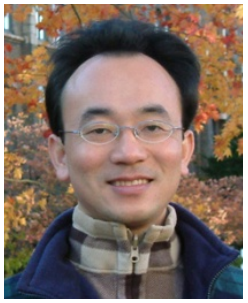
Tamkang University

商業智慧實務
Practices of Business Intelligence

商業智慧導論
(Introduction to Business Intelligence)

1022BI01
MI4
Wed, 9,10 (16:10-18:00) (B113)



Min-Yuh Day
戴敏育
Assistant Professor
專任助理教授

Dept. of Information Management, Tamkang University
淡江大學 資訊管理學系

http://mail. tku.edu.tw/myday/

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淡江大學102學年度第2學期
課程教學計畫表
Spring 2014 (2014.02 - 2014.06)

- 課程名稱：商業智慧實務
  (Practices of Business Intelligence)
- 授課教師：戴敏育 (Min-Yuh Day)
- 開課系級：資管四P (TLMXB4P)
- 開課資料：選修 單學期 2 學分 (2 Credits, Elective)
- 上課時間：週三 9,10 (Wed 16:10-18:00)
- 上課教室：B113

課程簡介

- 本課程介紹商業智慧 (Business Intelligence) 的基礎概念及技術實務。
- 課程內容包括
  - 商業智慧導論、
  - 管理決策支援系統與商業智慧、
  - 企業績效管理、
  - 資料倉儲、
  - 商業智慧的資料探勘、
  - 資料科學與巨量資料分析、
  - 文字探勘與網路探勘、
  - 意見探勘與情感分析、
  - 社會網路分析。

Course Introduction

- This course introduces the fundamental concepts and technology practices of business intelligence.
- Topics include
  - Introduction to Business Intelligence,
  - Management Decision Support System and Business Intelligence,
  - Business Performance Management,
  - Data Warehousing,
  - Data Mining for Business Intelligence,
  - Data Science and Big Data Analytics,
  - Text and Web Mining,
  - Opinion Mining and Sentiment Analysis,
  - Social Network Analysis.

課程目標

瞭解及應用

商業智慧

基本概念

與

技術實務

Objective

understand and apply
the fundamental concepts
and
technology practices
of
business intelligence.

課程大綱 (Syllabus)

週次 (Week)	日期 (Date)	內容 (Subject/Topics)
1	103/02/19	商業智慧導論 (Introduction to Business Intelligence)
2	103/02/26	管理決策支援系統與商業智慧 (Management Decision Support System and Business Intelligence)
3	103/03/05	企業績效管理 (Business Performance Management)
4	103/03/12	資料倉儲 (Data Warehousing)
5	103/03/19	商業智慧的資料探勘 (Data Mining for Business Intelligence)
6	103/03/26	商業智慧的資料探勘 (Data Mining for Business Intelligence)
7	103/04/02	教學行政觀摩日 (Off-campus study)
8	103/04/09	資料科學與巨量資料分析 (Data Science and Big Data Analytics)

課程大綱 (Syllabus)

週次	日期	內容（Subject/Topics）
9	103/04/16	期中報告 (Midterm Project Presentation)
10	103/04/23	期中考試週 (Midterm Exam)
11	103/04/30	文字探勘與網路探勘 (Text and Web Mining)
12	103/05/07	意見探勘與情感分析 (Opinion Mining and Sentiment Analysis)
13	103/05/14	社會網路分析 (Social Network Analysis)
14	103/05/21	期末報告 (Final Project Presentation)
15	103/05/28	畢業考試週 (Final Exam)

