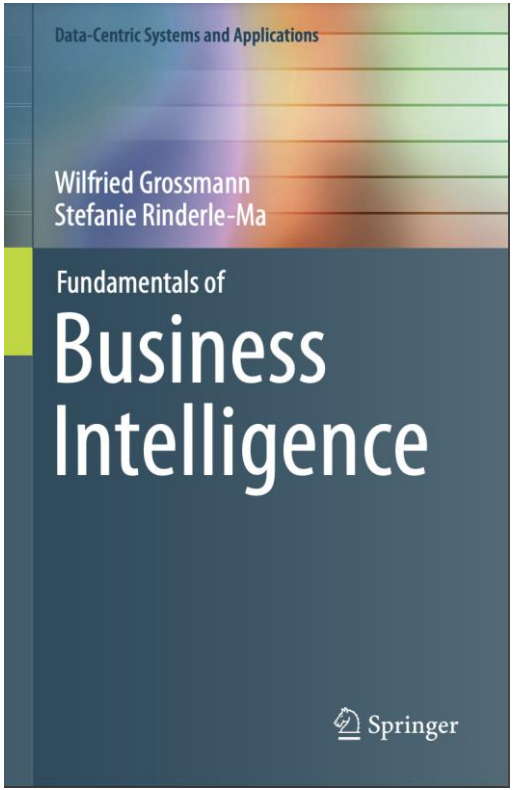
BUSINESS INTELLIGENCE

M.S Ma Ngan Giang



[1] Business Intelligence and Analytics, Drew Bentley (2017)
[2] Fundamentals of Business Intelligence, Wilfried Grossmann Stefanie Rinderle-Ma

Đăng ký nhóm

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Group fb môn học

Course Schedule and Contents

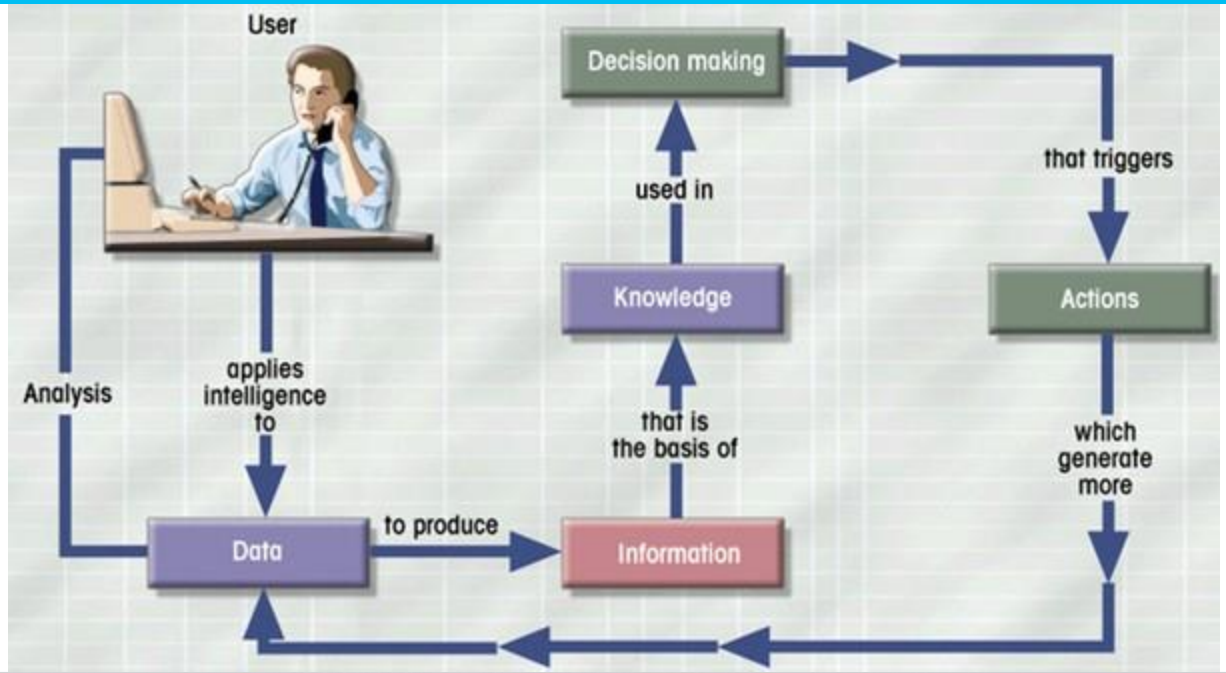
W/S	Topics	Ref
1	Introduction to Business Intelligence	[1, chapter 1]
2	Modeling Business Intelligence	[2, chapter 2]
3	Modeling Business Intelligence (cont.)	[2, chapter 2]
4	Data Provisioning	[2, chapter 3]
5	Data Description Visualization	[2, chapter 4]
6, 7	Data Mining	[1, chapter 3], [2, chapter 5,6]
8	Data Mining (cont)	[1, chapter 3], [2, chapter 5,6]
9,10	Essential Aspects of Business Intelligence	[1, chapter 6]
11,12	Operational Intelligence: Technological Components (cont.)	[1, chapter 7]

