Introduction to MIS

Enterprise Systems

Learning Objectives

- Explain how supply chain management is used

- Describe customer relationship management systems

- Describe knowledge management systems

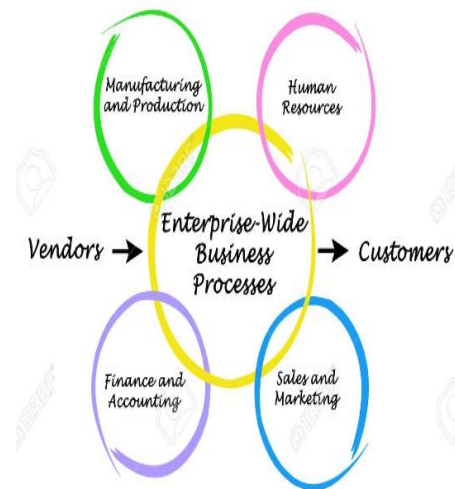- Describe enterprise resource planning systems

Introduction

- ## Enterprise systems
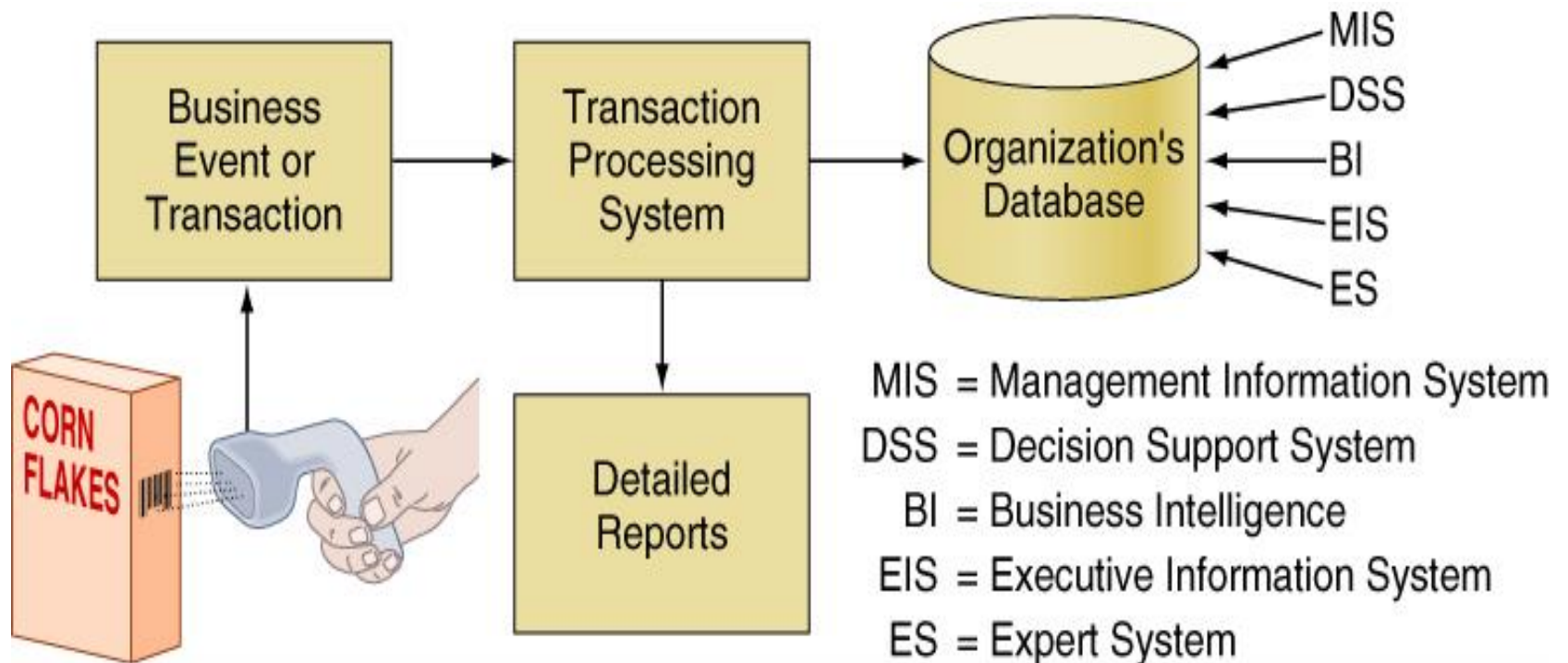 - Applications used in all the functions of a business
  - Supports activities <u>throughout the organization</u> by getting the right data to the right people at the right time
- ## Enterprise resource planning system
  - Used to plan and coordinate operations, resources, and decision making among manufacturing, production, marketing, and human resources
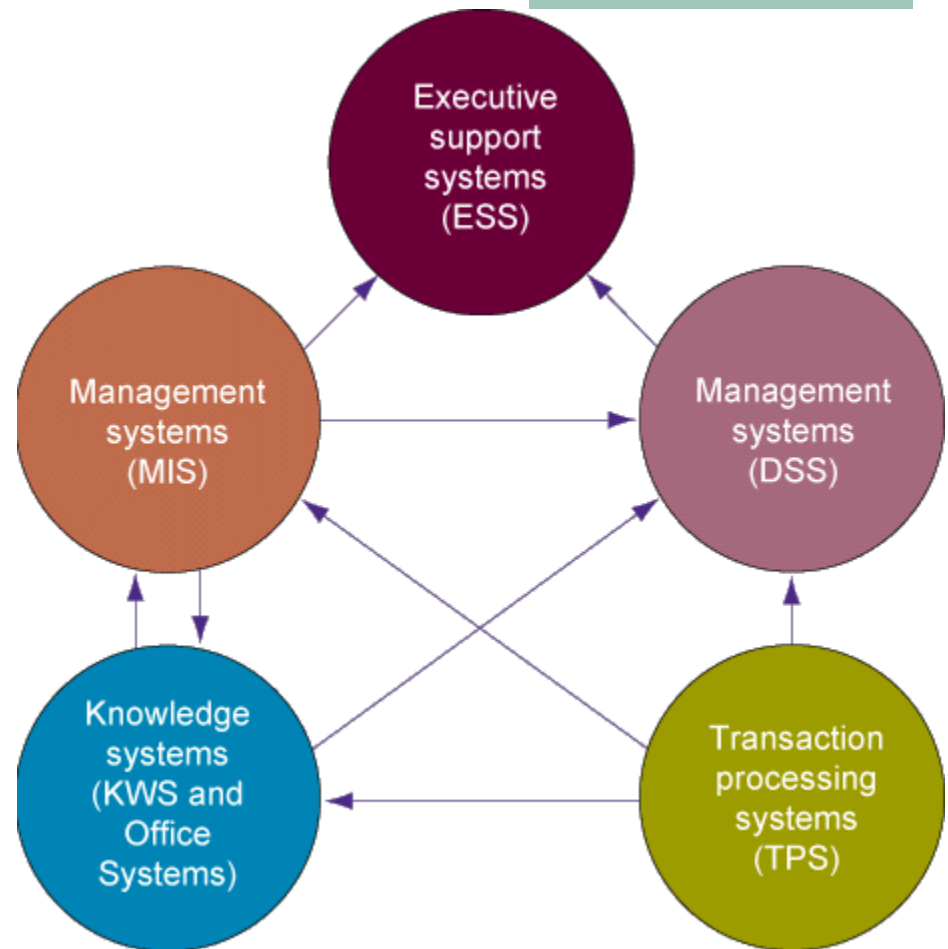
Business IT Systems

Business Event or Transaction → **Transaction Processing System** → **Organization's Database**

Transaction Processing System → **Detailed Reports**

CORN FLAKES

MIS
DSS
BI
EIS
ES

MIS = Management Information System
DSS = Decision Support System
BI = Business Intelligence
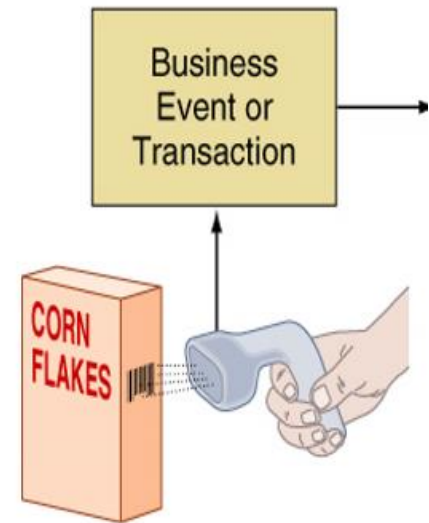EIS = Executive Information System
ES = Expert System

Business IT System (con't)

- This learning module (organizational info systems) focuses on TPS and MIS
- DSS, ESS/EIS, BI, and AI EIS will be covered in a later learning module

Transaction Processing Systems

- **Transaction Processing System (TPS)** monitors, collects, stores, and processes data generated from all business transactions

- ***Source data automation*** is the process of automating the TPS data entry as much as possible because of the large volume involved

POS (Point of Sale)

POS (con't)

POS
Credit Card Reader & Smart Phone POS

Square

1D Barcodes

<u>Uniform Product Code (UPC))</u>

Retail stores for sales checkout; inventory, etc.

<u>Code 39 (Code 3 of 9)</u>

Identification, inventory, and tracking shipments

<u>POSTNET</u>

Encoding zip codes on U.S. mail

<u>Bookland</u>

Based on ISBN numbers and used on book covers

1D Barcodes (con't)

Code 128

Used in preference to Code 39 because it is more compact

Interleaved 2 of 5

Used in the shipping and warehouse industries

Codabar

Used by Federal Express, in libraries, and blood banks

2D Barcodes

PDF417

Large amounts of text and data can be stored because it can be compressed. Used to print postage accepted by the UPSP. It is also used by airlines on boarding passes.
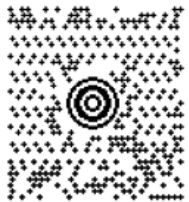
Maxicode

MaxiCode symbols can encode two messages; a primary and a secondary message. Used by the United Parcel Service.

2D Barcodes (con't)

Data Matrix

Ideal for marking small items due to it's ability to encode 50 characters in an extremely small size. Popular in healthcare and electronic components industry.

QR Code

Common in advertising because it provides a way to access a brand's website quickly. Easily read by smartphones.

■For ABC pharmacy, what might be their plan for "source data automation" ?
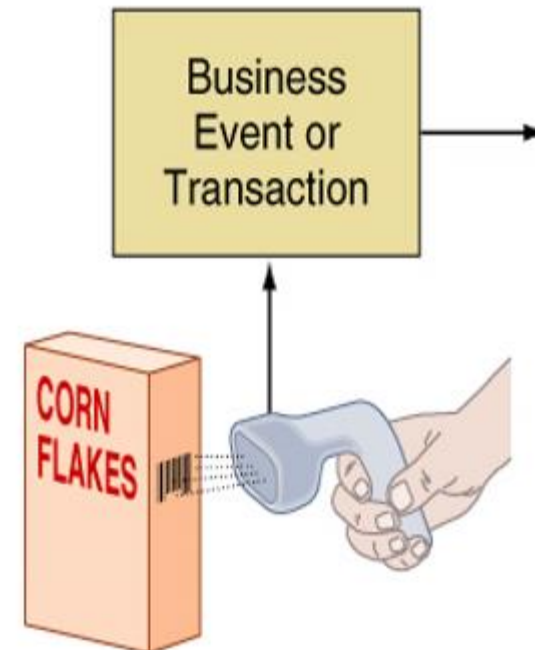
Don't look ahead …

ABC Source Data Automation

- *In the case of ABC, when customers (or their doctors) upload their RX info via the internet (as opposed to entering data from a paper RX)*
  - *OCR – optical character recognition*
- *Scanning bar codes for :*
  - *Refills*
  - *Inventory*
  - *Shipment tracking*

Transaction – Unit of Business Work
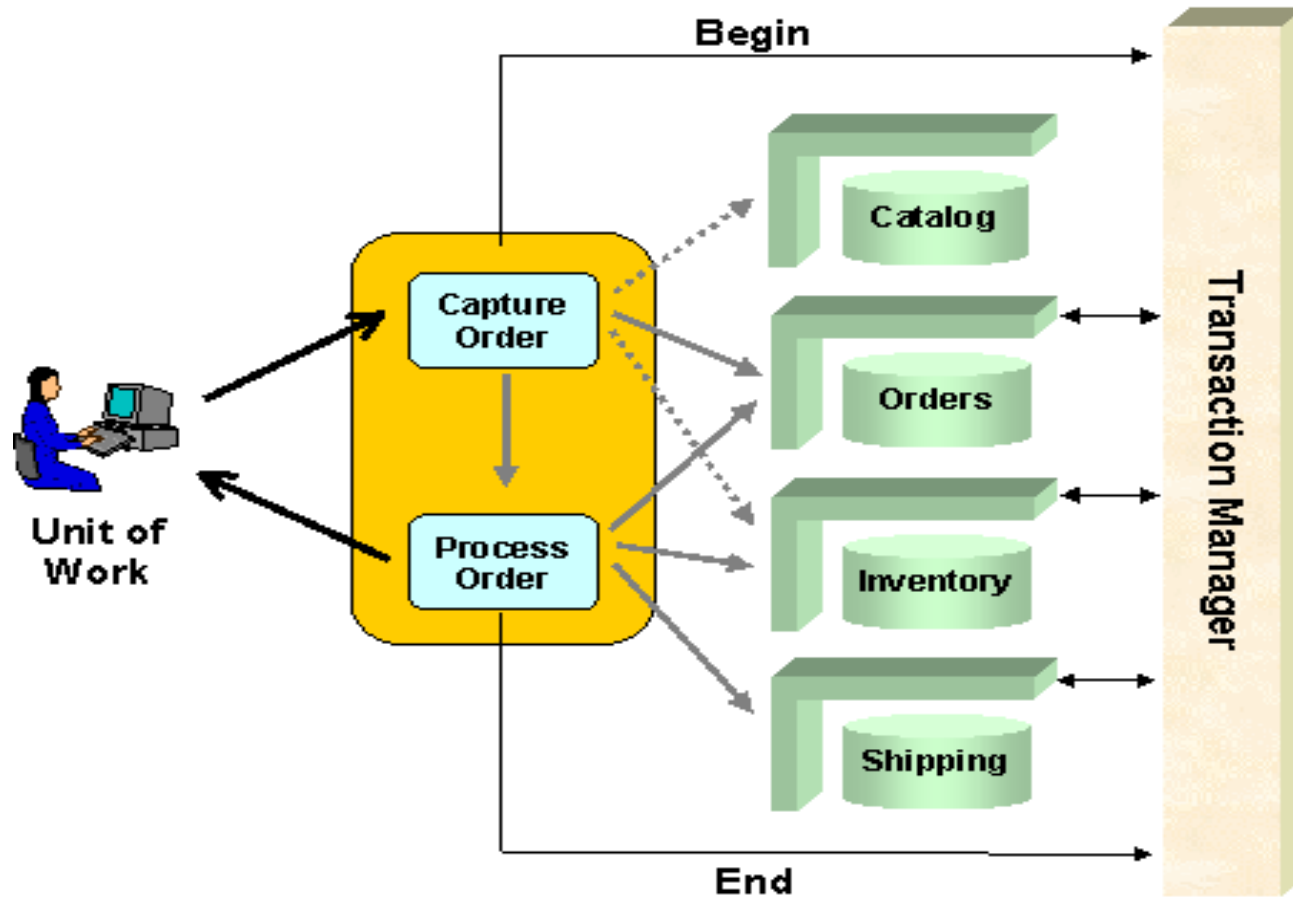
TPS's (Con't)
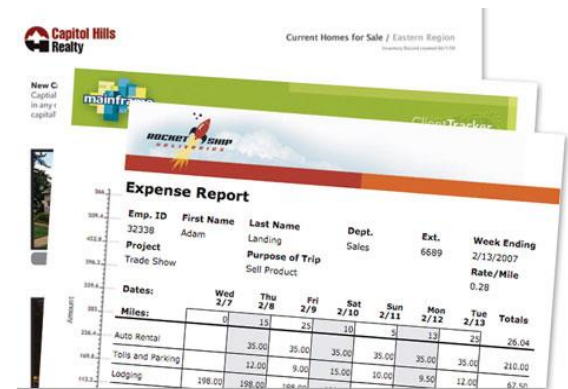
- **Batch Processing** is when the firm collects data from transactions as they occur, placing them in group or *batches*, then prepares and processes the batches periodically (say, every night).
  - Safer, but slower and less powerful inquiry
  - ABC's older way of entering shipment info
- **Online Transaction Processing (OLTP)** is when business transactions are processed online as soon as they occur
  - Riskier, but provides better inquiry
- **Hybrid Batch OLTP Systems**

Traditional IT Batch TPS
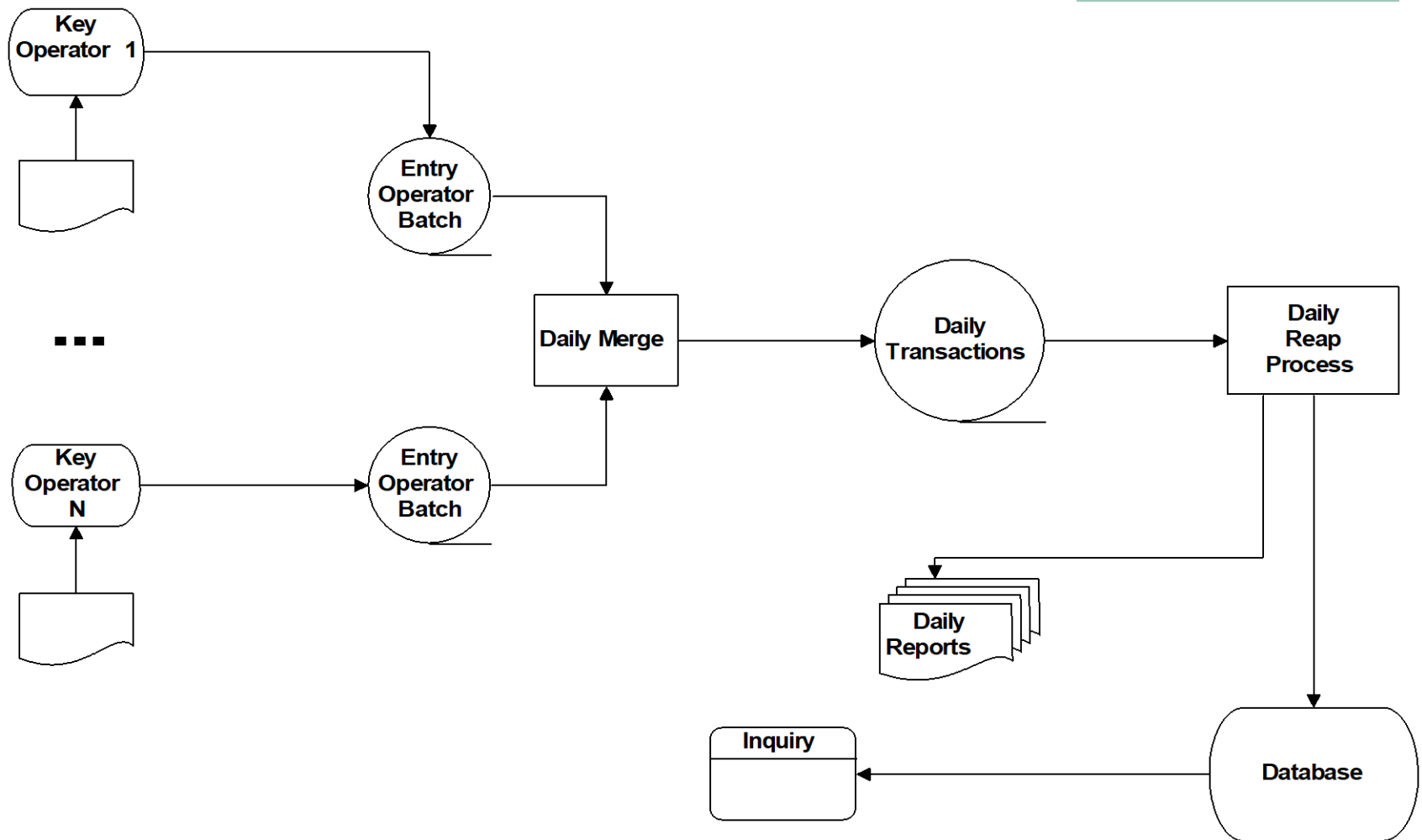
TPS Reporting

- Transaction detail
  - Reviewed by low level managers and/or supervisors – *operational control*
- Summaries:
  - Volume, revenue, and other vital statistics typically by day
- Errors and exceptions in daily activity

Functional Information Systems

- **Functional Information Systems** also called **Management Information Systems (MISs)** or **Functional Area** **IS** provide information to managers (usually middle-level managers) in the functional areas

- MIS's generally support *tactical control* and decisions:
  - Planning
  - Organizing
  - Controlling Operations

Information Systems for Specific Functional Areas

■ Information Systems that are designed to support a functional area by increasing its internal effectiveness and efficiency in the following areas:

- ■ Accounting
- ■ Finance
- ■ Marketing
- ■ Operations
- ■ Human Resources

Functional Areas (con't)

- Note that all functional areas work with much of the **same data** originating in the TPS systems, however each functional area is looking at that information in a different way:
  - Accounting (profit, cost vs budget)
  - Finance (cash flow, use of capital, return on investments)
  - Marketing (sales by various dimensions, use of time)
  - Operations (efficiency→ use of equipment, facilities)
  - Human Resources Management (use of human resources, people needs)

DSS

Profitability Planning

Financial Planning

Employment Planning, Outsourcing

Product Life Cycle Management

Sales Forecasting, Advertising Planning

MIS

Auditing, Budgeting

Investment Management

Benefits Administration, Performance Evaluation

Quality Control, Inventory Management

Customer Relations, Sales Force Automation

TPS

Payroll, Accounts Payable, Accounts Receivable

Manage Cash, Manage Financial Transactions

Maintain Employee Records

Order Fulfillment, Order Processing

Set Pricing, Profile Customers

ACOUNTING FINANCE HUMAN RESOURCES PRODUCTION/ OPERATIONS MARKETING

Activities Supported by Functional Area Information Systems

Accounting and Finance

Financial planning—availability and cost of money
Budgeting—allocates financial resources among participants and activities
Capital budgeting—financing of asset acquisitions
Managing financial transactions
   Handling multiple currencies
   Virtual close—ability to close books at any time on short notice
Investment management—managing organizational investments in stocks, bonds, real estate, and other investment vehicles
Budgetary control—monitoring expenditures and comparing against budget
Auditing—ensuring the accuracy and condition of financial health of organization
Payroll

Marketing and Sales

Customer relations—know who customers are and treat them like royalty
Customer profiles and preferences
Sales force automation—using software to automate the business tasks of sales, thereby improving the productivity of salespeople

Production/Operations and Logistics

Inventory management—how much inventory to order, how much inventory to keep, and when to order new inventory
Quality control—controlling for defects in incoming material and defects in goods produced
Materials requirements planning—planning process that integrates production, purchasing, and inventory management of interdependent items (MRP)
Manufacturing resource planning—planning process that integrates an enterprise's production, inventory management, purchasing, financing, and labor activities (MRP II)
Just-in-time systems—principle of production and inventory control in which materials and parts arrive precisely when and where needed for production (JIT)
Computer-integrated manufacturing—manufacturing approach that integrates several computerized systems, such as computer-assisted design (CAD), computer-assisted manufacturing (CAM), MRP, and JIT
Product life cycle management—business strategy that enables manufacturers to collaborate on product design and development efforts, using the Web

Human Resource Management

Recruitment—finding employees, testing them, and deciding which ones to hire
Performance evaluation—periodic evaluation by superiors
Training
Employee records
Benefits administration—medical, retirement, disability, unemployment, etc.