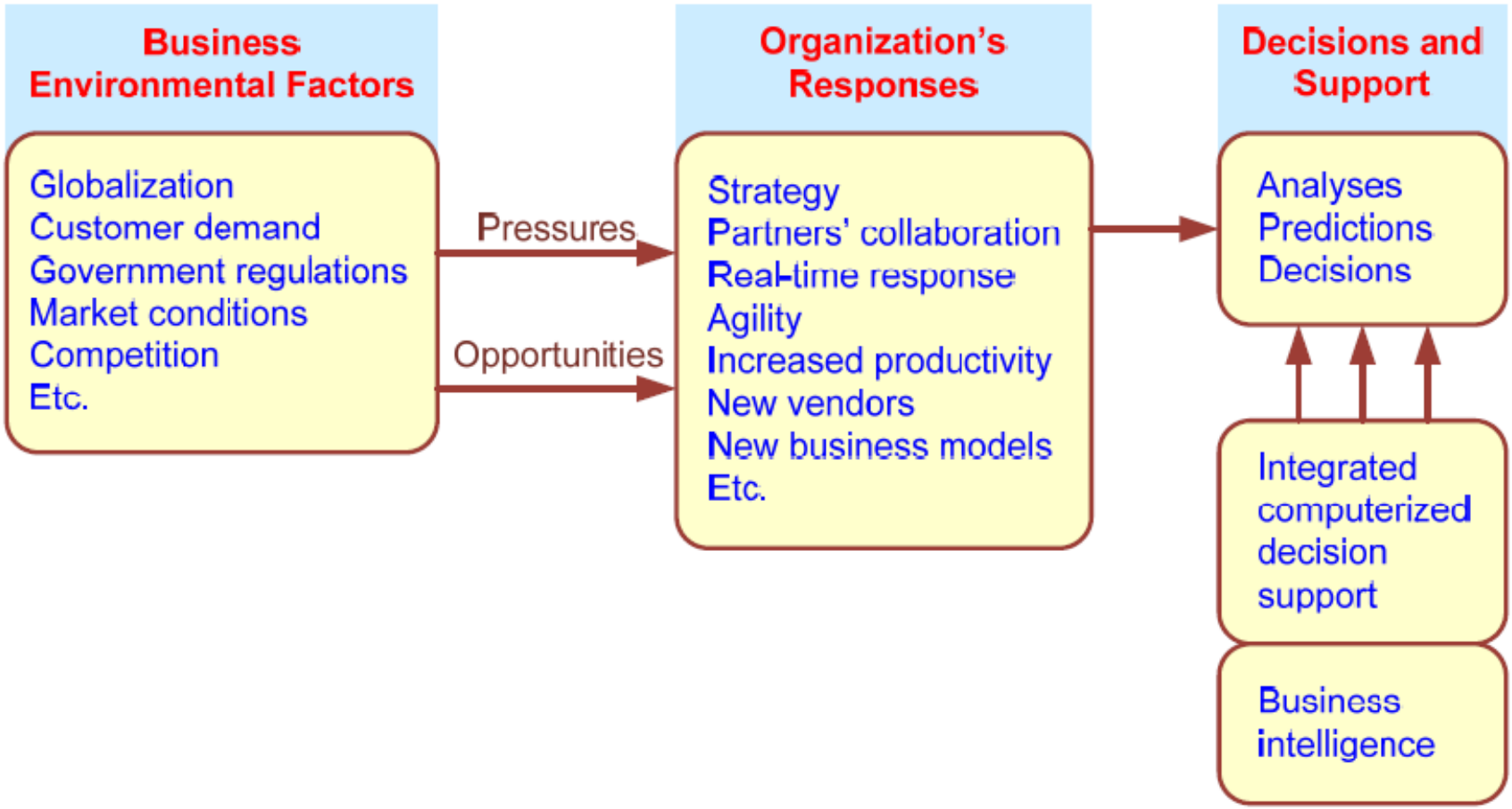
教材課本與參考書籍

- 教材課本 (Textbook)：講義 (Slides)
- 參考書籍 (References)：
  - Business Intelligence: A Managerial Approach, Second Edition, Efraim Turban, Ramesh Sharda, Dursun Delen, David King, 2011, Pearson
  - Decision Support and Business Intelligence Systems, Ninth Edition, Efraim Turban, Ramesh Sharda, Dursun Delen, 2011, Pearson
  - 決策支援與企業智慧系統，九版，Efraim Turban 等著，李昇暾審定，2011，華泰

作業與學期成績計算方式

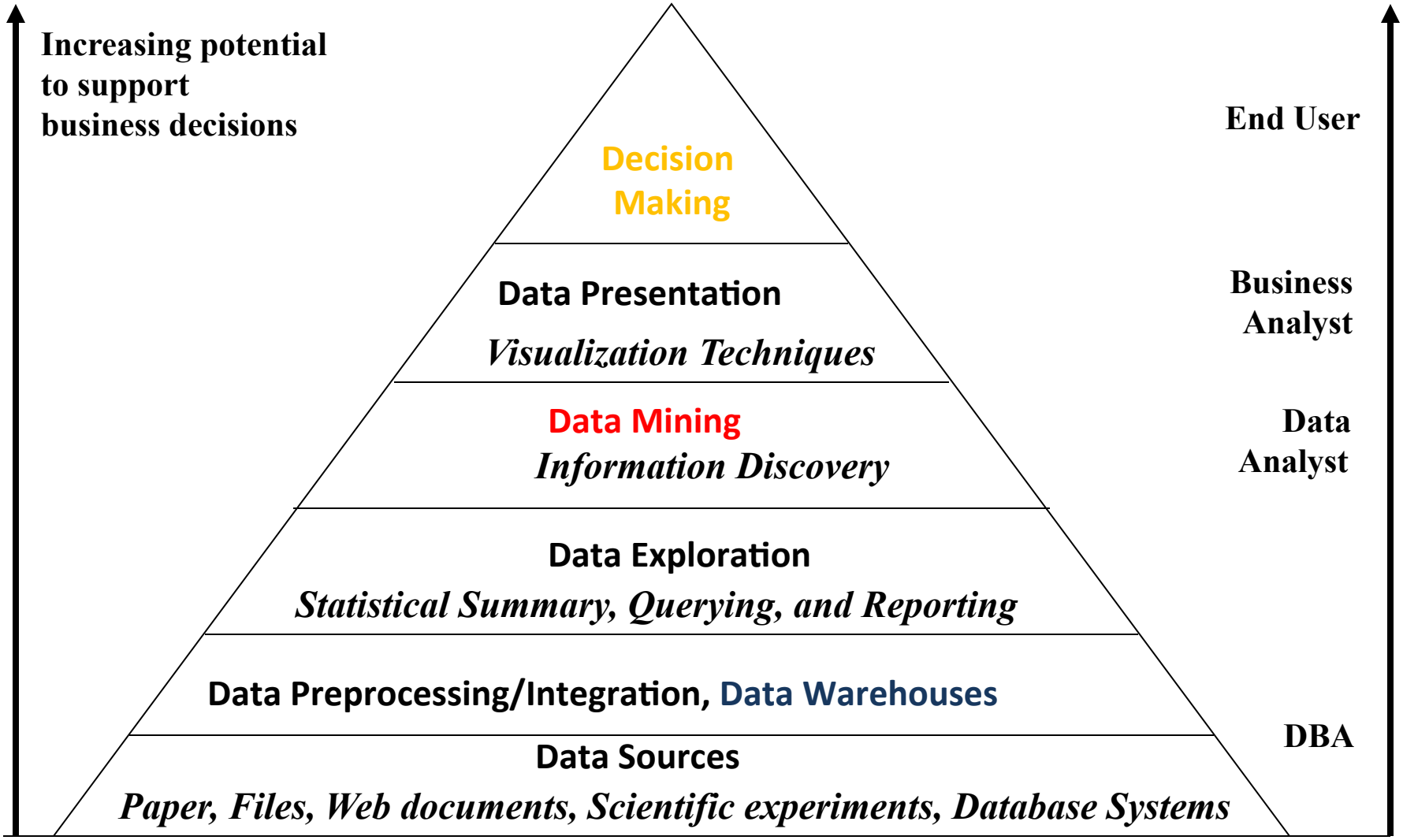
- 作業篇數
  - 3篇
- 學期成績計算方式
  - ☑期中評量：30％
  - ☑期末評量：30 ％
  - ☑其他（課堂參與及報告討論表現）： 40 ％