Chapter 1:
INTRODUCTION TO BUSINESS INTELLIGENCE

Decision Making Process

Decision making at different levels
– Operational
• Related to daily activities with short-term effect
• Structured decisions taken by lower management
– Tactical
• Semi-structured decisions taken by middle management
– Strategic
• Long-term effect
• Unstructured decisions taken by top management
• Decision making steps include
– Problem identification,
– Finding alternative solutions,
– Making a choice
• Information and knowledge form the backbone of the decision-making process

Decision Making Process

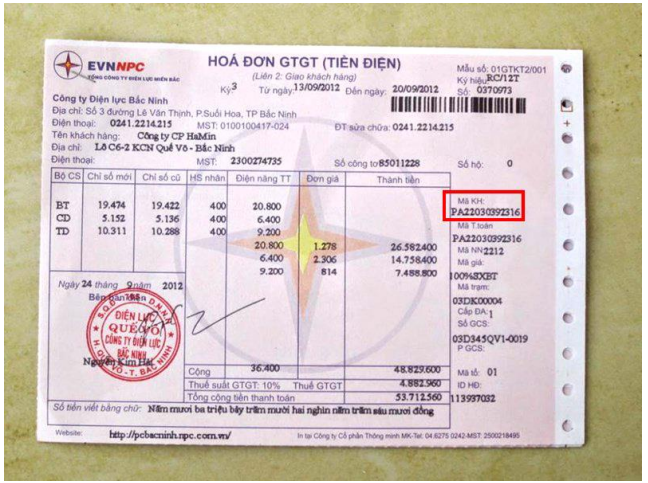


What Is Business Intelligence?

What is Business intelligence ?

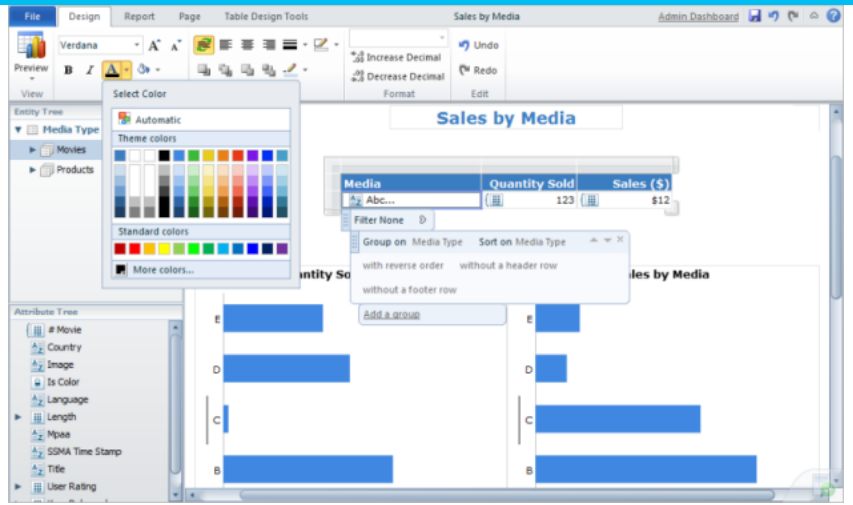
Common forms of BI

1. Operational Reporting: Reports that provide regular summaries of information in a predetermined format



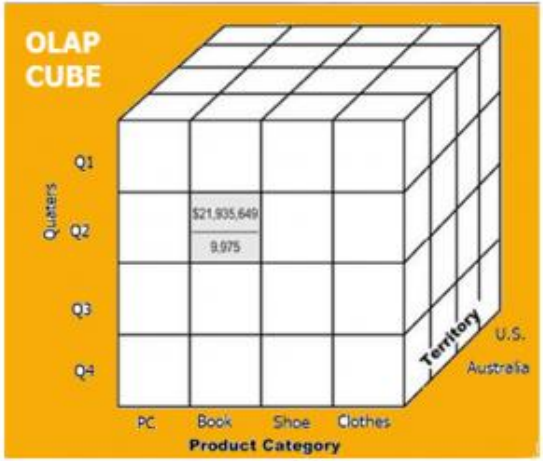
Common forms of BI

2. Ad Hoc Reporting tools: Tools that put users in control so that they can create custom reports on an as-needed basis by selecting fields, ranges, summary conditions, and other parameters.