MIS Reports

- Routine reports – scheduled
  - Status
  - Trends
- Ad-hoc reports – on demand
  - Drill-down reports
  - Key-indicator reports
  - Comparative reports (different time periods, different regions, different salespersons, etc)
- Exception reports – outside the *norm*

MIS Reports (con't)
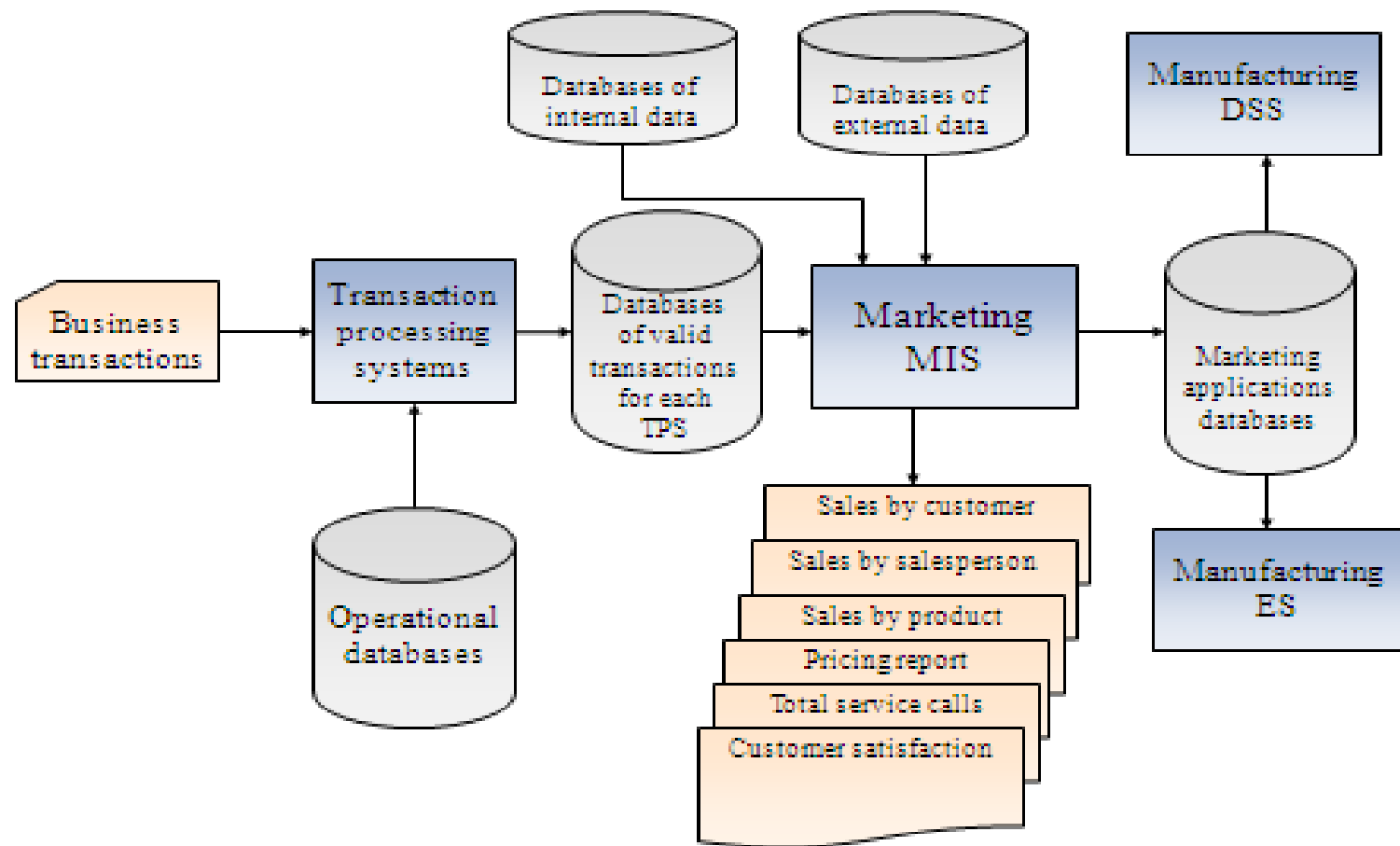
Enterprise Resource Planning Systems

- **Enterprise Resource Planning (ERP) systems** integrate the planning, management, and use of all resources of the organization

- ERP's major objective is to <u>tightly integrate the functional areas of the organization</u> and to enable seamless information flows across the functional areas:
    - Same entities
    - Same properties, formats, validation
    - Same database

Reporting Applications

Financial Applications

Sales and Distribution Applications

Central Database

Manufacturing Applications

Service Applications

Human Resource Management Applications

Inventory And Supply Applications
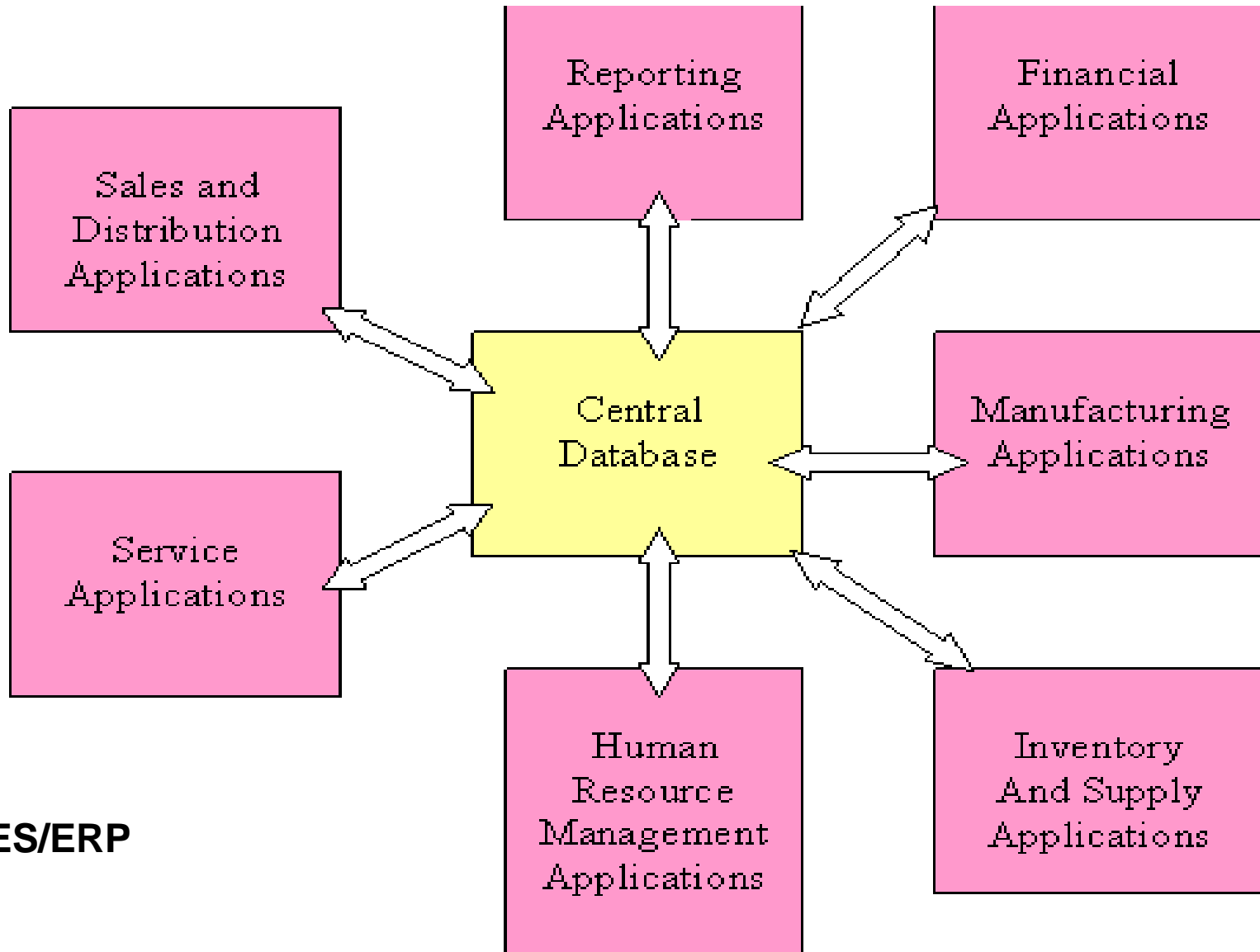
ES/ERP

ERP Basic Components

Components	Functions
Unified database	Collects and analyzes relevant internal and external data and information needed by other functions
Inventory management	Provides inventory status and inventory forecasts
Supply chain	Provides information on supply chain members, including suppliers, manufacturing, distribution, and customers
Manufacturing	Provides information on production costs and pricing
Human resources	Provides information on assessing job candidates, scheduling and assigning employees, and predicting future personnel needs
CRM	Provides information on customers and their needs and preferences

ERP Basic Components (con't)

Components	Functions
Purchasing	Provides information related to the purchasing function, including e-procurement
Accounting	Tracks financial information, such as budget allocations and debits and credits
Vendor integration	Integrates information for vendors, such as offering automated downloads of data on product pricing, specifications, and availability
E-commerce	Provides B2C information related to order status and B2B information related to suppliers and business partners
Sales	Provides information on sales and marketing

ERP Systems (Con't)

- **Best practices** are the most successful solutions or problem-solving methods for achieving a business objective
- They can be extremely complex, expensive, and time-consuming to implement
- May not fit your current business processes
  - Somewhat "tunable" without major customization
- Leading ERP software vendors include SAP, Oracle and PeopleSoft
- **Loss of competitive advantage ?**

ERP Benefits

- **Benefits of a well-designed ERP system**
  - Increased availability and timeliness of integrated information
  - Increased data accuracy and response time
  - Improved customer and employee satisfaction, planning and scheduling, supplier relationship, and reliability of information
  - Reduced inventory costs, labor costs, and order-to-fulfillment time

Reasons for Implementing ERP

Reason	Percentage
Other (please specify)	7%
To standardize global business operations	7%
Because other companies have ERP	24%
To ensure reporting / regulatory compliance	29%
To appease the parent company or other key stakeholders	32%
To replace an old ERP or legacy system	38%
To better integrate systems across multiple locations	41%
To make employee jobs easier	49%
To better serve customers	54%
To reduce working capital	57%
To position the company for growth	57%
To improve business performance	64%

ERP Drawbacks

- **Drawbacks**
  - High cost
  - Difficulties in installation
  - Need for extensive training
  - Compatibility problems with legacy systems
  - Cannot use for portions of IT that are needed for a competitive advantage
- Available as modules so organizations can purchase only required components
  - Keeps costs down

Comprehensive ERP Subsystems
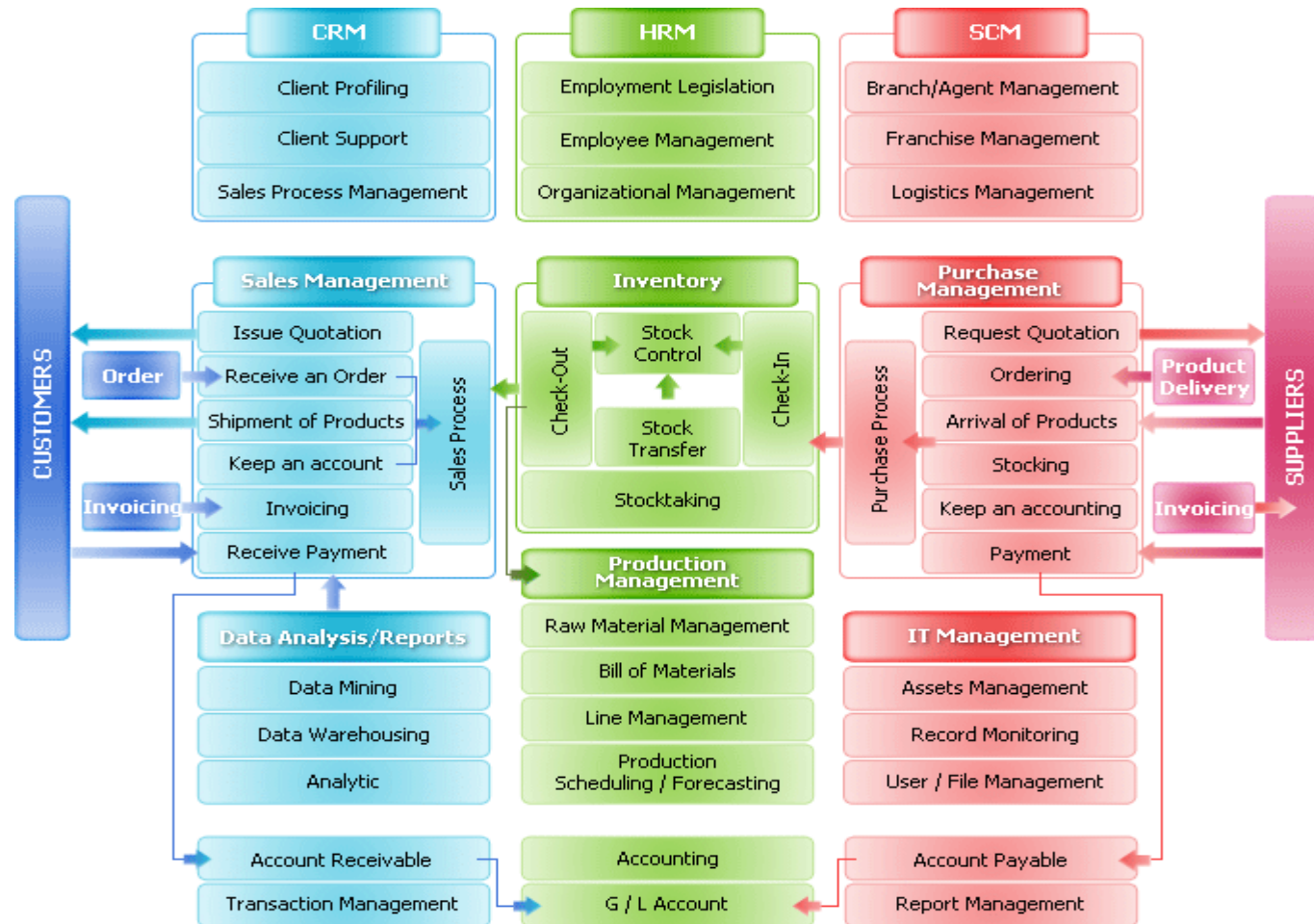
ERP Vendors

2017 ERP Market Share

- SAP — 22.50%
- Oracle — 12.20%
- Sage — 6.10%
- Workday — 5.80%
- Infor — 5.10%
- Others — 52.00%

Microsoft, etc.
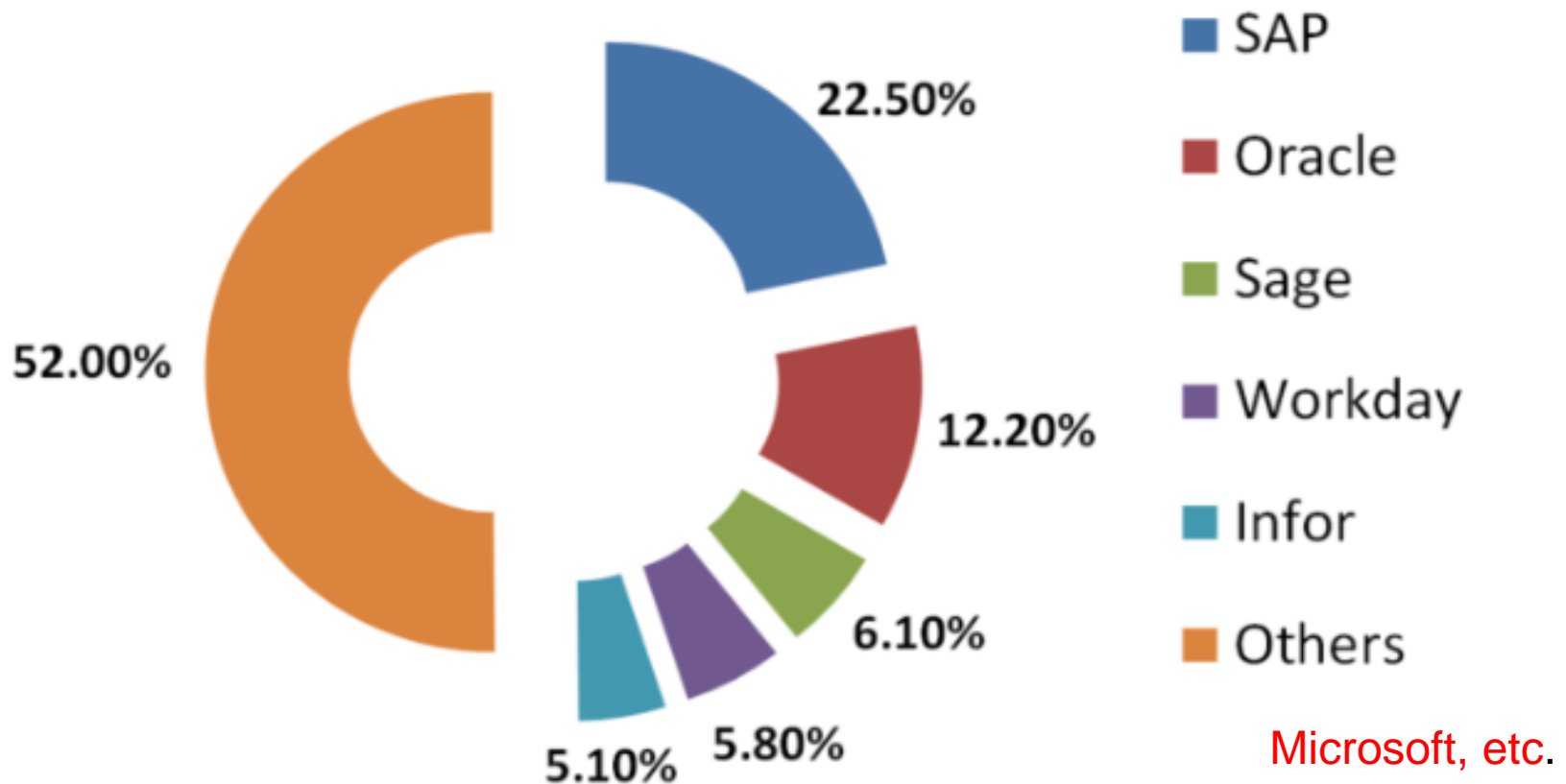
Customer Relationship Management

- **Customer Relationship Management (CRM)** is an enterprise-wide effort to acquire and retain customers
  - Fosters a *one-to-one* relationship between a customer and a seller
  - One simple idea "*Treat different customers differently*"
    - Rates & quotes
    - Opportunities, leads, references
    - Contact info
    - History of contacts
    - Customer issues & support needs
    - Forecasts
  - <u>Helps keep profitable customers and maximizes lifetime revenue from them</u>

CRM Applications

- **Customer touch point** is a method of interaction with a customer such as: telephone, e-mail, a customer service or help desk, conventional mail, Web site, and store
- CRM maximizes benefit by tailoring the touch points for each customer contact
- CRM systems provide applications in 3 major areas:
  - **Sales** - *sales force automation (SFA)*
  - **Marketing Opportunities** – support marketing campaigns & provide opportunities for *cross-selling, up-selling,* and *bundling*
  - **Customer service** – can take many Web-based forms

CRM Operation

Customer Relationship Management
Through the Ages

circa 2500BC

Pyramids pass user acceptance testing. Customer is king (literally).

circa 1AD

Travelling myrrh salesmen land a big account; an easy sale, but the personal attention was appreciated.

circa 1335AD

Plague tonic sales are booming: CRM takes a hit as record-keeping degenerates to **"Customer Dead"** or **"Customer Not Dead Yet".**

Not Dead

Dead

The birth of targeted advertising (only Not Dead Yet customers receive marketing collateral).

