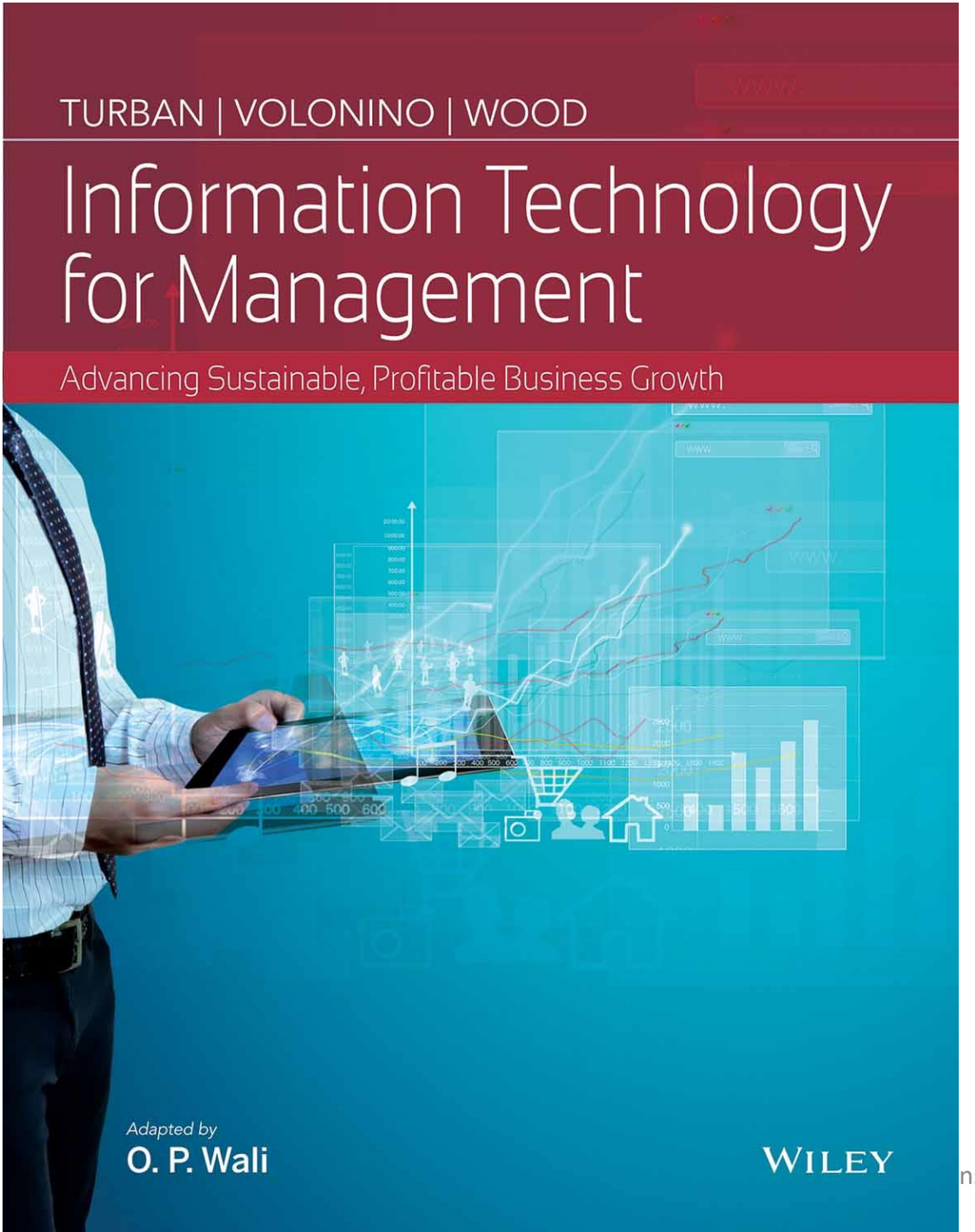


Chapter 11

Managing Data to Improve Business Performance

Chapter Outline

1. Data Visualization
2. Enterprise Data Mashups
3. Digital Dash Boards
4. Geographic Information Systems

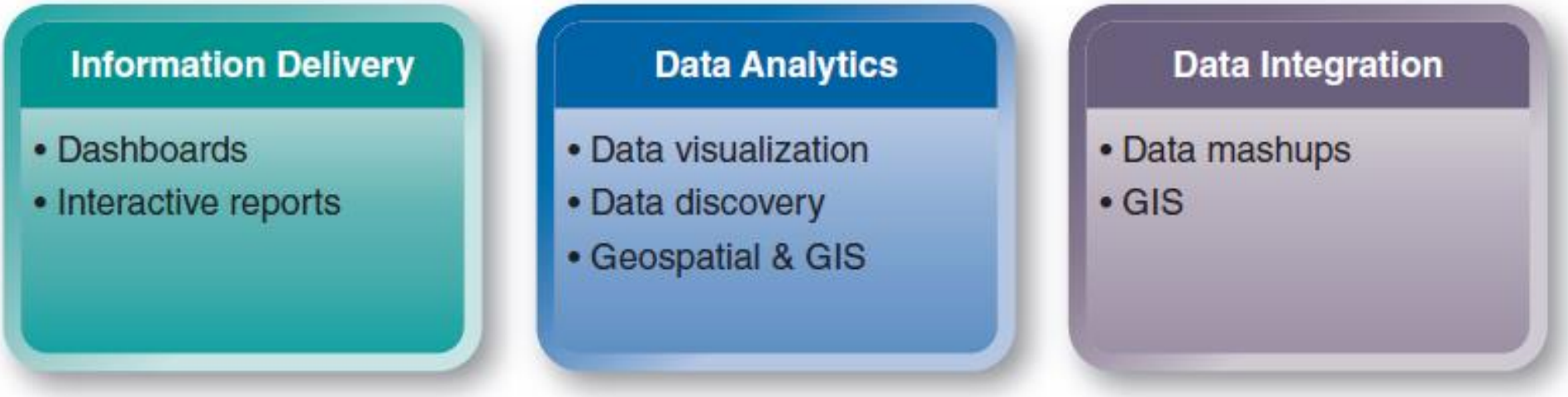
1. Data Visualization

Data Visualization

- Data visualization is the presentation of data in a pictorial or graphical format.