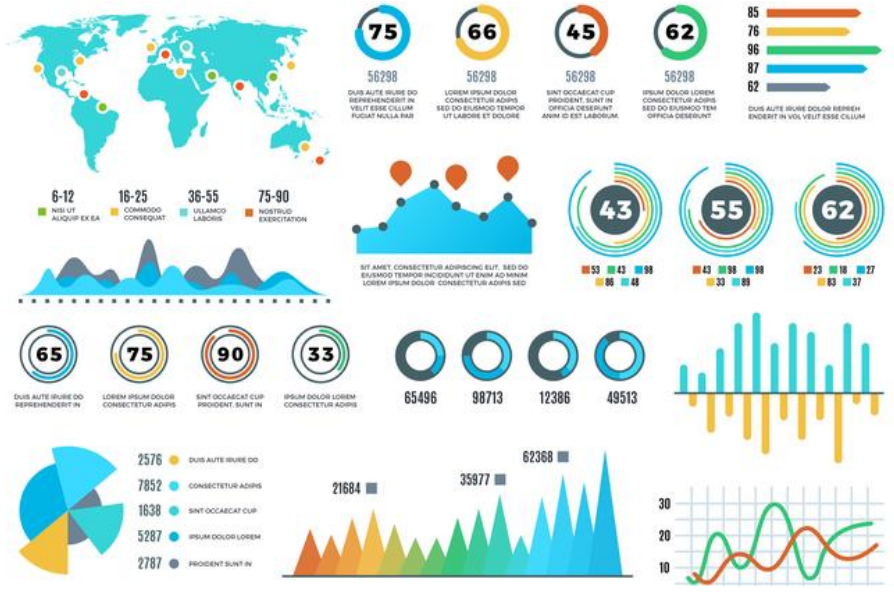
Common forms of BI

3. OLAP Analysis: A method of querying and reporting that takes data from standard relational databases, calculates and summarizes the data, and then stores the data in a special database called a data cube



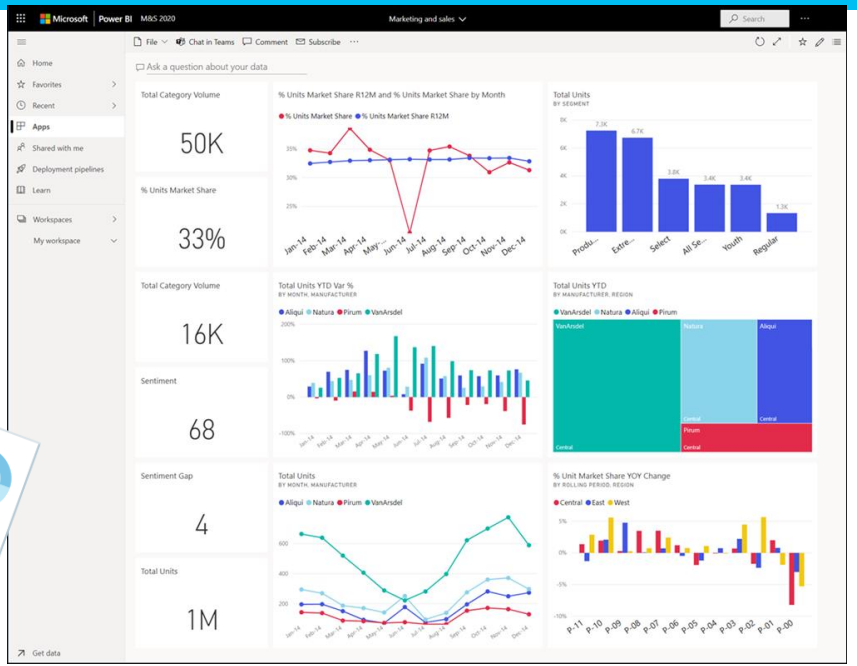
Common forms of BI

4. Data Visualization



Common forms of BI

5. Dashboards A heads-up display of critical indicators that allow managers to get a graphical glance at key performance metrics



Features of BI

- Task of BI: The main task of BI is providing decision support for specific goals defined in the context of business activities in different domain areas taking into account the organizational and institutional framework
- Foundation of BI: BI decision support mainly relies on empirical information based on data. Besides this empirical background, BI uses also different types of knowledge and theories for information generation

Features of BI

- Realization of BI: The decision support has to be realized as a system using the actual capabilities in information and communication technologies (ICT)
- Delivery of BI: A BI-system has to deliver information at the right time to the right people in an appropriate form

Actual Challenges

- Integration of improved process understanding, workflow considerations, and process mining
- Applications to new organizational structures
- New data sources (web data, semi-structured data, text data)
- New methods for new data types (text mining, opinion mining)
- Using actual IT facilities: SaaS, BigData (cloud)
- New devices: mobile devices, real time decision support

Definition of Business Intelligence

Topics Related to BI

- Business Analytics: Finding new insights and understanding of the business

- CRM Analytics: Focus on customers in order to improve relationship to customers

- Predictive Analytics: Main emphasis is on prediction of future business events by using statistically oriented models

