

# Management Information Systems

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# Enterprise Information Systems, ERP and CRM

# Enterprise Systems

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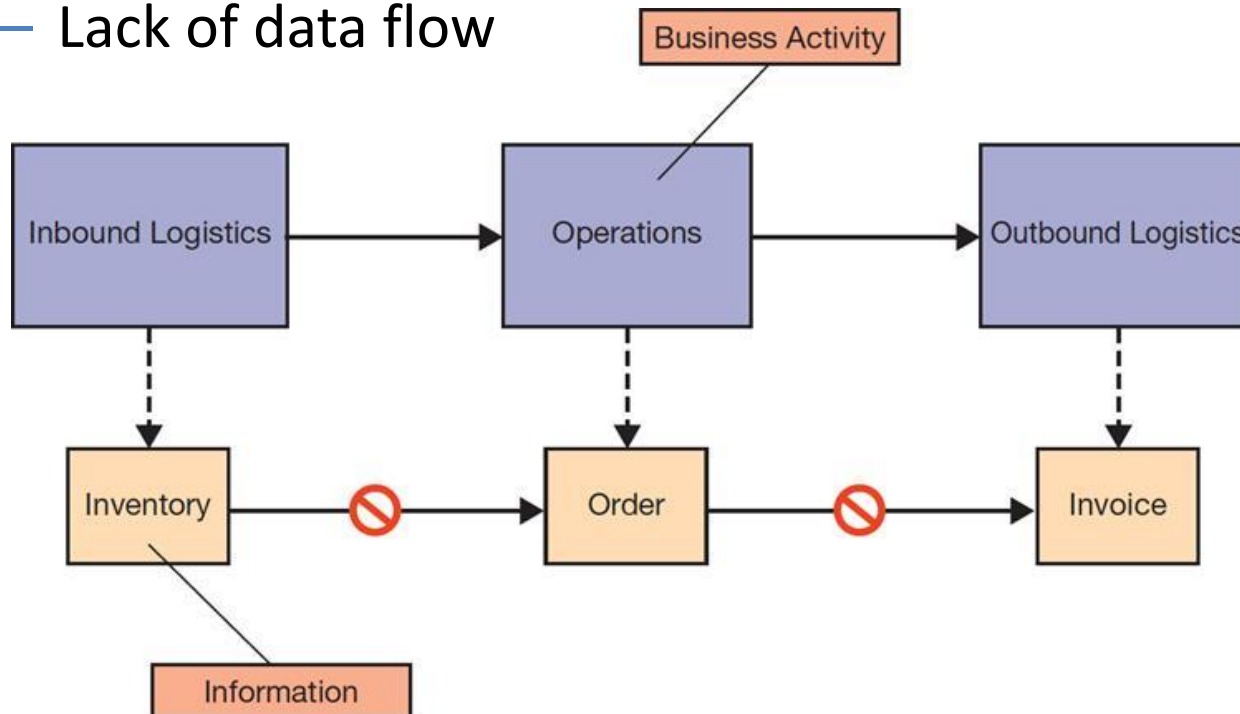
- **Enterprise Information System (EIS):**

Any kind of information system which improves the functions of an enterprise business processes by integration.

- High quality of service
- Deal with large volumes of data
- Allow data sharing among different functional areas within a company
- Support large and complex organization or enterprise