1908

Henry Ford scales "Any customer can have a car painted any color that he wants so long as it is black."

CRM is dealt another blow with the introduction of the Ford Model T. Who needs customer engagement when you own the market?

1961

CRM?

Customer relationship management? Hmm, we call that the "3-martini lunch." Post-war consumerism at its best, thank you very much.

June 2003

Google

Google changes everything with the introduction of AdSense. How will you manage millions of anonymous customers? CRM explodes and businesses begin to live or die by this new thing called SEO.

February 2004

facebook.

Facebook changes everything... again. It will take a couple of years, but it will redefine customer engagement and make social media a vital part of CRM and related software.

Marketing Opportunities

- In regards to marketing and sales, companies are concerned with:
  - Acquiring customers
  - Growing revenue
  - Maintaining customer loyalty

Segmentation
Targeting

Marketing department

Indicators

Customer Satisfaction

Mobile client SFA

Sales document generation

Planning

& Alarms jement

Sales administration

Prospects management & sales action

Sales department

Marketing Opportunities(con't) →
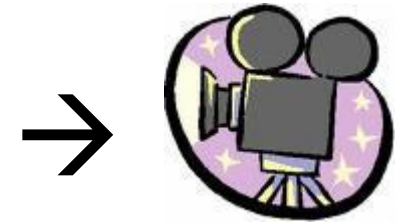
- Growing revenue
  - **Cross-selling** refers to the marketing of complementary products (products often bought together) to customers
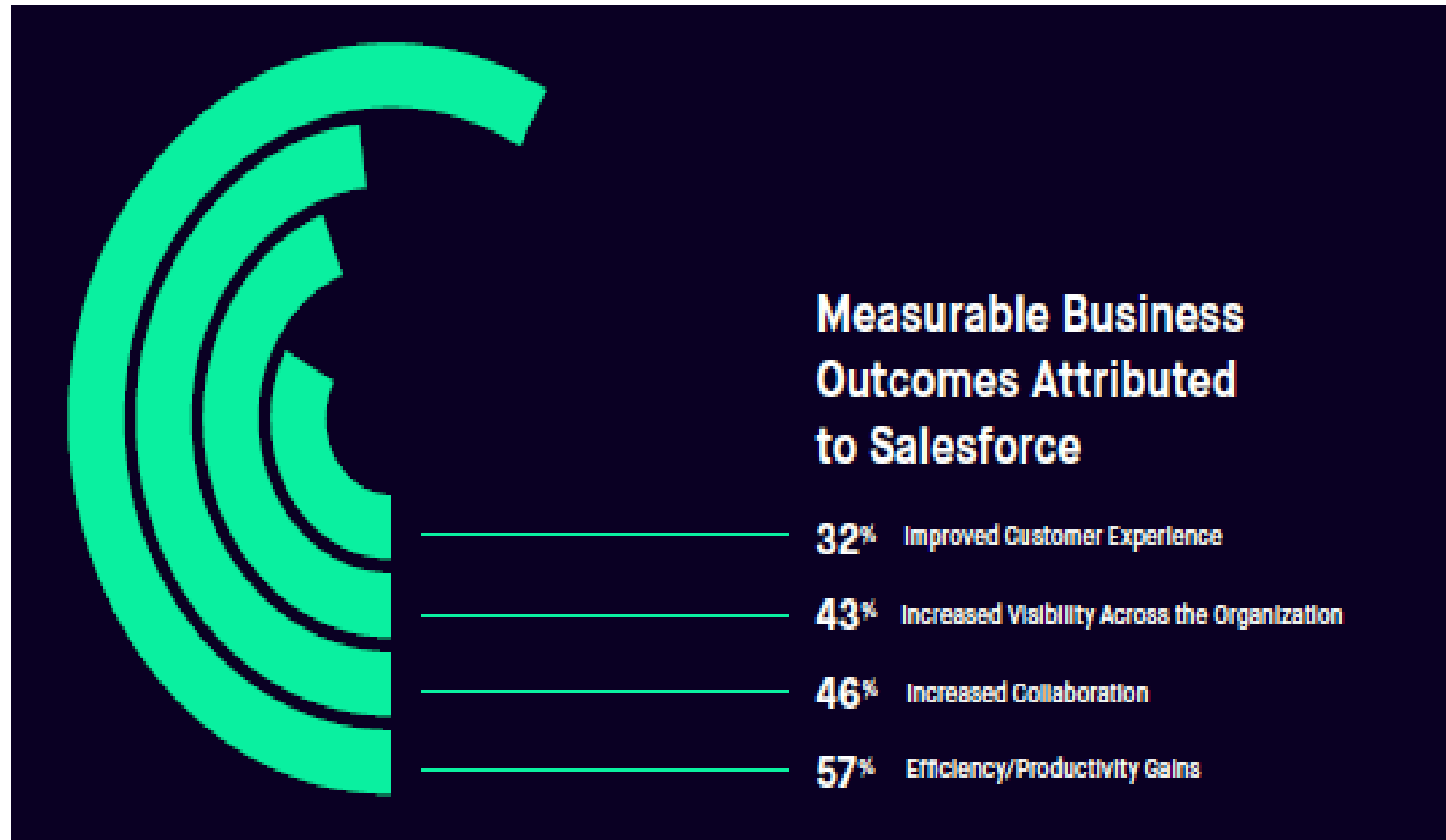 - **Up-selling** is the marketing of higher-value products or services to new or existing customers
  - **Bundling** is a type of cross-selling in which a combination of products is sold together at a lower price than the combined costs of the individual products

SFA (con't)

Measurable Business Outcomes Attributed to Salesforce

- 32% Improved Customer Experience
- 43% Increased Visibility Across the Organization
- 46% Increased Collaboration
- 57% Efficiency/Productivity Gains

SFA & Sales Jobs

- <u>Many college grads take sales jobs even if their major/concentration is not in business marketing</u>
  - High demand for sales jobs
  - High pay (base of $70,000 plus commission)
- Knowledge of SFA and other MIS applications is vital to today's salesperson
- Today's SFA's applications are being delivered via smartphones as well as traditional laptops, netbooks, or tablets

CRM/SFA Apps

Service Apps	Current	Future	
Agent Productivity	28%	48%	↑
Social Tools	15%	42%	↑↑
Field Service	12%	32%	↑↑
Surveys	26%	52%	↑
Telephony	21%	43%	↑
Dashboards & Reports	53%	73%	↑

Sales Apps	Current	Future	
Compensation Management	14%	29%	↑
Contract Management	22%	45%	↑
Dashboards & Reports	49%	70%	↑
Document Generation	27%	53%	↑
eCommerce	11%	29%	↑↑
Email & Calendar Sync	32%	56%	↑
Forecasting & Territory Management	17%	40%	↑↑
Geolocation	15%	33%	↑↑
Partner Management	11%	28%	↑↑
Productivity	18%	44%	↑↑
Quotes & Orders	19%	41%	↑↑
Sales Intelligence	16%	44%	↑↑
Sales Methodologies	12%	36%	↑↑

Marketing Apps	Current	Future	
Campaign Management	33%	56%	↑
Event Management	20%	44%	↑↑
Marketing Automation	31%	56%	↑
Mass Emails	33%	54%	↑
Website Integration	18%	44%	↑↑

↑↑ On Fire   ↑ Hot   ↑ Growing   ▬ Steady

SalesForce.com

1,182% SALESFORCE

ADOBE

MICROSOFT
SAP
ORACLE

2010   2015   2020
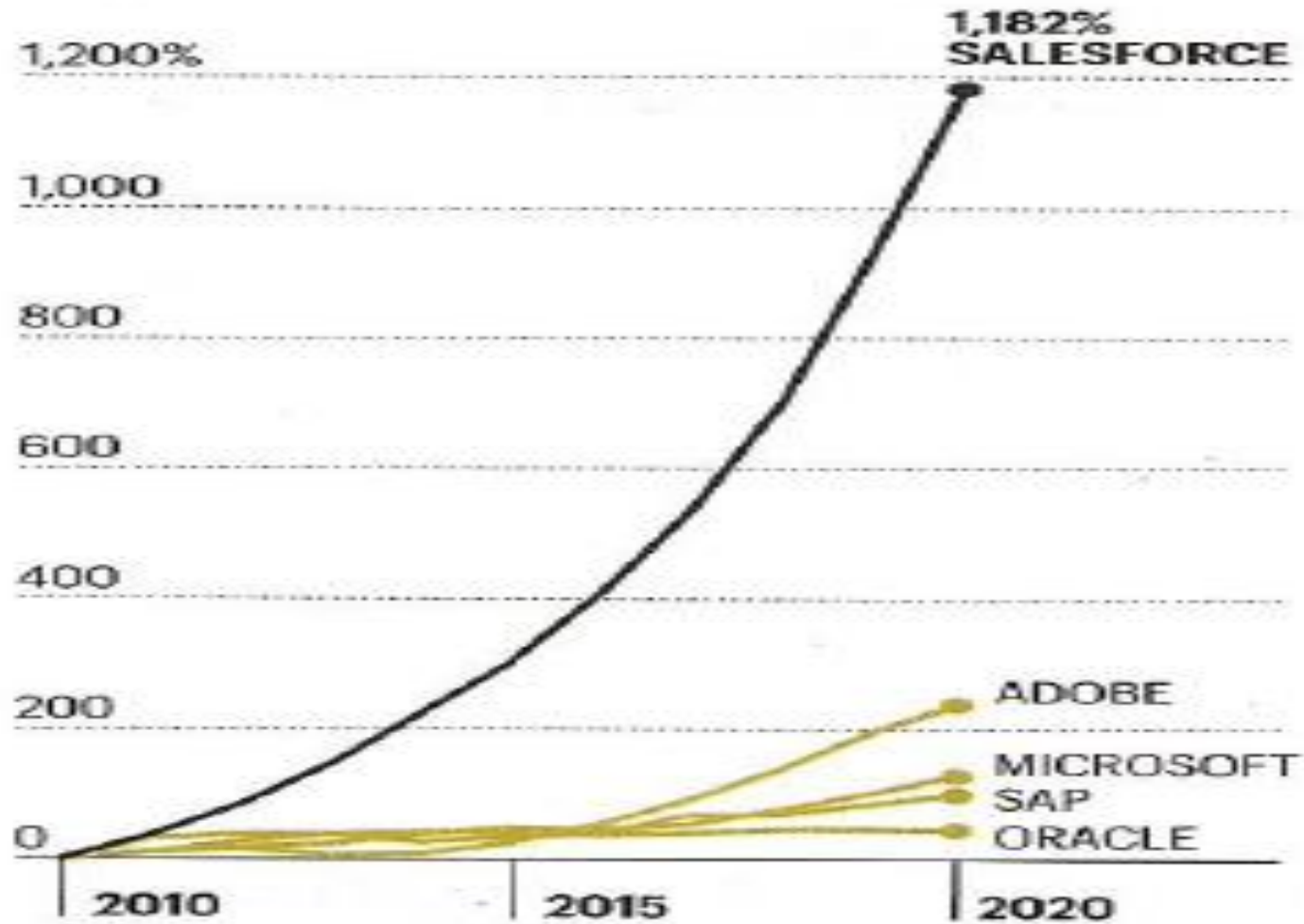
SOURCES: S&P GLOBAL; COMPANY FILINGS

Traditional Four P's of Marketing

- **Product** - A product is seen as an item that satisfies what a consumer demands. It is a tangible good or an intangible service. Tangible products are those that have an independent physical existence

- **Price** - The amount a customer pays for the product. The price is very important as it determines the company's profit and hence, survival. Adjusting the price has a profound impact on the marketing strategy and, depending on the price elasticity of the product, often it will affect the demand and sales as well.

- **Promotion** - All of the methods of communication that a marketer may use to provide information to different parties about the product, including advertising, public relations, sales organization and special deals

- **Place** - Refers to providing the product at a place which is convenient for consumers, including strategies such as online sales, intensive distribution, selective distribution, exclusive distribution and franchising

Big Data – Social Media Data

- **Customer reviews:** From online review sites like Yelp

- **Tweets and Facebook posts/likes:** From friends, family, and one's social network, who give the most important recommendations

- **Product comments:** From retail sites that solicit product reviews

- **Blog posts:** From influencers in your industry who recommend to your customers

- **E-mail comments:** In response to product newsletters

Digital Advertising

- US advertisers now spend more for digital adds than other media (TV, print, etc.) about $100 billion

- Internet advertising is growing at 35% per year versus 5% for TV

- 37% of digital ads go to Google and 21% to Facebook, with Amazon and Twitter growing fast

- Amazon has greater potential for growth, and unlike Facebook, ads are not its main source of revenue

- Mobile phone and video ads are growing the fastest

- Soon there will be live chats in which human (or robot) salespersons swap instant messages with web/smartphone users about products/services

Generations and Advertising

Share of respondents who say they primarily find out about products through...
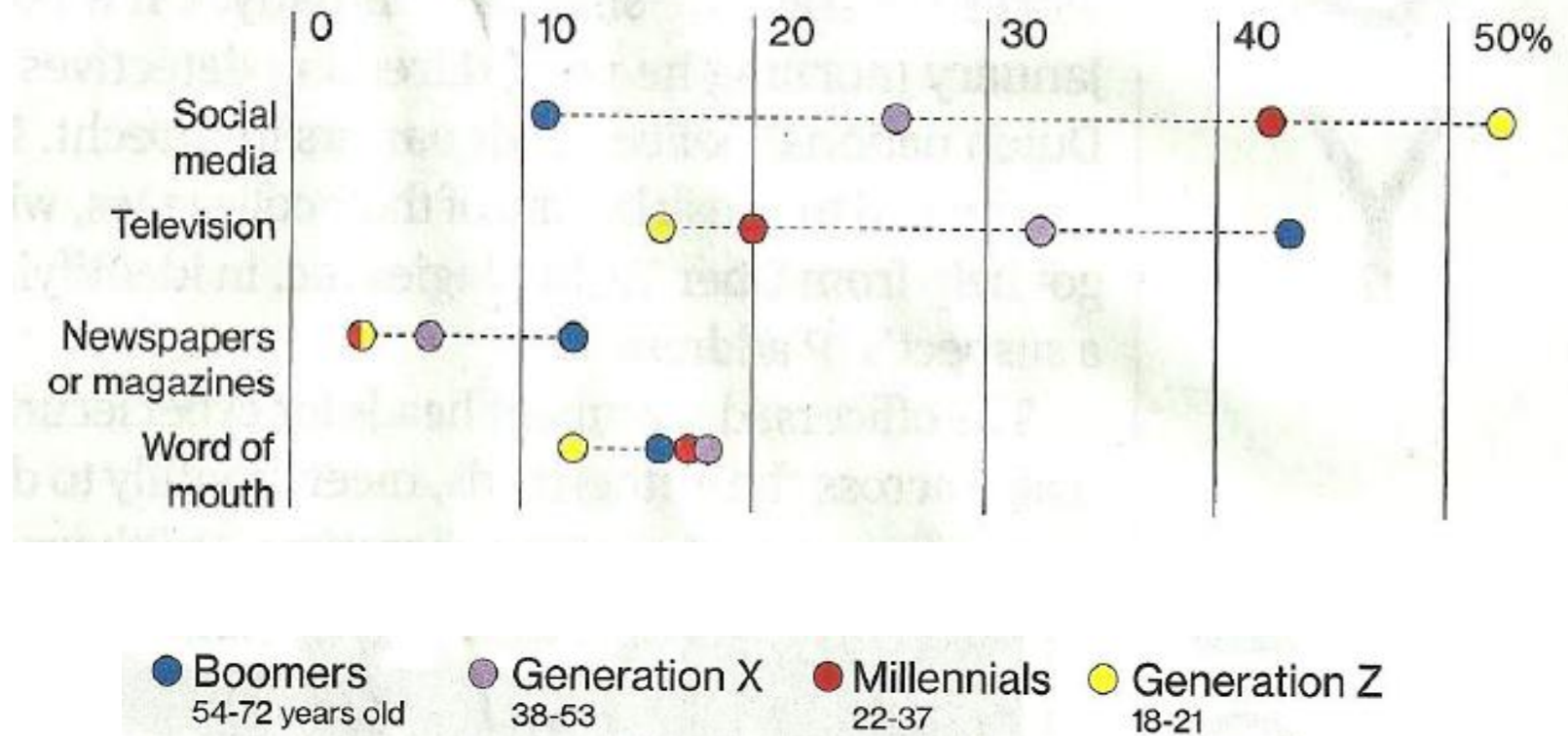
The Four V's of Modern Marketing Information

- **Volume:** With the ever-increasing availability of data, getting a handle on gathering and segmenting is difficult
  - Ninety percent of the data in the world today has been created in the last two years, and it's projected to increase 50 times in the next decade
- **Variety:** Data is available in a variety of formats
  - **Structured:** Data that can be classified and put into rows and columns like in a database; an example would be a customer transaction
  - **Unstructured:** Data that can include video, voice, and free form text. These require complex analysis to make sense of the information. About 80 percent of the data now available is unstructured data.

The Four V's of Modern Marketing Information (con't)

- **Velocity:** Data is generated at an ever-accelerating rate and should be analyzed in as close to real time as possible to extract its value
  - For example, when dealing with unsatisfied customers, time is crucial when delivering the optimal, targeted retention offer to keep them from defecting to a competitor
- **Veracity:** Managers need to be able to make predictions about data and be aware of the inevitable <u>uncertainty</u> that exists with all forms of data
  - Veracity can mean you have multiple customer IDs in your system, each with a slightly differently spelled name perhaps, but they're in fact the same customer; are you sending out multiple offers to this one customer?

Business Intelligence Tools for Customer Management
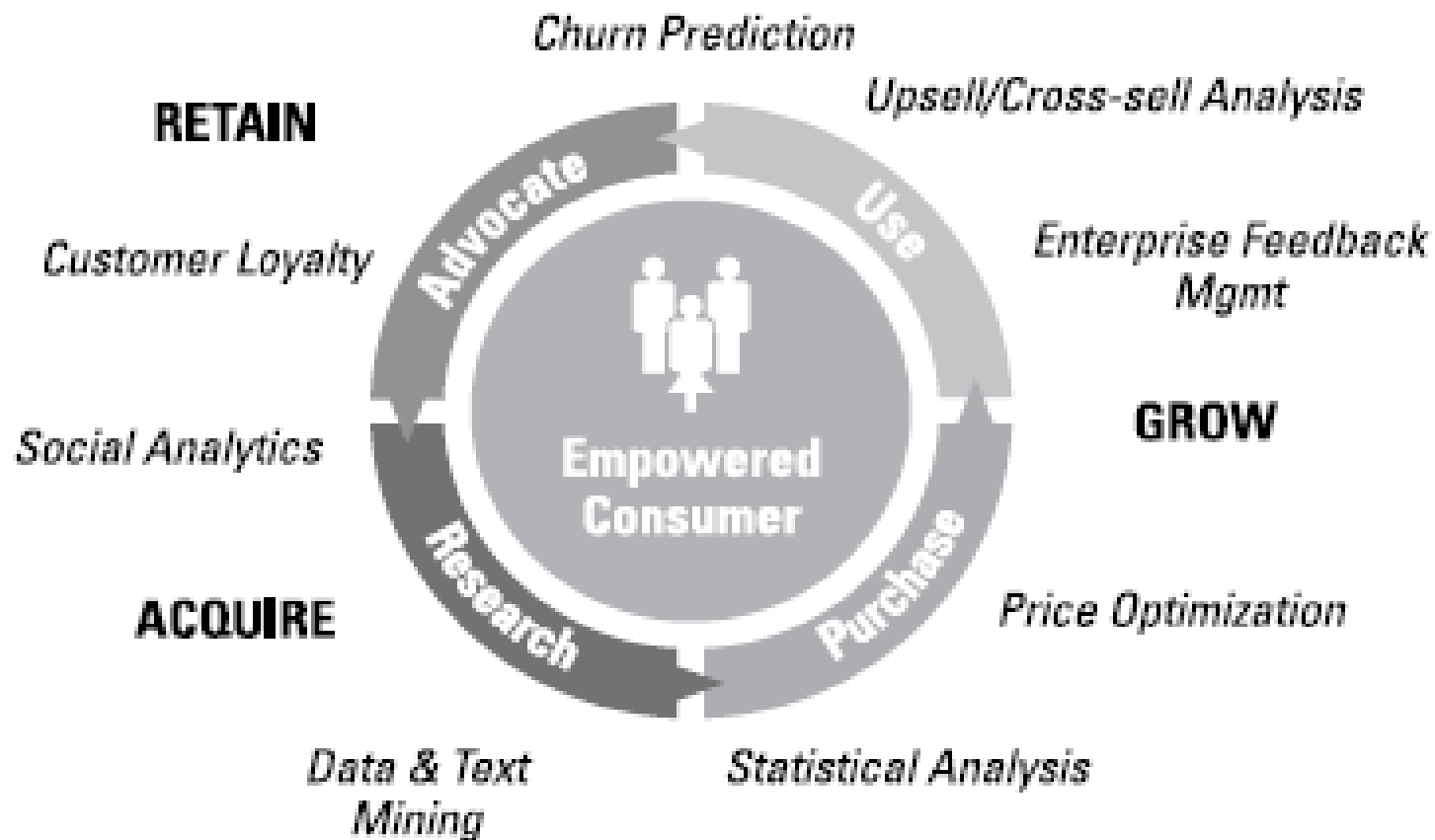
Customer Data Mining

- **Classification algorithms:** Identify attributes causing something to occur (for example, cascading attributes of defection behavior)
  - Use this to build alerts for call centers to take corrective action on customers identified as at risk for going to a competitor
- **Association algorithms:** Discover associations, links, or sequences in your data (for example, identify items likely to be purchased together)
  - Use this to build campaigns and promotions that combine items offered or provide recommendations for purchase. When offering items that are often purchased together, consider discounting one item and not the other so one increases the average sale.
- **Segmentation algorithms:** Group like data or uncover patterns in your data (for example, identify those likely to respond to a marketing campaign)
  - Use this to reduce the number of people you market to by selecting only those most likely to respond. This process reduces your opt-out rate and increases your return on marketing investment.