Business Pressures–Responses–Support Model



Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

Business Intelligence and Data Mining



Source: Han & Kamber (2006)

Business Intelligence (BI)

- BI is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodologies
- Like DSS, BI a content-free expression, so it means different things to different people
- BI's major objective is to enable easy access to data (and models) to provide business managers with the ability to conduct analysis
- BI helps *transform* data, to information (and knowledge), to decisions and finally to action

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

A Brief History of BI

- The term BI was coined by the Gartner Group in the mid-1990s
- However, the concept is much older
  - 1970s - MIS reporting - static/periodic reports
  - 1980s - Executive Information Systems (EIS)
  - 1990s - OLAP, dynamic, multidimensional, ad-hoc reporting -> coining of the term "BI"
  - 2005+ Inclusion of AI and Data/Text Mining capabilities; Web-based Portals/Dashboards
  - 2010s - yet to be seen

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

The Evolution of BI Capabilities

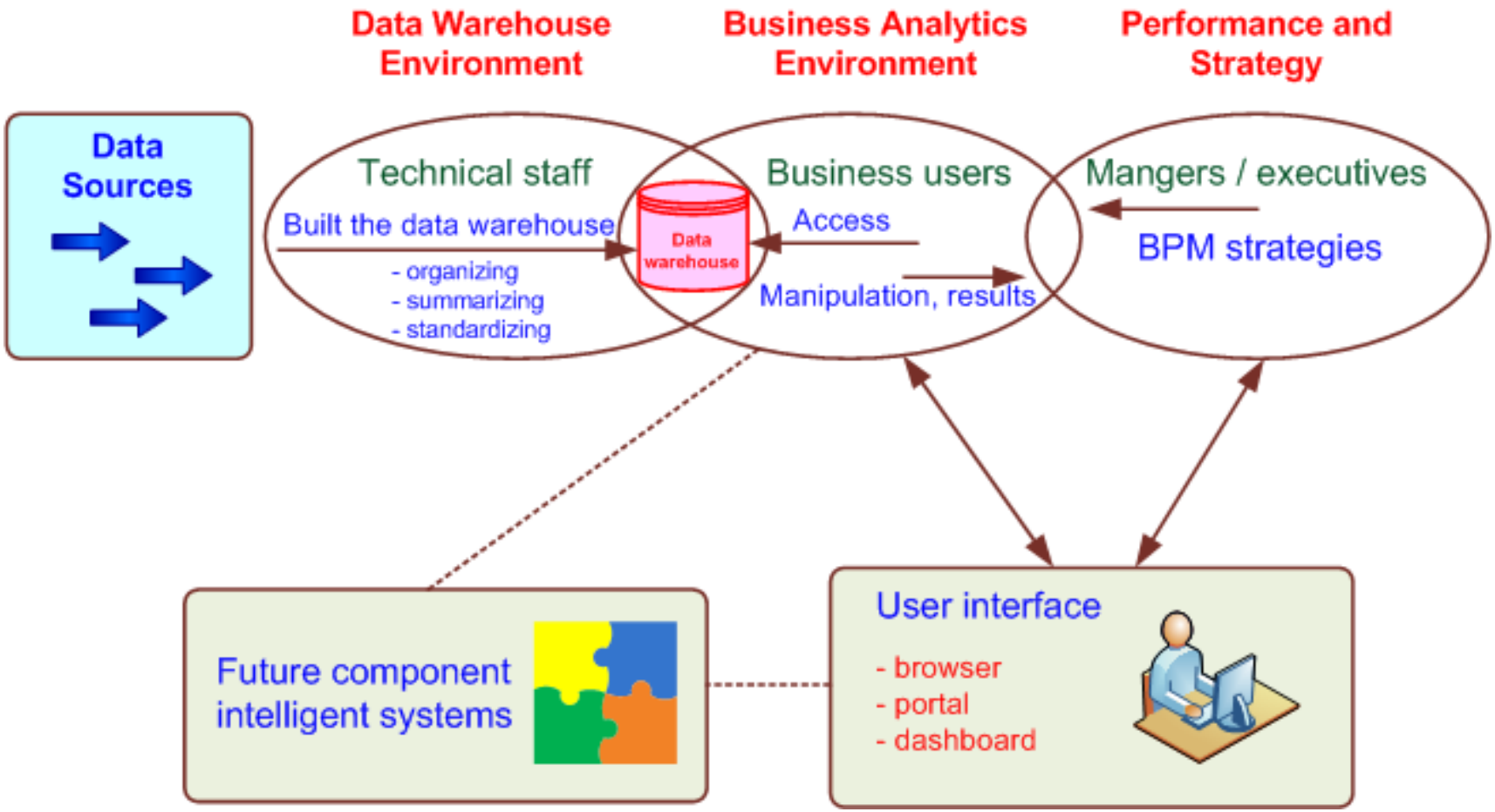
Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

The Architecture of BI

- A BI system has four major components
  - a data warehouse, with its source data
  - business analytics, a collection of tools for manipulating, mining, and analyzing the data in the data warehouse;
  - business performance management (BPM) for monitoring and analyzing performance
  - a user interface (e.g., dashboard)