# Enterprise Systems: Standalone

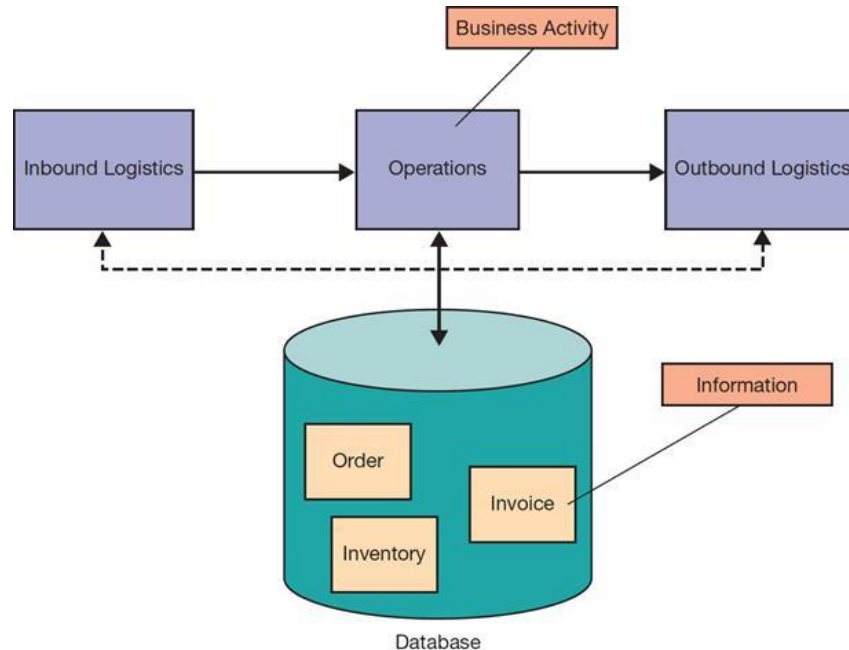
- Standalone Applications (Legacy Systems)
  - Proprietary systems from multiple vendors on a department-by-department or process-by-process basis.
  - Not designed to communicate with other systems
  - Information could not be aggregated without manual labor
  - Lack of data flow



# Enterprise Systems: Integrated

- Enterprise System (Integrated Suite)

- All departments are integrated into one system
- No duplication of data
- Common user interface
- Seamless information sharing
- Streamlined operations and enhanced efficiency



# Enterprise Resource Planning



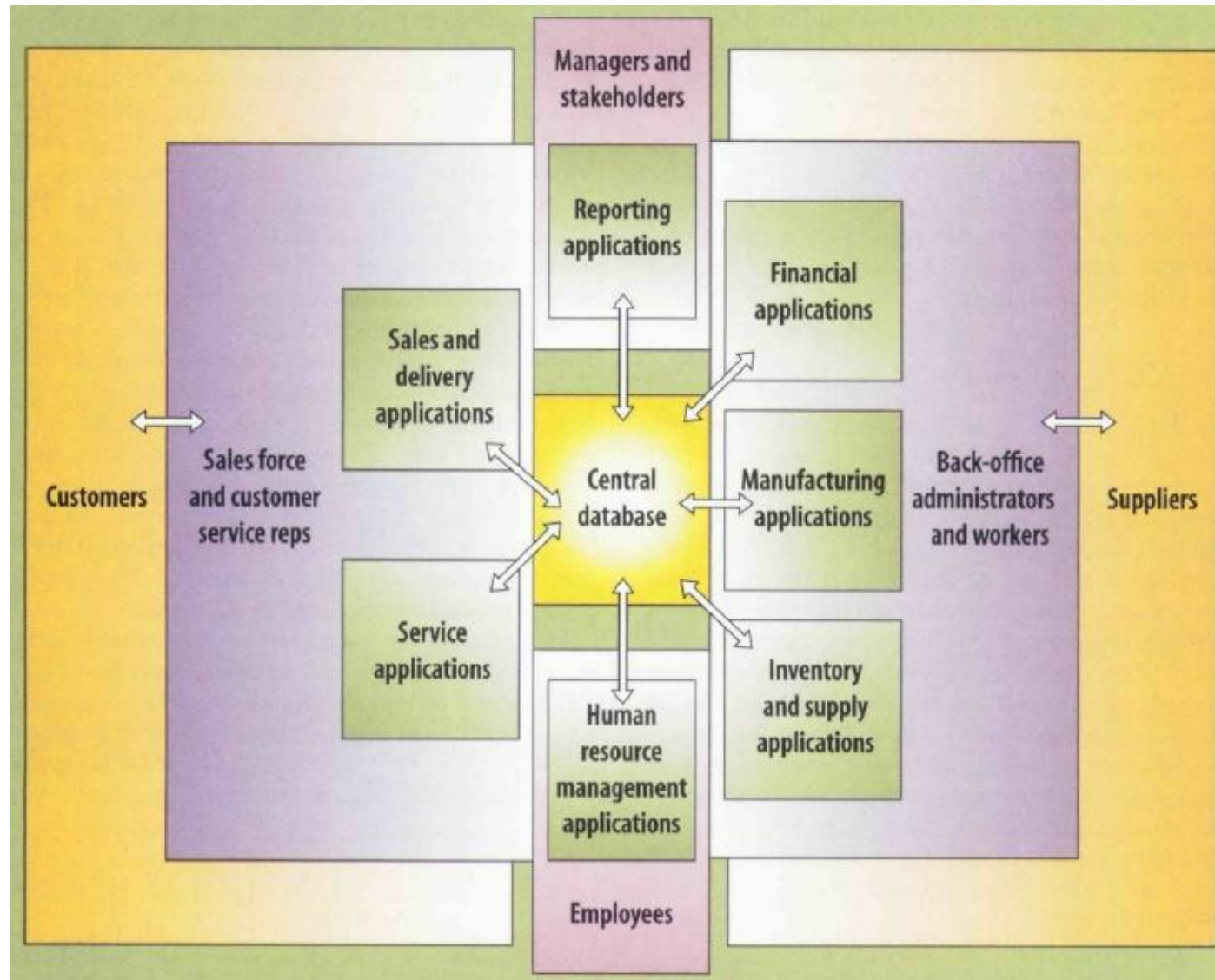
- **Enterprise resource planning (ERP):** Method of efficiently utilizing people, hardware and software to increase productivity and profit, thus simplifying a company's business processes
  - Merge each of the company's key operations into one software system
  - Internally and Externally Focused System integration
  - Manage business processes/functions via various modules
  - Automation and integration of business processes
  - Data and information sharing
  - Incorporate and implement "*best practices*"

