



COLLABORATE15

TECHNOLOGY AND APPLICATIONS FORUM
FOR THE ORACLE COMMUNITY

Designing an Analytics Strategy for the 21st Century

Session ID#: 10452

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APRIL 12-16, 2015
MANDALAY BAY
RESORT & CASINO

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REMINDER

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Vlamis Software Solutions

- Founded 20+ years ago by Dan Vlamis
- Headquartered in Liberty (Kansas City), MO
- Oracle “Gold” Partner and Oracle University Partner
- Focused on Oracle Business Intelligence and Analytics
- Led more than 200 Oracle BI/Analytics implementations
- Specialize in the analytical options to the Oracle DB
 - Oracle Advanced Analytics
 - Oracle Data Mining
 - Oracle R Enterprise
 - Oracle OLAP
 - Oracle Spatial & Graph
 - Oracle In-Memory



Tim Vlamis and Dan Vlamis

■ Tim Vlamis

- 25+ years experience in business modeling and valuation, forecasting, and scenario analyses
- Oracle ACE
- Instructor for Oracle University's Data Mining Techniques and Oracle R Enterprise Essentials Courses
- Professional Certified Marketer (PCM) from AMA
- Adjunct Professor of Business Benedictine College
- MBA Kellogg School of Management (Northwestern University)
- BA Economics Yale University

■ Dan Vlamis

- Founded Vlamis Software Solutions in 1993
- 25+ years in business intelligence, dimensional modeling
- Oracle ACE Director
- Developer for IRI (expert in Oracle OLAP and related)
- BA Computer Science Brown University



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Vlamiis Collaborate Sessions

Presenter	Session	Time	Location	Title
Dan and Tim Vlamiis	OAUG	Mon 12:45 – 1:45 PM	South Seas D	Data Visualization for Oracle Business Intelligence 11g
Dan and Tim Vlamiis	OAUG	Mon 3:15 – 4:15 PM	Coral B	Designing an Analytics Strategy for the 21st Century
Dan and Tim Vlamiis	IOUG	Tues 2:00 – 3:00 PM	Jasmine E	Forecasting, Prediction Models, and Time Series Analysis with Database Analytics and OBIEE
Dan and Tim Vlamiis	IOUG	Wed 3:15 – 4:15 PM	Banyan D	The Oracle Data Mining Machine Bundle: Zero to Predictive Analytics in Two Weeks
Jon Clark	IOUG	Thurs 12:15 – 1:15 PM	Reef F	Using Cloud technology for Oracle Database and Oracle BI Sandboxes and Training Environments



Agenda

- Your comments, questions, opinions, and ideas are more important to this session than
- our prepared PowerPoint slides!



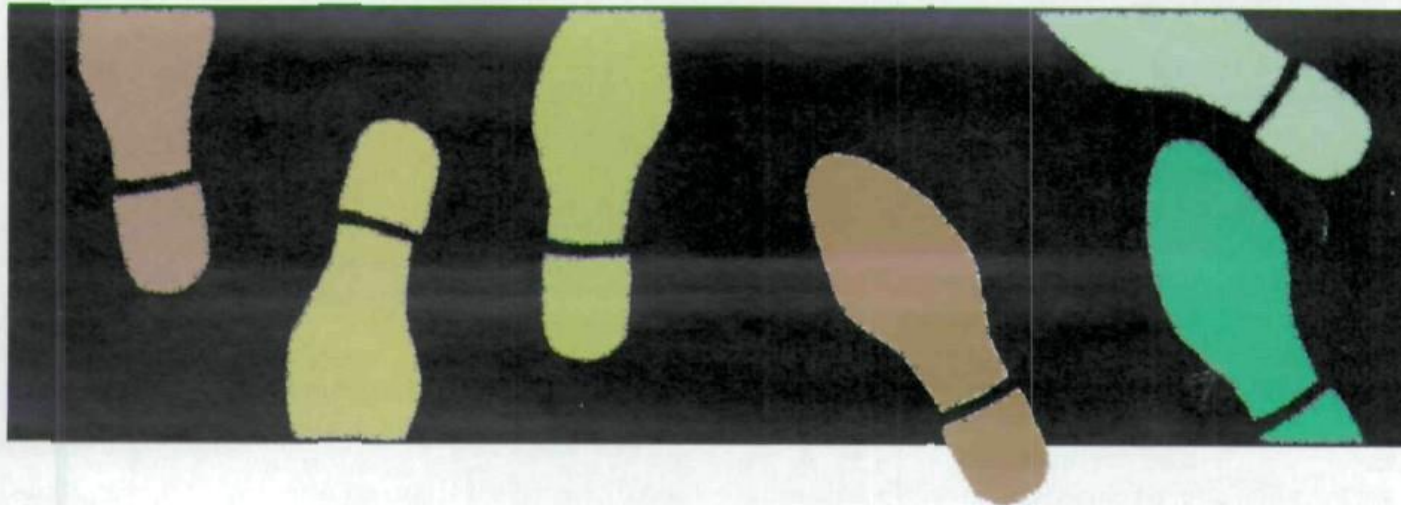
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Good News!

- Analytical tools are readily available, very powerful.
- Significant performance gains are being achieved through advanced analytics.
- Everyone has a basic grounding in analytical thinking.





I. Operational Effectiveness Is Not Strategy

For almost two decades, managers have been learning to play by a new set of rules. Companies must be flexible to respond rapidly to competitive and market changes. They must benchmark continuously to achieve best practice. They must outsource aggressively to gain efficiencies. And they must nurture a few core competencies in the race to stay ahead of rivals.

egy. The quest for productivity, quality, and speed has spawned a remarkable number of management tools and techniques: total quality management, benchmarking, time-based competition, outsourcing,

ing, partnering, reengineering, change management. Although the resulting operational improvements have often

What Is Strategy?

by Michael E. Porter

been dramatic, many companies have



The image shows four rectangular trays of marbled paper, arranged in a 2x2 grid. The top-left tray has a yellow-orange base with red and orange marbled patterns. The top-right tray is a solid, deep red color. The bottom-left tray is a light beige or cream color with small, dark brown or black speckles. The bottom-right tray is a vibrant teal or turquoise color with small, dark brown or black speckles. The text "Strategy involves choices" is overlaid on the top-right tray in a white, serif font.

Strategy
involves choices

Strategy

=

Design

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We have LOTS of data

Every day, we create 2.5 quintillion bytes of data – so much that 90% of the data in the world today has been created in the last two years.