360 Degree View of Customers
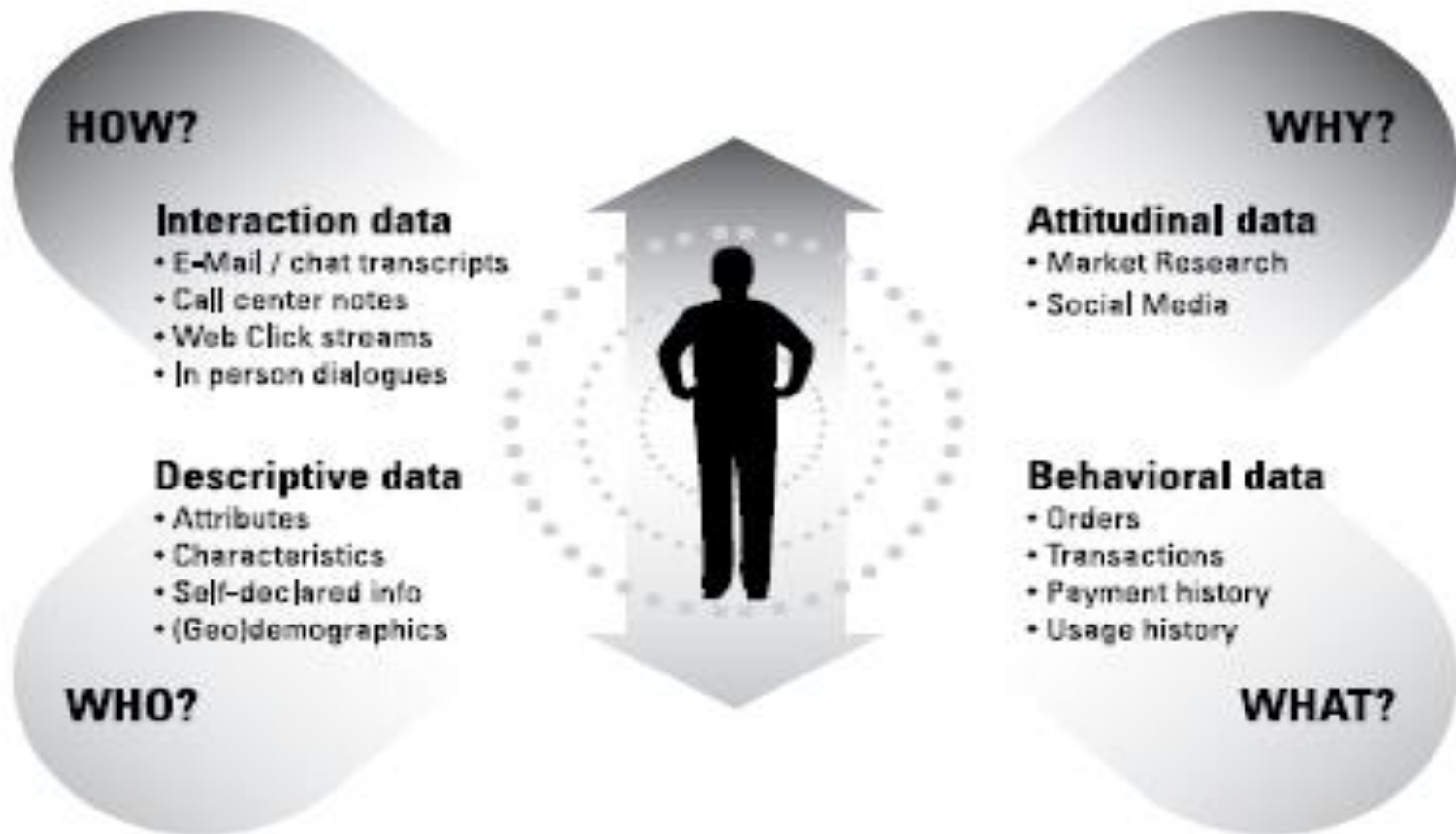
Customer Segmentation

- **Identifies customer groups (or corporate customers) so sales resources can be better focused:**
  - **Recency:** How recently did he purchase? ("1" can be 5 years ago; "5" can be 5 days ago)
  - **Frequency:** How frequently does he visit? ("1" can be 0 times a month; "5" can be 5 times a month)
  - **Monetary:** What's the average monetary value spend? ("1" can be $0; "5" can be $500)

Micro Segmentation

- In order to deliver personalized offers to your customers, it is necessary to move from segmenting groups to segmenting individuals

- *Micro segmentation* identifies each individual customer's preferences, needs and behaviors

- By personalizing your offers at this level, you can maximize your marketing campaign dollars ("targeted advertising") and enhance your customer relationship

Programmatic Advertising

- Many of the ads you see on your screen when you visit websites are the result of auctions among advertisers that are taking place in fractions of seconds

- This is know as "Programmatic Advertising", a field that is expected to grow by 30% annually over the next 5 years

- It's a much more cost effective way for advertisers to target the right ad to a particular customer
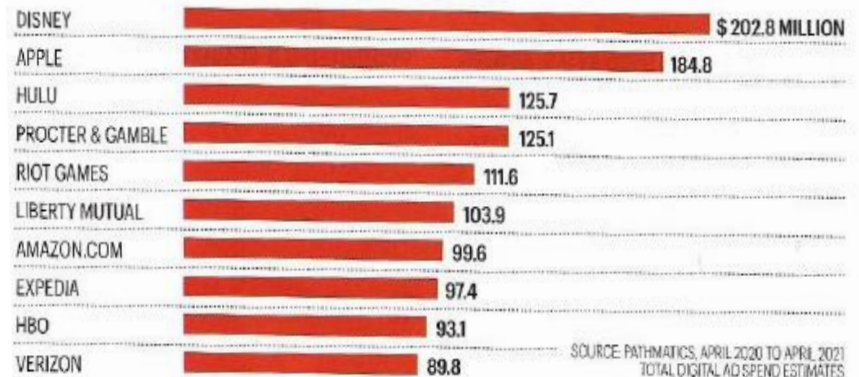
Google (Alphabet) Includes YouTube
Facebook Includes Instagram

2019 net digital ad revenues ($billions)
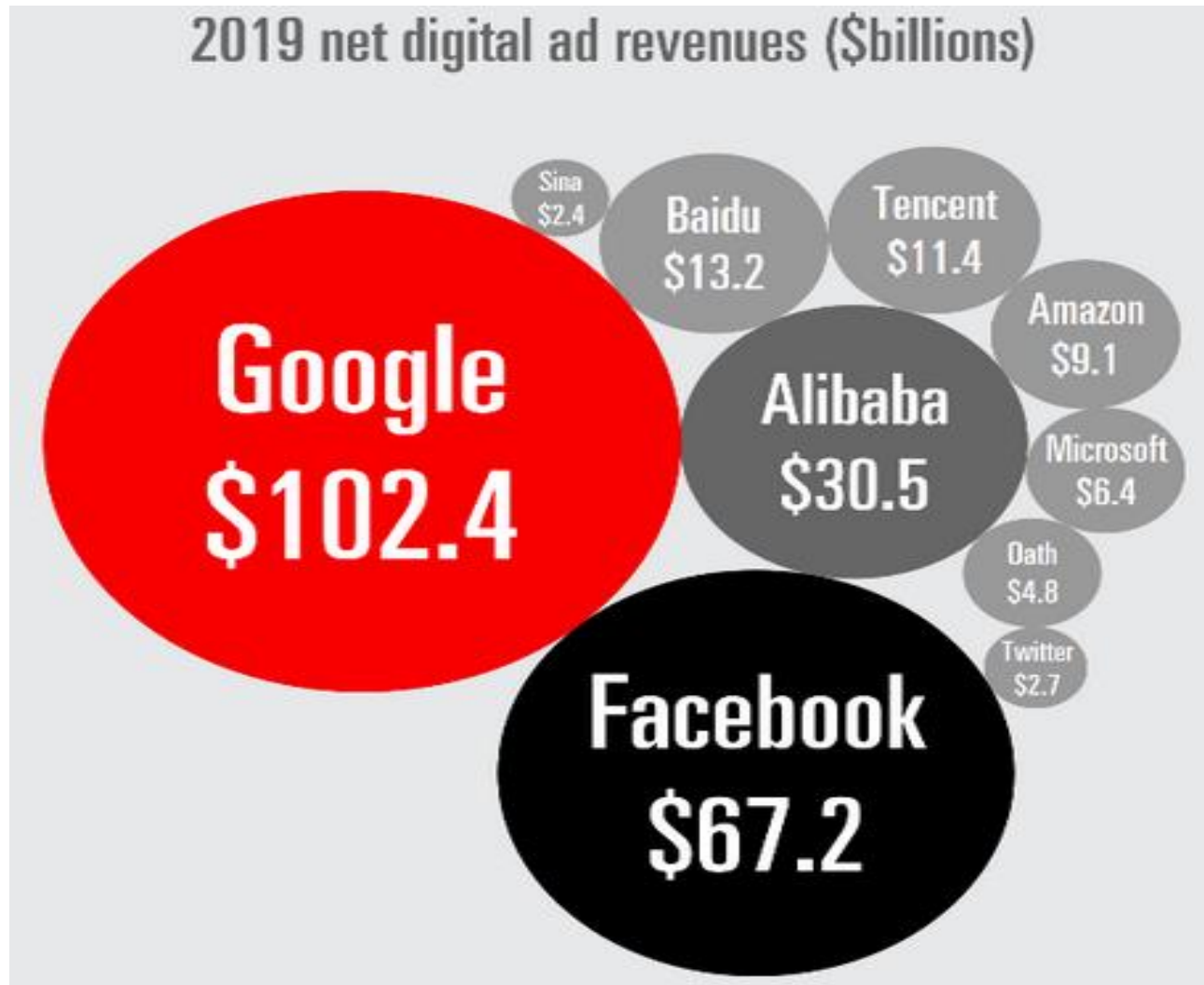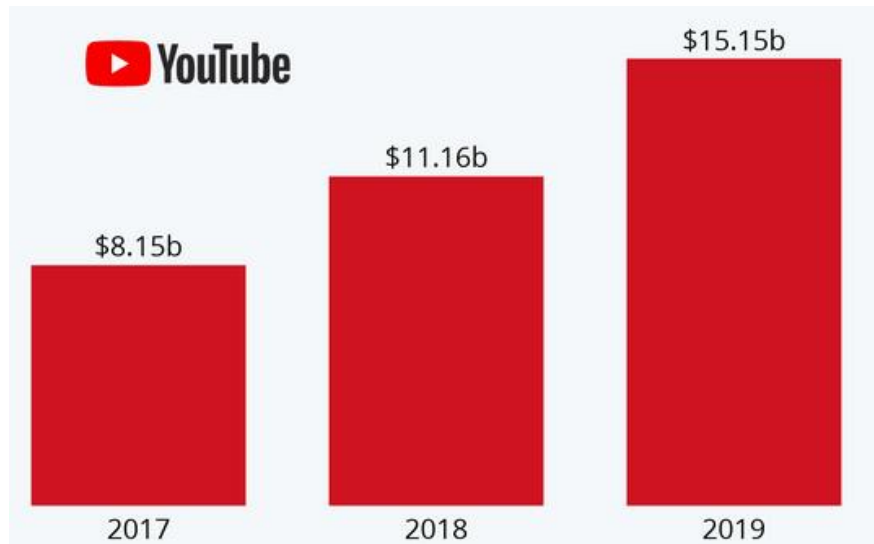
YouTube Ads

Mobile Advertising via Instagram

Instagram Ads (con't)

REVENUE GROWTH
(Projected change from 2018)

400%

351.8%

300

INSTAGRAM ADS —

200

100

62.7%

FACEBOOK ADS

2018   2019   2022
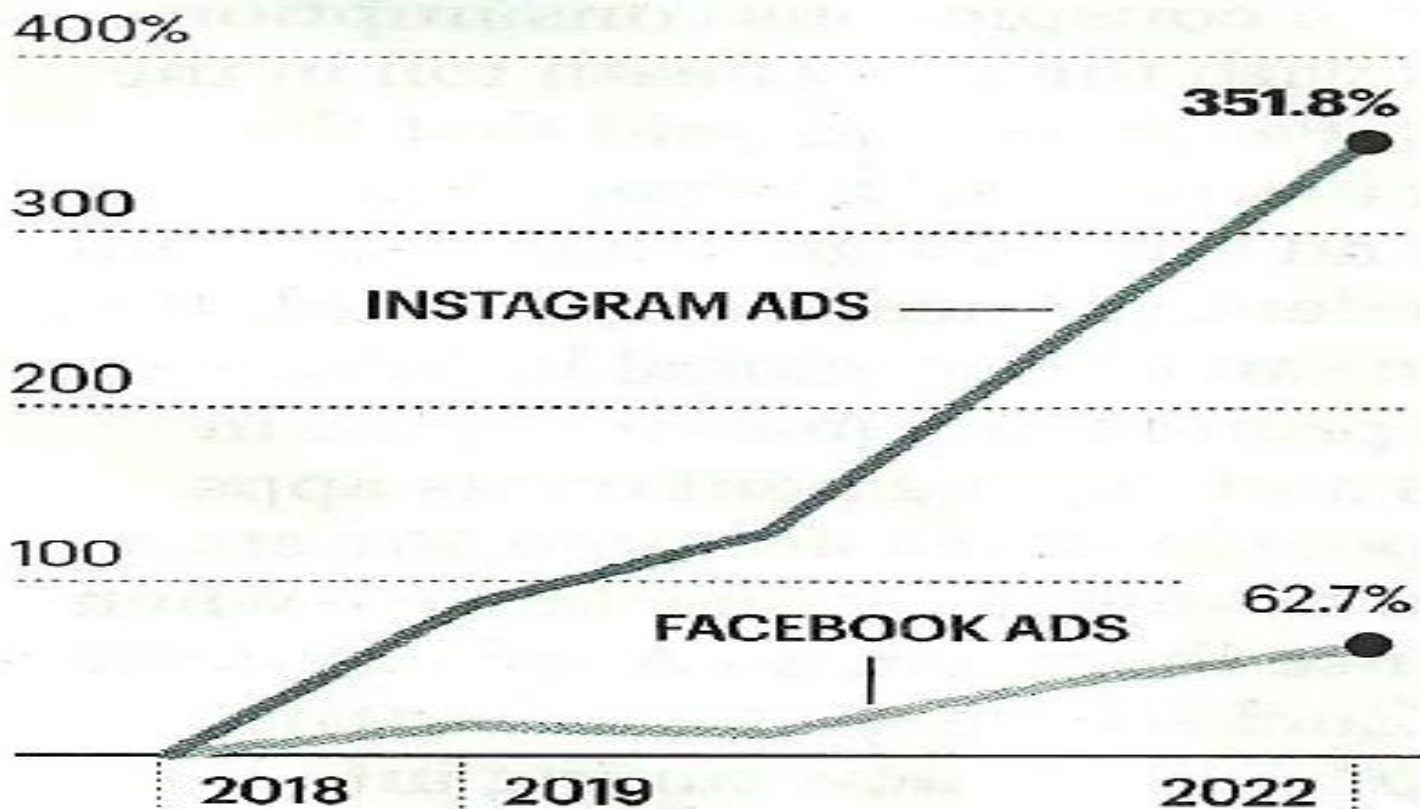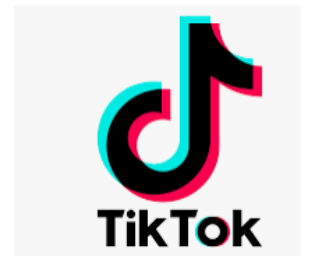
TikTok

- TikTok is experiencing very high growth – ads jumped 500% in 2020

- Despite the fact that TikTok is gaining in popularity, Instagram is still the most popular app when it comes to interaction and user base

- TikTok has over 700 million active users every month around the world, compared to Instagram, who has 1 billion active users every month

- Both apps have extremely high engagement rates when it comes to likes and views and every day

- For every million dollars brands spend on ads on Tiktok, they're seeing $7.2 million in new sales

Customer Retention

- As well as getting new customers, retention of current customers is vital

At this moment, someone is deciding if they want to love you or leave you.
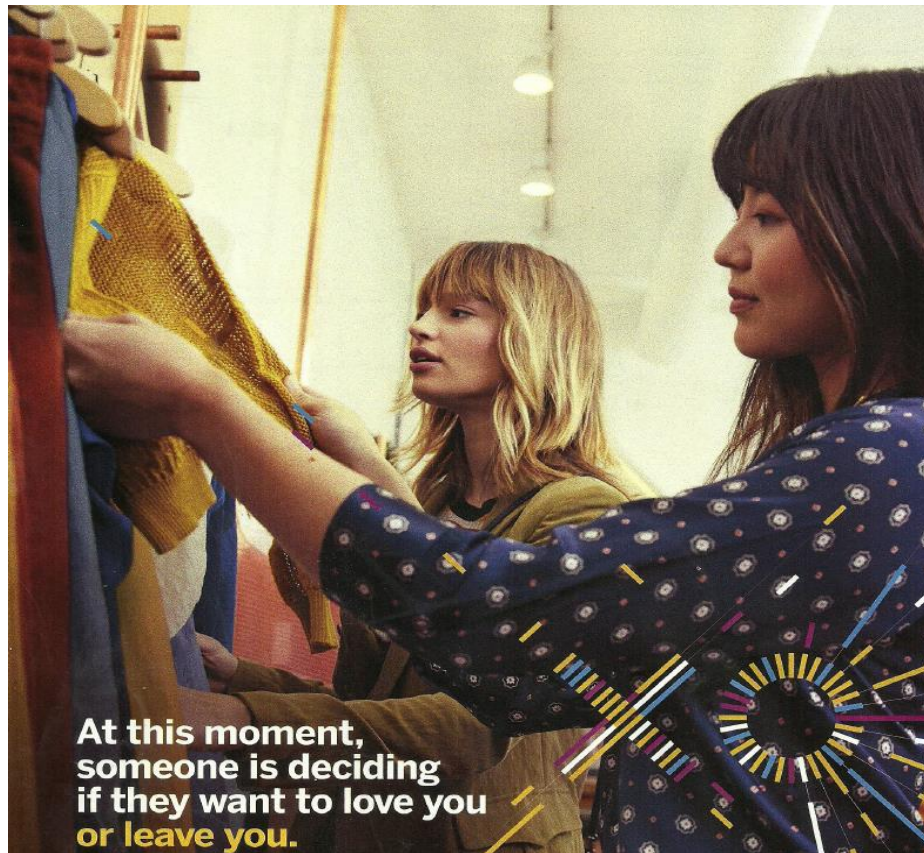
Increasing Customer Retention

- Immediately spot small problems that could become large ones through anomaly detection
  - *Anomaly detection* identifies data points that are significantly different from the rest (in the case of churn, determining behaviors that fall outside of the desired norm)
- Target those customers at risk of defecting and score them on their propensity to churn
- Deliver a timely targeted retention offer to get customers back on track
- Track and report success of retention efforts

Customer Analytics Software

	Product	Deployment	Analytics/ROI Tracking	Campaign Tracking	Dashboard	Performance Metrics	Social Media Monitoring	Website Analytics
LeadsRx	LeadsRx ★★★★☆ 4.4 (145)	☁	✅	✅	✅	✅	✅	✅
	Dreamdata ★★★★★ 4.8 (25)	☁	✅	✅	✅	✅	❌	✅
salesforce	Datorama ★★★★☆ 4.6 (16)	▯ ☁	✅	✅	✅	✅	✅	✅
	Singular ★★★★☆ 4.5 (10)	☁	✅	✅	✅	✅	✅	✅
hotjar	Hotjar ★★★★☆ 4.7 (400)	▯ ☁	❌	❌	✅	✅	❌	✅
im	Improvado ★★★★☆ 4.5 (21)	☁	✅	✅	✅	✅	✅	✅
📊	monday.com ★★★★☆ 4.6 (2426)	🖥 ▯ ☁	✅	✅	✅	✅	✅	❌
AppsFlyer	AppsFlyer ★★★★☆ 4.1 (21)	▯ ☁	✅	✅	✅	✅	✅	✅
JC	JustControl.it ★★★★★ 5.0 (2)	☁	✅	✅	✅	✅	✅	✅
factors.ai	Factors.ai ★★★★☆ 4.7 (11)	🖥 ☁	✅	❌	❌	✅	❌	✅

Hotjar

[https://www.hotjar.com]

Manage Social Media Marketing

Customer Service

- **Customer service** functions provide information and tools to make call centers, help desks, and customer support staff more efficient

- **Customer service** can take many forms and includes:
    - **Returns and allowances**
    - **Usage, technical and other information and services**
    - **Customized products and services** →

CUSTOMER SERVICE TOP TEN

1. APPEARANCE
– first impressions last a long time

2. ATTITUDE
– a learned behavior, make it positive

3. FRIENDLINESS
– be generous, give smiles unconditionally

4. IMPRESSION
– what's left in the room after I leave

5. RESPONSE-ABILITY
– take action, exceed customers expectations

6. COMMITMENT
– my pledge to service and teamwork

7. TEAM THINKING
– my actions effect everyone in my organization

8. COMMUNICATION
– active listening and positive responses

9. SERVICE
– my personal commitment to make a difference

10. PERSONAL EXCELLENCE
– I believe in my ability to make a difference

Customer Service (Con't)

- **Tracking account or order status**
- **Personalized web pages**
- **FAQs & HELP**
- **E-mail and automated response**
- **Call centers**

"Someone calling themselves a customer says they want something called service."

