Data, Analytics and BI: A Practical Approach

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Agenda

AH Business & Technology
What is 'Business Intelligence'?
BI vs Data Analytics
Key Players in BI
Our Approach to BI
Behind the Curtain – Practical BI
Q&A
We sit in-between a traditional staffing company and a high dollar Big 4 Advisory firm to provide advisory, consulting, talent augmentation and needed capacity.

Business & Technology Practice Areas

Aventine Hill consultants provide both strategic support and implementation services in these key areas.

- Data, Analytics, Business Intelligence
- Project, Program, Portfolio Management, PMO Development
- Systems Selection, Implementation, Optimization
- Cyber Security
- Automation & Robotics (RPA)
- Business Alignment & Technology Assessment
- CIO & Architecture as a Service
- Technology Simplification
**Extract, Transform, Load (ETL)**

The process of data extraction, transformation and loading to model

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**The History of Business Intelligence**

1865

1960's

1970s

1980s

1990s

2000s

2010s

1958 - Hans Peter Luhn (IBM researcher) introduced and expanded upon the modern concept of Business Intelligence (BI) intelligence in a landmark article.


1970s - BI vendors began selling tools to access and organize stored data. These were the earliest complete BI tools.

1980s - Emergence of the Data Warehouse: new techniques and technologies to transform raw data into meaningful information.

1988 - Future Gartner analyst Howard Dresner defines business intelligence as "Concepts and methods to improve business decision making by using fact-based support systems."

2000s - 2nd Generation of BI

2000s - 1st Generation of BI

2000s - IT-led operation, from end-to-end. The old order – high prices and long wait times

2010s - 3rd Generation of BI

2010s - Entire process is self-service (IT-Enabled). Mainstreaming (Costs drop significantly). Data-driven decision-making starts to become natural.
What is ‘Business Intelligence’?

**Descriptive Analytics**
What Happened?

**Diagnostic Analytics**
Why did it happen?

**Predictive Analytics**
What will happen?

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**BI vs Analytics**

Differing opinions and perspectives. To AH, BI and Analytics are one in the same - two sides of the same coin.

**The textbook definitions:**

- **BI** technologies provide historical, current and predictive views of business operations

- **Analytics** is the discovery and communication of meaningful patterns in data

**Observations:**

- Some of our clients have a **single** organization providing both BI & Data Analytics.
- Others have split the **descriptive and diagnostics** analytics into a **BI** Department and the **predictive and prescriptive** analytics into an **Analytics** Department.
The Gartner Analytic Continuum

BI and Data Analytics Maturity Progression

Foresight

Insight

Hindsight

VALUE

DIFFICULTY

BI or Business Intelligence
Advanced Analytics
Artificial Intelligence (AI)

Prescriptive Analytics

Diagnostic Analytics

Descriptive Analytics

How can we make it happen?

Run

Simulation (Monte Carlo)

Graph Analytics

Neural Networks

Walk

Neural Networks

Heuristics / Rule Engines

Complex-Event Processing (CEP)

Operations Research (Optimization)

Stagger

Multivariate Stats

Forecasting

Regression Analysis

Alerts

Semantic and Sentiment Analysis

Predictive Modeling

Pattern Matching

Predictive Analytics

Why did it happen?

What happened?

What will happen?

OLAP

Data Discovery

Query and Ad Hoc Reporting

Drill Down/Across

Data/Text Mining

Visualization

Network/Cluster Analysis

Pattern Matching

Diagnosis

Crawl

Alert

Visualization

Network/Cluster Analysis

Prescriptive Analytics

Example BI Dashboards

Modern BI tools deliver Dashboards with real-time data for monitoring and alerting.

Modern Dashboards also provide advanced Drill Down Capabilities!

View the Raw Data for your visuals in the Dashboard!
Who Needs BI Anyway?

Anyone who needs to understand more about their business or organization!

“Gartner’s recent survey of more than 3,000 CIOs shows that CIOs ranked analytics and BI as the top differentiating technology for their organizations.

It attracts the most new investment and is also considered the most strategic technology area by top-performing CIOs.”

The Technology Adoption Curve

Sources:
(1) www.joycehostyn.com
(2) 2017 Big Data Analytics Market Study by Dresner Advisory Services, LLC
What are Current BI Trends?

Traditional BI platforms: *IT-produced* analytic content.

Modern BI platforms: *IT-enabled*, agile self-service.

