



Data Analytics Technical Concepts



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Topic Outline

- ☐ Big data
- ☐ Data analytics maturity
- ☐ Data architecture for data analytics
- ☐ Data-driven path to value
- ☐ Recommendations



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Learning Objectives

- ❑ Understand big data
- ❑ Differentiate key data analytics terminology
- ❑ Recognize data architecture alternatives for data analytics
- ❑ Understand data-driven path to value concept



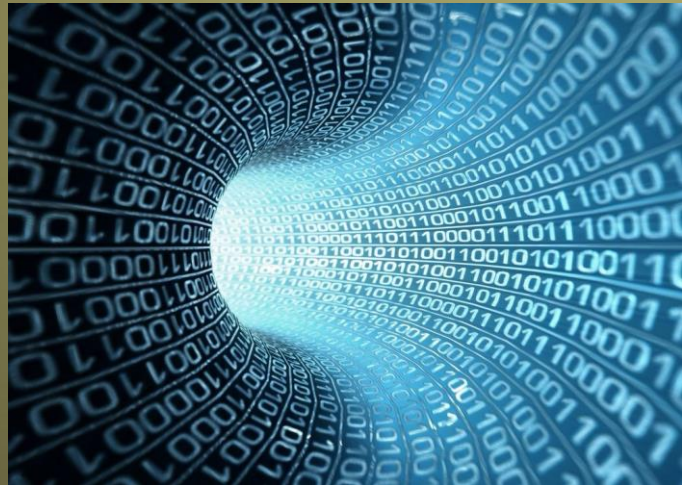
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Big Data



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Big Data Definition

“Big data” is high-volume, -velocity and -variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision-making

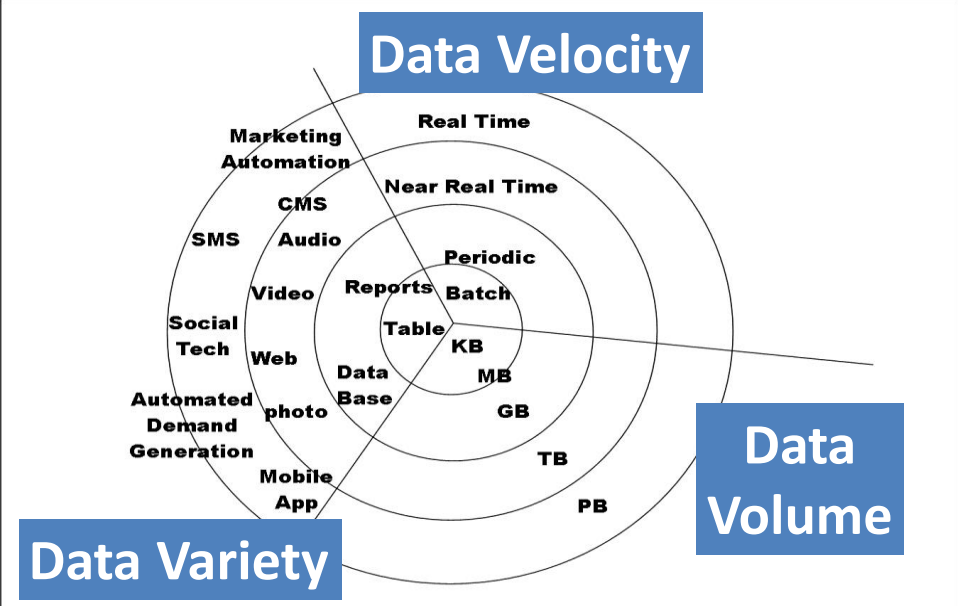
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Big Data Defined



Data Velocity


Data Volume

Data Variety

Real Time
Near Real Time
Periodic
Batch
Table
KB
MB
GB
TB
PB

Marketing Automation
CMS
SMS
Audio
Video
Social Tech
Web
Automated Demand Generation
photo
Mobile App

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Digital Storage in Place

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Storage Cost Trends

The Digital Universe Growth Paradox: Falling Cost and Rising Investment

Year	Cost per GB (\$)	Total Investment (\$T)
2005	18.5	2.5
2006	16.5	3.0
2007	12.5	3.5
2008	8.5	3.8
2009	5.5	4.0
2010	4.0	4.2
2011	3.0	4.5
2012	2.5	4.8
2013	2.0	5.0
2014	1.8	5.2
2015	1.5	5.5