Help Desk Support
[both external & internal]

Help Desk (con't)

Ancient Help Desk

Today's Help Desk

Star Wars Help Desk

Supply Chain Management Systems

- **Supply chain** refers to the flow of <u>materials, information, money</u>, and services from raw material suppliers, through factories and warehouses, to the end customers

- **Supply Chain Management (SCM)** is the function of planning, organizing, and <u>optimizing</u> the supply chain's resources and activities
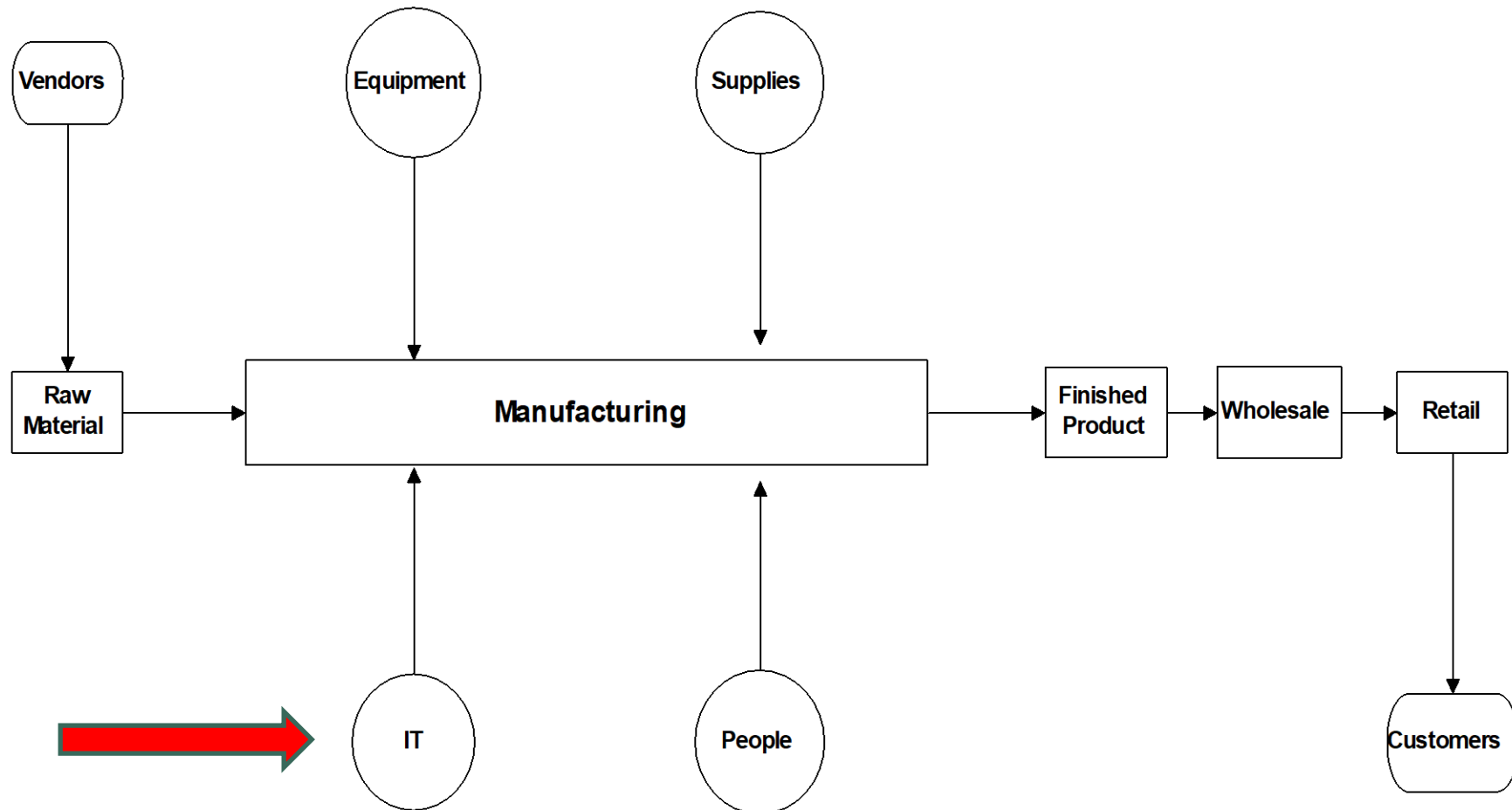
Supply Chain Components

Raw materials · Supplier · Manufacturing · Distribution · Retailer · Consumer
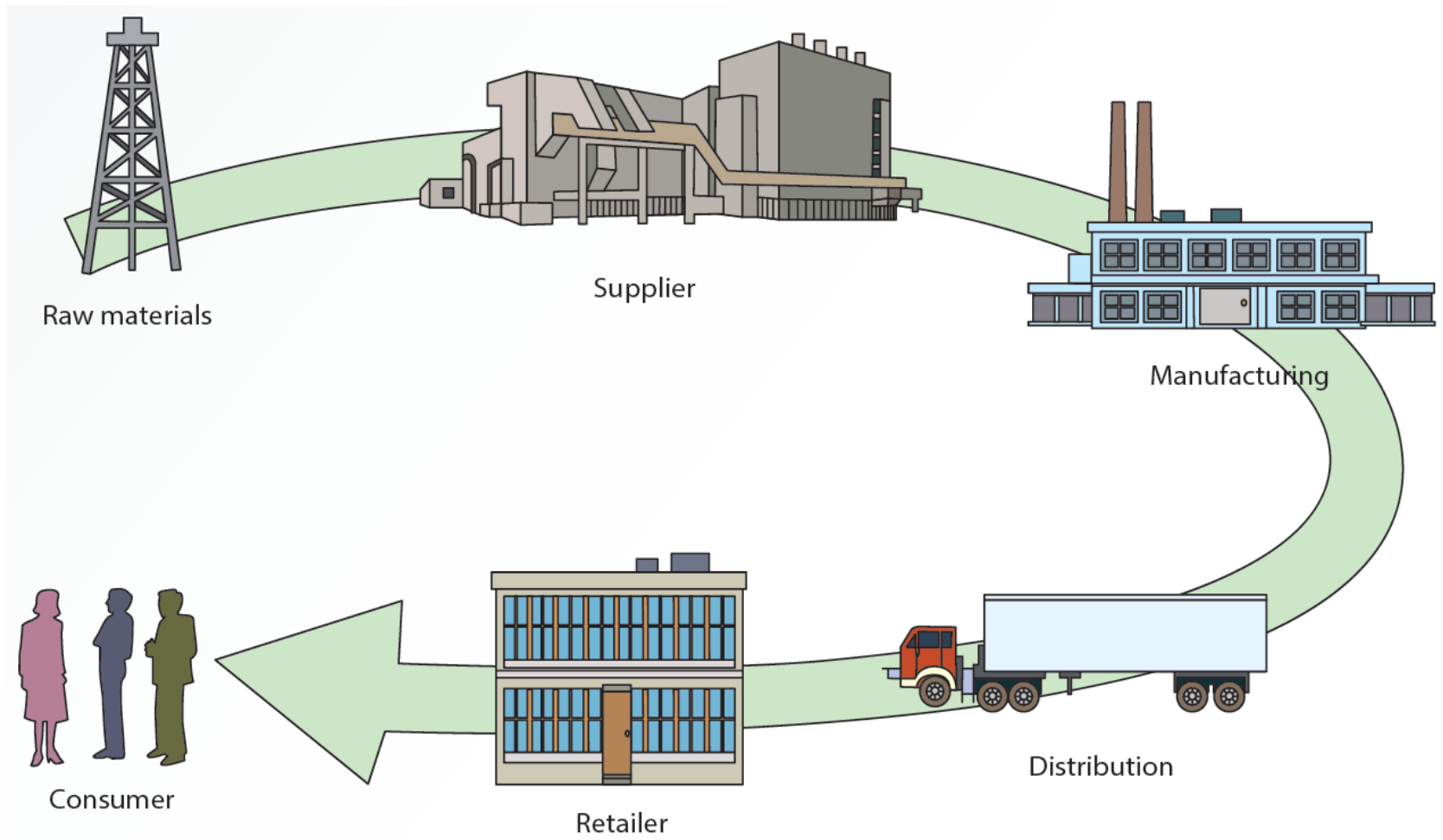
Supply Chain Management

- The management of the future requirements, supply planning, goods flow, and utilization of product, perhaps throughout a Global Network
- Supply Chain management is concerned with:
  - Right item
  - Right quantity
  - Right time
  - Right place
- The key Corporate Metrics are to maximize sales revenue and minimize inventory investment and other costs

Classical Supply Chain

Vendors → Raw Material → Manufacturing → Finished Product → Wholesale → Retail → Customers

Equipment → Manufacturing

Supplies → Manufacturing

IT → Manufacturing

People → Manufacturing

Inventory Management

- Inventory planning
  - Allocation
  - Obsolescence
  - Substitution
- Demand planning
  - Forecasting
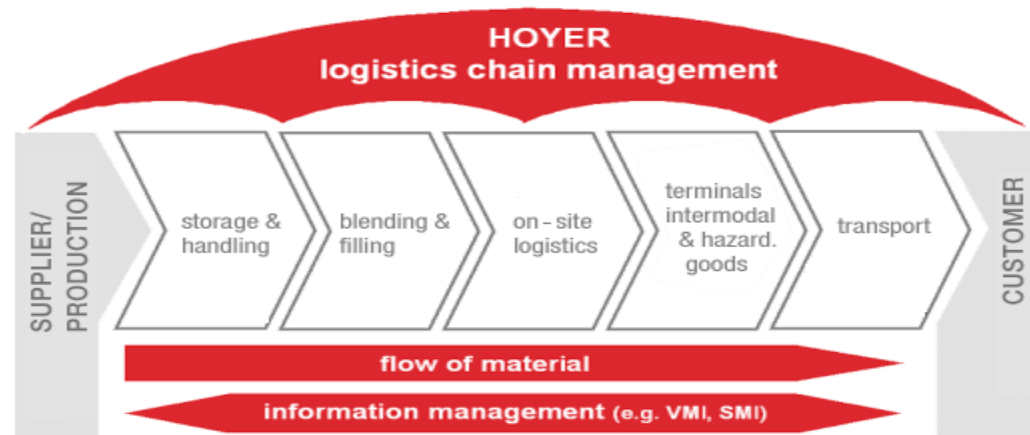 - Business plans
  - Process levels

Distribution Architecture

- Customer Service
- E.D.I.
- Sales Analysis
- OPENPRO ERP DISTRIBUTION
- Purchasing
- Warehouse Management
- Point of Sale
- Inventory Control
- Order Entry

Inventory Allocation

- Deployment –<u>Determines how inventory should be deployed between locations</u>. If available quantities are not sufficient to fulfill the demand, fair share rules are used to determine how to spread inventories, and if available quantity exceeds the demand then push rules can be used to determine the deployment plan

- Allocation Process – Problems with inventory levels can occur for various reasons including short supply/production issues, overselling forecast, unexpected returns, and demand adjustments based on future requirements

  - The allocation process helps to identify the above problems along with the ability to <u>identify the excess inventory and coordinate stock transfers to alleviate back orders and mitigate supply shortages</u> with minimum risks

The Flows in the Supply Chain

- ***Material flows*** are the physical products, raw materials, supplies and so forth that flow along the chain
  - *Reverse* flows – returned products, recycled products and disposal of materials or products
- ***Information flows*** are all data related to demand, shipments, orders, returns, and schedules as well as changes in any of these data
- ***Financial flows*** are all transfers of money, payments, and credit-related data

The Flows in the Supply Chain (con't)

- All three flows (material, information, currency) involve:
  - Time
  - Cost
  - Risk (Possibility of errors, damage, etc.)
- The goal of ABC (and all business) is to minimize time, cost, and risk through whatever means possible, particularly technology !!!

HOYER
logistics chain management

SUPPLIER/ PRODUCTION — storage & handling — blending & filling — on – site logistics — terminals intermodal & hazard. goods — transport — CUSTOMER

flow of material

information management (e.g. VMI, SMI)

Copyright – Dan Brandon

The Structure & Components of Supply Chains

- A supply chain involves three segments:
  - *Upstream*, where sourcing or procurement from external suppliers occurs
  - *Internal*, where receiving, inventory, picking, packaging, assembly or manufacturing takes place
  - *Downstream*, where distribution takes place, frequently by external distributors
- **Tiers of suppliers**, a supplier may have one or more subsuppliers, and the subsupplier may have its own subsupplier(s) and so on

Supply Chains
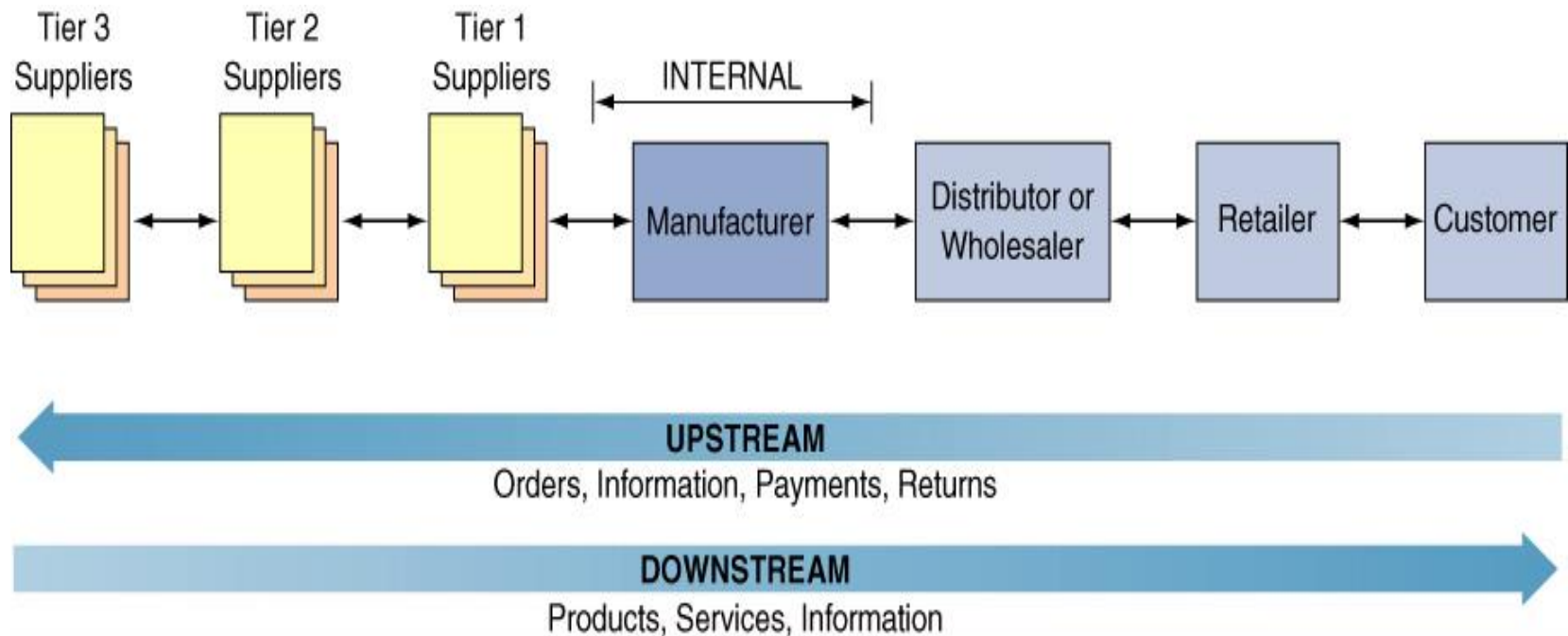
← money, material, information →

Interorganizational Information Systems

- **Interorganizational information system (IOS)** involves information flows among two or more organizations
- **Global information systems** are interorganizational information systems that connect companies located in two or more countries:
  - **Cultural differences**
  - **Localization**
  - **Economic and Political Differences**
  - **Legal issues**
  - **Cross-border data transfer** which refers to the flow of corporate data across nations' borders

Problems along the Supply Chain

- **Poor customer service** – not delivering quality products or services when and where the customers need them
- **Raw material problems**: high costs, shortages and interruptions, quality problems
- **Inventory problems**: too low inventory, too high inventory, picking delays/cost, packing costs
- **Production problems**: quality, delays, strikes
- **Delivery problems**: delays, loss, shortage, damage, theft

Solutions to Supply Chain Problems

- <u>Vertical integration</u> – purchase suppliers, or bring raw material production in-house

- <u>Optimal inventory</u> – problems with inventory being:
  - Too high – high "holding" cost
  - Too low – delay in fulfillment

- <u>Information sharing</u> amongst supply chain players: forecasts, actual sales, supplies, inventories (see next slide)
  - Suppliers can even manage a company's inventory for raw materials

Electronic Data Interchange and Extranets

- **Electronic data interchange (EDI)** is a communication standard that enables business partners to exchange routine documents, such as purchase orders, electronically

- *EDI transactions* include repetitive business transactions such as purchase orders, invoices, credit approvals, shipping notices, and confirmations

- *Data formatting standards* are used and an *EDI translator* converts data into a standard format before it is transmitted

- **EDI** serves as a catalyst and a stimulus to improve the standard of information that flows between and among organizations

EDI Benefits

- Reduces cycle time
- Minimize data entry errors
- Length of messages are shorter
- Messages are secured
- Increases productivity and reduces cost
- Enhances customer service
- Minimizes paper costs and delays (usage and storage)

WITHOUT EDI

Start

Order Placer

Accounting/Finance

Purchasing

Mail Room

Shipping Receiving

P.O. Delivery

Order Confirmation Bill Delivery

Payment Delivery

Product Delivery

Mail Room

Sales

Accounting/Finance

Shipping

Order Fullfillment

Buyer

Seller

WITH EDI

Standardized P.O. Form

P.O.

Start

EDI Converter

Departmental Buyer

Receiving

Product Delivery

Computer Convertor Generates Standardized P.O. Form

P.O.