Empowering the masses - to perform complex data analysis tasks
Mainstreaming - decreasing product pricing, increasing access
Sharing data - especially what is embedded in applications
Augmented Analytics - automates insights using machine learning and natural-language generation; is the next wave of disruption!

Source: https://www.gartner.com

### Analytics & BI: Gartner’s Magic Quadrant

<table>
<thead>
<tr>
<th>Platform</th>
<th>Comments</th>
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<tbody>
<tr>
<td>#1 Power BI &amp; Excel</td>
<td>New #1! <em>Maturing</em></td>
</tr>
<tr>
<td>#2 Tableau</td>
<td>Former #1! <em>Regrouping</em></td>
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<td>#3 Qlik</td>
<td>Losing Ground</td>
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<td>#4 ThoughtSpot</td>
<td><strong>New to Leaders Quadrant!</strong> Very significant move</td>
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#### Other Comments

- A pack is coalescing near Leaders
- **IBM** lost more ground; just a Niche Player
- New Niche Player: **GoodData**

As of Jan 2019. Source: https://www.gartner.com
What are the Top BI Platforms?

![Chart showing BI platform usage percentages]

Source: Robert Walters, UK 2018 BI Research (consistent with Gartner magic quadrant)

Top BI Objectives & Requirements

- Most popular objective: Improving revenues using BI
- The most strategic BI initiatives underway are:
  - Reporting,
  - dashboards,
  - data integration,
  - advanced visualization, and
  - end-user self-service
- Operations, Executive Management, Finance, and Sales are primarily driving Business Intelligence (BI) adoption
- Operations & Sales teams in Tech companies are the most effective at driving BI adoption
- Advertising is driving BI adoption across Marketing

Dresner Advisory Services 2019 research per Forbes
Aventine Hill’s Approach to BI

-----Discovery-----/---------Implement First Dashboard in 1-4 Weeks---------/

**BI QuickStart**

Assist in all phases of the lifecycle for BI and Analytics.

QuickStart Methodology focuses on your:
- options,
- value and
- costs;
and accelerates access to tools that support real time interactive business decision making.

**STEPS**

1. **DEFINE** Business & Technical Requirements
2. **CONNECT** Data Sources
3. **CREATE & TEST** Dashboards & Reports
4. **CONFIRM** BI Options/Value/Cost and Data Architecture
5. **VALIDATE & HAND OFF** To End Users

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**Additional BI & Analytics Lifecycle Support**

Tangible and immediate benefits:

- Master Data Management & Data Governance
- Strategy & Roadmap
- BI and Reporting Platforms
- Data Analysis & KPI Specification
- Dashboard and Reporting Implementation
- Project and Change Management
Behind the Curtain: Practical BI - using Microsoft (Power BI + EXCEL)

Microsoft’s Modern BI Suite of Tools

Better Together
How Will BI Work with My Data?

Train, Model & Serve

Data Layer
Structured, Unstructured & Semi-Structured

Accounting System(s)
Siloed Workbooks
Operational System(s)
Info from the Web

Refresh Frequency is determined based on business needs & system constraints

Excel Power Ad-Ins

Excel Power Ad-Ins are **FREE** tools that provide a mechanism to import, manipulate and work with large amounts of data from a variety of data sources.
**Data Streamer**

A two-way data transfer **FREE** add-in for Excel that streams live data between an Internet of Things (IoT) device and Excel.

Opens up emerging world of IoT to the classroom and helps educators meet requirements for data science.

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**Power BI Publisher for Excel**

Use this **FREE** add-in to take snapshots of your most important insights in Excel, like PivotTables, charts, and ranges & pin them to dashboards in Power BI.
Key Things to Know about BI

- Graphs highlight trends - and cause specific questions to be asked
- Accountants used to try to prepare for every question;
  .......and then have to research off line to answer unanticipated questions
- Power BI empowers users to drill down on data to explain trends for themselves
- E.g., If you are in the bike business and you notice a spike in revenues in 2018.
  - You are able to drill down in 2018 and visualize revenue changes by country.
  - From there, you see Australia is responsible for most of variance. Drill down.
  - From there, you see two "extreme" versions of your bike had over 50% increases in sales in months of November and December.

Key Things to Know about BI

- Once you are able to identify the cause of the variance, you can shape a dashboard with pertinent visuals to explain what happened to interested parties in your company
- You can even publish your findings (send emails that link people to your dashboards)

- RESULT: You can set up alerts that automatically send emails to important decision makers once a data threshold is exceeded
Power BI Platform (FREE version available. Pro is $9.99/ Month)

Cloud based business analytics toolset - designed to assist businesses visualize and analyze data with speed and efficiency.

