Harnessing Data and Analytics: Empowerment or Anarchy?

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From enabling IT
To enabling the Information Superhero

- Hard things easy
- Be the information superhero
To enabling everyone: Augmented Intelligence

- Smart
- Pervasive
- In context
Key Issues

1. What is the state of the D&A market today?
2. What emerging trends and best practices are driving success?
3. Where is the cutting edge moving and how do you prepare?
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1. What is the state of the D&A market today?
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First Wave of Disruption

- IBM Cognos
- OBIEE*
- Microsoft SSAS/SSRS**
- MicroStrategy
- SAP BusinessObjects

Semantic Layer-Based Platforms

* Oracle Business Intelligence Enterprise Edition
**Microsoft SQL Server Analysis Services/SQL Server Reporting Services
The Visual-Based Data Discovery Market Disruption

- Semantic Layer-Based Platforms
- IBM Cognos OBIEE*
- Microsoft SSAS/SSRS**
- MicroStrategy
- SAP BusinessObjects

- Visual-Based Data Discovery Platforms
- Tableau
- Qlik
- Microsoft Power BI
- TIBCO Spotfire

* Oracle Business Intelligence Enterprise Edition
**Microsoft SQL Server Analysis Services/SQL Server Reporting Services
We Are at a Market Disruption Point

Pervasiveness of ML-Enabled Advanced Insight on All Data

Low

High

Months

Days/Hours

Time to Advanced Insight

Instant/In-Line

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Augmented Analytics

Salesforce Einstein Discovery

ThoughtSpot

Microsoft Power BI (Quick Insights)

IBM Watson Analytics

SAP Analytics Cloud

Yellowfin

Big Squid

Oracle Analytics Cloud

SparkBeyond

DataRobot

H2O

Tellius

Augmented Data Science

Augmented Data Discovery

Early

Today

2 to 5 Years

~2015

Semantic Layer-Based Platforms

IBM Cognos

OBIEE

Microsoft SSAS/SSRS

MicroStrategy

SAP BusinessObjects

Visual-Based Data Discovery Platforms

Tableau

Qlik

Microsoft Power BI

TIBCO Spotfire

*Sample of vendors not exhaustive
The Future of Data & Analytics Is Augmented Analytics

- Semantic Layer-Based Platforms (~1990)
- Visual-Based Data Discovery Platforms (~2015)
- Augmented Analytics (2 to 5 Years)

- IT-Led Descriptive
- Pervasiveness of ML-Enabled Advanced Insight on All Data

- Time to Advanced Insight:
  - Months
  - Days/Hours
  - Instant/In-Line

- Machine Learning Automation
  - Pervasive Autodescriptive, Diagnostic
  - Predictive, Prescriptive

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Machine learning (ML) and artificial intelligence (AI) projects:

• Grant organizations the superpowers to classify and predict in ways workers cannot achieve alone.
• From “what happened?” and “why?” to “what’s next?” and “what’s best?”
• Integrated into the business in a way that is automated and optimized.
Why So Much Interest in Analytics, Machine Learning and AI Now?

- Open Source
- Cloud
- High-Performance Computing
- New Algorithms
- Big Data
- Digital Disruption
- Proven ROI
Key Issues

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Hype Cycle for BI and Analytics, 2018

New Data Sources
New Processing Technologies
New Use Cases
New Delivery Models
New Users
1,000's of New Vendors

Augmented Data Discovery
Embedded Analytics
Continuous Intelligence
Immersive Analytics

Predictive Analytics
Prescriptive Analytics
Servware

Data and Analytic Services
Logical Data Warehouse
Mobile App Analytics
Mobile BI

Text Analytics
NLQ
NLG

Data and Analytic Services
Logical Data Warehouse
Mobile App Analytics
Mobile BI

Immersive Analytics
Continuous Intelligence
Augmented Data Discovery
Embedded Analytics
Keep the Four Pillars in Mind

Business Outcomes

Information Management Foundation (Data):
- Data Governance
- EIM
- Information-Driven Enterprise