2,500,000,000,
000,000,000



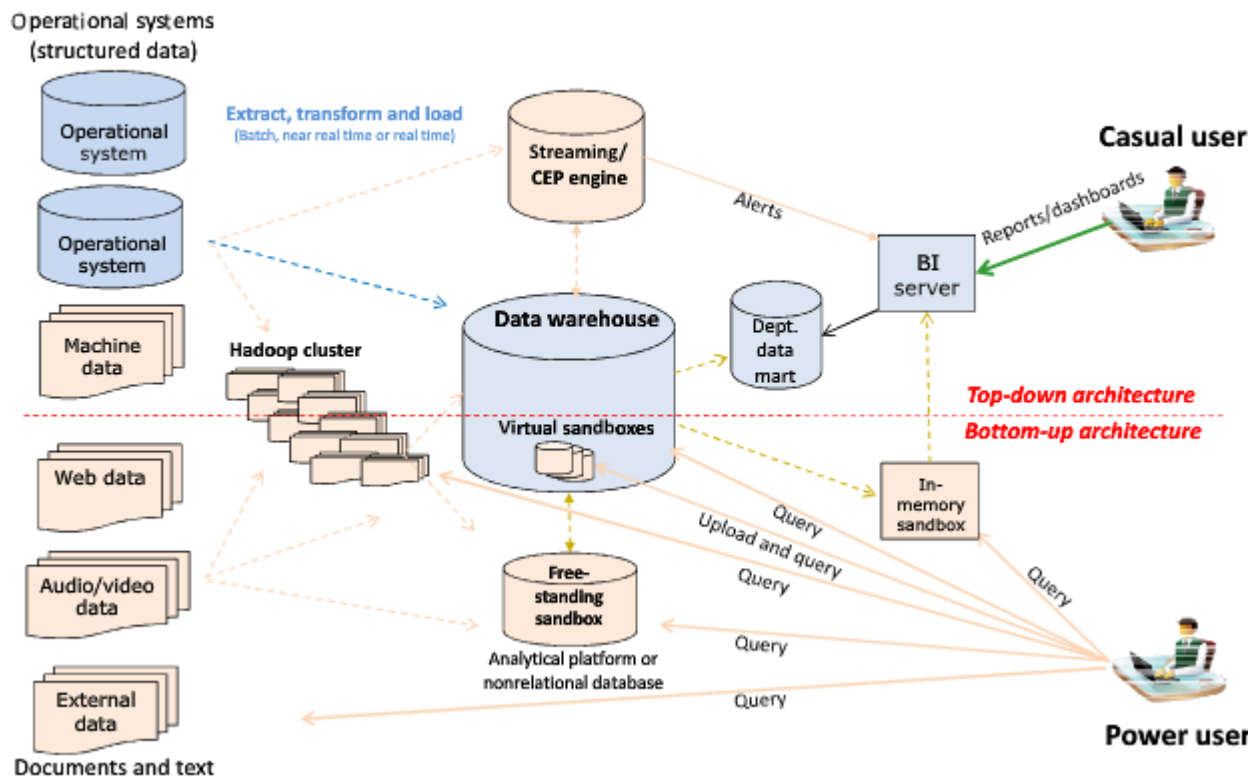
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Analytics Data Warehouses are large

- Oracle Business Intelligence implementations average:
 - About 3000 users
 - Approximately 5 terabytes of data