- Data mining: Extracting information about the business from large data sets

Definition of Business Intelligence

Topics Related to BI

- Machine Learning: Computer programs with the ability to learn how to solve a task (AI); in its origin not so much oriented towards many data instance

- Data Warehousing: Organize all relevant data from operative systems and external systems under a unified view which supports information retrieval

- Process Mining: Finding structure in instances of business processes (more production-oriented)

Definition of Business Intelligence

Basic definitions:

- Business can be understood as any kind of activities of an organization for delivering goods or services to consumers
    - Size of business: Size of the enterprise, possible generalizations to similar enterprises or larger units
    - Scope of business: Complexity of the activities
- Business strategy describes how the organization intends to succeed
    - Depends on size of an organization and the scope of activities
- Business model reflects the strategy of an enterprise to create value
    - There are many other definitions of a business model

Definition of Business Intelligence

Business Intelligence Scenarios

- Business Intelligence separated from strategic management
- Business Intelligence supports monitoring of strategy performance
- Business Intelligence as feedback on strategy formulation
- Business Intelligence as strategic resource

Business Intelligence perspectives

- Business activities are frequently structured by formulating a business process

- *Business process*: A collection of related and structured activities necessary for delivering a certain good or service to customers together with possible response activities of customers

- *Process instances*: observable realization of the business process

Business Intelligence perspectives

Three different perspectives of business processes:

- Production perspective: What should be offered to customers? How should the offer be produced?
- Customer perspective: How do customers perceive the product? How do customers react?
- Organizational perspective: What organizational structure is behind

production? What organizational structure is behind customers?

Business Intelligence perspectives

In connection with the organizational perspective it is often important to identify roles of involved parties:

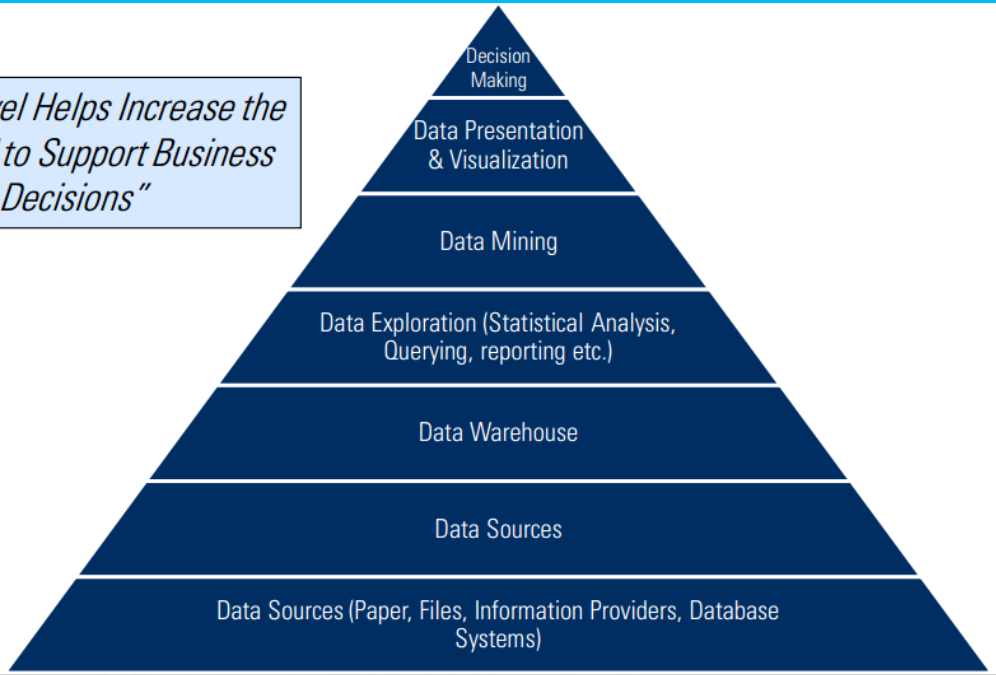
- *Process owner*: Responsible for setting up the rules behind the process
- *Process subjects*: Identifiers for the process instances
- *Process actors*: Other persons or organizational units involved in the process execution

Definition of Business Intelligence

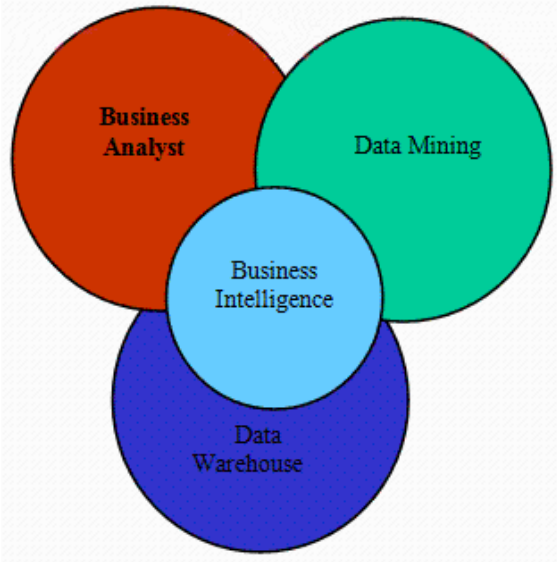
- Business intelligence (BI) is a broad category of applications, technologies, and processes for gathering, storing, accessing, and analyzing data to help business users make better decisions.