- It enables decision makers to see analytics presented visually, so they can grasp difficult concepts or identify new patterns.
- With interactive visualization, one can take the concept a step further by using technology to drill down into charts and graphs for more detail, interactively changing what data you see and how it’s processed.

Data Visualization

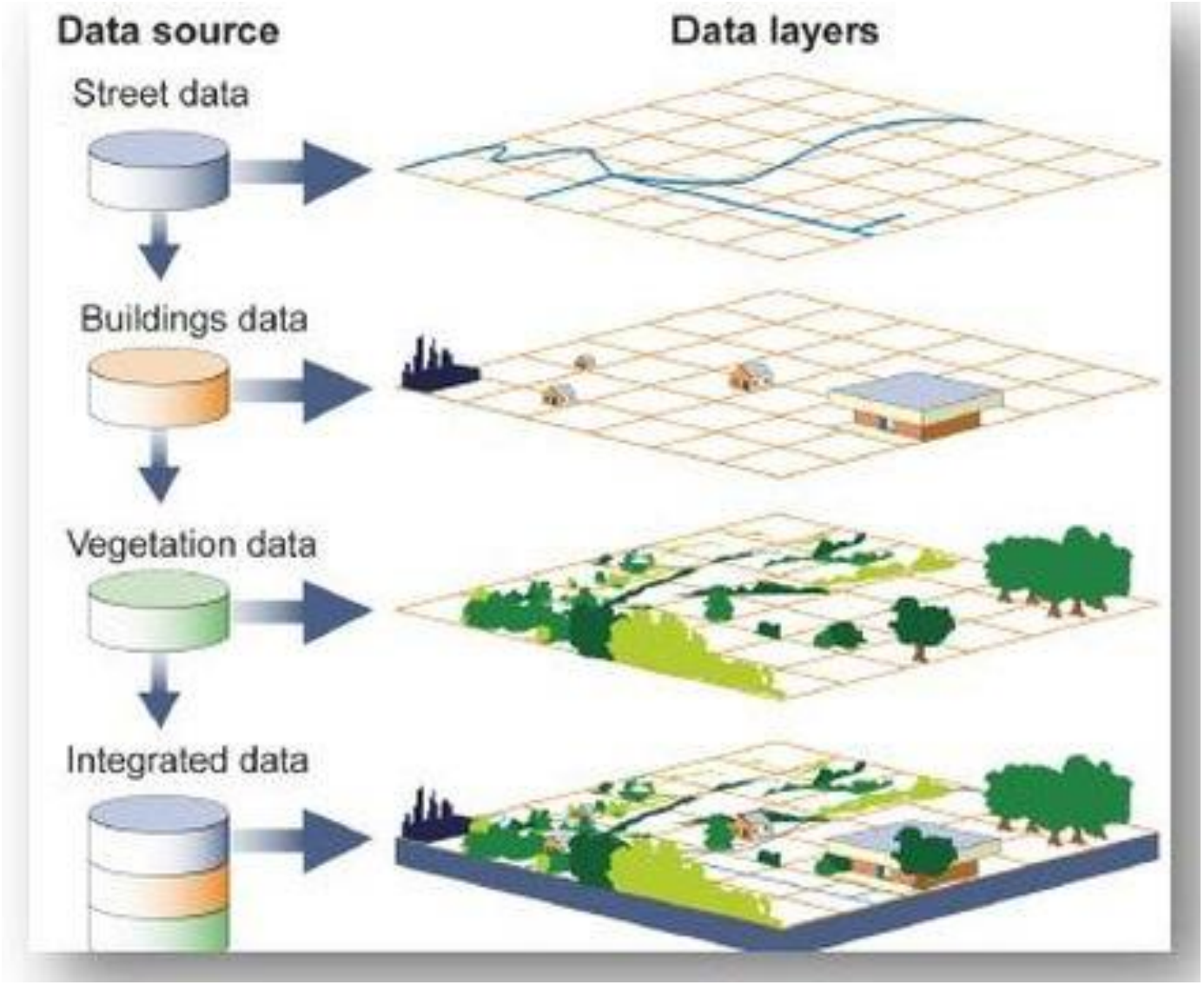
- Tools and technologies in this chapter fall into three related categories.