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

A High-Level Architecture of BI



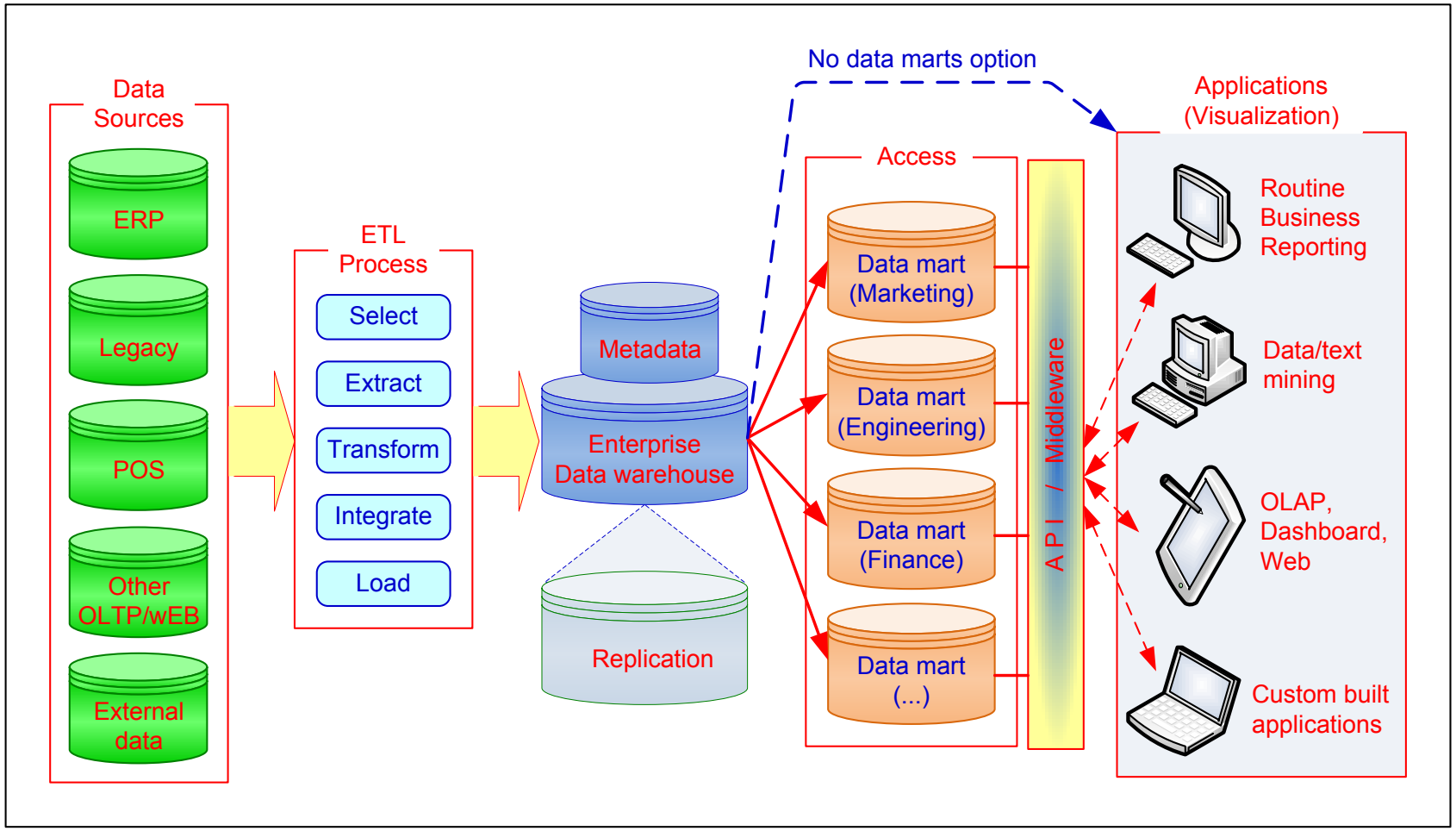
Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

Components in a BI Architecture

- The data warehouse is a large repository of well-organized historical data
- Business analytics are the tools that allow transformation of data into information and knowledge
- Business performance management (BPM) allows monitoring, measuring, and comparing key performance indicators
- User interface (e.g., dashboards) allows access and easy manipulation of other BI components

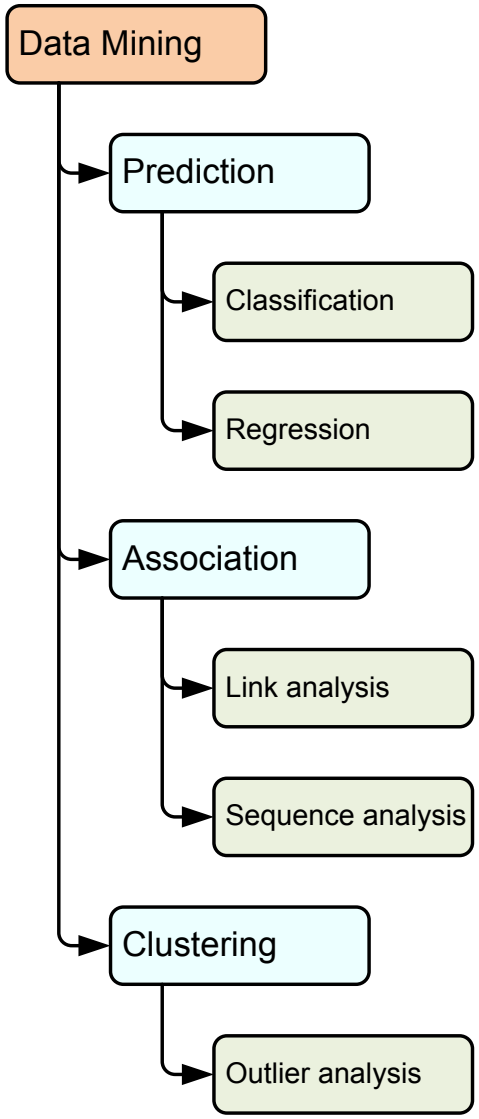
Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