Business Intelligence Processes

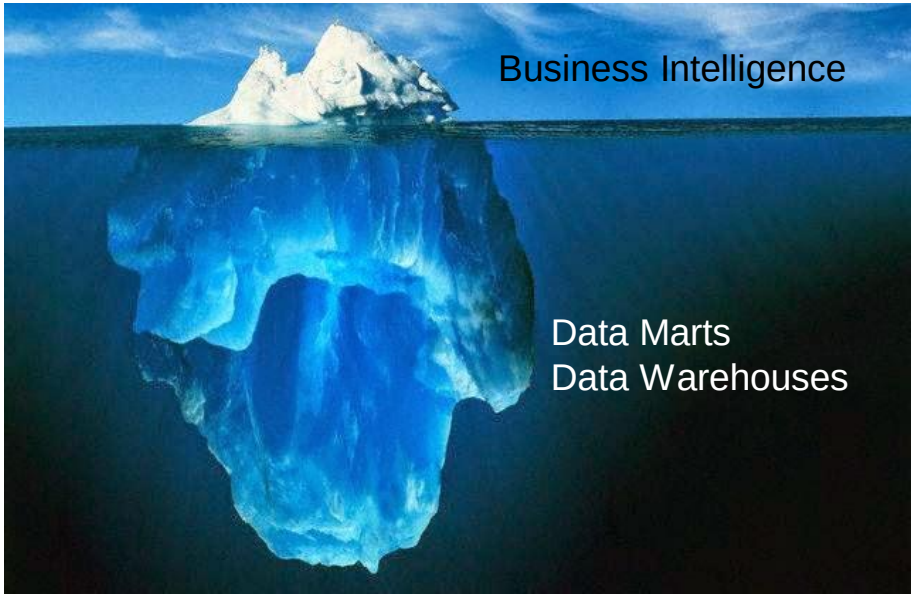
"Every Level Helps Increase the Potential to Support Business Decisions"



Business Intelligence Processes



Business Intelligence Processes



Data Warehouses and Data Marts

- **Data warehouses**: A set of databases designed to support decision making in an organization
  - Structured for fast online queries and exploration
  - May aggregate enormous amounts of data from many different operational systems
- **Data marts**: A database or databases focused on addressing the concerns of a specific problem (e.g., increasing customer retention, improving product quality) or business unit (e.g., marketing, engineering)

Data Warehouses and Data Marts

- Marts and warehouses may contain huge volumes of data
- Large data warehouses can cost millions and take years to build
- Large-scale data analytics projects should start with a clear vision with business-focused objectives

Data Mining

- Data mining is the process of using computers to identify hidden patterns in (and to build models from) large data sets
- Key areas where businesses are leveraging data mining include:
  - Customer segmentation
  - Marketing and promotion targeting
  - Market basket analysis
  - Collaborative filtering
  - Financial modeling
  - Hiring and promotion

Data Mining

- For data mining to work, two critical conditions need to be present:
  - The organization must have clean, consistent data
  - The events in that data should reflect current and future trends

Data Mining

- A data mining and business analytics team should possesses three critical skills:
  - Information technology
  - Statistics
  - Business knowledge

Applications in an Enterprise

Applications in an Enterprise

Business intelligence can be applied to the following business purposes, in order to drive business value:

- Measurement
- Analytics
- Reporting
- Collaboration/collaboration platform
- Knowledge management

Why do organizations need business intelligence ?

Why do organizations need business intelligence ?

- Data communications and data storage are essentially free, and **enormous amounts of data are created and stored** every day.

Why do organizations need business intelligence ?

- Businesses use BI systems to:
  - **Process** data (from operational DB, Social Data, purchased data, etc.)
  - **produce** patterns, relationships, and other forms of information;
  - **deliver** that information on a timely basis to users who need it.

Draw mind map
about BI system.

BUSINESS INTELLIGENCE TARGET?

BEAUTIFUL DASHBOARD ?

PROFESSIONAL PRESENTATION ?

COMPLEX ANALYSIS ?