The New Analytical Ecosystem



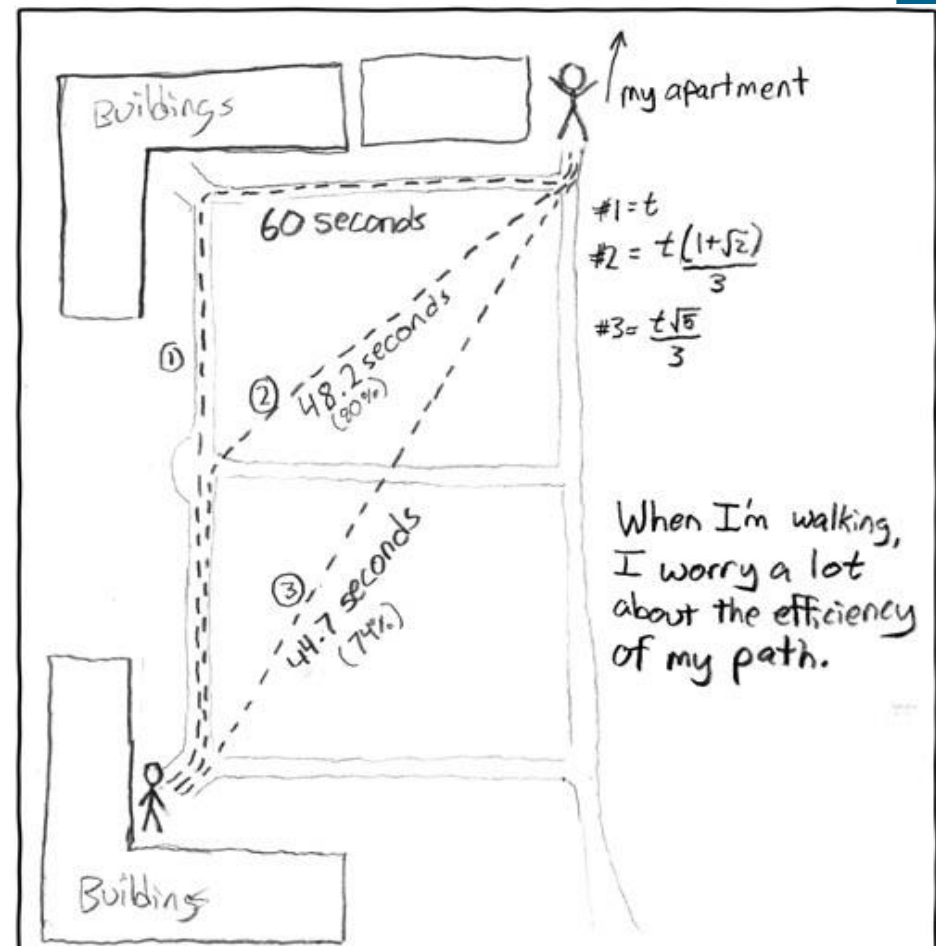
Main Uses of BI Reports & Dashboards

Exploration



xkcd.com

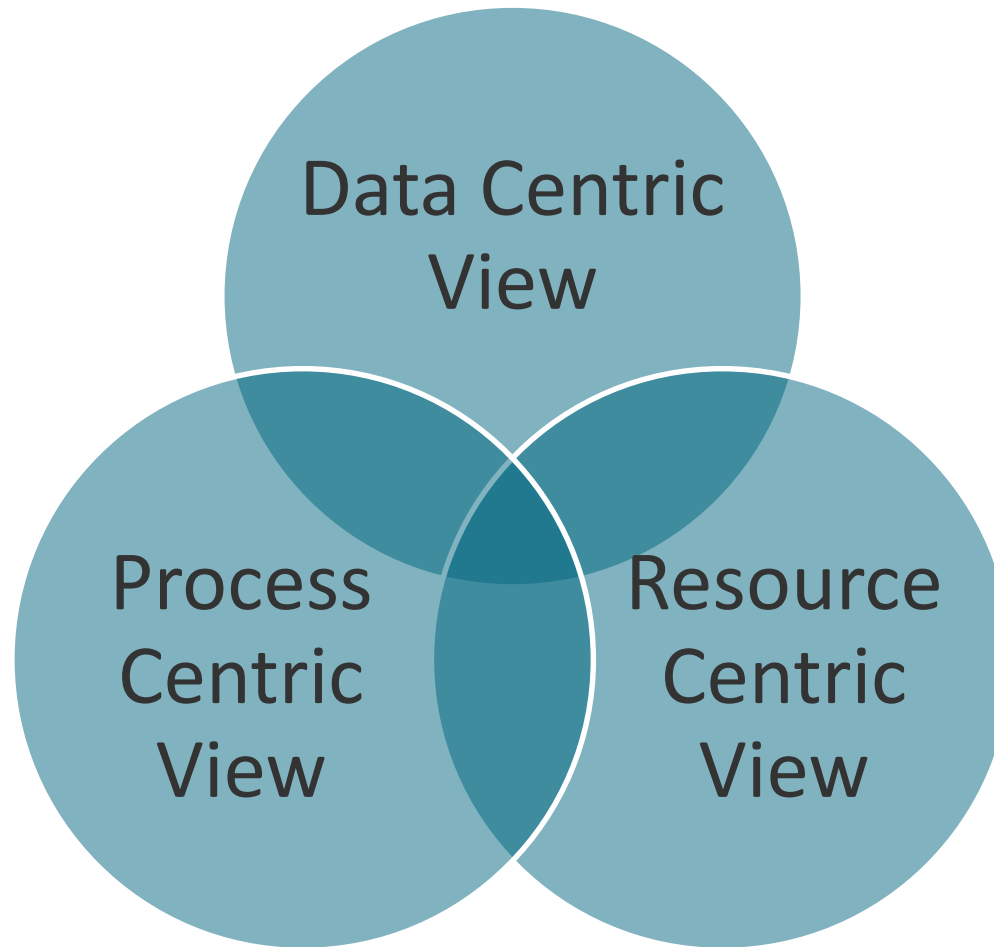
Explanation



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Three Different Major Perspectives Used for Developing Analytics Strategy



Data Centric View

- Think of data as you would a building, piece of equipment, key staff member, cash, inventory, etc.
- You have to do something with data at some point in time in order for it to generate returns.
- Most data is perishable.
- Data loses value at different rates.
- Some is important because of its age.
- What data do we have?
- What data do we desire?
- How secure is our data?
- How do we create new data from existing data?
- How do we turn data into knowledge and actionable insights?



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Single Source of the Truth vs. Data Discovery

- Common Enterprise Information Model
 - Consistent, clean, auditable
 - Drives coherence and coordination in large organizations
 - Reduces internal disagreements about “what are the numbers?”
 - Allows for the development of a greater shared understanding of the organization’s position and performance
- Data Discovery and BYOD
 - Allows for faster development of new insights and opportunities
 - Extremely “hot” in the business intelligence and big data fields
 - Allows for new, broader data sources to be included in analyses
 - Promotes a larger number of individual discoveries and insights
 - Allows for user driven data mashups



Process Centric View

- Sees analytics as an integral part of business processes
- Focus on application of analytics to improving functionality of business
- Focuses on data flows and getting information to decision makers (often customer facing positions)
- Often focused on applications for different business functions and responsibilities
- What information do different positions need?
- How fast do they need information?
- What do customers (external and internal) require from different positions and functions?



Business vs. IT

- Analytics savvy business functions don't want to deal with IT "just give me my data"
- Other business functions rely too much on IT for analytics
- IT may not understand the business issues driving analytic workflows designs
- IT doesn't feel respected by business
- Business believes that IT is slow and power hungry



Resources Centric View

- Sees data and data as a potential source of competitive advantage
- Highly focused on ROI
- Often seeks to leverage strengths in terms of systems strengths and individual talents
- More grounded in reality than other two perspectives
- Better able to justify investments in new technologies and systems
- What are the sources of our analytic capabilities?
- Where do we need new capabilities: Talent? Equipment? Data? Algorithms and workflows?
- What's most important: Probability of positive return? Size of expected return? Minimization of potential loss?



Buy vs. Build

- Why spend money on expensive systems when commodity hardware and open-source software are available?
- Why take on problems that others have solved?
- Why hire expensive talent when we have smart people that we can train?
- Why take on the expense and time to train?
- Speed of results versus cost of build/train.



Best in Suite vs. Best in Class

- Easier process integration
 - Consistent data model
 - Common user interface
 - “One throat to choke”
 - Favored by IT
- Richer function set
 - Deeper development
 - Better industry focus
 - Easier to use
 - Favored by business



What's the Right Speed of Analytics Adoption?*

- Be conservative if:
 - Your competitors aren't doing much with analytics.
 - Technology hasn't driven industry transformation in the past.
 - You don't have much data on customers or other business entities.
 - Your firm typically isn't a first mover.

*Adapted from "big data @ work" by Thomas Davenport.



What's the Right Speed of Analytics Adoption?*

- Be moderately aggressive if:
 - Your industry is already active with analytics.
 - You want to stay ahead of competitors.
 - Your firm is good with technology and data.
 - You have some internal analytical talent.

*Adapted from “big data @ work” by Thomas Davenport.



What's the Right Speed of Analytics Adoption?*

- Be aggressive if:
 - Someone in your industry is already being aggressive.
 - You have been an analytical competitor in the past.
 - You have used technology to transform your industry in the past.
 - You have assembled all the necessary capabilities.

*Adapted from “big data @ work” by Thomas Davenport.