Source: IDC's Digital Universe Study, sponsored by EMC, June 2011

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Big Data Skills in Demand



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Big Data Issues

☐ Technical Concepts

☐ Processes

☐ Processes



– Insufficient attention to data quality

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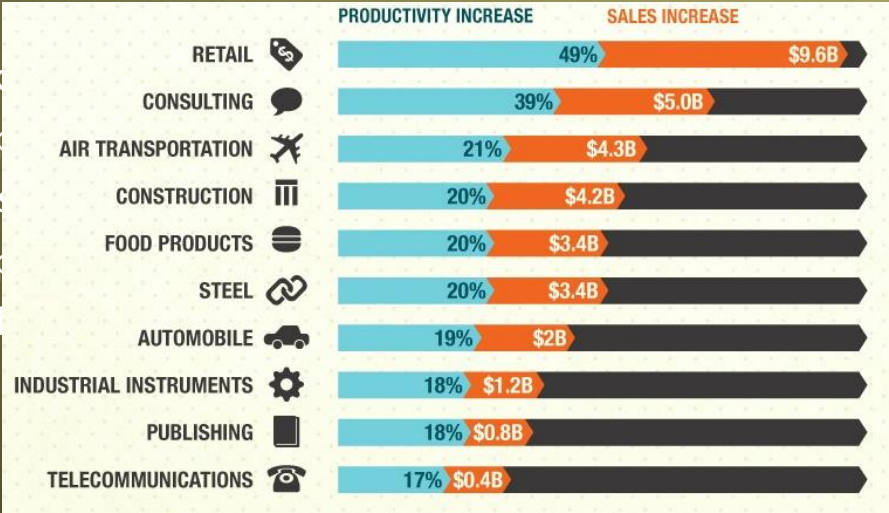
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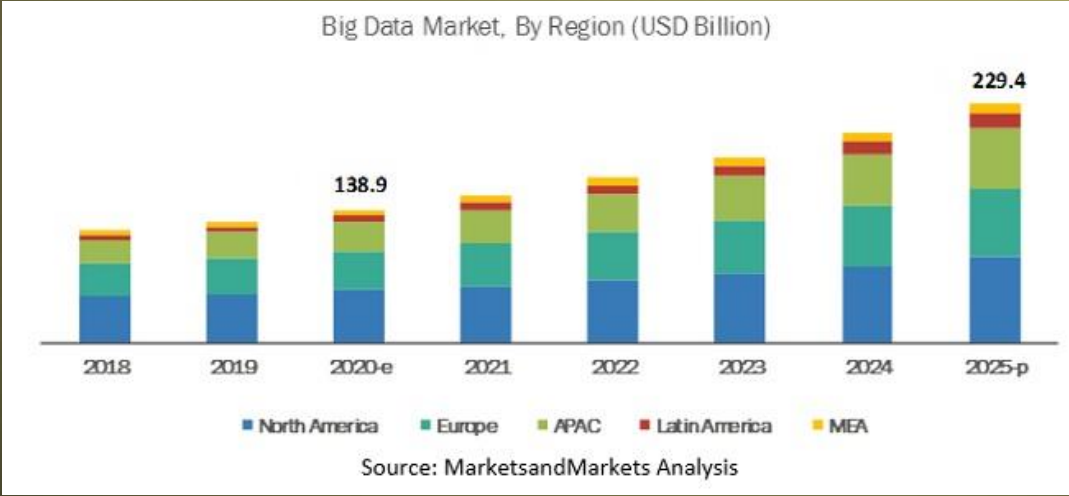
Value of Big Data

- ❑ Make
- ❑ Supp
- ❑ Assis
- ❑ Supp
- ❑ Facil



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Big Data Market Forecast



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Data Analytics Maturity Model



Data Analytics Technical Concepts

Descriptive Analytics

- ❑ Organizes data into informational summaries
- ❑ Enables monitoring how business is performing



Current
data

Looks back
in time

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Diagnostic Analytics

- ❑ Analyzes curated data to extract meaningful insights
- ❑ Reveals trends and KPIs/metrics that are not easily apparent in large volumes of information
- ❑ Produces insights used to drive business decisions