BUSINESS INTELLIGENCE BENEFITS

01 HELP TO UNDERSTAND YOUR BUSINESS

02 REDUDE RISK

03 INDENTIFY WASTE OF SYSTEM

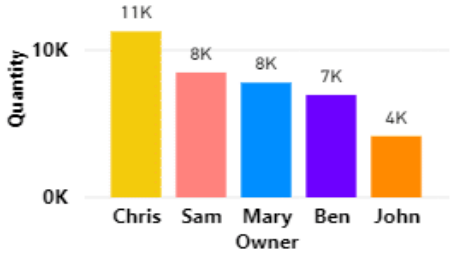
04 RIGHT TIME, RIGHT INFORMATION

05 IMPROVE DECISION MAKING PROCESS

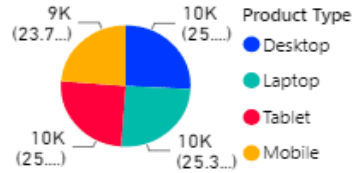
TECHNOLOGY

Month	Quantity
October	7394
May	7109
April	4685
September	4685
March	3924
August	3924
June	3415
November	3320
July	233
Total	38689

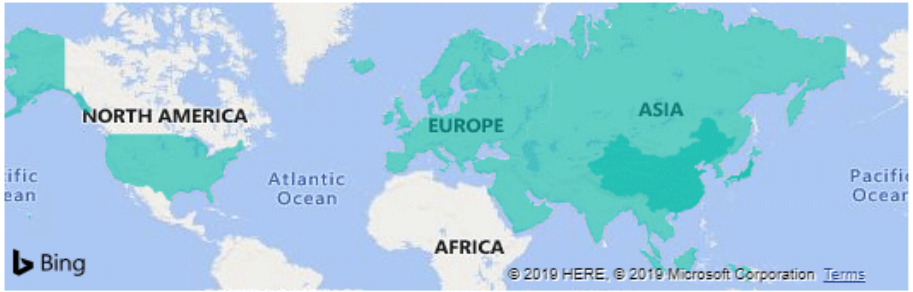
Quantity by Owner



Quantity by Product Type



Quantity by Region



Owner
- Ben
- Chris
- John
- Mary
- Sam

Region
- America
- Asia
- China
- Europe
- Japan

Product Class
- Class 1
- Class 10
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Class 8
- Class 9