Invoice

Flash Report

Instant Data to
- Sales
- Inventory
- Manufacturing
- Engineering

Order Fullfillment

Shipping

Buyer

Seller

Traditional EDI Limitations

- Significant initial investment to implement
- Ongoing operating costs are high due to the use of expensive, private VANs
- Traditional EDI system is inflexible
- Long startup period
- Multiple EDI standards exist

Extranets
(EDI over the Net)

- **Extranets** link business partners to one another over the Internet by providing access to certain areas of each other's corporate intranets

- The main goal of **extranets** is to foster collaboration between business partners

- An **extranet** is open to selected B2B suppliers, customers and other business partners

- **Common protocols: XML, JSON**

Internet Business Connections
[VPN- Virtual Private Network]
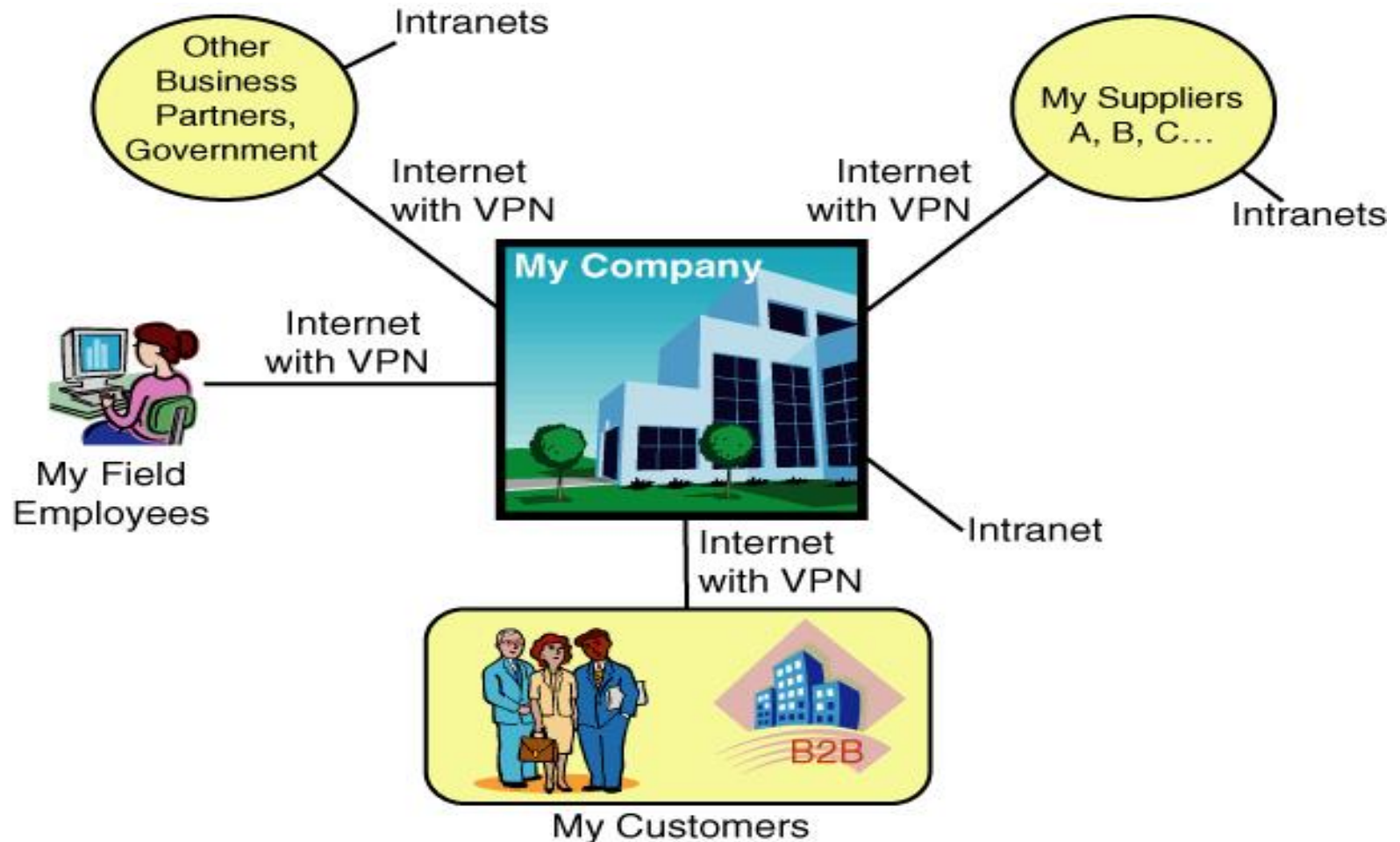
Google Analytics

- Google Analytics (GA) allows organizations to generate, analyze, and visualize information about their website hits

- GA helps organization to better focus available resources to generate and retain more customers and more business from these customers

- GA enables organizations to "work smarter" and to generate more success from their digital property

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Google Analytics (con't)

- GA can answer questions such as:
  - How do customers find and enter our website
  - Which content is most traversed, most useful, most consuming
  - How easy is it for visitors to find what they need, to make a purchase, to get support
  - How can visitors' experience be improved
  - How successful are promotions, sales campaigns, etc.
  - How can key customer groups be identified for targeting advertising and promotion (targeted ads are 3 times more cost effective)
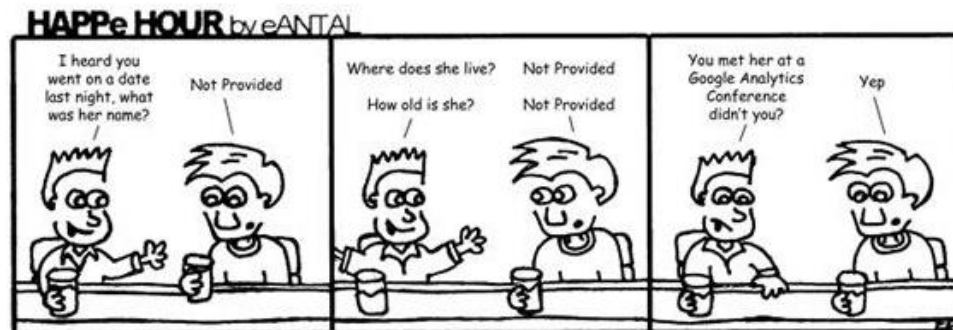
Google Analytics (con't)

- GA can track the origin of website visitors and relate these origins to page interactions, conversions, purchases, downloads, and other transactions

- GA is free to set up and use as long as the volume level is below a limit (currently 10 million hits per month)

- GA provides for "attribution" where a value is assigned to visitor touchpoints to determine the relative contribution of each touchpoint to a purchase
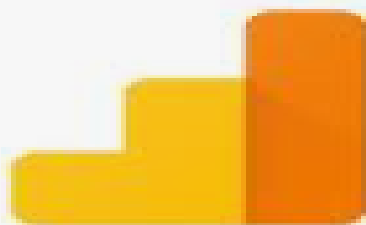
Getting people to visit your website — Acquisition — Users get a great first time experience

Activation

Retention — Making sure users come back

Users invite others — Referral

Revenue — Users pay for the product

Google Analytics

Account	Property	View	Start Date	End Date
My Store	My Store	All Web Site Data	09/21/2014	09/27/2014

Site Traffic

■ Sessions

Average Page Load Times

■ Avg. Page Load Time (sec)

Sep 26, 2014
Avg. Page Load Time (sec): **5.41**

Users by Country

Pageviews by Browser

■ Chrome   ■ Safari   ■ Firefox   ■ Internet Explorer   ■ Android Browser

7.3%

12.3%

Google Analytics (con't)

- <HTML>

- <HEAD>
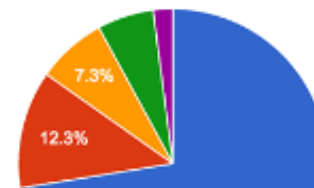
```html
<!-- Global Site Tag (gtag.js) - Google Analytics -->
<script async src="https://www.googletagmanager.com/gtag/js?
id=GA_TRACKING_ID"></script>
<script>
  window.dataLayer = window.dataLayer || [];
  function gtag(){dataLayer.push(arguments);}
  gtag('js', new Date());

  gtag('config', 'GA_TRACKING_ID');
</script>
```

Advertising on Google [Google Ads]

- **Google Ads** (previously **AdWords** before July 2018) is an online advertising platform where advertisers pay to display brief advertisements, service offerings, product listings, video content and generate mobile application installs

- Google Ads' system is based partly on cookies and partly on keywords determined by advertisers

- Google uses these characteristics to place advertising copy on pages where they think it might be relevant

- Advertisers pay when users divert their browsing to click on the advertising copy; partner websites receive payments based on clicks or purchases

- Google Ads is now Google's main source of revenue, contributing to Google's total advertising revenues of over $100 billion

Advertisers

If a dog food company wants to advertise a new treat online, it hires a creative agency to design an ad. That ad goes to the digital-ad ecosystem, a bewildering array of buyer and seller platforms that manage ad-space inventory, auction off space, and track responses. Google is a major player almost every step of the way.

Ad server

The ad is loaded onto a server, where it sits until the advertiser and publishers have agreed on price and placement. Google Campaign Manager competes with Innovid Inc. and Amazon.com Inc.'s Sizmek, among others.

Demand-side platform (DSP)

This is what an advertiser uses to see the available ad space and decide what it wants to buy. Google Display & Video 360 compete with Amazon Advertising, Trade Desk Inc., and MediaMath Inc. But if advertisers want access to YouTube, in most cases they have to use the Google DSP.

Publisher-side ad server

Here, websites including newspapers upload available ad space so the dog food company can bid on it. Once the sides agree on terms, the ad server sends the ad to the publisher's website. Google Ad Manager's share of this business—estimated as high as 80%—dwarfs that of Smart AdServer SAS and AppNexus Inc.

Google Campaign Manager

Innovid

Sizmek

Analytics

Websites can use analytical services to see who is visiting their sites and from which sources. Google Analytics is the largest of these providers, which also include Adobe Inc. and Oracle Corp.

Google Display & Video 360

MediaMath

Amazon Advertising

Trade Desk

Google Ad Manager

Smart AdServer

AppNexus

Publisher

The ads are uploaded in real time as viewers open a website.
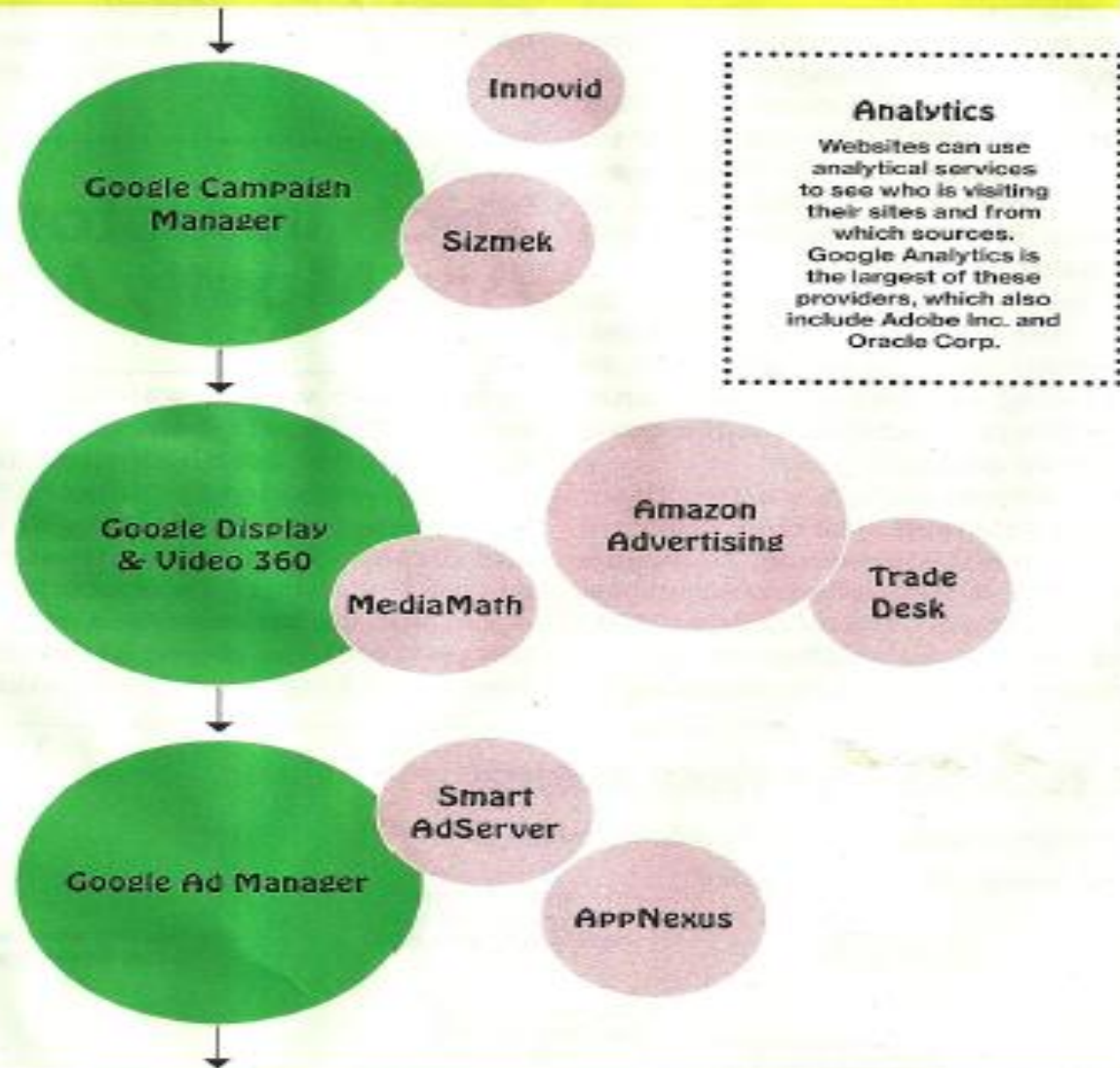
Linking Google Ads to Google Analytics

- Linking your Google Ads and Google Analytics accounts gives you access to the entire picture of customer behavior, from ad click or impression through your site to conversion

- Once you've linked your accounts, you can use insights from GA to refine and optimize your Google Ads campaigns, improving the overall performance of your business

- When you link accounts, you:

  - Begin seeing ad and site performance data in the *Google Ads* reports in Analytics

  - Can import Analytics goals and Ecommerce transactions directly into your Google Ads account

  - Can also import valuable Analytics metrics—such as *Bounce Rate*, *Avg. Session Duration*, and *Pages/Session*—into your Google Ads account

  - Get enhanced Remarketing capabilities

  - Get richer data in the Analytics *Multi-Channel Funnels* reports

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Google AdSense

- **Google AdSense** is a program run by Google that allows publishers in the Google Network of content sites to serve automatic text, image, video, or interactive media advertisements, that are targeted to site content and audience

- These advertisements are administered, sorted, and maintained by Google

- They can generate revenue for the website publisher on either a per-click or per-impression basis

- Google earns over $15 billion annually or about 1/5 of total revenue through Google AdSense

- AdSense is a participant in the AdChoices program, so AdSense ads typically include the triangle-shaped AdChoices icon

- This program also operates on HTTP cookies

- Over 10 million websites use AdSense

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Google AdSense (con't)

- Google uses its technology to serve advertisements based on website content, the user's geographical location, and other factors
- Those wanting to advertise with Google's targeted advertisement system may enroll through Google Ads
- AdSense has become one of the popular programs that specializes in creating and placing banner advertisements on a website or blog, because the advertisements are less intrusive and the content of the advertisements is often relevant to the website
- Many websites use AdSense to make revenue from their web content (website, online videos, online audio content, etc.), and it is the most popular advertising network
- AdSense has been particularly important for delivering advertising revenue to small websites that do not have the resources for developing advertising sales programs and salespeople to seek out advertisers

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MIS Classes Google Analytics
[segregate by time, location, browser, device, gender, interests, etc.]
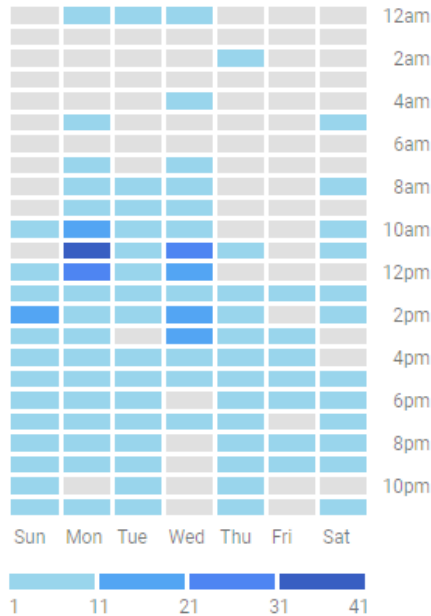
GA Home Page

Copyright Dan Brandon, PhD, PMP
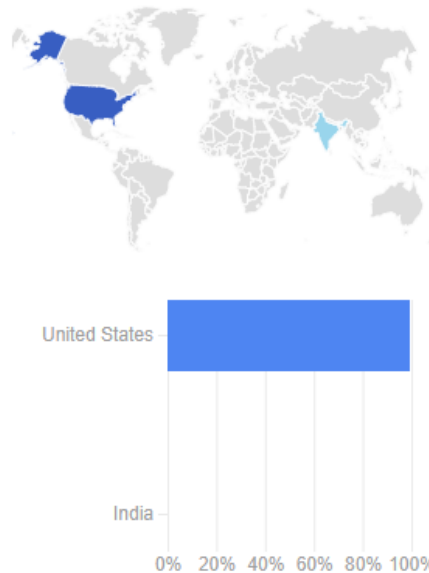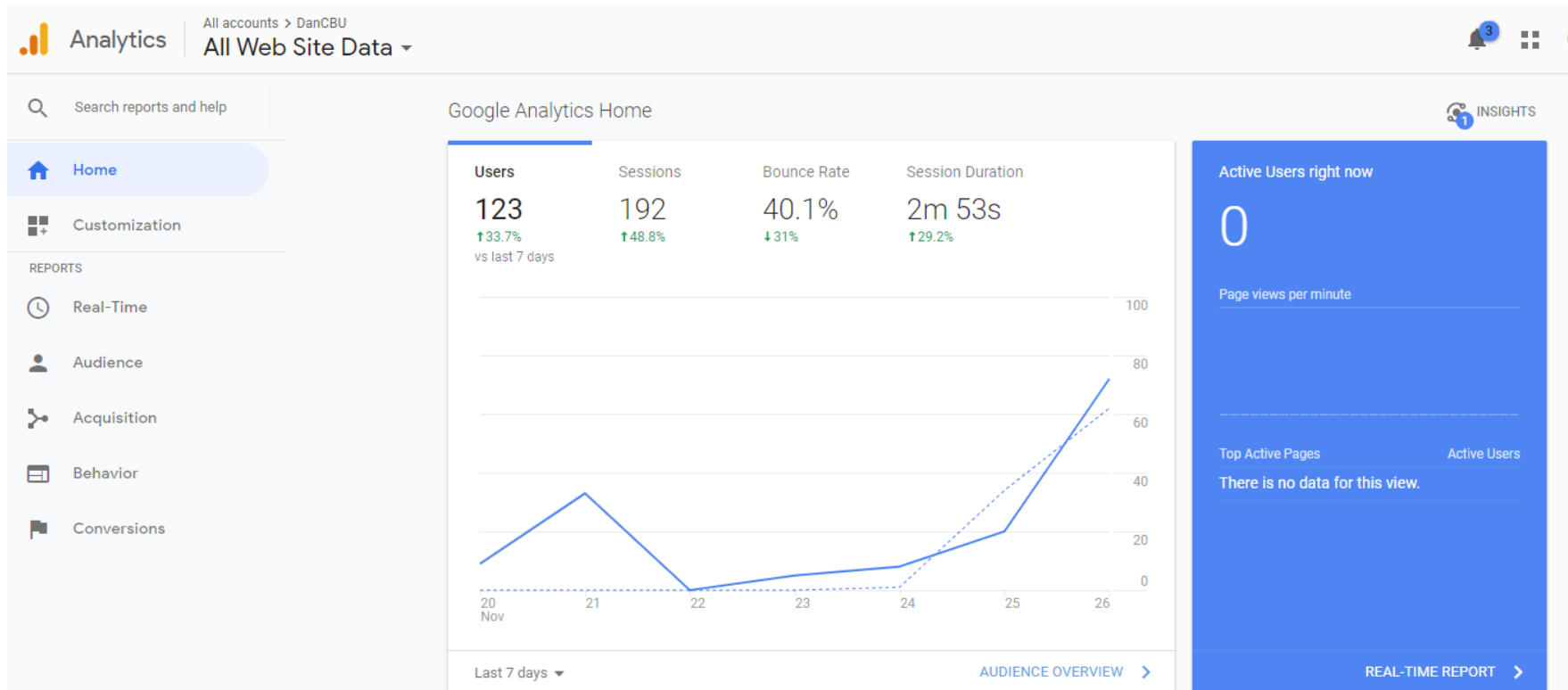
GA Acquire Users
[on home page]

