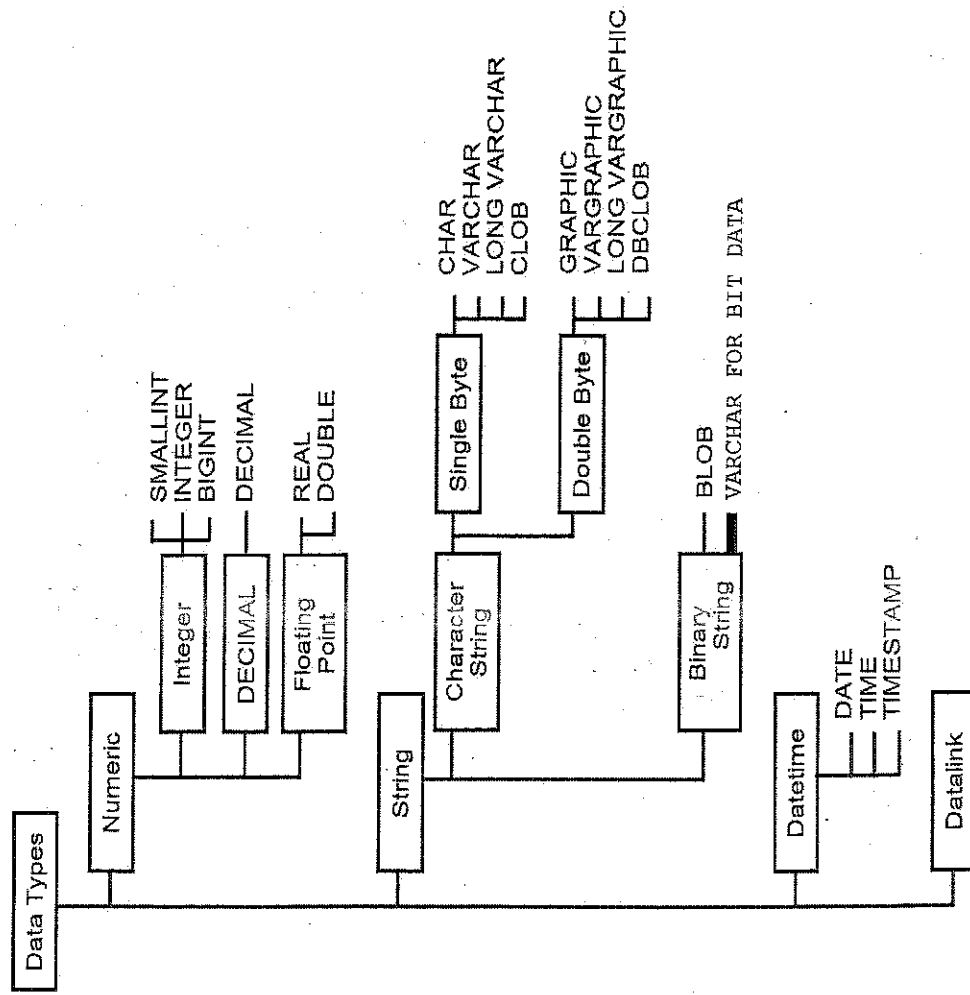
TABLE	VIEW	DESCRIPTION
SYSDBAUTH	DBAUTH	Authorities on database
SYSCHECKS	CHECKS	Check constraints
SYSCOLUMNS	COLUMNS	Column definitions
SYSCOLCHECKS	COLCHECKS	Columns referenced by check constraints
SYSCOLDIST	COLDIST	Detailed columns statistics
SYSKEYCOLUSE	KEYCOLUSE	Columns used in keys
SYSCONSTDEP	CONSTDEP	Constraint dependencies
SYSDATATYPES	DATATYPES	Datatype definitions (built-in & UDT)
SYSSEVENTMONITORS	EVENTMONITORS	Event Monitor Definitions
SYSSEVENTS	EVENTS	Events currently monitored
SYSFUNCPARMS	FUNCPARMS	Definitions of Parameters/Results of UDFs
SYSFUNCTIONS	FUNCTIONS	UDF definitions
SYSINDEXAUTH	INDEXAUTH	Index privileges
SYSINDEXES	INDEXES	Index definitions

System Catalog Tables and Views

Schema: Table = SYSIBM View = SYSCAT

TABLE	VIEW	DESCRIPTION
SYSPACKGEAUTH	PACKAGEAUTH	Authorities on packages
SYSPACKGEDEP	PACKAGEDEP	Package dependencies
SYSPACKAGES	PACKAGES	Package definitions
SYSREFERENCES	REFERENCES	Referential constraints definitions
SYSSTATEMENTS	STATEMENTS	Details of package SQL Statements
SYSTABAUTH	TABAUTH	Table Authorities
SYSTABCONST	TABCONST	Table constraint definitions
SYSTABLES	TABLES	Table definitions
SYSTABLESPACES	TABLESPACES	Table Space Definitions
SYSSTRIGDEP	TRIGDEPEVENTS	Trigger dependencies
SYSSTRIGGERS	TRIGGERS	Definitions of triggers
SYSVIEWWDEP	VIEWDEP	View dependencies
SYSVIEWS	VIEWS	View definitions

Data Types



CREATE TABLE Command

- You must have SYSADM or DBADM authority or CREATETAB privilege on the database
- Example:

```
connect to eddb;  
create table artists  
( artno                SMALLINT NOT NULL  
  , name                VARCHAR(50) WITH DEFAULT 'abc'  
  , classification      CHAR(1) NOT NULL  
  , bio                 CLOB(100K) LOGGED  
  , article             DATALINK LINKTYPE URL FILE  
  , picture             LINK CONTROL MODE DBOPTIONS,  
  , picture             BLOB(2M) NOT LOGGED COMPAT )  
INDEX IN indtbsp  
LONG IN longtbsp  
IN datatbsp;
```