A Conceptual Framework for DW



Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

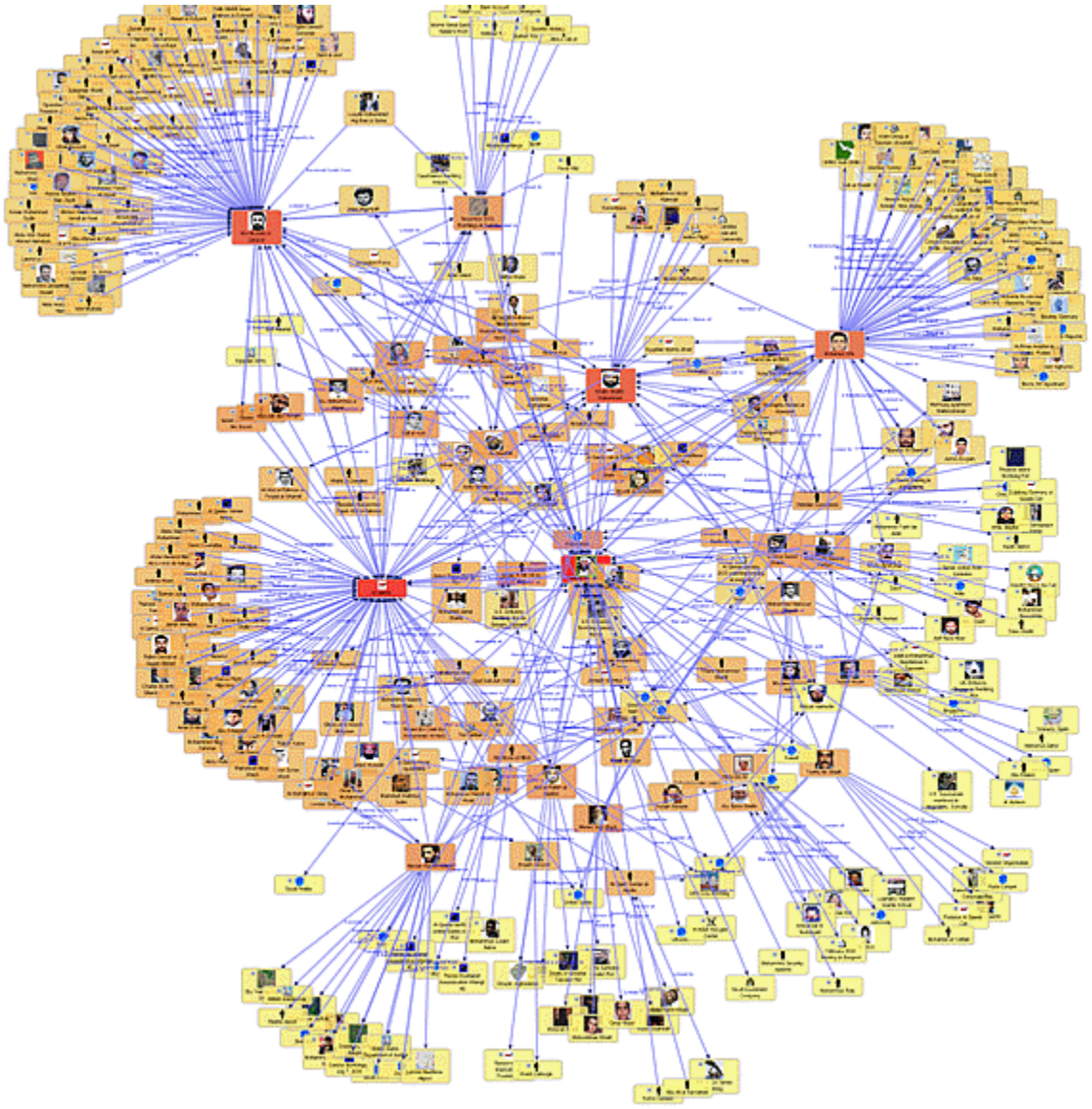
A Taxonomy for Data Mining Tasks



Learning Method	Popular Algorithms
Supervised	Classification and Regression Trees, ANN, SVM, Genetic Algorithms
Supervised	Decision trees, ANN/MLP, SVM, Rough sets, Genetic Algorithms
Supervised	Linear/Nonlinear Regression, Regression trees, ANN/MLP, SVM
Unsupervised	Apriory, OneR, ZeroR, Eclat
Unsupervised	Expectation Maximization, Apriory Algorithm, Graph-based Matching
Unsupervised	Apriory Algorithm, FP-Growth technique
Unsupervised	K-means, ANN/SOM
Unsupervised	K-means, Expectation Maximization (EM)

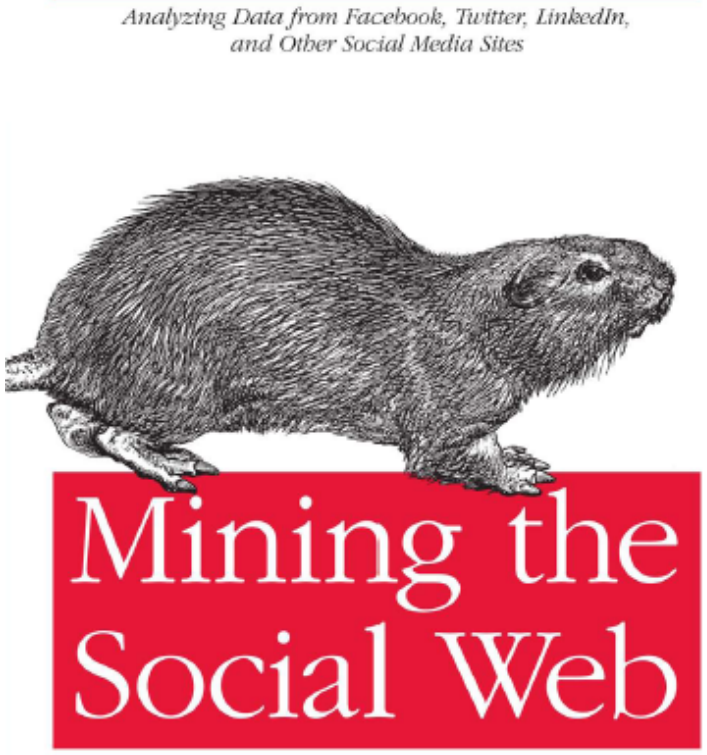
Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