Data Visualization

- **Geospatial data** identify the geographic location and characteristics of natural or constructed features and boundaries on the earth, typically represented by points, lines, or polygons.

Data Visualization



Data Visualization

- Learning, Exploring, and Discovery
  - Data discovery: discovering hidden relationships through *visualization*.
  - Used with predictive analytics to improve departmental decisions.
  - Summary data rather than statistical data for higher level absorption.

Data Visualization

- Visualizations
  - Dials, charts, graphs, timelines, geospatial maps, and heat maps with interactivity and drill-downs making it easier to understand data and identify patterns.
  - Returned more quickly than completed reports.
  - A common mistake is to invest in the analytics foundation—tools, quality data, data integration, touch screens—but overlook the most crucial component—namely, users' ability to interpret the visual reports and analyses correctly.

Heat Maps

- Heat Maps
  - Use colors to represent data categories that are more quickly identified at a glance in high pace environments.
  - Visuals are used to accent what you want to learn or convey.

Heat Maps

- A heat map is a two-dimensional representation of data in which values are represented by colors.
- A simple heat map provides an immediate visual summary of information.
- More elaborate heat maps allow the viewer to understand complex data sets.

Attendance sheet

BI and Data Discovery Market Split

Data analytics market split into two segments:

- Traditional BI market
- New data discovery market

Data Visualization

- Performance Management Visualizations
  - IBM SPSS Analytic Catalyst
    - Advanced analysis designed for experts in statistical software.
  - Tableau
    - Easier to implement, requiring just basic database information.
  - Roambi Analytics
    - Leading mobile reporting and data visualization app designed for iPads and iPhones.

Data Visualization

1. How does data visualization contribute to learning?
2. How do heat maps and tag clouds convey information?
3. Why are data visualization and discovery usage increasing?
4. Give two examples of data visualization for performance management.

2. Enterprise Data Mashups

Enterprise Data Mashups

- Enterprise Mashups
  - Combine business data and applications from multiple sources—typically a mix of internal data and applications with externally sourced data to create an integrated experience.
  - Does not require a huge investment and can be developed in hours rather than days or weeks.