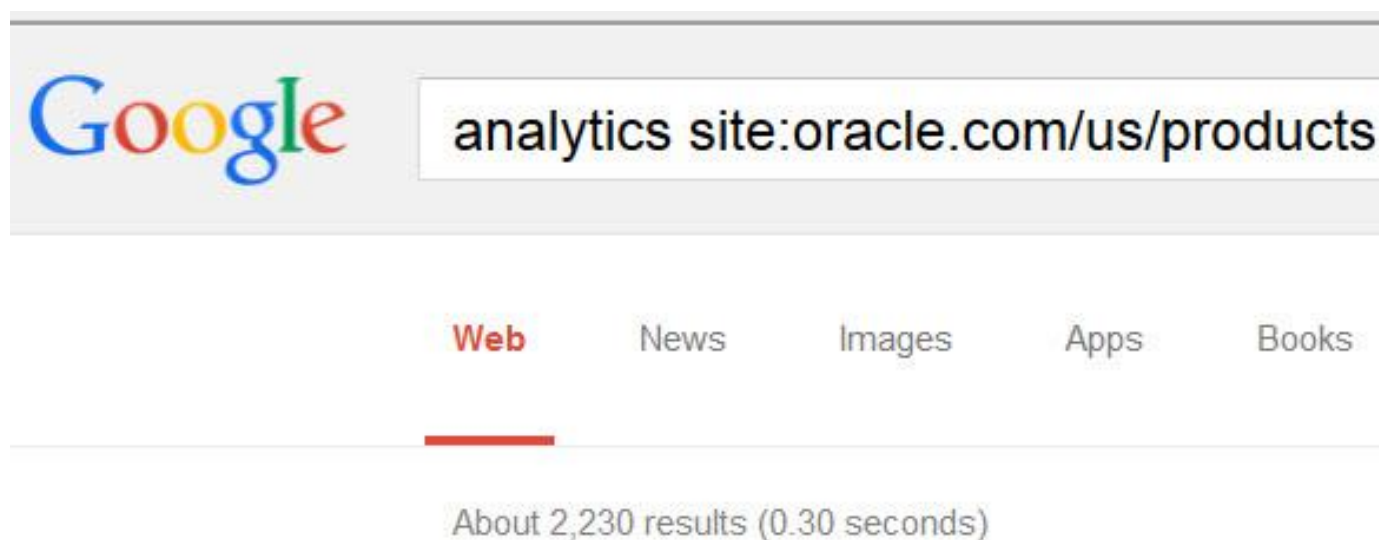
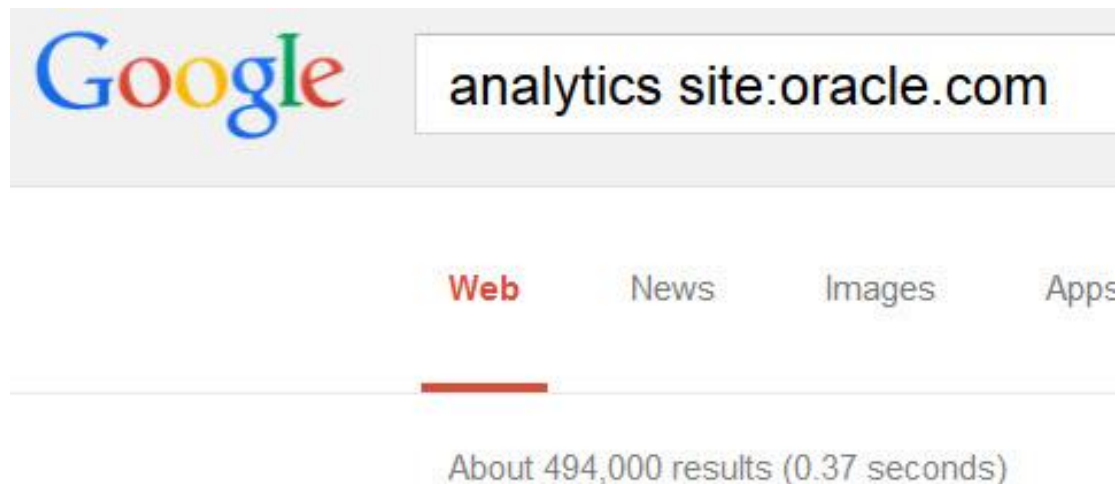


Overview on Oracle

- Oracle Software Fits into 1 of 3 Categories
 - Database
 - Middleware
 - Applications
- Oracle offers many industry/function specific solutions
 - Analytic Applications for business role
 - Analytic Applications for industry
 - Analytic Applications for product (ERP)
- BI “Bundles”
- Oracle “Engineered Systems” strategy
 - Hardware and software are optimized for each other
- Oracle’s “Open Source / Open Standards” strategy
 - Oracle stresses how it embraces “open”



Oracle's Products Are About Analytics



Results as of 3/2/2015



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Your Database Platform Strategy

is

Your Analytics Strategy



Analytical Options to Oracle Database

- Oracle Advanced Analytics (Data Mining & R)
 - Predictive and statistical analytics.
 - Series of highly advanced algorithms and workflows.
 - Extends the “R” language to the Oracle Database
- Oracle Spatial and Graph
 - Provides the capability of relating data to geo positional coordinates, objects, and constructs.
 - Allows the construction and analysis of network topologies.
- Oracle In-Memory
 - Provides lightning fast aggregations
- Oracle OLAP
 - Defines a multi-dimensional data structure that allows information for highly complex calculations to be done quickly.



Spectrum of Oracle DB BI & Analytics

OLAP

Summaries and drills by dimensions

“Analysis”

What is the average duration of phone calls, by region, by year?

Data Mining

Knowledge discovery of hidden patterns

“Insight & Prediction”

Who is likely to answer the phone at certain times of day and why?