Copyright Dan Brandon, PhD, PMP
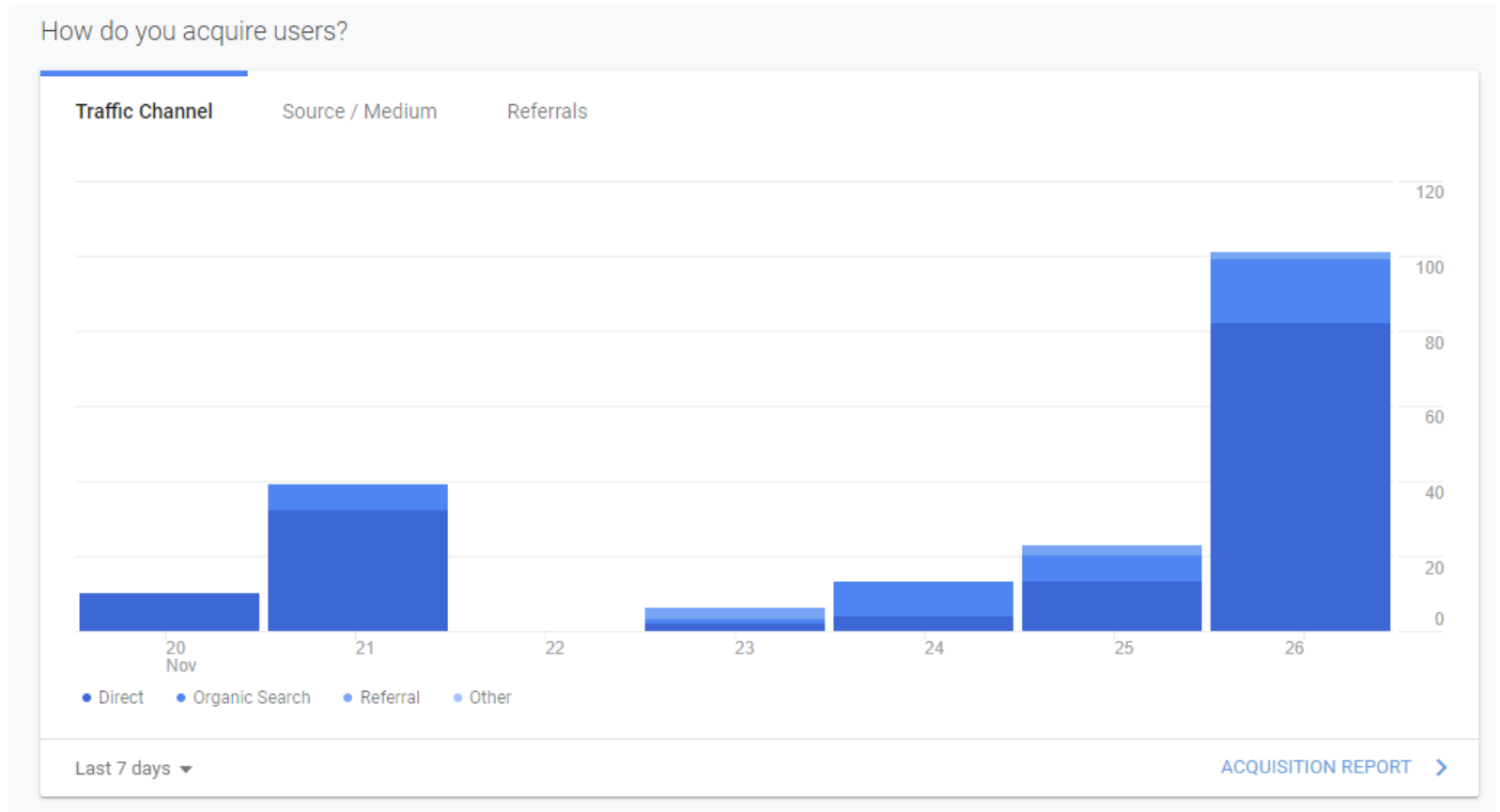
GA When/Where/What
[on home page]
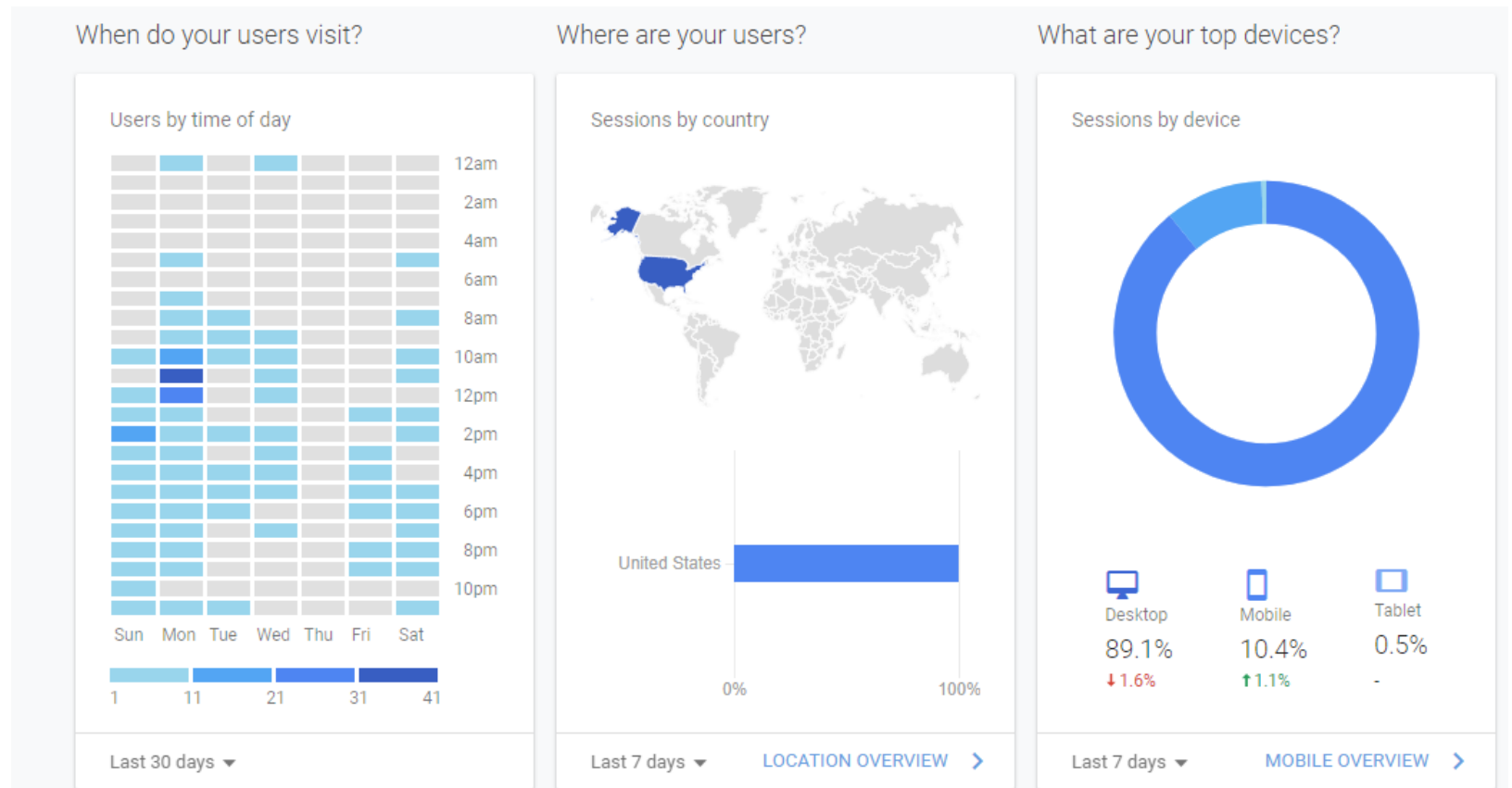
Acquisitions and Channels

Copyright Dan Brandon, PhD, PMP
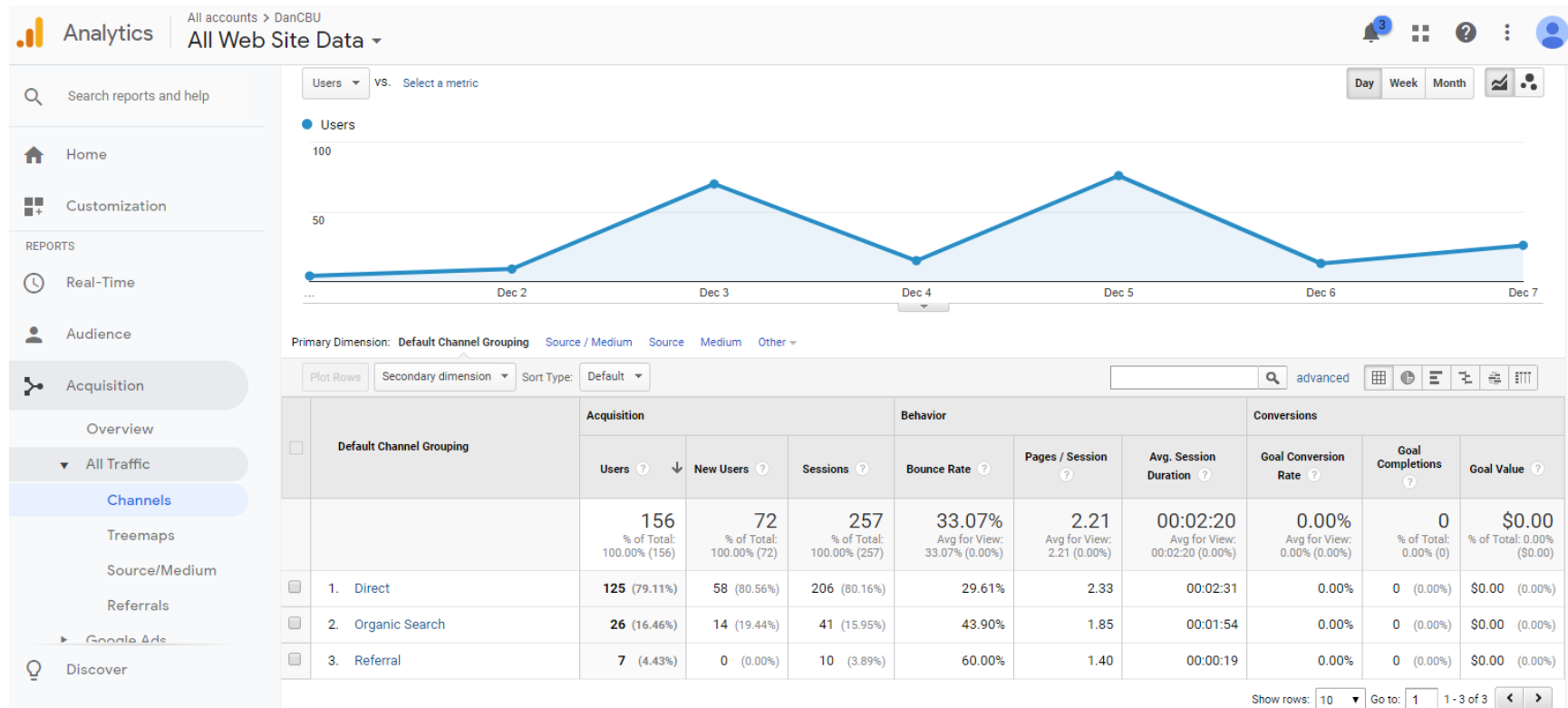
GA Page Visits
[on home page]

What pages do your users visit?

Page	Pageviews	Page Value
/dbrandon/	135	$0.00
/dbrandon/CIS231.html	79	$0.00
/dbrandon/CIS153.html	72	$0.00
/dbrandon/CIS481.html	66	$0.00
/dbrandon/CIS351.html	28	$0.00
/~dbrandon/CIS231.html	22	$0.00
/~dbrandon/	9	$0.00
/~dbrandon/CIS481.html	7	$0.00
/~dbrandon/CIS153.html	3	$0.00
/~dbrandon/CIS351.html	2	$0.00

Last 7 days ▾   PAGES REPORT ⟩

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Audience Menu

[language, country, city, browser, opsys, provider, mobile, resolution]

Copyright Dan Brandon, PhD, PMP
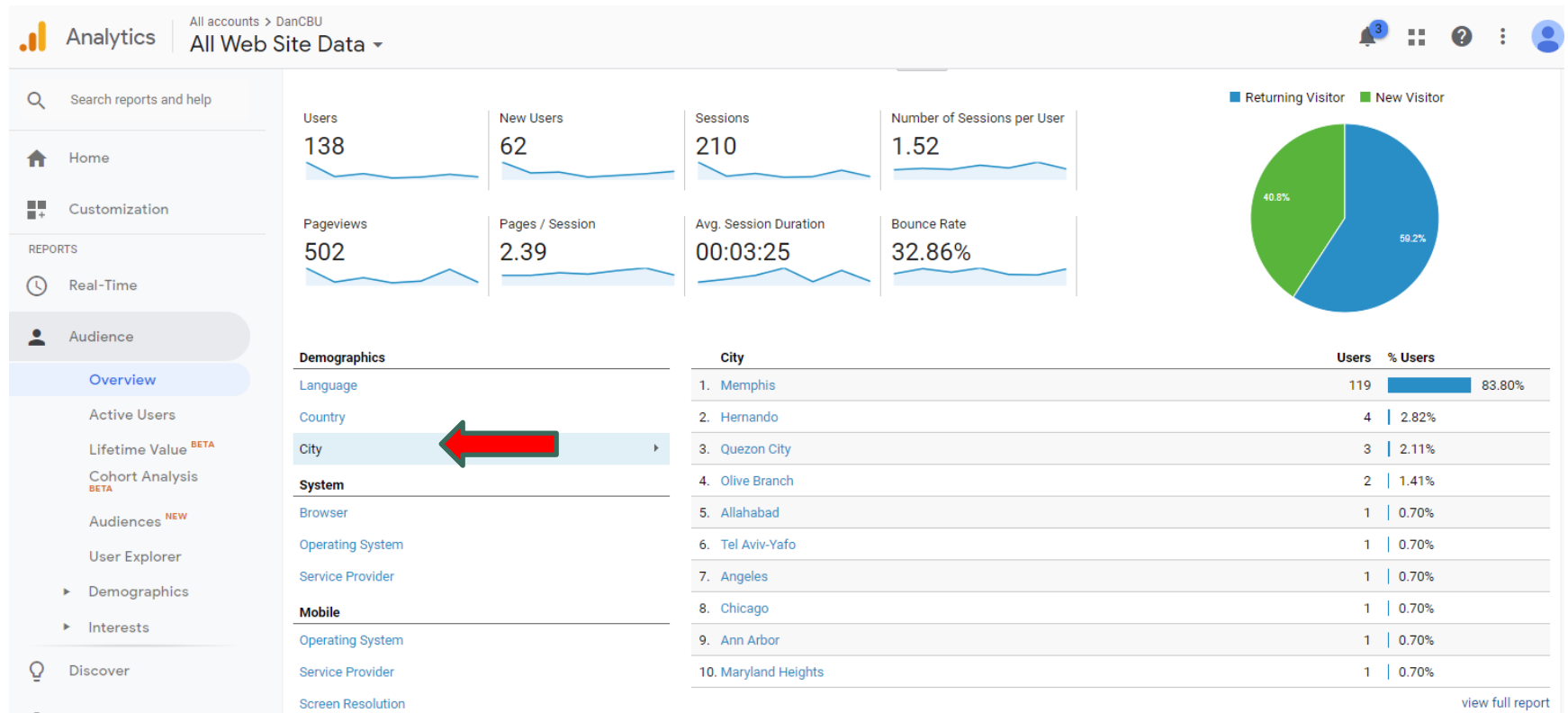
Audience (con't)

- Users - # of unique visitors who have at least one session
- Sessions – a group of interactions that take place on the site within a give time frame
  - A single session can involve multiple page views and transactions; sessions end after 30 minutes of inactivity or at midnight or a switch in campaigns
- Bounce rate - the % of single page session
- Pageview – total page landings during all sessions

Users	New Users	Sessions	Number of Sessions per User
203	110	400	1.97

Pageviews	Pages / Session	Avg. Session Duration	Bounce Rate
941	2.35	00:02:59	35.00%
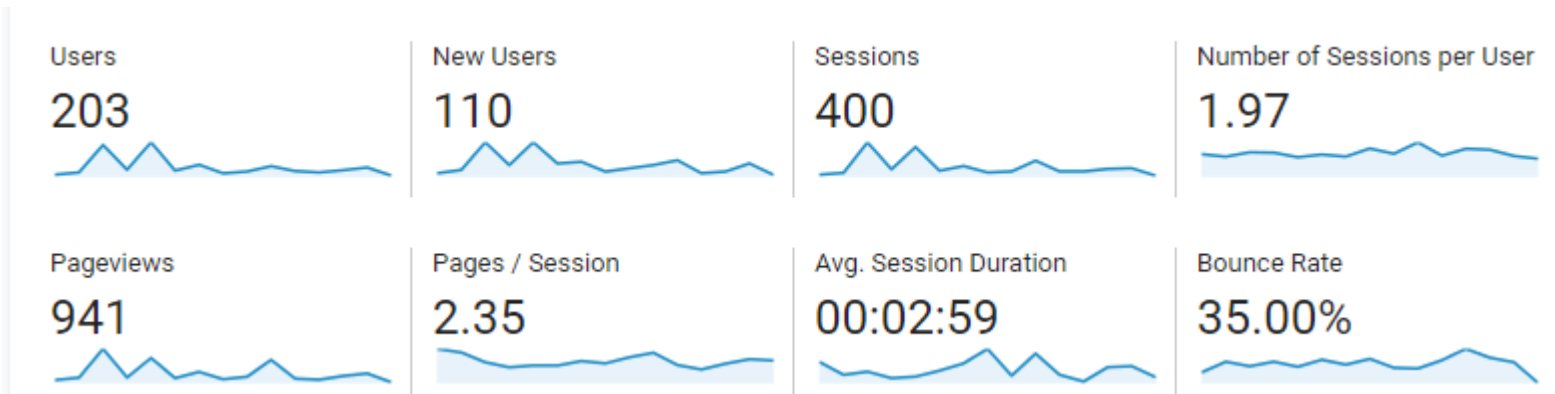
Audience (con't)

- ## Cohort Analysis
  - Allows one to specify a "cohort type" (such as acquisition date) and study behaviors of that group

- ## Lifetime Value
  - Allows one to study the "value" of customers based on their lifetime transaction (purchases) behavior
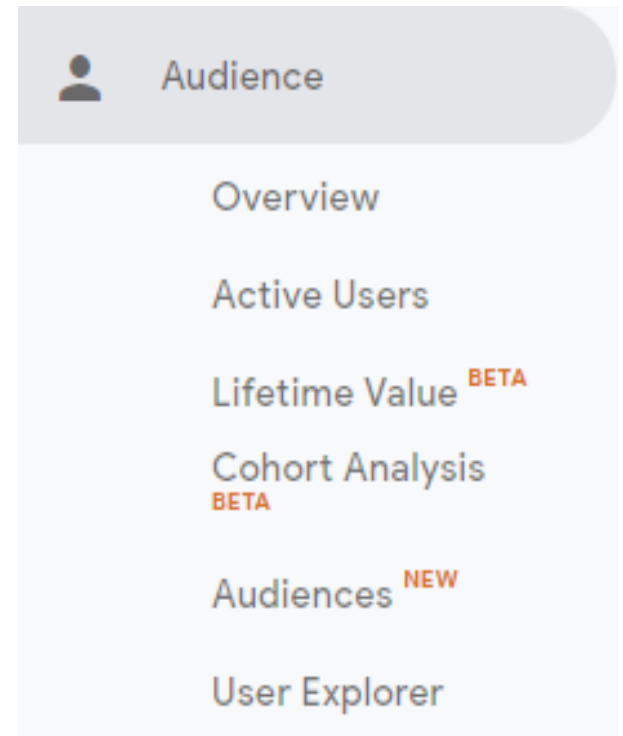
Demographics & Interest
[age, gender, interests]

The Demographics and Interest sections include Overview reports, along with new Age, Gender, and Interest Categories reports.

- They allow you to better understand who your users are.

- You can segment the rest of your Analytics data by these same characteristics so you can understand how converting and non-converting users differ (and many other such comparisons).

- These are the same demographics & interest categories used to target ads on the Google Display Network. Use these insights about your users to refine your ad campaign strategies.

- Not all of your users may have demographics associated with them, so these reports may only represent a subset of your users and may not be representative of your overall site composition.

Age — 100% of total sessions

18-24	25-34	35-44	45-54	55-64	65+
27.50%	33.50%	15.50%	12.50%	5.50%	5.50%
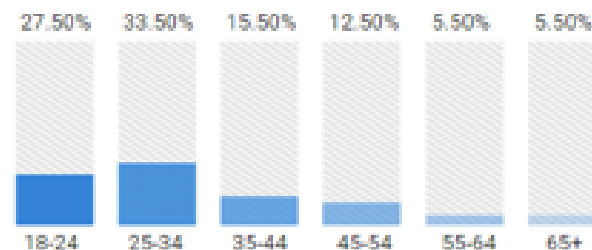
Gender — 100% of total sessions

45.85% Female

54.15% Male
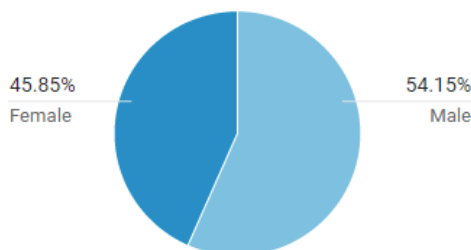
Interest Category — 100% of total sessions

5.49%	Sports/ Individual Sports/ Running & Walking
3.94%	Computers & Electronics/ Consumer Electronics/ Electronic Accessories
3.05%	Sports/ Individual Sports/ Cycling
2.96%	Food & Drinks/ Cooking & Recipe/ Soups & Stews
2.45%	Travel/ Tourist Destinations/ Historical Sites & Buildings

113
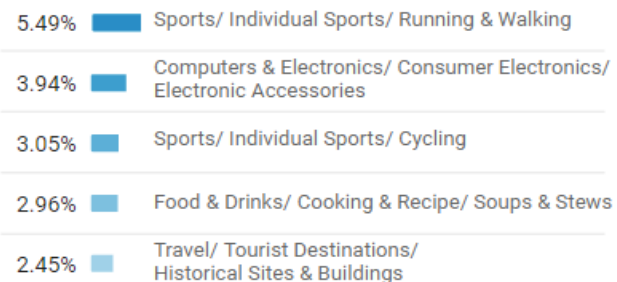
Demographics & Interest (con't)

