Emerging Business Intelligence
Best Practices

David Stodder
Director, TDWI Research, Business Intelligence
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Speakers

David Stodder  
Research Director,  
Business Intelligence, TDWI

Suzanne Hoffman  
Senior Director,  
Analyst Relations, Tableau
Today’s Agenda

• BI/Analytics Challenges
  – Democratization of data
  – Getting Agile
  – Improving speed-to-insight
  – Data variety
• Four Emerging Technologies
  – Self-service, mobile, visualization, and cloud
• Concluding Remarks
“Democratization” of Data: No Going Back

• **Data everywhere**: Sharing and collaboration on data are becoming essential to business and personal life

• **Digital universe**: “1.8 trillion gigabytes in 500 quadrillion ‘files’”

• **Data decisions everywhere**: not just at executive and managerial levels; front lines, consumers, and automated
Business Intelligence Penetration: How Far So Far?

Approximately what percentage of users in your organization is implementing BI and analytics tools on ANY platform?

Democratization of Data: Issues and Drivers

• “We want to get data to the people who need it, when they need it, and how they need it.” (large org CIO)
• First step: Get the data house in order
• Silos: “Departments own their data and you have to go through a lot of red tape to get information needed”
• Enterprise data warehouse still a key goal; interest in federated data access (or data virtualization)
• Role for BI/data governance/COE
Getting Agile with BI, Analytics, & Data Warehousing

• How well can organizations adjust to change and take advantage of emerging opportunities?
• Do BI/DW systems support agility – or do they make it harder to adjust?
• Is there a culture of using data and analytics to make decisions in times of change?
• TDWI June 2012 Tech Survey: slow development time is the overall biggest challenge
Current State of Agility: Mostly Average

How would your rate your organization’s ability to adjust to change and take advantage of emerging opportunities?

- Excellent
- Good
- Average
- Poor
- Don’t know

Source: Preliminary results from TDWI Best Practices Report research survey, to be published fourth quarter 2012. Based on answers from 449 respondents.
Agile Development Techniques and Disciplines

• Long popular in many areas of application development
• Growing adoption as common engineering approach for business intelligence and data warehousing projects
• Aligned with goals for making BI/DW development more focused on delivering business value sooner
• Emphasis on early and frequent delivery of working software and greater stakeholder collaboration
• Improving programmer productivity, delivery quality, and lowering project risk attributes
• Planning for what you know today and being prepared to adjust to change and uncertainty
Experience with Agile Development

For how many years has your BI/DW organization been implementing agile development techniques?

- Over 10 years
- 5 - 10
- 2 - 5
- 1 - 2
- Less than a year
- No experience

Source: “Adoption of Agile Methods Among Business Intelligence and Data Warehousing Development Teams,” joint research study by Ceregenics, Inc. and TDWI, July 2012. Based on answers from 394 respondents.
Speed to Insight: Creating Information Advantages

- Organizations that can analyze data faster and feed insights and updates to decision makers can realize significant advantages
- Architecture shift: Increasing role of in-memory computing for making big data available to users for faster discovery and analytics
- Organizations evaluating their systems for what might impede speed to insight: people, process, data, and technology issues
BI/Analytics: Pressure to Satisfy User Demands

What is the highest level of frequency with which IT/data or business teams are able to launch new features and functions for BI/analytics systems?

Source: Preliminary results from TDWI Best Practices Report research survey, to be published fourth quarter 2012. Based on answers from 359 respondents.
Data Variety: Most Challenging “V” of Big Data?

- Users want access to multiple sources; even structured, business application data sources can vary; metadata confusion
- Growing volumes of “unstructured” or semi-structured data: text, audio & video files, photos & visualizations, social media comments, location data, and more
- Organizations seek a “360-degree view” of customers, processes, and operations; accessing only limited structured data is not enough
- Business intelligence/OLAP traditionally about query and reporting on narrow selection of structured data sources
- Business decision-makers have had to develop “unstructured” context around the BI reports and results on their own
Data Variety: Creating New Pressure Points

- Can Hadoop/MapReduce help? How does this fit with BI/DW?
- Tools, expertise in demand: Are organizations capable of accessing and analyzing unstructured and semi-structured data?
- As sources diversify, mere data access is no longer enough
- Organizations seek higher-level, easily understood analytics: “What is the information telling me, and can I trust it?”
- Understanding data relationships: focus on comparing and correlating across sources
Big Data and the Emerging “Analytics Culture”

• **Marketing and customer analytics**: becoming predictive and proactive; looking out to social networks, customer sentiment

• **Not just for Ph.D.’s (aka, data scientists)**: Nontechnical users seek to employ analytics