LEMONDATA GUY
Data Into Knowledge

TEMPLATE 1

462.85K
kpi1

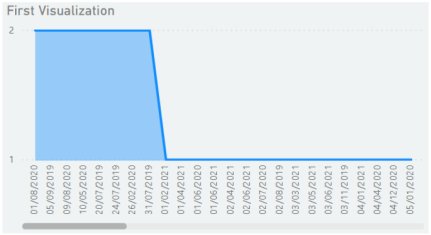
471.48K
kpi2

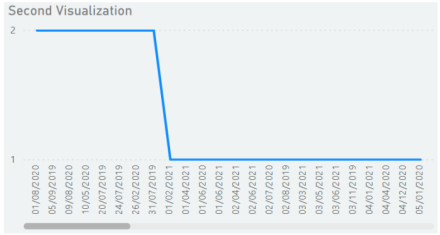
529.51K
kpi3

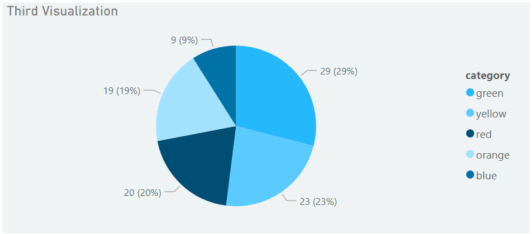
502.63K
kpi4

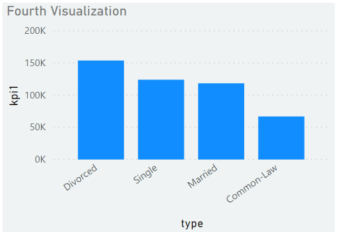
47.67K
kpi5

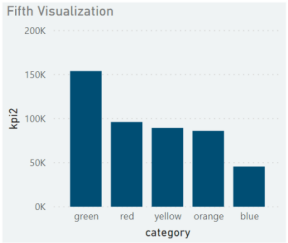
406.28K
kpi6

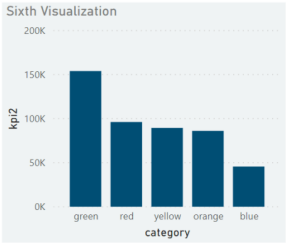


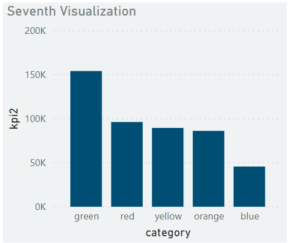


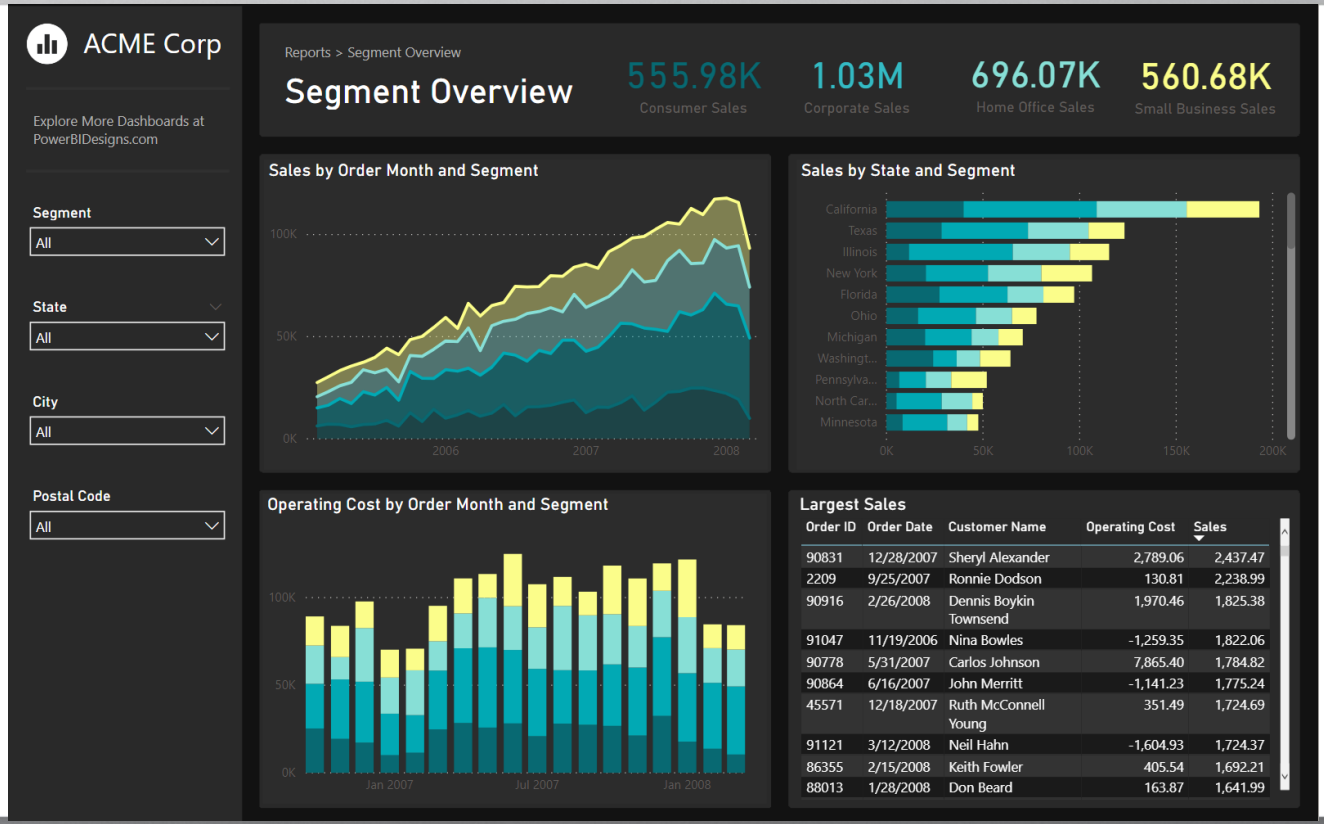


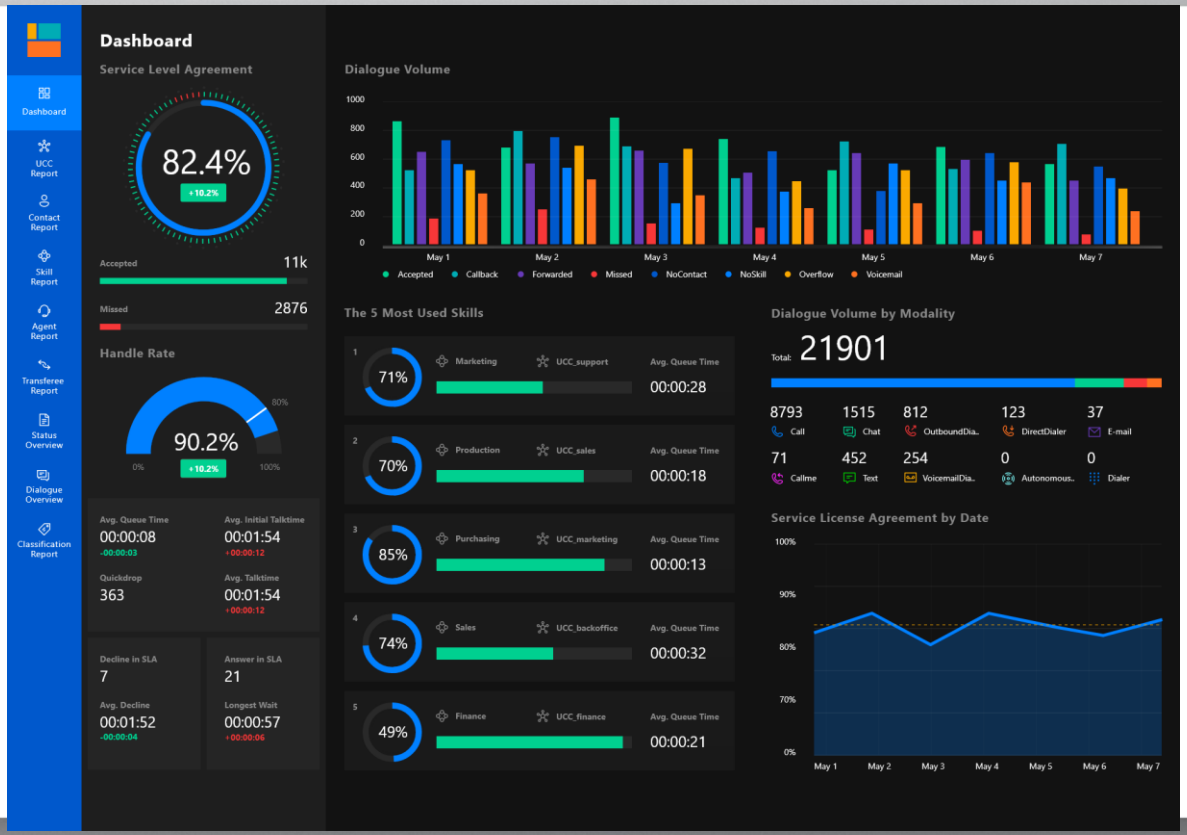









ACME Corp
Explore More Dashboards at PowerBIDesigns.com
Segment
All
State
All
City
All
Postal Code
All
Reports > Segment Overview
Segment Overview
555.98K
Consumer Sales
1.03M
Corporate Sales
696.07K
Home Office Sales
560.68K
Small Business Sales
Sales by Order Month and Segment
100K
50K
0K
2006
2007
2008
Sales by State and Segment
California
Texas
Illinois
New York
Florida
Ohio
Michigan
Washingt...
Pennsylva...
North Car...
Minnesota
0K
50K
100K
150K
200K
Operating Cost by Order Month and Segment
100K
50K
0K
Jan 2007
Jul 2007
Jan 2008
Largest Sales
Order ID | Order Date | Customer Name | Operating Cost | Sales
90831 | 12/28/2007 | Sheryl Alexander | 2,789.06 | 2,437.47
2209 | 9/25/2007 | Ronnie Dodson | 130.81 | 2,238.99
90916 | 2/26/2008 | Dennis Boykin Townsend | 1,970.46 | 1,825.38
91047 | 11/19/2006 | Nina Bowles | -1,259.35 | 1,822.06