Historical
data

Looks back
in time

Current
data

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Predictive Analytics

- ❑ Encompasses a variety of statistical techniques such as predictive modeling, machine learning, and data mining to analyze current and historical facts to make predictions about future or unknown events
- ❑ Exploits patterns found in historical and transactional data to identify risks and opportunities

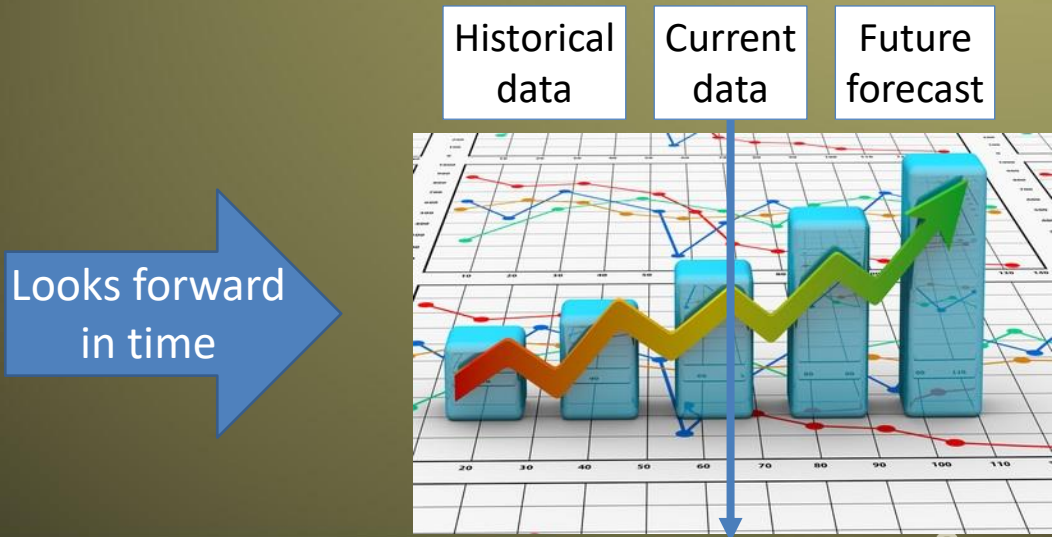
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Predictive Analytics



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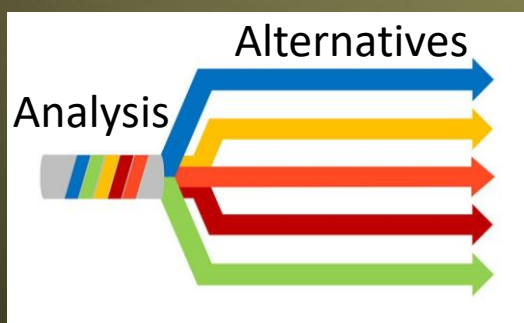
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Prescriptive Analytics

- ❑ Applies mathematical and computational sciences to suggest decision alternatives
- ❑ Builds on the results of diagnostic and predictive analytics



Looks forward
in time

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Data Architecture for Data Analytics

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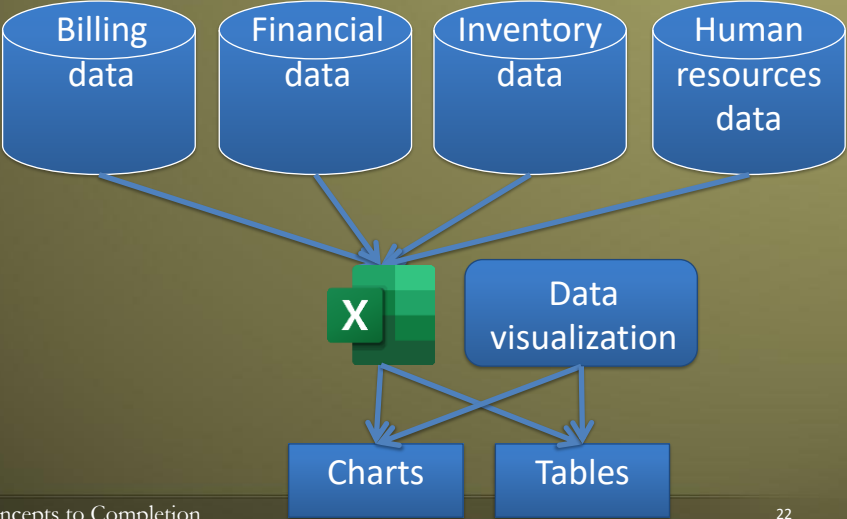