Can:
- access data from different sources AND
- simplify its preparation and cleaning and enable ad-hoc analysis.

**Same Engine as Excel Power Ad-Ins**

Advantages of Microsoft BI Suite

- Automate cleaning very large data sets of dirty data in .CSV files, Excel Files, Databases etc.
- Simple Ad-hoc reporting AND designing full-blown Business Intelligence solutions.
- No longer required to learn more advanced techniques or technologies, such as Excel Formulas, Visual Basic, Macros, or languages like SQL, PL/SQL, MySQL.
- For many years these other tools were the only means for cleaning and transforming data into something meaningful to make business decisions. While effective, these methods still take time master – AND to build.
- MS BI Suite reduces need for complex Big Data infrastructure for Analytics while still maintaining Data Governance best practices.
Power BI Architecture

- Hundreds of data sources
- Power BI Desktop
- **FREE Version or included in Pro License for total charge of $9.99/ Month**

Power BI Desktop – Main Components

The Report Designer main User Interface is a powerful development tool

- **Data Model** is where you can view your data tables, as well as perform additional shaping on your data model

- **Report View** is where you drag and drop your visualizations to the canvas

- **Relationships View** is where you define and build the relationships between your Data or Fact tables and your lookup tables
Power BI Desktop – Main Components

Query Editor (Also known as Power Query)

- This is an ETL tool and data transformation engine.
- This is where you initially pull all of your data sets into Power BI and where a majority of your data transformation will occur.
- Note: 80% of dashboard time and effort in creating dashboards occurs in the data transformation process.

Power BI Desktop – Report Designer

- Report View
- Visualization
- Controls & Formatting
- CANVAS
- Account Sign-In
- Fields Pane (Data Model)
- Relation -ships
- Data Model Views
Power BI Desktop – Report Designer

**DAX Calculations**

- Select to manage Relationships
- Relationship Keys

**Relationship View**

- Objects
Analyze in Excel

FREE

Provides access to Power BI cloud datasets in Excel for use in Power Pivot.
This provides the ability to view data graphically in Power BI and for tabular analysis in Excel from a single source of truth.

NOTE: Data Model is in the cloud - which speeds up performance of the Pivot Charts in Excel.
Paginated Report Builder

**FREE**

Latest companion application for Power BI!
Lets you author Paginated Reports..

Primary authoring experience for paginated reports.
Use in place of SQL Server Reporting Services Report Builder.
Provides a familiar experience, but specifically optimized for publishing to the Power BI Service.

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Power BI Desktop in 5 Steps

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What We Covered

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What is 'Business Intelligence'?
BI vs Data Analytics
Key Players in BI
Our Approach to BI
Behind the Curtain – Practical BI
Q&A

Questions?
This looks cool.

How much would it cost my client or my employer?

Thank You!
Resources

I. PUG Resources
   A. Webinars https://www.pbiusergroup.com/engage/training
   B. Webinar Recordings https://www.pbiusergroup.com/engage/webinarrecordings
   C. Pug Exchange https://www.pbiusergroup.com/engage/redirectopenforum
   D. San Antonio Chapter https://www.pbiusergroup.com/communities/sanantonio

II. Popular YouTube Channels
   A. Guy in a cube https://www.youtube.com/channel/UCFp1vaKzpfvoGai0vE5Vj0w
   B. Microsoft Power BI https://www.youtube.com/channel/UCy--PYywBwAeuYaR8JLmrfg
   C. Avi Sing https://www.youtube.com/channel/UCRNmSv7mAPYiC0Y40TJjjAw
   D. Excel Is Fun https://www.youtube.com/user/ExcelIsFun

III. Resources on the Web
   A. Whitepapers for Power BI https://docs.microsoft.com/en-us/power-bi/whitepapers

Additional Materials
This is an introductory video course about the DAX language. DAX is the native language of Power BI, Power Pivot for Excel, and SSAS Tabular models in Microsoft SQL Server Analysis Services. The training is aimed at users of Power BI, Power Pivot for Excel, and at Analysis Services developers that want to move the first steps with DAX.

The goal is to teach the DAX language using Power BI for all the examples. You can download the initial Power BI files (or the used in the demos and recorded video).