Social Network Analysis



Source: http://www.fmsasg.com/SocialNetworkAnalysis/

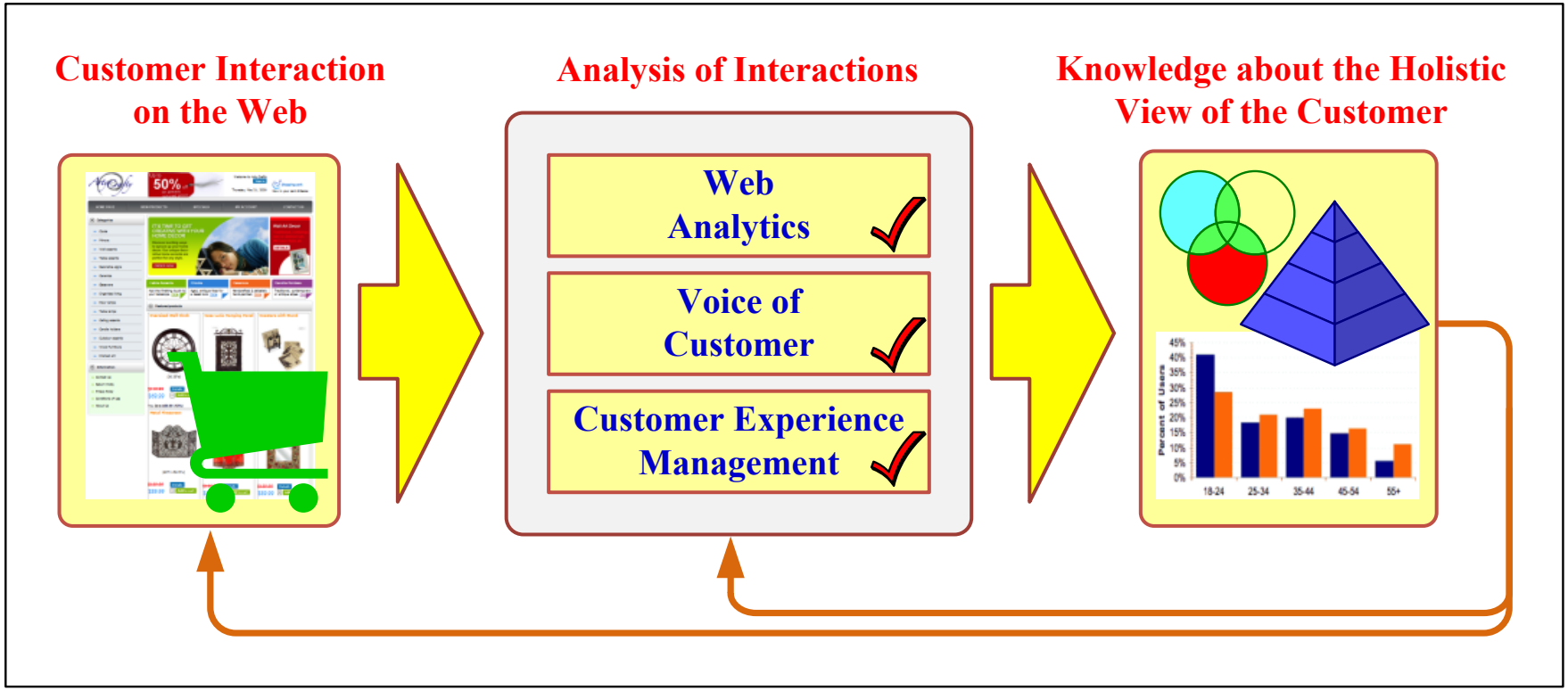
Mining the Social Web: Analyzing Data from Facebook, Twitter, LinkedIn, and Other Social Media Sites