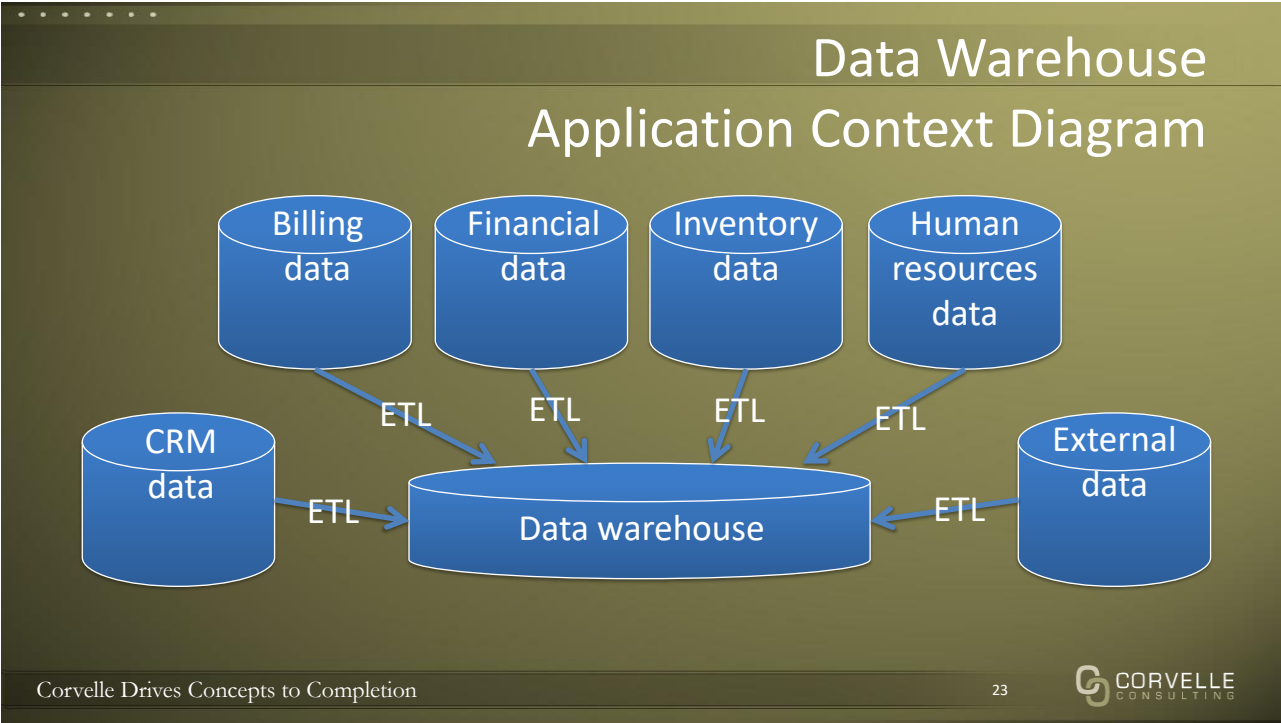
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Data Lake vs. Data Warehouse vs. Operational Datastore