Spatial

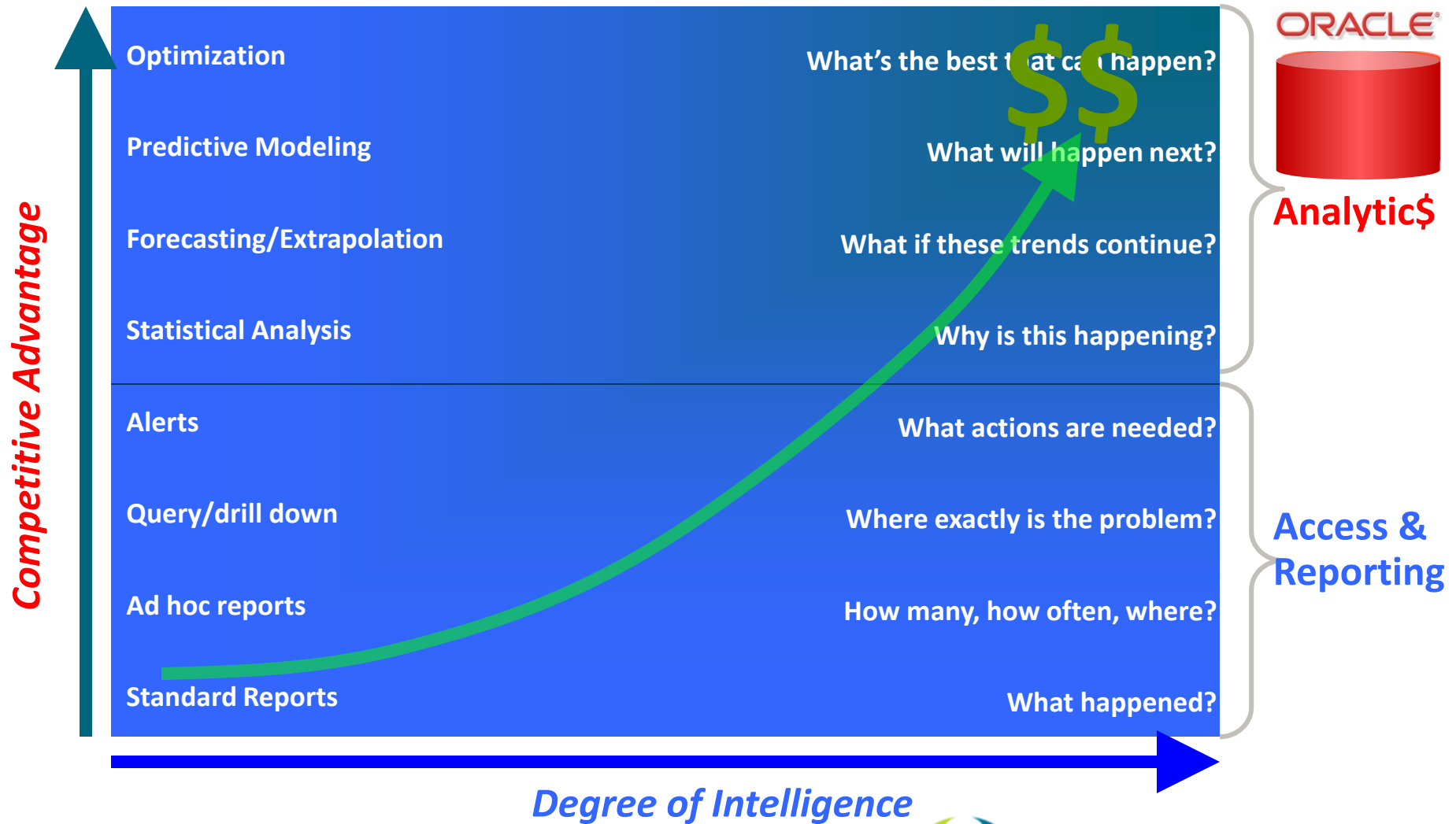
Spatial relationships between data

“Location”

Where were stores with the highest answer rates in the last 3 years?



Competitive Advantage of BI & Analytics



Source: Competing on Analytics, by T. Davenport & J. Harris

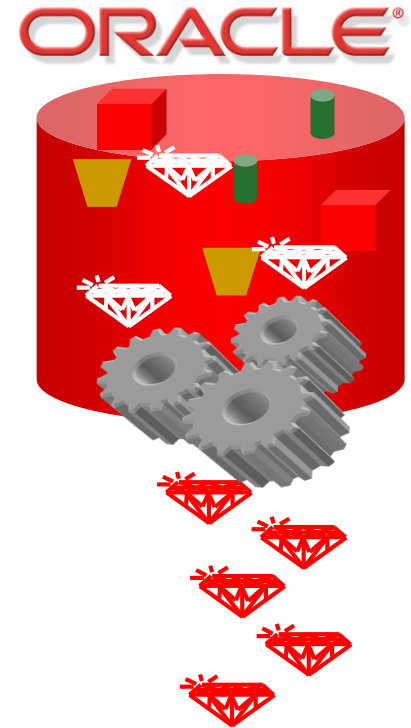


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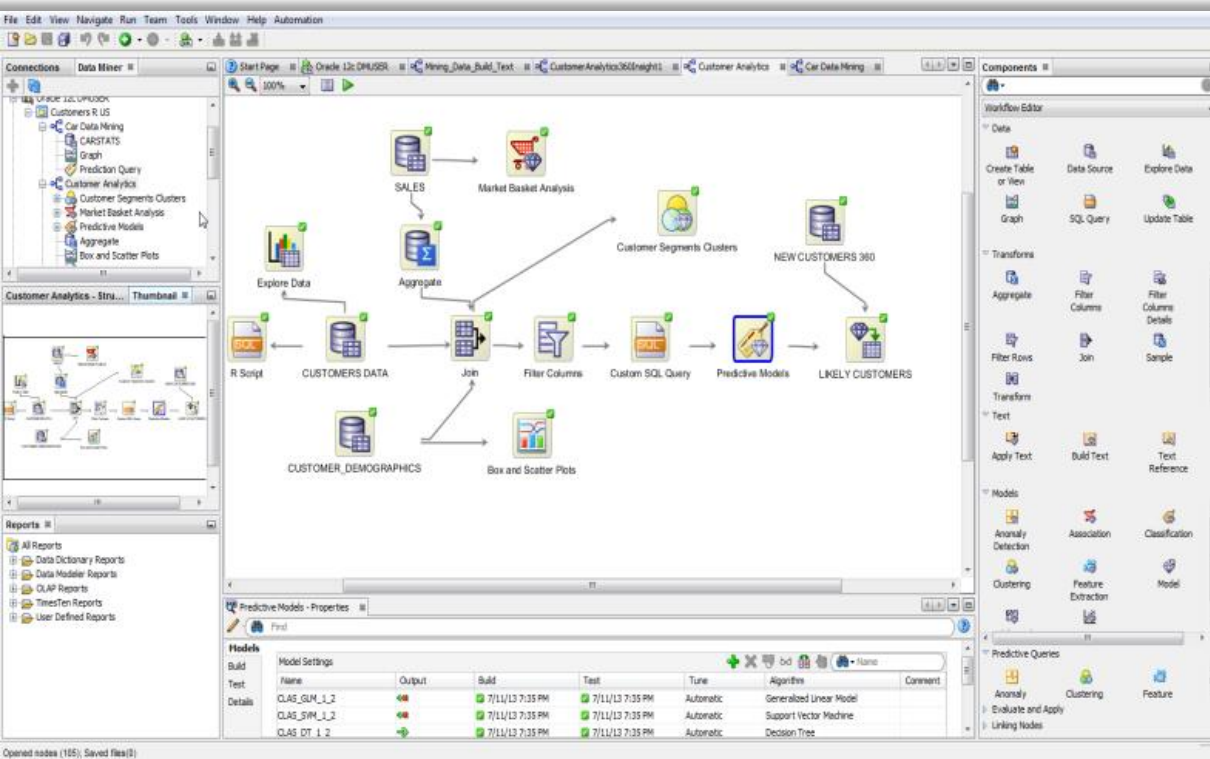
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What is Data Mining?