Source: http://www.amazon.com/Mining-Social-Web-Analyzing-Facebook/dp/1449388345

Web Mining Success Stories

- Amazon.com, Ask.com, Scholastic.com, …
- Website Optimization Ecosystem



Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

A Closed-Loop Process to Optimize Business Performance

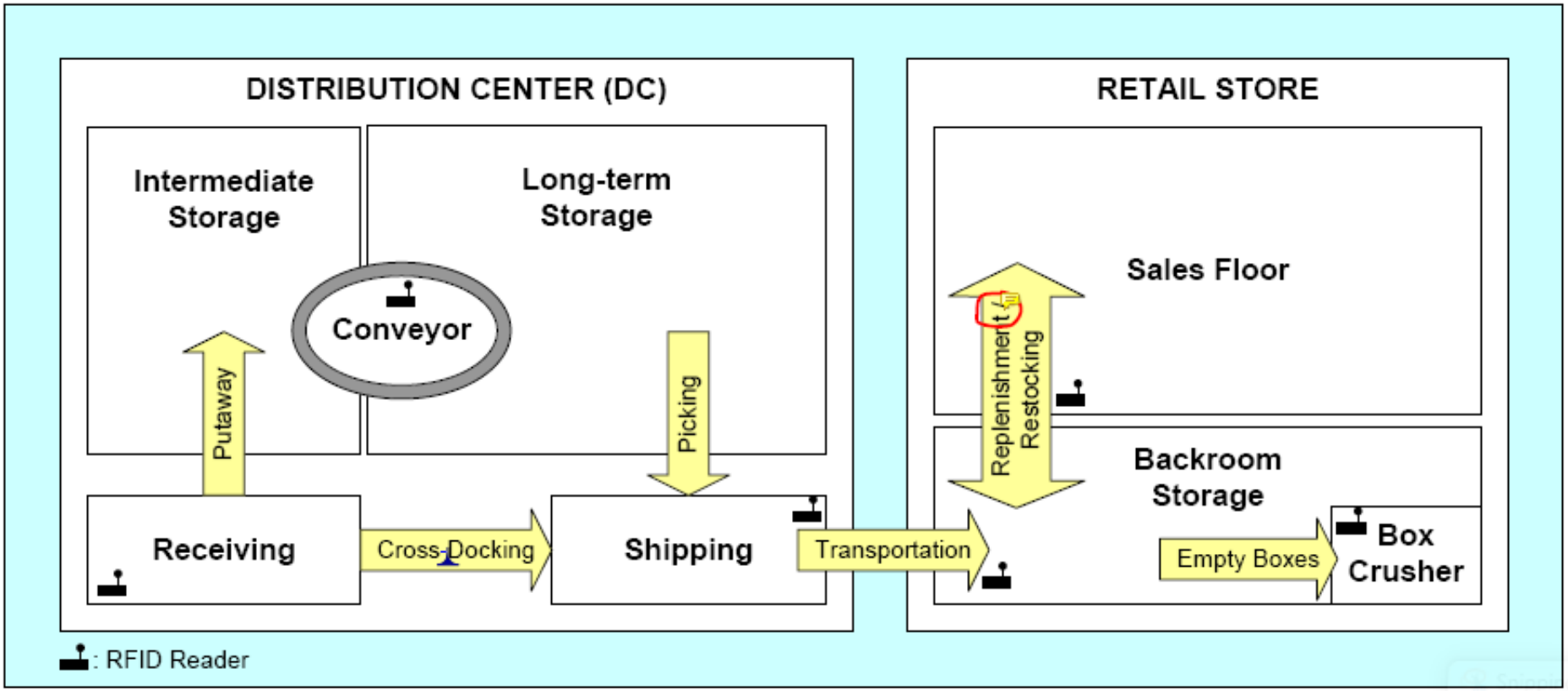
- Process Steps
  1. Strategize
  2. Plan
  3. Monitor/analyze
  4. Act/adjust

Each with its own process steps…

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

RFID for Supply Chain BI

- RFID in Retail Systems



Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

Implications of Business and Enterprise Social Networks

- Business oriented social networks can go beyond "advertising and sales"
- Emerging enterprise social networking apps:
  - Finding and Recruiting Workers
  - Management Activities and Support
  - Training
  - Knowledge Management and Expert Location
    - e.g., innocentive.com; awareness.com; Caterpillar
  - Enhancing Collaboration
  - Using Blogs and Wikis Within the Enterprise

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

Implications of Business and Enterprise Social Networks

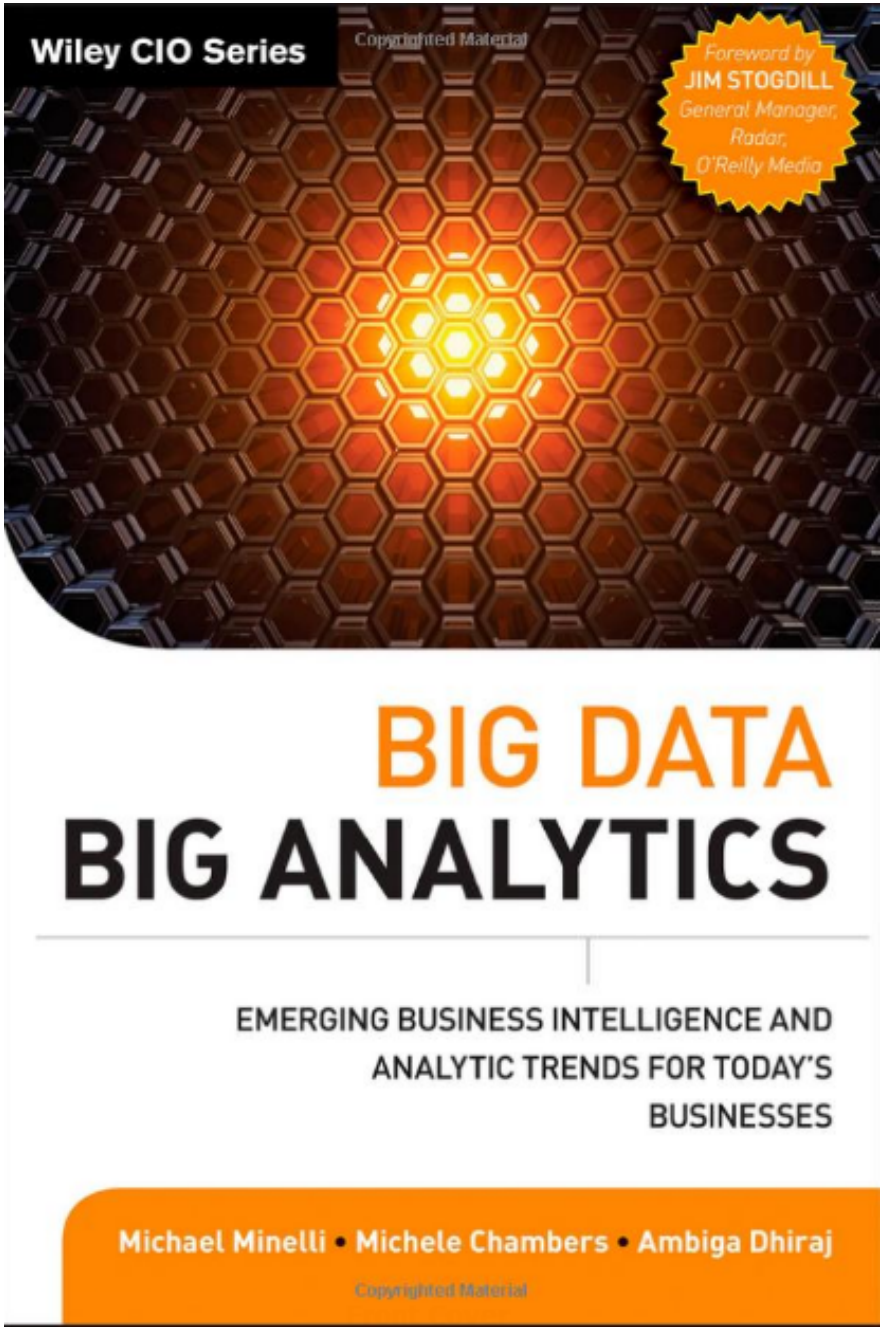
- Survey shows that best-in-class companies use blogs and wikis for the following applications:
  - Project collaboration and communication (63%)
  - Process and procedure document (63%)
  - FAQs (61%)
  - E-learning and training (46%)
  - Forums for new ideas (41%)
  - Corporate-specific dynamic glossary and terminology (38%)
  - Collaboration with customers (24%)