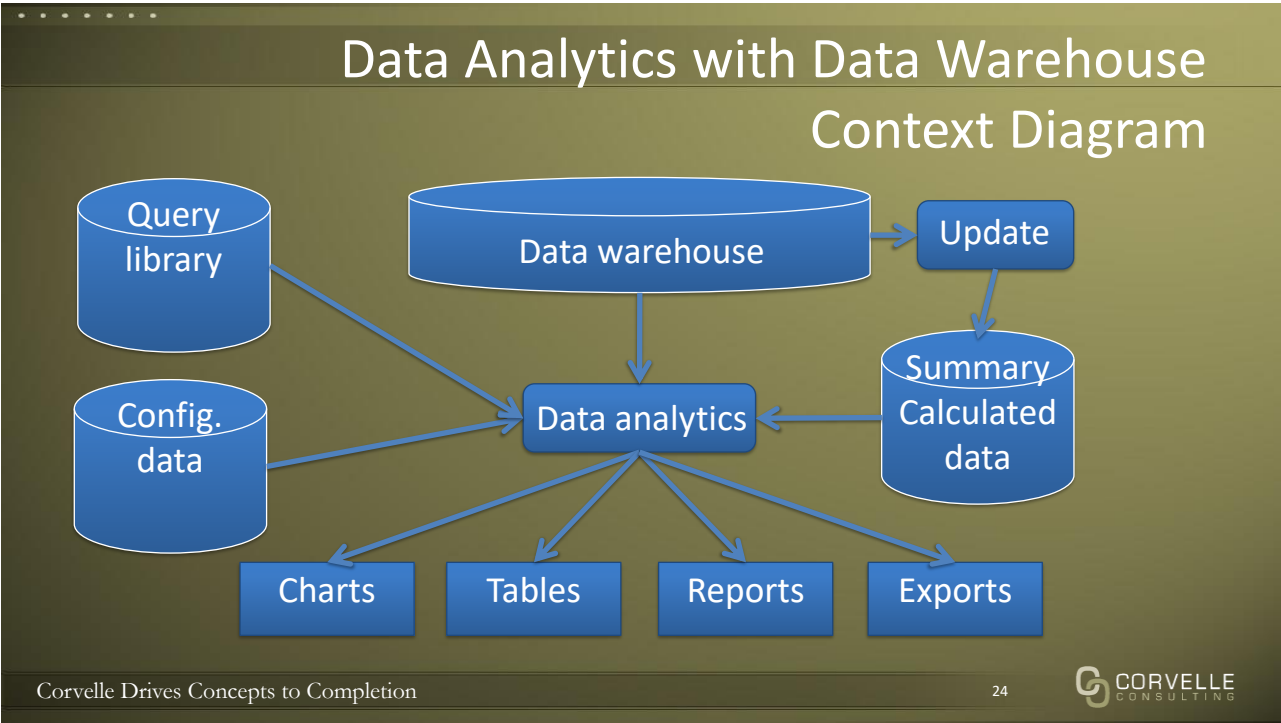
- Operational datastore or database
 - Contains transactional data for one system
 - Contains limited recent historical data
 - Designs data structure/schema to meet transaction processing requirements
 - Used by functional staff
- Data lake
 - Contains all data from multiple source systems without data loss
 - Contains considerable amounts of historical data
 - Offers no data integration
 - Stores data is in its original schema without conversion of original data values
 - Maintains data structure/schema from source systems
 - Used by data scientists
- Data warehouse
 - Contains selected data from multiple source systems
 - Contains selected range of historical data
 - Integrates data across source databases
 - Converts original data to harmonize values and formats
 - Designs data structure/schema to meet data analysis requirements
 - Used by data analysts
- All
 - Offer varying amounts of locks, control, and governance
 - Are based on database technology