Organization (People):
- Business and IT Team Roles
- Individual Skills
- Centralized or Decentralized

Fact-Based Decision Making (Process):
- Information as an Asset
- Instinct vs. Analytics
- Management and Governance

Appropriate Technology Platform (Technology):
- Integrated Toolset and Delivery Platform
- Not Silos of Capability

The Information-Driven Enterprise
Consider the Complete Data & Analytics Pipeline

Data → Insight → Action → Impact

Acquire → Organize → Analyze → Deliver → Measure
**Focus on Real Organizational Needs: Goals Organizations Pursuing with ML and AI**

<table>
<thead>
<tr>
<th>Improved speed and efficiency</th>
<th>Better data processing and analytics</th>
<th>Enhance customer experience and engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Process improvement and efficiency — ensuring staff are better utilized on value-add processes.&quot;</td>
<td>&quot;Use AI for predictive analytics and handling huge amount of event logs and tickets we have to process on a daily basis.&quot;</td>
<td>&quot;Customer care and service desk optimization.&quot;</td>
</tr>
<tr>
<td>&quot;Reduce operating costs and increase operating efficiencies.&quot;</td>
<td>&quot;Leveraging the treasure trove of unstructured data for analysis and future efficiencies.&quot;</td>
<td>&quot;New customer services or significantly enhance process effectiveness/value/cost savings.&quot;</td>
</tr>
</tbody>
</table>

Base: n = 79 Gartner Research Circle Members/Excludes 'blanks'

Q. Lastly, what specific business goal or objective is your organization trying to address with AI?
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SPAs: What Will the Market Impact Be?

• By 2020, organizations that offer users access to a curated catalog of internal and external data will realize twice the business value from analytics investments than those that do not.

• By 2020, 50% of the analytic queries will be generated using search, NLP or voice or will be autogenerated.

• By 2020, 30% of today’s data scientist tasks will be automated and the number of citizen data scientists will grow five times faster than the number of highly skilled data scientists.

• By 2021, the number of users of modern BI and analytics platforms that are differentiated by augmented data discovery capabilities will grow at twice the rate of those that are not, and will deliver twice the business value.

• By 2022, more than half of major new business systems will incorporate continuous intelligence that uses real-time context data to improve decisions.
Common Themes

Intelligent

Emergent

Scale
Where is the Cutting Edge Moving?

Better Decisions

Pervasiveness

Complex, Comprehensive Data

New Buying Patterns

Augmented Analytics

Continuum of Analytic Capabilities
Where is the Cutting Edge Moving?

Better Decisions

Complex, Comprehensive Data

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Pervasiveness

New Buying Patterns

Continuum of Analytic Capabilities
Smarter Business Analytics

Visual Perception and Brain Research

Advanced Analytics, Natural Language, Machine Learning
Modern Analytics and BI Today

Prepare Data
- Manual data preparation, data quality, enrichment cataloging

Find Patterns in Data
- Manual exploration of data using interactive visualization
- Manual feature engineering and model building

Share and Operationalize Findings
- Dashboards, storytelling, collaboration
- Depends on user to interpret results

Modern Analytics and BI
What Changes With Augmented Analytics

Augmented Data Preparation

Prepare Data
Algorithms detect schemas, profile, catalog and recommend enrichment, data lineage and metadata

Share and Operationalize Findings
Insights are narrated in natural language or visualizations to focus user on what is important and actionable
Embedded in apps or conversational UI

Augmented Data Discovery

Augmented Analytics

Find Patterns in Data
Natural-language query
Algorithms find all relevant patterns in data
Features are autoselected
Models are autoselected
Code is autogenerated

Augmented Data Science and ML
Traits of a Citizen Data Scientist

- Contextualized vision of the organization
- Proven application of analytic techniques to business problems
- Appetite for what matters relative to impact and business priorities
- Connections within IT and the business at multiple levels
- Unique perspective of individual business area
- Curiosity to explore and learn
- Able to "go to bat" to justify business value
- Involved hands-on in multiple analytic areas and activities
Where is the Cutting Edge Moving?