• **Performance and financial management**: Deeper analysis of data behind metrics; use unstructured information to understand context

• **Operations and business processes**: information insights that enable faster reaction to a changing environment

• **Healthcare, environmental analysis**, geo/location, fraud detection, and more: big data, data democratization as catalysts for change
Emerging Tech #1: Self-Service Discovery

• The BI “Renaissance” in the hands of users
• Exploring (“discovering”) data and authoring own reports
• Users are not uniform – not all are power users but not all are novices
• Business leaders know that data insights are critical to success – they want to be in control
• Integrating structured and unstructured: IT can’t meet all needs
Differences Between Query and Discovery Activity

**Query**
- Have to know ahead of time what you want to know
- Queries must conform to constraints of query system and source structures
- Often limited or slow interaction (drill down) with data
- IT often highly involved to manage performance against databases
- Can deliver precise answers: But are they relevant to decision?

**Discovery**
- Solving unknowns: Don’t know second question until you answer first one
- Investigative, iterative “what-if” style of inquiry
- Need to seeing information from different perspectives/contexts
- Data variety: While dangers, less overhead if users can specify sources
TDWI Research: Why Self-Service BI?

What are the main reasons for implementing self-service BI?

- 65%: Constantly changing business needs
- 57%: Inability of IT to meet user demands
- 54%: Need to be more of an analytic-driven organization
- 47%: Slow or untimely access to information
- 34%: Business user dissatisfaction with IT BI capabilities

Which factors present significant barriers to increasing users’ self-reliance with BI/analytics?

- **61%**: Users lack budget, skills, or training
- **47%**: Data governance and security concerns
- **36%**: Data quality inadequate for self-service BI/analytics
- **34%**: Delays in data warehousing/ETL processes
- **29%**: Lack of role-based tools for business/IT collaboration

Source: Preliminary results from TDWI Best Practices Report research survey, to be published fourth quarter 2012. Based on answers from 365 respondents; respondents could select all that apply.
Self-Service Integration of BI and Advanced Analytics

- **Advanced analytics**: data/text mining, predictive modeling and analytics, NLP, AI
- **Big data**: Going beyond OLAP to explore deep patterns, associations, and correlations in detailed data and event streams
- **Complementary strategy**: Do data scientists share insights with users implementing self-service BI/analytics?
- **Bringing** predictive analytics to BI dashboards
Self-Service BI/Discovery Best Practices

- **IT needs to accept self-service**: “We empowered the ‘nerd herd’ and enabled end-users to answer their own questions.” (Drex DeFord, SVP/CIO, Seattle Children’s Hospital)

- **Establish and encourage** Centers of Excellence or Governance Committees to set user expectations, improve data quality, and address governance and security concerns

- **Evaluate technologies** that support self-service and reduced dependence on IT

- **Not a panacea**: self-service should not mean “you’re on your own”
Emerging Tech #2: Mobile BI and Analytics

- Data democratization on the go: Mobile devices can get BI closer to the “right data, right users, at the right time” goal
- Data variety is an established characteristic: devices are used for multiple purposes and access multiple types of data
- Speed-to-insight promise: Mobile devices will push demand for real-time information and analysis
Business Benefits Sought from Mobile BI

- 65% Improved customer sales, service, and support
- 60% More efficiency and coordination in operations and business processes
- 50% Faster deployment of BI and analytics apps and services
- 45% Customer self-service benefits (e.g., decreased contact center costs)
- 36% Financial performance accountability and transparency

Improving Sales, Service, and Support

• Mobile can help address difficulty of providing personnel who are on the go and engaged with customers a single, complete view of data
• Proving mobile dashboards and data visualizations that both nontechnical personnel and customers can easily understand
• 45% surveyed want mobile to improve customer self-service

User Story: Creighton University (Omaha, Nebraska)
• Admissions personnel needed consolidated view of what’s going on in “admissions funnel” for applicants, and trending variables
• Using Tableau on iPads, recruiters tap analytics featuring 480 variables, 120 types; improved Creighton competitiveness
Critical Issues in Mobile BI and Analytics

- **Security, security, security**: Concern about sensitive data exposure trumps all other issues
- **Increased demand for “real-time”** data and analytics; setting user expectations for “right time” updates and availability
- **Developer dilemmas**: Native applications versus Web browser-based using HTML5: Why not both?
- **Dashboard access** (synchronization) and data visualization: making information actionable
- **Information integration** for users; location aspect of mobile
Emerging Tech #3: Data Visualization and Analysis

- Age of visual invention is here; visuals can deliver insights that reports hide
- Visual, role-based view of actionable information rather than data dump
- Transparency: Can users interact with and drill down into data?
- Mashup at the glass: Integration of different types of information
Data Visualization & Analysis Best Practices

• Enable data interactivity: essential to the value of dashboards and visualization
• Know when enough is enough: deliver clarity and focus, not confusion and clutter
• Consider how users collaborate: visualizations will be shared: on the go, in “war rooms,” etc.
• How can visualizations enhance collaborative decision making?
• Mix structured and unstructured: users need multiple views and types of information
Emerging Tech #4: Cloud Computing and BI/Analytics

• **Speed**: Organizations seek rapid BI and analytics deployment

• **Access from anywhere**: Data, analytics, and BI services available from any platform (mobile, desktop, etc.)