- Automatically sifts through data to find hidden patterns, discover new insights, and make predictions
- Data Mining can provide valuable results:
 - Predict customer behavior (*Classification*)
 - Predict or estimate a value (*Regression*)
 - Segment a population (*Clustering*)
 - Identify factors more associated with a business problem (*Attribute Importance*)
 - Find profiles of targeted people or items (*Decision Trees*)
 - Determine important relationships and “market baskets” within the population (*Associations*)
 - Find fraudulent or “rare events” (*Anomaly Detection*)



Oracle Data Miner



- Easy to Use
 - Oracle Data Miner GUI for data analysts
 - “Work flow” paradigm
- Powerful
 - Multiple algorithms & data transformations
 - Runs 100% in-DB
 - Build, evaluate and apply models
- Automate and Deploy
 - Save and share analytical workflows
 - Generate SQL scripts for deployment



What is R?

- R is an Open Source scripting language and environment for statistical computing and graphics
<http://www.R-project.org/>
- Popular alternative to SAS, SPSS & other proprietary statistical environments
- Around 2 million R users worldwide
- Thousands of R packages available



Bayesian	Bayesian Inference
ChemPhys	Chemometrics and Computational Physics
ClinicalTrials	Clinical Trial Design, Monitoring, and Analysis
Cluster	Cluster Analysis & Finite Mixture Models
DifferentialEquations	Differential Equations
Distributions	Probability Distributions
Econometrics	Computational Econometrics
Environmetrics	Analysis of Ecological and Environmental Data
ExperimentalDesign	Design of Experiments (DoE) & Analysis of Experimental Data
Finance	Empirical Finance
Genetics	Statistical Genetics
Graphics	Graphic Displays & Dynamic Graphics & Graphic Devices & Visualization
HighPerformanceComputing	High-Performance and Parallel Computing with R
MachineLearning	Machine Learning & Statistical Learning
MedicalImaging	Medical Image Analysis
MetaAnalysis	Meta-Analysis
Multivariate	Multivariate Statistics
NaturalLanguageProcessing	Natural Language Processing
OfficialStatistics	Official Statistics & Survey Methodology
Optimization	Optimization and Mathematical Programming
Pharmacokinetics	Analysis of Pharmacokinetic Data
Phylogenetics	Phylogenetics, Especially Comparative Methods
Psychometrics	Psychometric Models and Methods
ReproducibleResearch	Reproducible Research
Robust	Robust Statistical Methods
SocialSciences	Statistics for the Social Sciences
Spatial	Analysis of Spatial Data
SpatioTemporal	Handling and Analyzing Spatio-Temporal Data
Survival	Survival Analysis
TimeSeries	Time Series Analysis
gR	Graphical Models in R



Oracle R Enterprise

- Part of the Advanced Analytics Option to the Oracle Database Enterprise Edition
- Provides transparent access to database-resident data from R
- Embedded R script execution through database managed R engines with SQL language integration
- Provides data and task parallelism and full power of Oracle database for R
- Enables advanced statistics for in-database execution
- Integrates R into the IT software stack
- Extends and enhances open source R



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Oracle R Distribution



ability to dynamically load:

Intel Math Kernel Library (MKL)

AMD Core Math Library

Solaris Sun Performance Library



Oracle
Support

- Improved scalability at client and database for embedded R execution
- Enhanced linear algebra performance using Intel's MKL, AMD's ACML, and Solaris Sun Performance Library
- Enterprise support for customers of Oracle Advanced Analytics option, Big Data Appliance, and Oracle Linux
- Available as a free download from Oracle
- Oracle to contribute bug fixes and enhancements to open source R



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Other R Offerings

- ROracle
 - Open source Oracle database interface driver for R
 - Based on OCI
 - Maintained by Oracle, optimizations and bug fixes released to open source community
- Oracle R Advanced Analytics for Hadoop (ORAAH)
 - R interface to Oracle Hadoop Cluster on Big Data Appliance
 - Access/manipulate data in HDFS, database, and file system
 - Write and execute MapReduce functions using R
- Rstudio
 - Popular open source user interface for R
 - Integrated Development Environment



Understanding SQL vs. NoSQL

- Hardened, strident acolytes on both sides.
- Both have good use cases for analytics.
- Different sets of advantages and disadvantages for analytics.



Data Capture and Storage vs. Usage

- Data storage has never been cheaper
- Clean, consistent, well-structured data is easy to use
- Identify your “cornerstone” data
 - Data that is used often
 - Data that is significant impact on many analyses
 - Identify internal sources, storage, and processing
 - Identify external sources, storage, and processing



Five Phases of Value (Big Data Discovery)

- Find: Identify relevant data
- Explore: Understand data potential
- Transform: Intuitive, user-driven data wrangling
- Discover: Unleash creativity
- Share: Drive collaboration



Predictive Analytics is not Benign

"With great power comes great responsibility."

Uncle Ben to Peter Parker, Spiderman 2002



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Target & the Pregnant Teen

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The New York Times | International Herald Tribune

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WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS OPINION AF

How Companies Learn Your Secrets



Antonio Bolfo/Reportage for The New York Times

By CHARLES DUHIGG
Published: February 18, 2012 | 570 Comments

http://www.nytimes.com/2012/02/19/magazine/shopping-habits.html?_r=1



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Frameworks for Analysis

- Stakeholder analysis
- Negotiations/shared interests
- Fiduciary responsibility
- Risk management
- Security
- Data governance and Master Data Management
- Distributive Justice, Ethics, and Moral Philosophy
- Legal framework (HIPAA, EU Data Protection Directive, FCRA, etc.)
- Data Mining Frameworks (KDD, CRISP-DM, etc.)
- Complex Adaptive Systems, Systems Dynamics,
- Your favorite framework