Better Decisions

- Pervasiveness
- Complex, Comprehensive Data
- New Buying Patterns
- Continuum of Analytic Capabilities
- Augmented Analytics
Analytic Businesses Are Concerned With More Than Just Transaction Data

Relational data warehouse no longer sufficient. Logical data warehouse, big data, NoSQL.
Data Gravity Pulls BI and Analytics to the Cloud

- Elastic scale needed for Pervasive Use
- More data sources move to the cloud, so will BI and analytics — “Data Gravity.”
- Hybrid BI deployments will become the norm as each solution finds its sweet spot.
- Line of business buyers more ready to adopt cloud BI than IT.
Invest in Data Literacy to Drive a Data-Driven Culture

The ability to read, write and communicate data “in context”.

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Where is the Cutting Edge Moving?

- Complex, Comprehensive Data
- Augmented Analytics
- Continuum of Analytic Capabilities
- New Buying Patterns

Better Decisions
Pervasive: Embedded and Mobile
Pervasive: Pushing Analysis to Where Consumed
Where is the Cutting Edge Moving?

Better Decisions

Pervasiveness

Complex, Comprehensive Data

Augmented Analytics

New Buying Patterns

Continuum of Analytic Capabilities
Market-Created Solutions

- Algorithmia
- Amazon Mechanical Turk
- Qlik
- Kaggle
- IBM Bluemix
- IBM Watson Developer Cloud
- Windows Azure
Convergence of Analytics Services and Software

"Servware"

Single Vendor

Service Provider

Service

Software

Software Vendor

Services

Software
Where is the Cutting Edge Moving?

- Better Decisions
- Pervasiveness
- Complex, Comprehensive Data
- New Buying Patterns
- Continuum of Analytic Capabilities
- Augmented Analytics
Four-Tier Analytic Architecture Supports Functional Clusters

**Information Portal**
- Reports
- Dashboards
- Credible
- Consistent
- ✔ Monitor

**Analytics Workbench**
- Self-Service Analytics & Data Preparation
- Citizen Data Science
- Agile
- Insightful
- ✔ Explore

**Data Science Laboratory**
- Advanced Analytics
- Machine Learning
- Advanced
- Comprehensive
- ✔ Investigate

**Decision Hub**
- Decision Support
- Decision Automation
- Automated
- Optimized
- ✔ Industrialize

**Detailed Data**
- IT/OT
- Audio
- Image
- Local Data Marts
- Ad Hoc Files
- Social
- Open Data
- External Data Providers
- Text

**Information**

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Recommendations

✓ Understand the definition, emerging trends, best practices and cutting edge technologies for analytics
  – And share your knowledge

✓ Use packaged analytic applications, embedded analytics and augmented analytics for broader business impact

✓ Empower data scientists and the citizen community
  – But in a managed way
  – Across the analytic pipeline and all 4 pillars

✓ Monitor analytics marketplaces, services and offerings as they evolve
Begin With the End in Mind

Collaboration Is Key
Data and Analytics has Transformative Power

- Inform Every Decision
- Drive Every Process
- Ensure Better Outcomes
- Guide Every Interaction

Data and Analytics at the Center of Everything
Recommended Gartner Research

- **Augmented Analytics Is the Future of Data and Analytics**
  Rita Sallam, Carlie Idoine and Cindi Howson (G00375087)

- **Maximize the Value of Your Data Science Efforts by Empowering Citizen Data Scientists**
  Carlie Idoine and Erick Brethenoux (G00343732)

- **Build a Comprehensive Ecosystem for Citizen Data Science to Drive Impactful Analytics**
  Carlie Idoine (G00375359)

- **Hype Cycle for Analytics and Business Intelligence, 2018**
  Jim Hare and Kurt Schlegel (G00340330)

- **Hype Cycle for Data Science and Machine Learning, 2018**
  Peter Krensky and Jim Hare (G00340329)
Thank You!