Initial Data Analytics Application Context Diagram

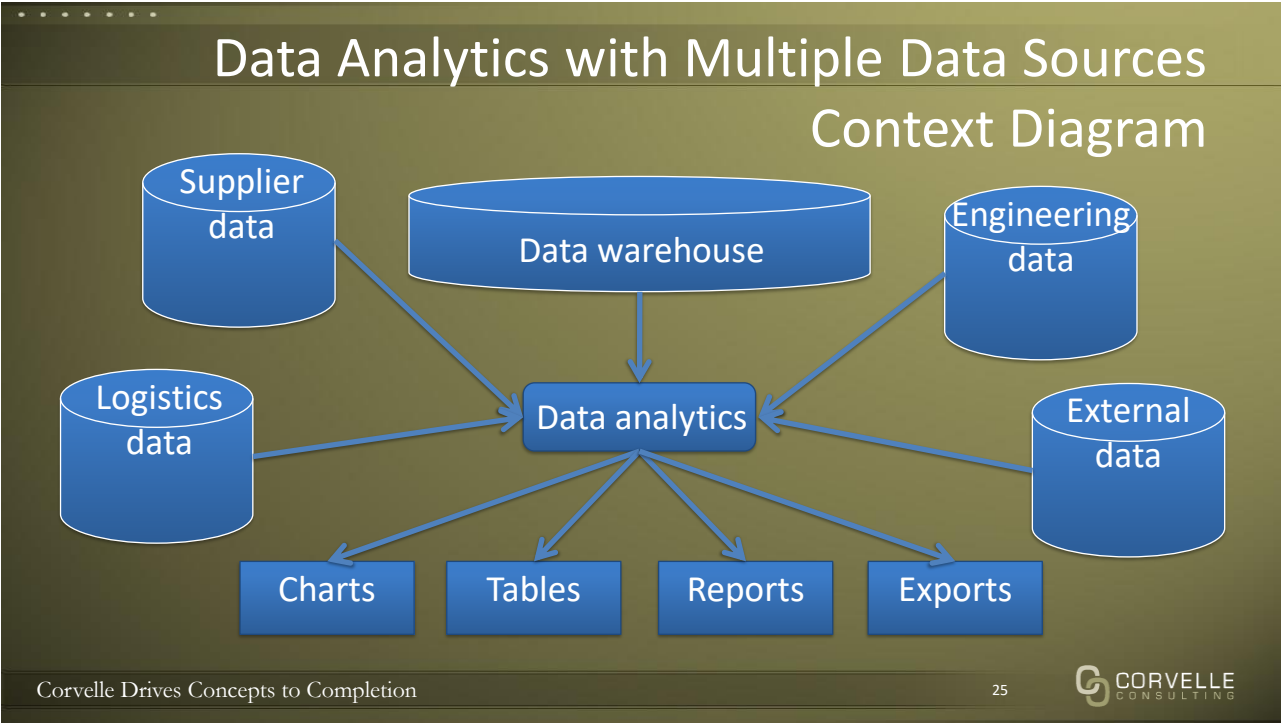




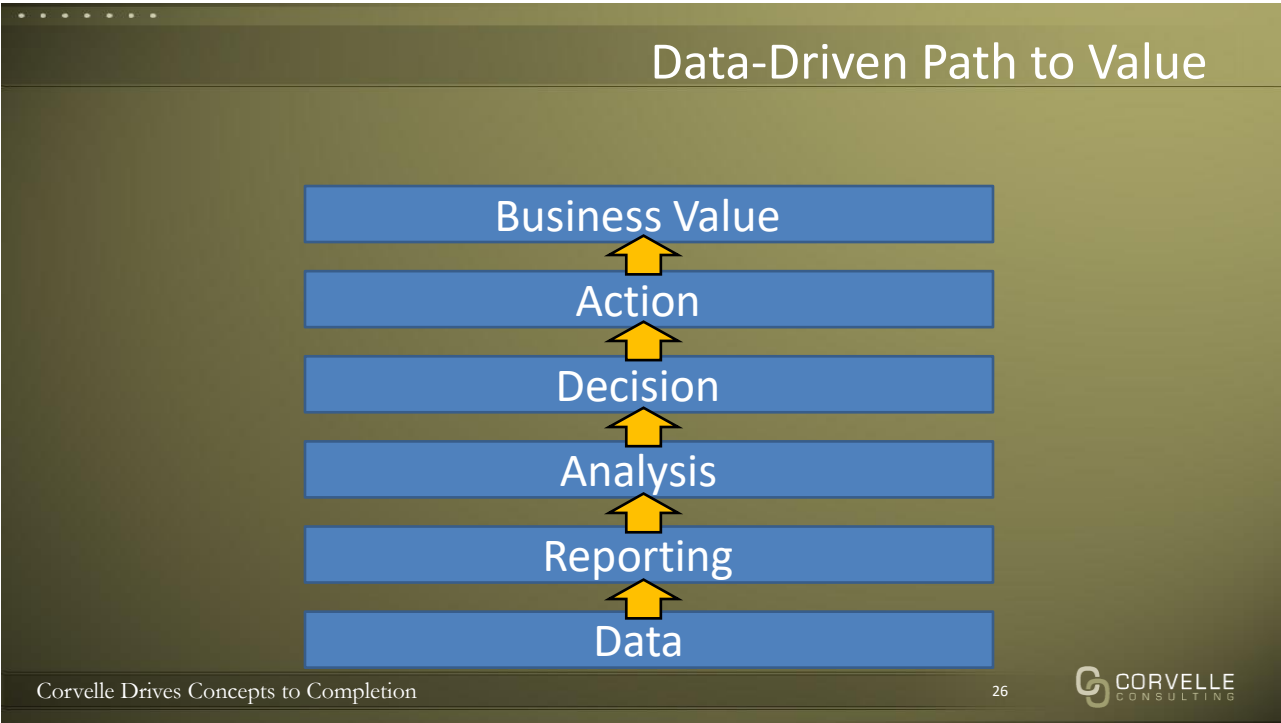
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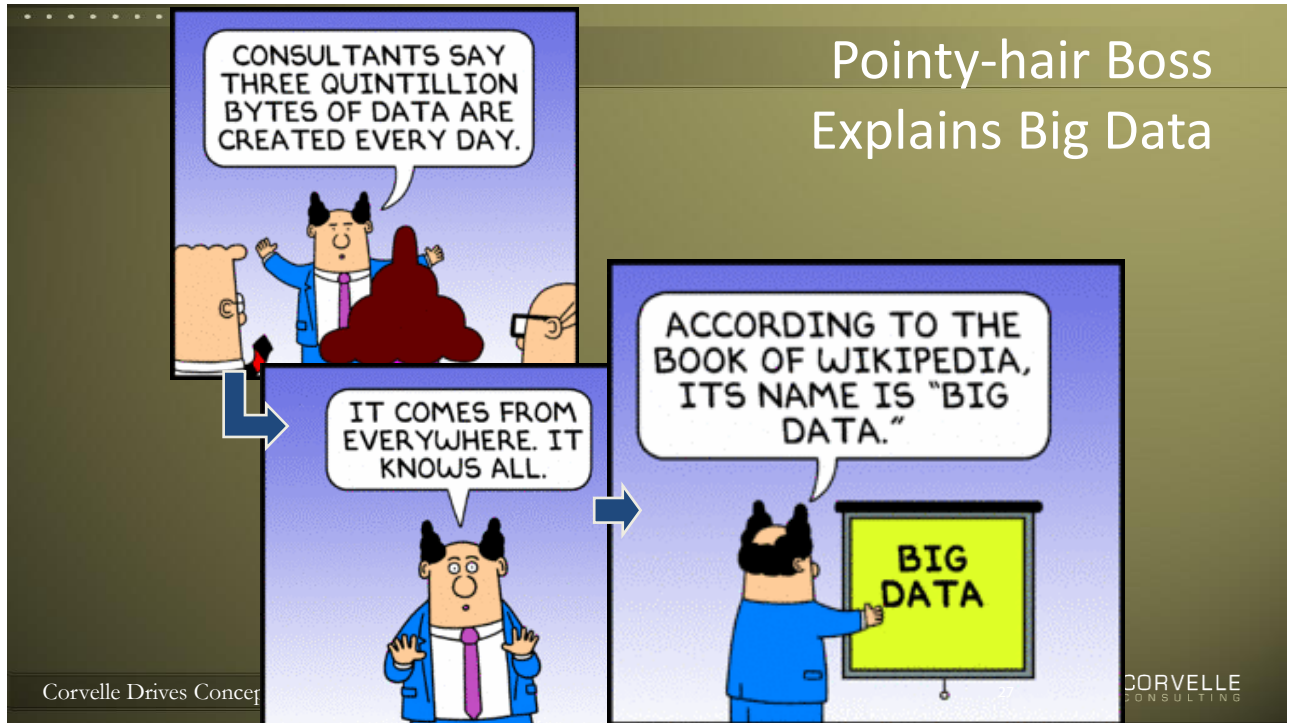


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Pointy-hair Boss Explains Big Data



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Recommendations

- ☐ Use terminology correctly within your organization
- ☐ Share data-driven path to value concept
- ☐ Don't sell data analytics based on intrinsic technical benefits

Operate a data warehouse or avoid it?



Yogi Schulz @itworldca

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Reflection Questions

1. How much value does Big Data produce?
2. What differentiates predictive analytics from diagnostic analytics?
3. What are the benefits as organizations move to a more data-driven approach to decision-making?
4. What are the impediments as organizations try to move to a more data-driven approach to decision-making?

Madame Zaza
Fortune Teller



Madame Zaza
PREDICTIVE ANALYTICS



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"Why the change? Well, I could see where the future was going . . ."