- Estimated accuracy for "known" sites is 80 -85%
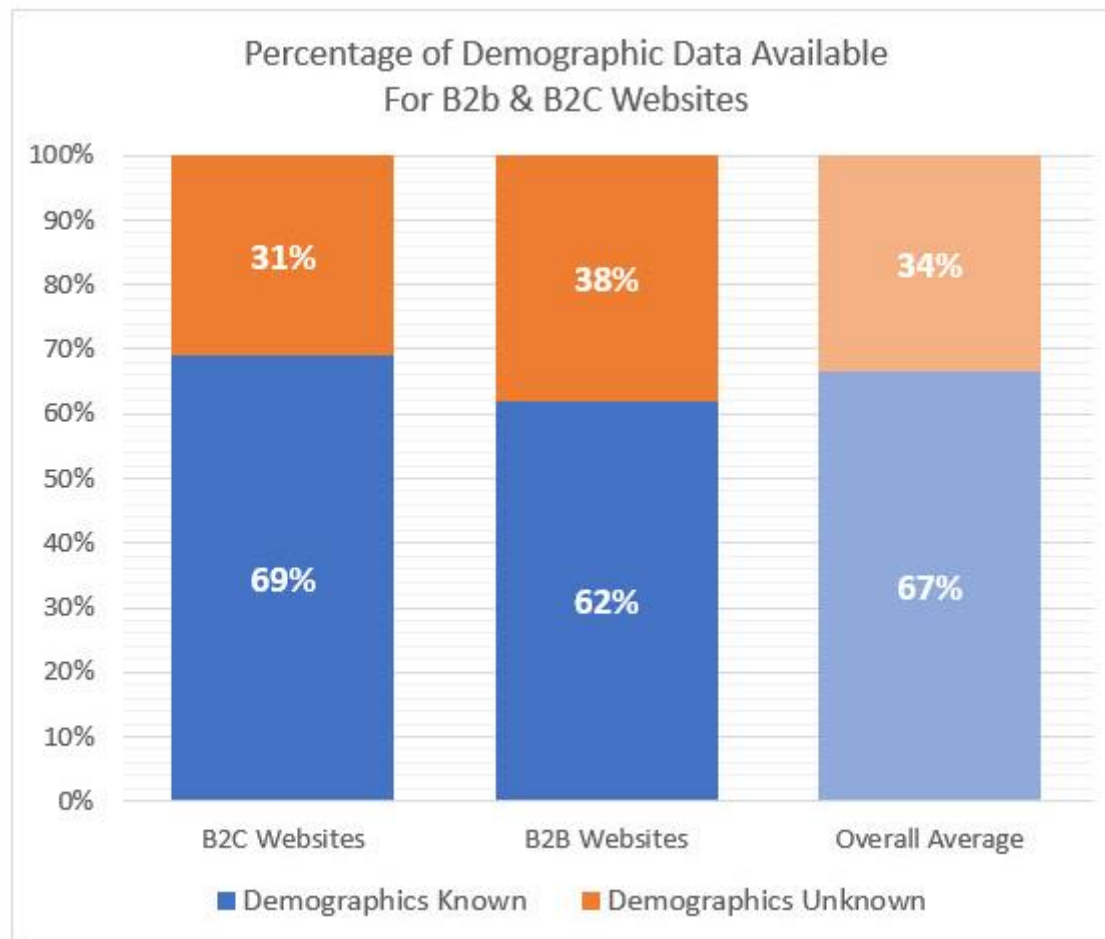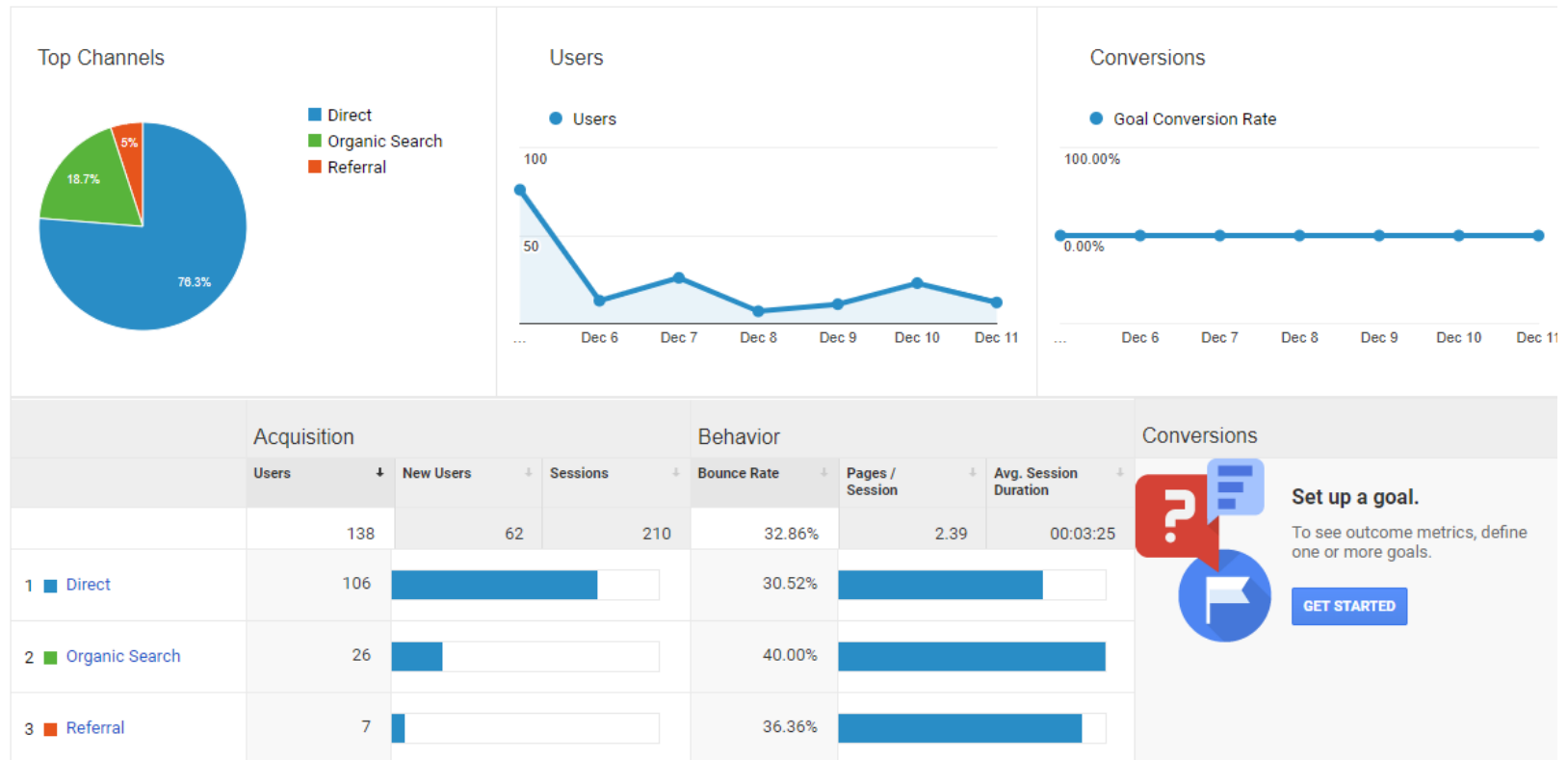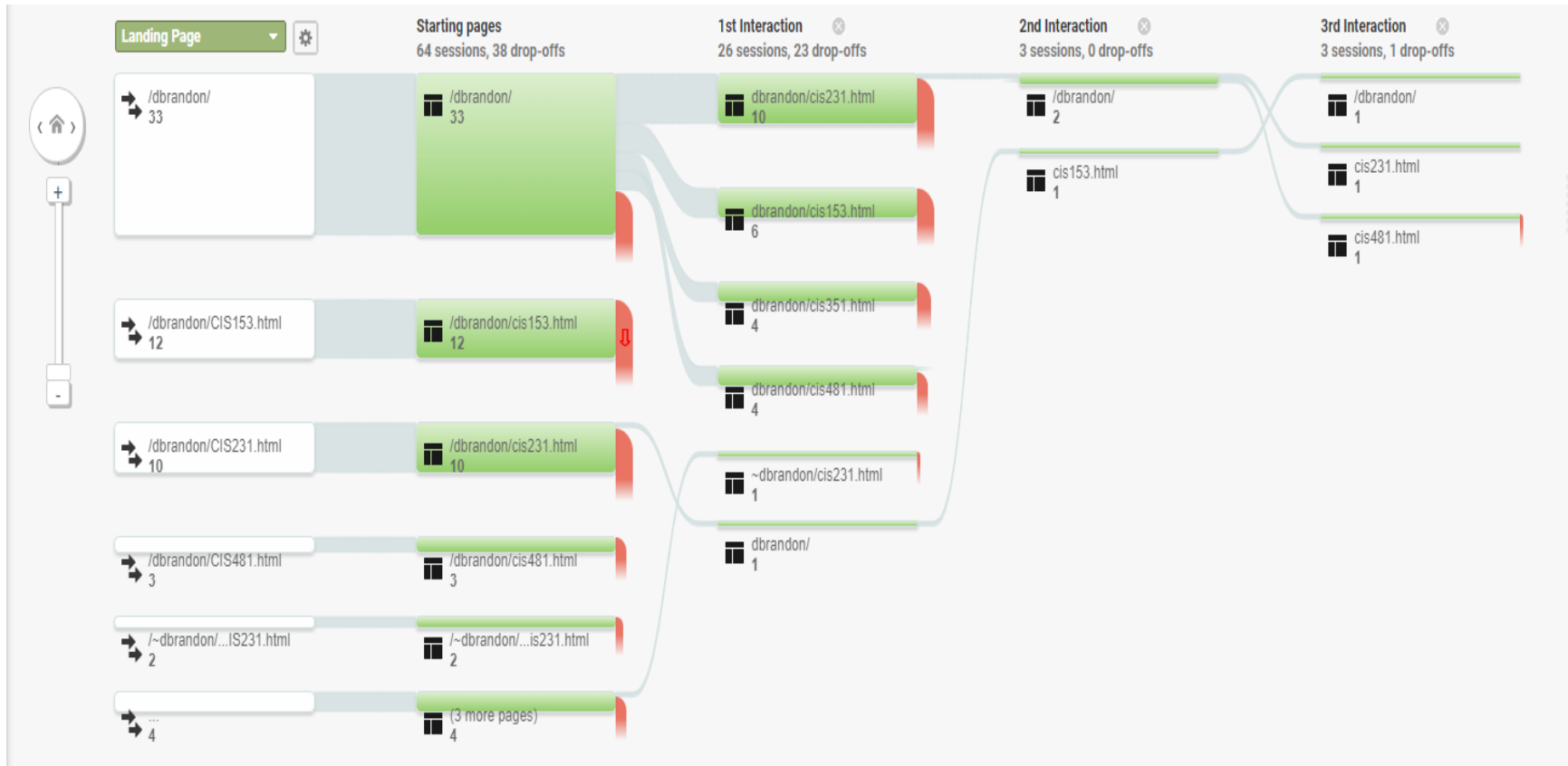
Percentage of Demographic Data Available For B2b & B2C Websites

Acquisition

Copyright Dan Brandon, PhD, PMP

User Flow

Copyright Dan Brandon, PhD, PMP

Site Speed

Copyright Dan Brandon, PhD, PMP
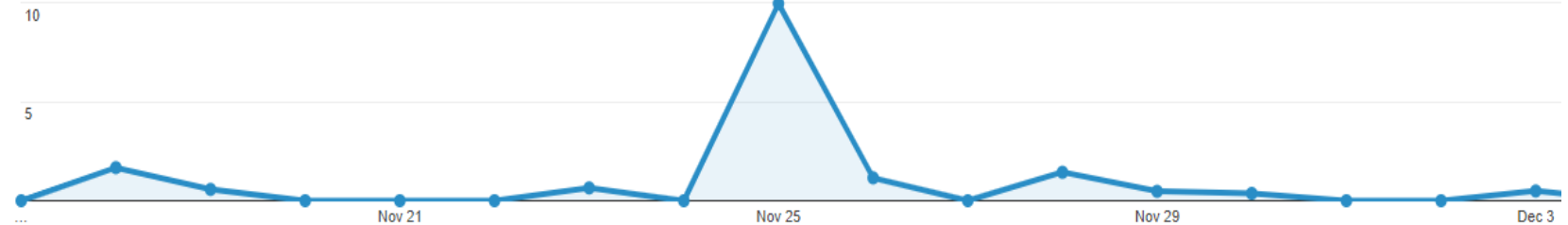
Page Timings

Page	Pageviews ▼ ↓	Avg. Page Load Time (sec) ▼ (compared to site average)
	1,622 % of Total: 100.00% (1,622)	**0.83** Avg for View: 0.83 (0.00%)
/dbrandon/	531	10.03%
/dbrandon/CIS153.html	340	-59.33%
/dbrandon/CIS231.html	245	87.76%
/dbrandon/CIS481.html	219	19.28%
/dbrandon/CIS351.html	119	-100.00%
/~dbrandon/CIS231.html	63	36.70%
/~dbrandon/	44	-100.00%
/~dbrandon/CIS153.html	21	-100.00%
/~dbrandon/CIS481.html	19	-100.00%
/	14	-100.00%

Show rows: 10 ▼   Go to: 1   1 - 10 of 11 ‹ ›

Page Speed Analysis
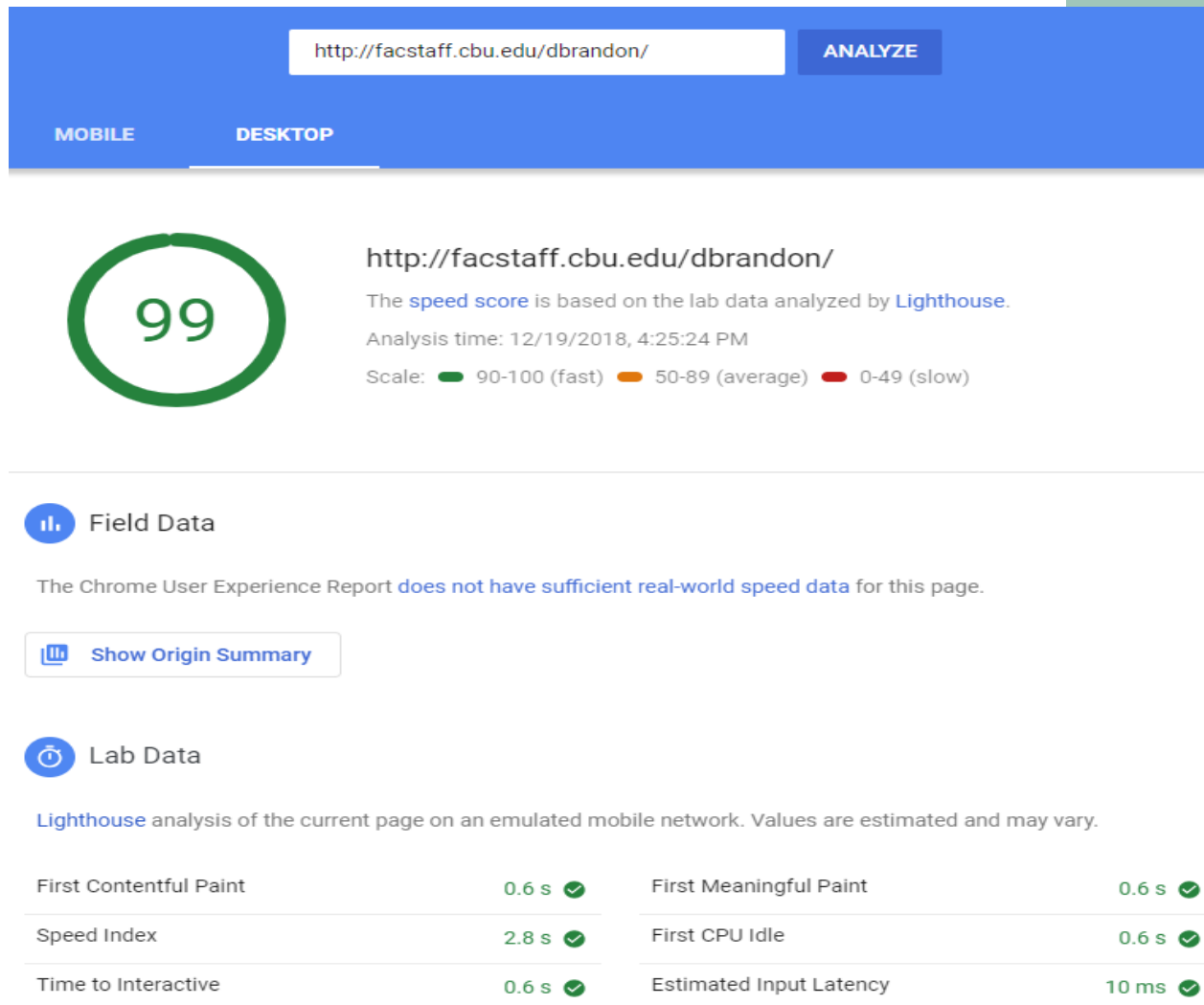
■ Today about what % of a US company's assets are intangible ?

Do not look ahead !

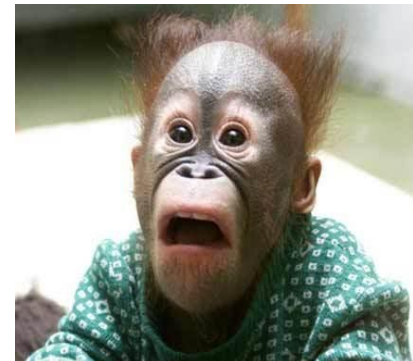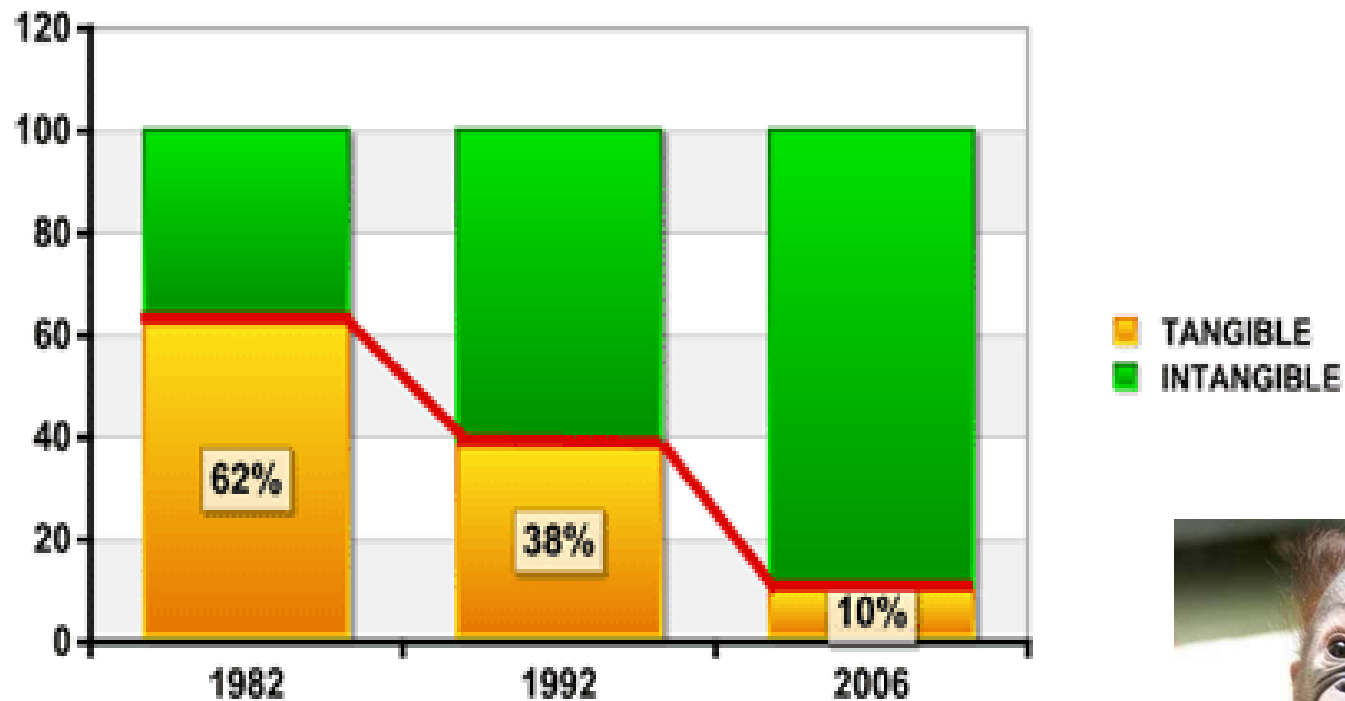# 30 to 90% in 20+ years !
[one generation]

Assets evolution value in the company.

Knowledge

- Knowledge is very distinct from data and information, and provides a higher level of meaning about that data and information
- The *ability to act* is an integral part of being knowledgeable

Having knowledge implies that it can be exercised to solve a problem, whereas having information does not

Knowledge Management

- Knowledge Management (KM) is a process that helps organizations identify, select, organize, disseminate, and transfer important information and expertise that are part of the <u>organization's memory</u>

- Knowledge is not subject to diminishing returns; when it is used, it is not consumed -- Its consumers can add to it, thus increasing its value

- <u>Knowledge is today's biggest corporate asset !</u>

Knowledge Driven Business

- From the industrial revolution until about 1980 the business landscape was mainly <u>product driven (better products prevailed)</u>
- Then from about 1980 until 2000, most business was primarily <u>market driven (better advertising sold products)</u>
- Today business is becoming <u>knowledge driven:</u>
  - customers need an additional reason to buy, and a company's knowledge about how best to use/deploy the product or service is becoming of paramount importance
- *Ultimately, an organization's only sustainable competitive advantage lies how its employees apply knowledge to business problems*

Why Manage Knowledge

- **Information and knowledge have become the fields in which businesses compete !!!**
- Several important factors include:
  - Sharing Best Practices
  - Globalization
  - Rapid Change
  - Downsizing
    - Keep knowledge as people come and go !
  - Managing Information and Communication Demand
  - Knowledge Embedded in Products
  - Sustainable Competitive Advantage

Tacit versus Explicit Knowledge

- **Tacit knowledge** is knowing more than one can tell
  - Memorandum explaining processes
  - Riding a bicycle, etc.
  - Personal and context specific
  - Hard to formalize and communicate
- **Explicit knowledge** is easily collected, organized, and communicated

Examples of Explicit and Tacit Knowledge

Tacit Knowledge

- Knowing how to identify the key issues necessary to solve a problem
- Applying similar experiences from past situations
- Estimating work required based on intuition & experience
- Deciding on an appropriate course of action

Explicit Knowledge

- Procedures listed in a manual
- Books and articles
- News reports and financial statements
- Information left over from past projects
- Estimation formulas

Example: Product Knowledge

- Product differentiation:
  - Faster (to market)
  - Cheaper
  - Better (quality)
    - Embedded knowledge ← Strategic Advantage
      - Directions
        - Including how to best use product in your business
      - Service
        - Installation, support, etc.

Summary

- Supply chains exist in both service and manufacturing organizations
  - CRM systems help organizations make better use of data and knowledge to understand their customers
  - KM systems are used to improve efficiency of CRM systems
  - ERP systems use a unified database to store data for various functions

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- **Selling the Sales Force on Automation** by Mark Cotteleer, Edward Inderrieden, and Felissa Lee

- **Understanding sales force automation outcomes: A managerial perspective [An article from: Industrial Marketing Management]** by A.J. Bush, J.B. Moore, and R. Rocco

- **CRM at the Speed of Light, 3e** by Paul Greenberg

- **Microsoft CRM For Dummies (For Dummies (Computer/Tech))** by Joel Scott and David Lee

Homework

- Textbook Chapter 11
- Quiz on this lesson and that chapter
- Individually for ABC; what enterprise systems does ABC need:
  - Enterprise systems
    - TPS and source data automation
    - MIS
    - CRM
    - ERP
    - EDI