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems

The Benefits of BI

- The ability to provide accurate information when needed, including a real-time view of the corporate performance and its parts
- A survey by Thompson (2004)
  - Faster, more accurate reporting (81%)
  - Improved decision making (78%)
  - Improved customer service (56%)
  - Increased revenue (49%)

Source: Turban et al. (2011), Decision Support and Business Intelligence Systems



Source: http://www.amazon.com/Big-Data-Analytics-Intelligence-Businesses/dp/111814760X

Business Intelligence Trends

1. Agile Information Management (IM)
2. Cloud Business Intelligence (BI)
3. Mobile Business Intelligence (BI)
4. Analytics
5. Big Data

Source: http://www.businessspectator.com.au/article/2013/1/22/technology/five-business-intelligence-trends-2013

Business Intelligence Trends: Computing and Service

- Cloud Computing and Service
- Mobile Computing and Service
- Social Computing and Service

Business Intelligence and Analytics

- Business Intelligence 2.0 (BI 2.0)
  - Web Intelligence
  - Web Analytics
  - Web 2.0
  - Social Networking and Microblogging sites
- Data Trends
  - Big Data
- Platform Technology Trends
  - Cloud computing platform

Source: Lim, E. P., Chen, H., & Chen, G. (2013). Business Intelligence and Analytics: Research Directions. *ACM Transactions on Management Information Systems (TMIS)*, *3*(4), 17

Business Intelligence and Analytics: Research Directions

1. Big Data Analytics
   - Data analytics using Hadoop / MapReduce framework
2. Text Analytics
   - From Information Extraction to Question Answering
   - From Sentiment Analysis to Opinion Mining
3. Network Analysis
   - Link mining
   - Community Detection
   - Social Recommendation

Source: Lim, E. P., Chen, H., & Chen, G. (2013). Business Intelligence and Analytics: Research Directions. *ACM Transactions on Management Information Systems (TMIS)*, *3*(4), 17

Data Scientist:

The Sexiest Job of the 21st Century

Meet the people who can coax treasure out of messy, unstructured data.

by Thomas H. Davenport and D.J. Patil

When Jonathan Goldman arrived for work in June 2006 at LinkedIn, the business networking site, the place still felt like a start-up. The company had just under 8 million accounts, and the number was growing quickly as existing members invited their friends and colleagues to join. But users weren't seeking out connections with the people who were already on the site at the rate executives had expected. Something was apparently missing in the social experience. As one LinkedIn manager put it, "It was like arriving at a conference reception and realizing you don't know anyone. So you just stand in the corner sipping your drink—and you probably leave early."

Source: Davenport, T. H., & Patil, D. J. (2012). Data Scientist. *Harvard business review*

Top 10 CIO Technology Priorities in 2013

Top 10 Technology Priorities	Ranking
Analytics and business intelligence	1
Mobile technologies	2
Cloud computing (SaaS, IaaS, PaaS)	3
Collaboration technologies (workflow)	4
Legacy modernization	5
IT management	6
CRM	7
Virtualization	8
Security	9
ERP Applications	10

Source: Gartner Executive Programs (January 2013)
http://www.gartner.com/newsroom/id/2304615

Top 10 CIO Business Priorities in 2013

Top 10 Business Priorities	Ranking
Increasing enterprise growth	1
Delivering operational results	2
Reducing enterprise costs	3
Attracting and retaining new customers	4
Improving IT applications and infrastructure	5
Creating new products and services (innovation)	6
Improving efficiency	7
Attracting and retaining the workforce	8
Implementing analytics and big data	9
Expanding into new markets and geographies	10

Source: Gartner Executive Programs (January 2013)
http://www.gartner.com/newsroom/id/2304615

Summary

- This course introduces the fundamental concepts and technology practices of business intelligence.
- Topics include
  - Introduction to Business Intelligence,
  - Management Decision Support System and Business Intelligence,
  - Business Performance Management,
  - Data Warehousing,
  - Data Mining for Business Intelligence,
  - Data Science and Big Data Analytics,
  - Text and Web Mining,
  - Opinion Mining and Sentiment Analysis,
  - Social Network Analysis.

Contact Information

戴敏育 博士 (Min-Yuh Day, Ph.D.)

專任助理教授
淡江大學 資訊管理學系

電話：02-26215656 #2347
傳真：02-26209737
研究室：i716 (覺生綜合大樓)
地址： 25137 新北市淡水區英專路151號
Email： myday@mail.tku.edu.tw
網址：http://mail.tku.edu.tw/myday/