Enterprise Data Mashups

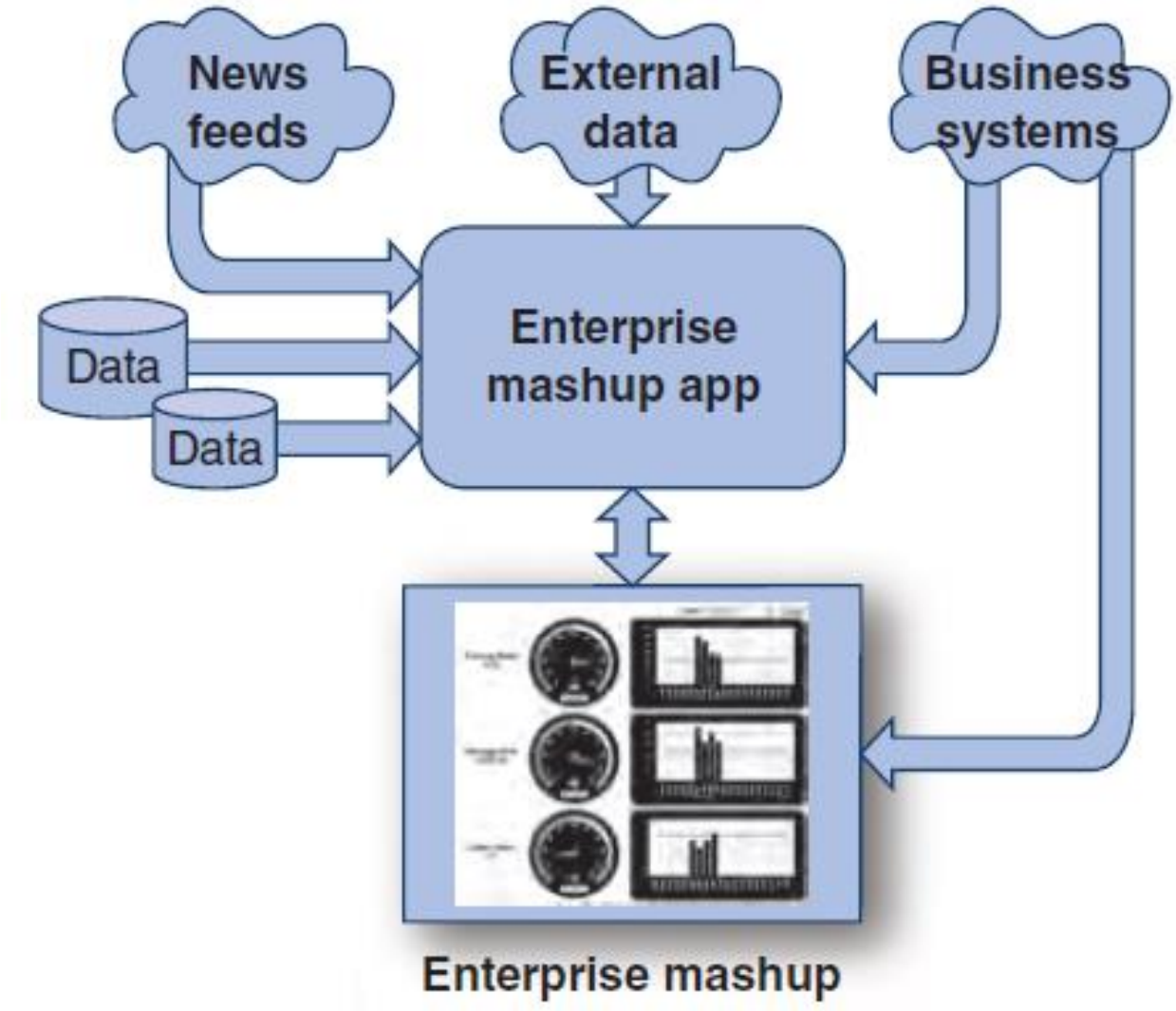


Figure 11.7 Architecture of enterprise mashup application.

Enterprise Data Mashups

- Enterprise Data Mashups
  - Combinations of data from various business systems and external sources, often in real time, without necessarily relying on a middle step of ETL (extract, transform, and load) from a data warehouse.

Enterprise Data Mashups

- Enterprise Mashup Types
  - Customer: provides a quick view of customer data for a sales person in preparation for a customer site visit.
  - Logistics: displays inventory for a group of department stores based on specific criteria.
  - Human resource: provides a quick glance at employee data such as profiles, salary, ratings, benefits status, and activities.