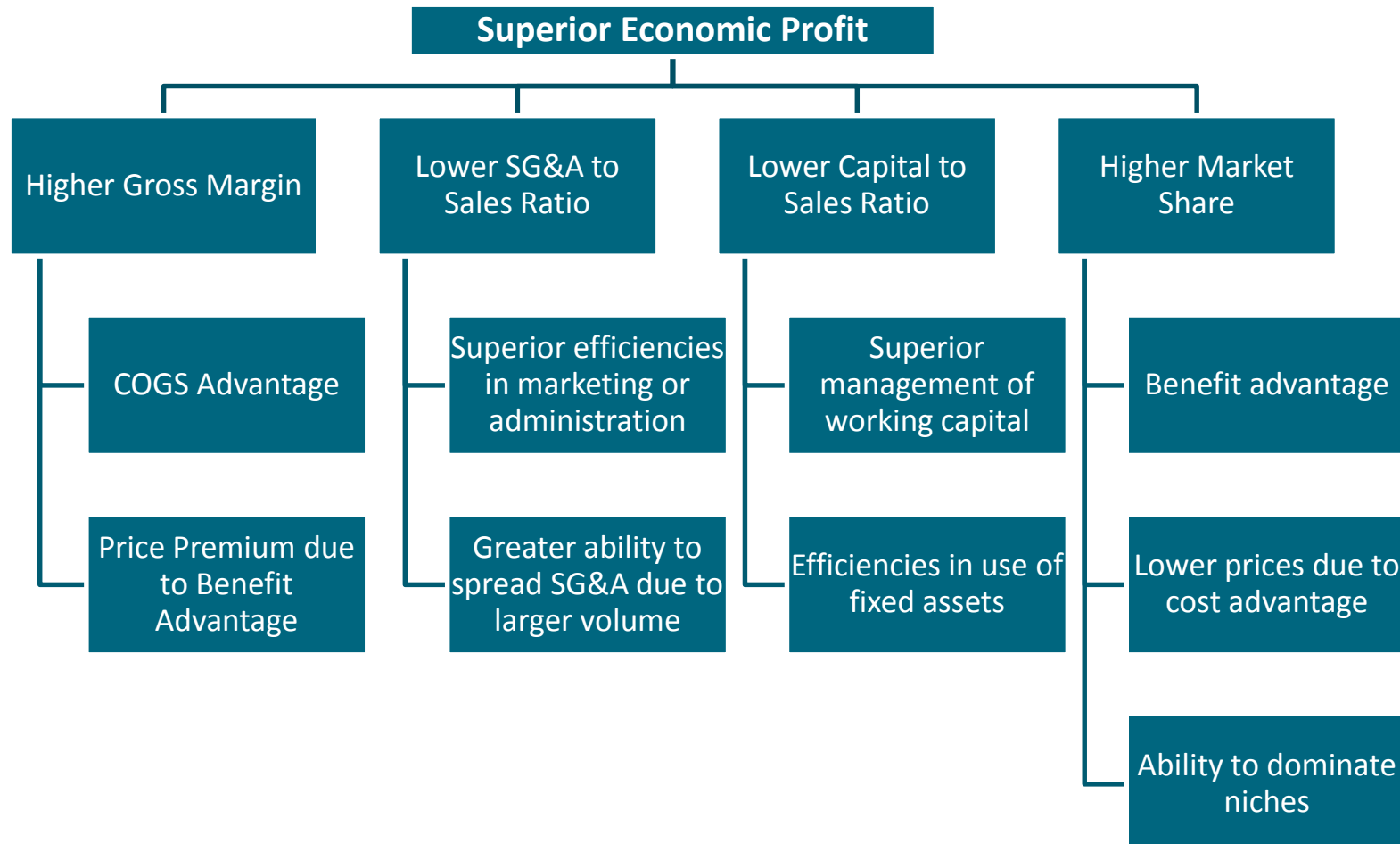
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Economic Profit Analysis

$$\text{Economic Profit} = \text{NOPAT} - (\text{WACC} \times \text{Capital})$$

$$= \left\{ (1 - \text{tax rate}) \times \left(\frac{(\text{Sales} - \text{COGS})}{\text{Sales}} - \frac{\text{SG \& A}}{\text{Sales}} \right) - \text{WACC} \times \frac{\text{Capital}}{\text{Sales}} \right\} \times \text{Market Share} \times \text{Market Size}$$



Analytics Strategies

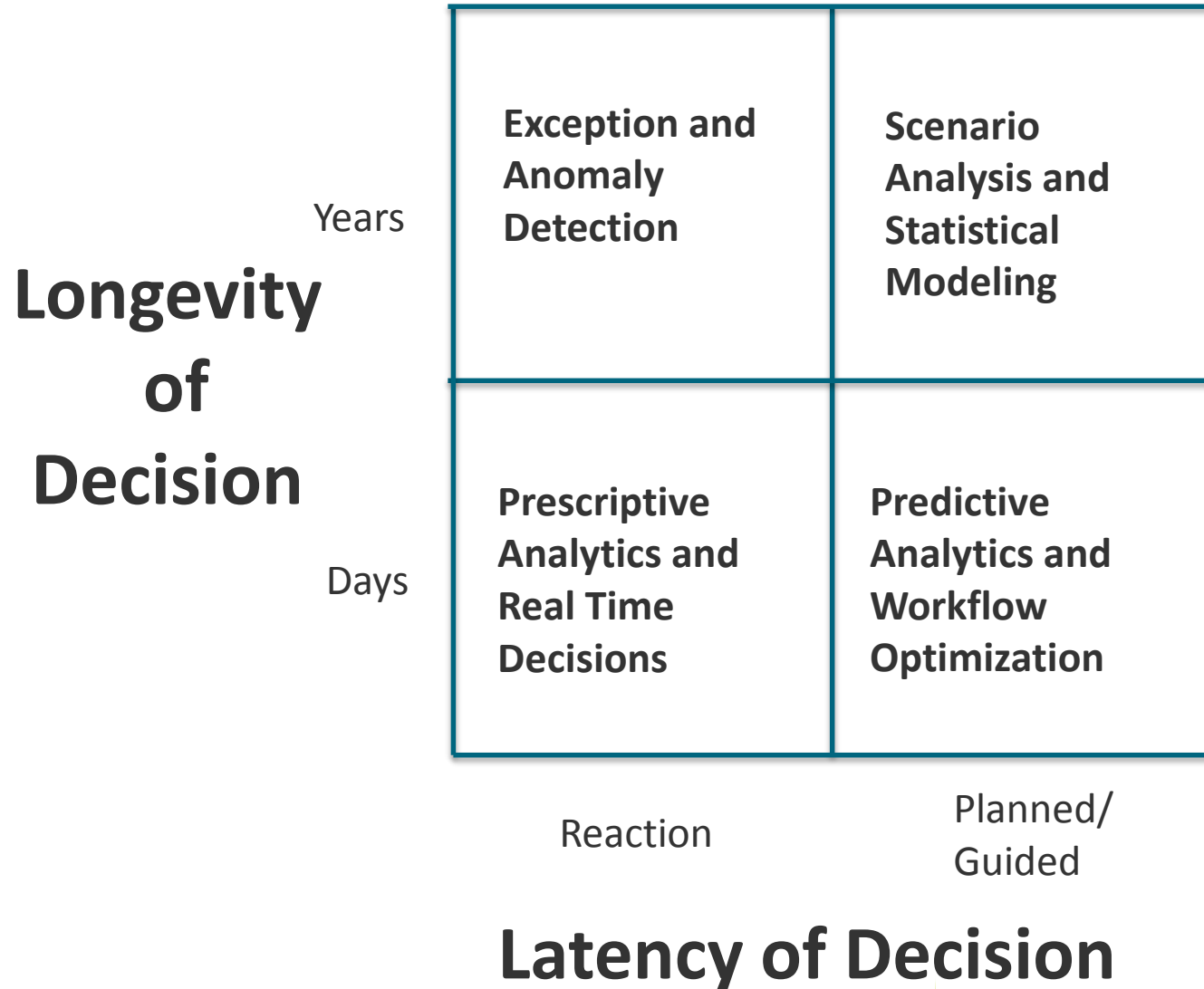
- Cost Reduction
- Time Reduction
- Sales Increase
 - Market Penetration
 - Market Development
 - Product Development
 - Diversification