90778 | 5/31/2007 | Carlos Johnson | 7,865.40 | 1,784.82
90864 | 6/16/2007 | John Merritt | -1,141.23 | 1,775.24
45571 | 12/18/2007 | Ruth McConnell Young | 351.49 | 1,724.69
91121 | 3/12/2008 | Neil Hahn | -1,604.93 | 1,724.37
86355 | 2/15/2008 | Keith Fowler | 405.54 | 1,692.21
88013 | 1/28/2008 | Don Beard | 163.87 | 1,641.99


Dashboard
Dashboard
UCC Report
Contact Report
Skill Report
Agent Report
Transferee Report
Status Overview
Dialogue Overview
Classification Report
Service Level Agreement
82.4%
+10.2%
Accepted
11k
Missed
2876
Handle Rate
90.2%
+10.2%
Avg. Queue Time
00:00:08
-00:00:03
Avg. Initial Talktime
00:01:54
+00:00:12
Quickdrop
363
Avg. Talktime
00:01:54
+00:00:12
Decline in SLA
7
Answer in SLA
21
Avg. Decline
00:01:52
-00:00:04
Longest Wait
00:00:57
+00:00:06
Dialogue Volume
May 1
May 2
May 3
May 4
May 5
May 6
May 7
Accepted
Callback
Forwarded
Missed
NoContact
NoSkill
Overflow
Voicemail
The 5 Most Used Skills
71%
Marketing
UCC_support
Avg. Queue Time
00:00:28
70%
Production
UCC_sales
00:00:18
85%
Purchasing
UCC_marketing
00:00:13
74%
Sales
UCC_backoffice
00:00:32
49%
Finance
UCC_finance
00:00:21
Dialogue Volume by Modality
Total: 21901
8793 Call
1515 Chat
812 OutboundDia..
123 DirectDialer
37 E-mail
71 Callme
452 Text
254 VoicemailDia..
0 Autonomous..
0 Dialer
Service License Agreement by Date