Enterprise Data Mashups

TABLE 11.2 Enterprise Mashups Benefits

Summary of benefits of mashup technology to an enterprise:

- Dramatically reduces time and effort needed to combine disparate data sources.
- Users can define their own data mashups by combining fields from different data sources that were not previously modeled.
- Users can import external data sources, e.g., spreadsheets and competitor data, to create new dashboards.
- Enables the building of complex queries by nonexperts with a drag-and-drop query building tool.
- Enables *agile BI* because new data sources can be added to a BI system quickly via direct links to operational data sources, bypassing the need to load them to a data warehouse.
- Provides a mechanism to easily customize and share knowledge throughout the company.

Enterprise Data Mashups

1. Sketch or describe the architecture of an enterprise mashup application.
2. What is an enterprise data mashup?
3. What are the functions and uses of enterprise mashups?
4. Explain why business workers may need data mashup technology.
5. What are three benefits of mashup technology to the organization?

3. Digital Dash Boards

Digital Dashboards

- Dashboards
  - A style of reporting that depicts KPIs, operational or strategic information with intuitive and interactive displays.
  - Custom programmed to automatically and securely pull, analyze, and display data from enterprise systems, cloud apps, data feeds, and external sources and then display the metrics.

TABLE 11.3 Metrics Displayed on Dashboards by Function

DASHBOARDS	METRICS
Financial performance	• Net income • Cash balance, actual vs. expected • Profit, current month projection • Changes in A/R and A/P
E-commerce	• Daily website visitors by traffic source • Trend of mobile vs. tablet traffic • Location where visitors are located • Top referring websites • Top keywords referring traffic • Revenue per website visitor
Revenue	• Sales per day per channel • How revenue is trending • Days with strongest sales, weakest sales • Products selling the best, worst

TABLE 11.3 Metrics Displayed on Dashboards by Function

DASHBOARDS	METRICS
Sales team	• Sales by lead source; which leads are most and least effective • Number of leads and proposals per salesperson • Proposal close percentage, • Salesperson closing percentages • Where in the conversion funnel customers are being lost. Conversion funnels are paths that prospective customers take before they become paying clients
Advertising	• Number of leads generated by advertising; which advertising is most and least effective • Cost per lead, by advertising source • Advertising expense, as a percent of sales • Which advertising sources directly lead to sales
Order fulfillment	• Number of products manufactured, reworked • On-time completion percent • Changes in inventory levels • Percent of on-time delivery per week, month

Digital Dashboards

- Components of dashboards are:
  - Design
  - Performance metrics
  - API
  - Access

Digital Dashboards

- Dashboard – Real Time Data
  - Having real-time, or near-real-time, data is essential to keep users aware of any meaningful changes in the metrics as they occur and to provide information for making decisions in real time.

Digital Dashboards

- Dashboard Functions
  - Displays company performance metrics, automatically updated in real time.
  - Improve the information synthesis process bringing in multiple, disparate data feeds and sources, extracting features of interest, and manipulating the data so the information is in a more accessible format.
  - Eliminates need to log into multiple applications to view business performance.

Digital Dashboards

- Dashboard Benefits
  - Visibility: blind spots are minimized or eliminated; Threats and opportunities are detected as soon as possible.
  - Continuous improvement: custom designed to display the user's critical metrics and measures.
  - Single sign on: save time and effort logging onto numerous corporate information systems.
  - Budget or planning deviations: metrics can be programmed to display deviations from targets.
  - Accountability: employees tend to be motivated to improve their performance when tracked.

Digital Dashboards

1. Describe business dashboards and their functions.
2. Why do you think dashboards must be in real time and customized for the executive or manager?
3. How do business dashboards differ from other types of visual reports?
4. Explain the components of dashboards.
5. What are benefits of dashboards?

4. Geographic Information Systems

Geospatial Data and Geographic Information Systems

- Geographic Information System (GIS)
  - Captures, manages, analyzes, and displays multidimensional geographic data, also called *geospatial data*.
- Geospatial Data
  - Where things or people are and where they are going—with descriptive data—what things are like or what customers are doing.

Geospatial Data and Geographic Information Systems

- GIS
  - MAP shows few details like name of the location and location. It is a flat map.
  - GIS is more than a map, with multiple layers of information for many ways of thinking about a geographic space.
  - By hovering over a state, such as Texas, another layer of data about sales and financial data appears.