Table

- If a table is created without the IN clause, it will be placed:
 - In the IBMDEFAULTGROUP table space (if it exists and if the page size is sufficient)
 - In a user created table space which is of the smallest pagesize that is sufficient for the table
 - Then it will go in USERSPACE1 (if it exists and has a sufficient page size)
- Use IN, INDEX IN, and LONG IN clauses to specify the tablespaces to stored related information
- To duplicate a table:
 - CREATE TABLE tab1new LIKE tab1;
- No constraints, triggers, or indexes copied, and data not copied
- May specify table or view
- To define a table using SQL statement
 - CREATE TABLE t1new
AS (SELECT c1, c8, c10 FROM t1)
DEFINITION ONLY;
- Column attributes of defined table based upon referenced table
- Data not populated

Other Useful Table Commands

- LIST TABLES
 - List tables for the current user
- LIST TABLES FOR ALL
 - List all tables defined in the database
- LIST TABLES FOR SCHEMA <schema>
 - List tables for the specified schema
- DESCRIBE TABLE <tablename>
 - Show the structure of the specified table

Column name	Data type schema	Data type name	Column Length	Scale	Nulls
DEPTNO	SYSTEM	CHARACTER	3	0	No
DEPTNAME	SYSTEM	CHARACTER	36	0	No
MGRNO	SYSTEM	CHARACTER	6	0	Yes
ADDRDEPT	SYSTEM	CHARACTER	3	0	No
LOCATION	SYSTEM	CHARACTER	16	0	Yes

5 record(s) selected.

C:\>=

Insert Statement

- You need to have appropriate table or view privilege
- Can insert one or more rows at a time

```
INSERT INTO department (deptno, deptname, admrdept)
VALUES ('E31', 'ARCHITECTURE', 'E01'),
      ('E32', 'INFRASTRUCTURE', 'E02')
```

- You can use subselect to determine values

```
INSERT INTO department (deptno, deptname)
SELECT deptno, deptname FROM sales_depts
```
- May also be done to a subset of columns provided:
 - A column not specified accepts NULLs or
 - Columns defined WITH DEFAULT
- Large amounts of data? Look at using LOAD instead

Update Statement

- UPDATES come in 3 main varieties :

- Full table

```
UPDATE employee SET salary = NULL
```

```
UPDATE employee SET (dept) = (
```

```
    SELECT deptname FROM department WHERE deptno = 1)
```

- Searched with a **WHERE** clause

```
UPDATE employee SET salary = salary * 1.10 WHERE title = 'DBA'
```

- Positioned using a **CURSOR** in a program

```
EXEC SQL DECLARE C1 CURSOR FOR
```

```
    SELECT * FROM EMPLOYEE FOR UPDATE OF JOB;
```

```
EXEC SQL OPEN C1;
```

```
EXEC SQL FETCH C1 INTO ... ;
```

```
if ( strcmp (change, "YES") == 0 )
```

```
    EXEC SQL UPDATE EMPLOYEE
```

```
        SET JOB = :newjob
```

```
        WHERE CURRENT OF C1;
```

```
EXEC SQL CLOSE C1;
```

```
end if
```

Delete Statement

- DELETES can apply to single or multiple rows
 - You can also use subselect to determine values
- Two forms of statement :
 - Searched DELETE form is used to delete one or more rows
 - Optionally determined by a search condition
 - Positioned DELETE form is used to delete exactly one row
 - Determined by the current position of a cursor
- Deleted rows not removed from table
 - Space is marked as unused
 - Reclaim space using the REORG command
- Example:

DELETE FROM DEPARTMENT WHERE DEPTNO = 'D11'

Select Statement

- SELECT is the QUERY element of the language
- Queries come in many styles:
 - Retrieving all table data
 - Limiting Columns or Rows retrieved
 - Cartesian Product
 - Inner Join
 - Set operators
 - Common table expressions
 - Other options:
 - derived columns
 - sub-query etc.
 - sorting
 - using functions
 - grouping values

ORDER BY Clauses

▪ ORDER BY clause

- The ORDER BY clause specifies an ordering of the rows of the result table
- If a single sort specification (one sort-key with associated direction) is identified, the rows are ordered by the values of that sort specification
- If more than one sort specification is identified, the rows are ordered by the values of the first identified sort specification, then by the values of the second identified sort specification, and so on
- Example:

```
SELECT c1, c2 FROM t1 ORDER BY c1;
```

GROUP BY, HAVING Clauses

- GROUP BY ... <grouping expression>
 - A GROUP BY clause contains a grouping expression, it specifies an intermediate result table that consists of a grouping of the rows of R. R is the result of the previous clause of the subselect.
SELECT workdept, MAX (salary) FROM employee GROUP BY workdept ;
- HAVING clause
 - The HAVING clause specifies an intermediate result table that consists of the groups of R for which the search-condition is true. R is the result of the previous clause of the subselect.
SELECT workdept, MAX (salary) FROM employee GROUP BY workdept
HAVING MAX (salary) < (SELECT avg (salary FROM employee) ;
- Obtain distinct value from a table
SELECT DISTINCT (position) FROM employee ;
- Use of LIKE
SELECT DISTINCT WORKDEPT FROM employee WHERE WORKDEPT LIKE 'A%';
- Use of EXISTS
SELECT empno, salary FROM employee
WHERE NOT EXISTS (SELECT empno FROM manager) ;
- Use of IN, NOT IN clauses
SELECT empno, salary FROM employee
WHERE department IN ('A00', 'B00', 'C00') ;

Questions & Answers



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