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4 Different Dimensions of Analytics



McKinsey's Take on Analytics Talent

“There will be a shortage of talent necessary for organizations to take advantage of big data. By 2018, the United States alone could face a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions.”

McKinsey Global Institute 2014

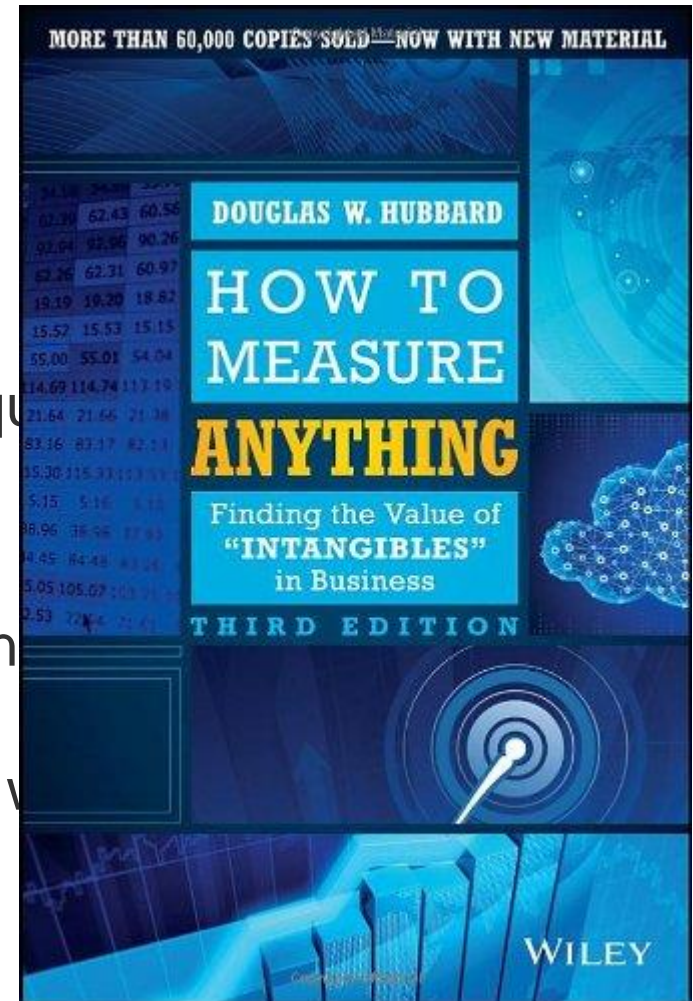


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Assessing Returns on Analytics Projects

- Think Likelihoods and Distributions
- Don't think "single point" estimates
- Broad strategies and investments require
- Design metrics for specific initiatives
- Match the time scale of the investment with the longevity of the technology
- Compare the scale of the investment with the scale of investing





BIWA Summit 2016, Jan 26-28

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**Business Intelligence, Warehousing and Analytics
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IOUG Special Interest Group

www.biwasummit.org

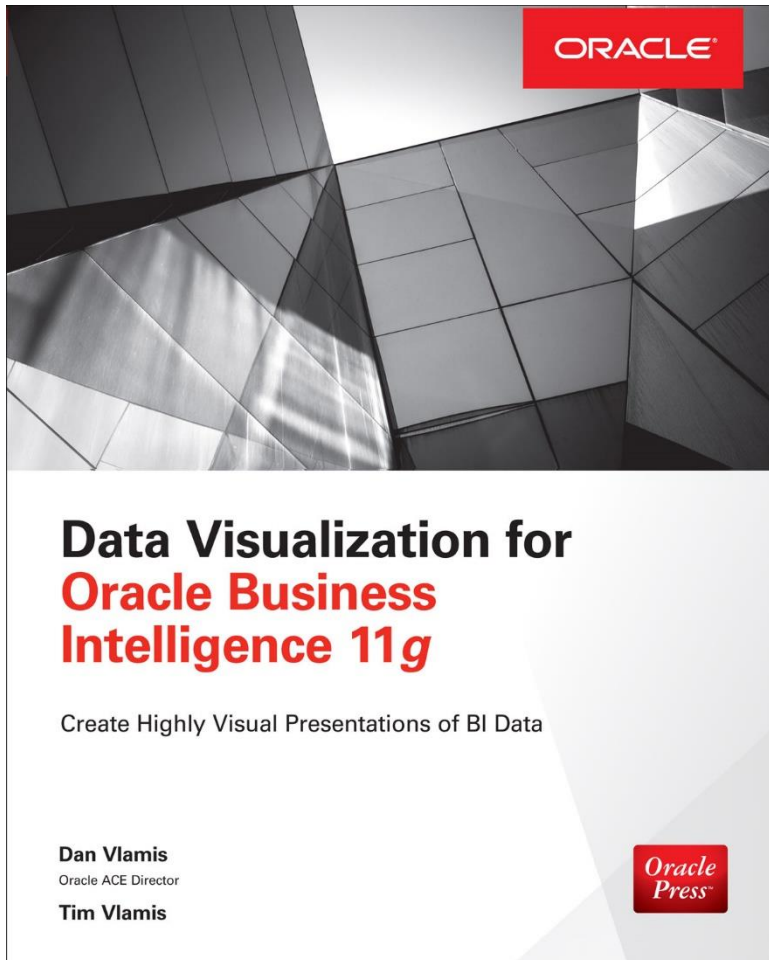


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Drawing for Free Book

- Add business card to basket or fill out card



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Please complete the session evaluation

We appreciate your feedback and insight!

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You may complete the session evaluation either on paper or online via the mobile app



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