Geographic Information Systems

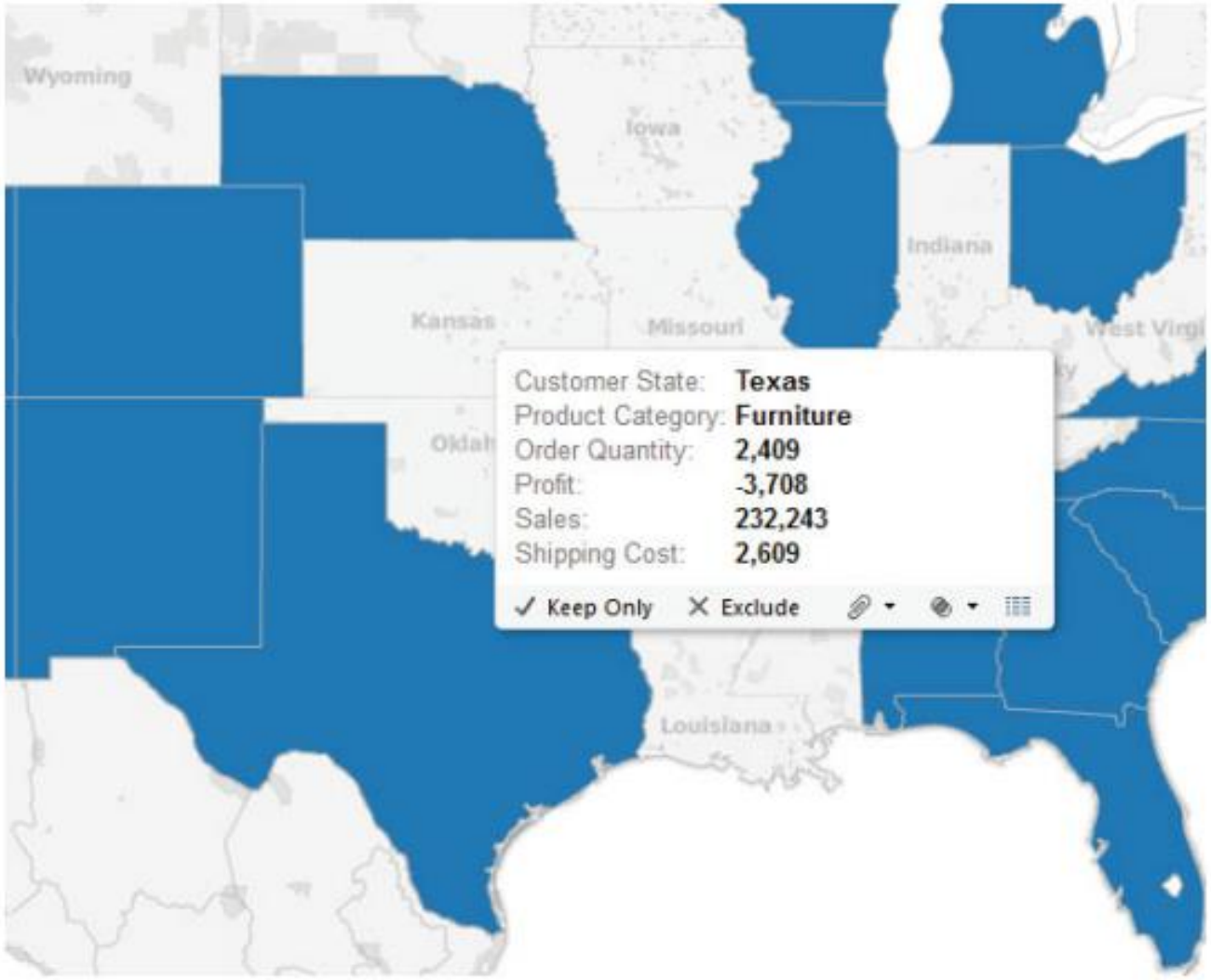


Figure 11.10 GIS can create maps with multiple layers of data.

Geospatial Data and Geographic Information Systems

- Global Integration
  - Cellular and Internet service providers, sensors, Google Earth, GPS, and RFID systems know the location of each connected user or object.
  - Foursquare, Google Maps, and other mobile apps rely on GPS locations.

Geospatial Data and Geographic Information Systems

- GIS Business Applications
  - Learn how store sales are impacted by population or the proximity to competitors' stores.
  - Use GIS to identify relevant demographics, proximity to highways, public transportation, and competitors' stores to select the best location options.
  - Food and consumer products companies can chart locations of complaint calls enabling product traceability in the event of a crisis or recall.
  - Sales reps might better target their customer visits by analyzing the geography of sales targets.