• **Embedded BI**: Cloud reporting, content, analytics can be embedded as widgets in mashups, mashboards, and services

• **Cost control**: Reduced costs and increase dynamic capabilities for spinning up analytic sandboxes or reports for end-of-quarter needs
BI/Analytics in the Cloud Best Practices

- **Know your users**: Just putting BI in the cloud may not be enough; nontechnical users require guidance.
- **Evaluate security and reliability**: Could data in cloud be more secure and reliable than on-premises?
- **Address data integration and ETL/ELT**: How will data be loaded into the cloud? How is it transformed?
- **Evaluate functionality**: Ensure that OLAP calculations, roll-ups, aggregations, and drill downs work for users.
- **Enter the brave new marketplace**: Learn the ways of app exchanges for pre-built apps, widgets, analytic/data services.
Emerging BI Best Practices: Conclusions

_Addressing democratization, agility, speed-to-insight, and data variety needs_

- Self-service discovery
- Mobile BI and analytics
- Data visualization and analysis
- Cloud computing and BI/analytics
  - _Coming this December 2-4: TDWI Solution Summit, “Cloud BI: Scalable, Cost-Effective BI Solutions on Clouds,” Scottsdale, AZ_
  - [http://events.tdwi.org/events/solution-summit-scottsdale-2012/home.aspx](http://events.tdwi.org/events/solution-summit-scottsdale-2012/home.aspx)
Thank You!

David Stodder
Director of Research for Business Intelligence
TDWI (www.tdwi.org)
dstodder@tdwi.org
(415) 859-9933
Where We Started
Fast and easy analytics for everyone

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Publications

- Design Choices when Architecting Visualizations
  - Tan Yen, Chris Stalte, and Vahid Bashir

- Multiscale Visualization Using Data Cubes
  - Chris Stalte, Tan Yen, and Pat Hanrahan
  - Best Paper Award.

- Query, Analysis, and Visualization of Hierarchically Structured Data using Polaris
  - Chris Stalte, Tan Yen, and Pat Hanrahan
  - Proceedings of the Ninth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, July 2003.

- Polaris: A System for Query, Analysis and Visualization of Multi-dimensional Relational Databases (extended paper)
  - Chris Stalte, Tan Yen, and Pat Hanrahan

- Polaris: A System for Query, Analysis and Visualization of Multi-dimensional Relational Databases
  - Chris Stalte and Pat Hanrahan

- Rivet: A Flexible Environment for Computer Systems Visualization
  - Robert Bashir, Chris Stalte, Marc Tang, John Oehrle, Michael Schindhelm, and Pat Hanrahan
Help people see and understand their data
The Problem: Diverse Data

Businesses and their people are struggling to unlock diverse data

- If we combine delivery routes, how will our supply chain change?
- What are the results of our offline advertisements?
- How do we incorporate social media feedback into our customer experience?
- Which high value customers are having a poor support experience?
- How can we reach 100% policy compliance while keeping costs low?
- What is the margin contribution of each product line by state?

Integrated and correlated data
Flexible

Transform all types of data into self-service analytics
Scalability

Tableau Public Traffic Trends

Total statistics 4/19/2012 2:01:31 PM

- Distinct Users: 20,307,031
- Distinct Sessions: 44,320,995
- Distinct Impressions: 48,246,741

Weekly traffic since launch: 3,218,422

Per hour traffic last 21 days:
- Apr 2: 20,797
- Apr 7: 20,797
- Apr 12: 20,797
- Apr 17: 20,797

Record hour:
- Nov 29: 94,690
- Dec 1: 94,690

Definitions:
- Distinct users is based on a cookie set within the browser.
- Distinct sessions is a count of the number of unique views the user has seen, not including reloads of the page.
- Distinct impressions is a count of the number of show view actions.
Better Visual Intelligence
“Author Once” Experience for Mobile
Customers
10,000 customers from every industry and geography

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Questions?
Contact Information

If you have further questions or comments:

Dave Stodder, TDWI
dstodder@tdwi.org

Suzanne Hoffman, Tableau
shoffman@tableausoftware.com