# ERP: Before and After

**TABLE 1-2** Before and After ERP: Systems Standpoint

|                     | <i>Before ERP</i>   | <i>After ERP</i>  |
|---------------------|---|---|
| Information systems | Stand-alone systems   | Integrated systems  |
| Coordination        | Lack of coordination among business functions (e.g., manufacturing and sales)   | Supports coordination across business functions                         |
| Databases           | Non-integrated data; data have different meanings (e.g., customer); inconsistent data definitions                     | Integrated data; data have the same meaning across multiple functions   |
| Maintenance         | Systems are maintained on a piecemeal basis; inconsistencies result; it is costly to maintain separate legacy systems | Uniform maintenance; changes affect multiple systems                    |
| Interfaces          | Difficult to manage interfaces between systems  | Common interfaces across systems  |
| Information         | Redundant, inconsistent information   | Consistent real-time information (e.g., about customers, vendors)       |
| System architecture | May not be state of the art   | Relies on a client-server model   |
| Processes           | Incompatible processes  | Consistent business processes which are based upon an information model |
| Applications        | Disparate applications (e.g., many different purchasing systems)  | Single applications (e.g., a common purchasing system)                  |

# ERP: Anatomy



<https://hbr.org/1998/07/putting-the-enterprise-into-the-enterprise-system>

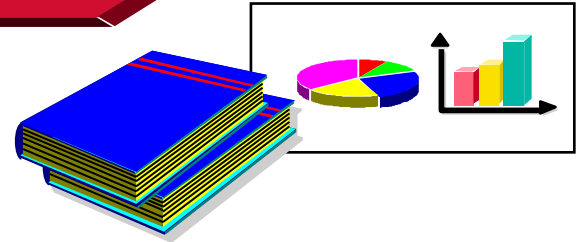


# ERP: Business Process Overview



Financial Controlling

Cost Controlling



Sales

Sales order

Initial  
Contact

Customer  
order

Inventory  
Sourcing

Delivery

Invoicing

Customer  
payment

Production

SOP

MPS

MRP

Planned  
order

Prod.  
order

Prod.  
control

Purchasing

Purchase  
requisite.

Vendor  
selection

Purch.  
order

Goods  
issue

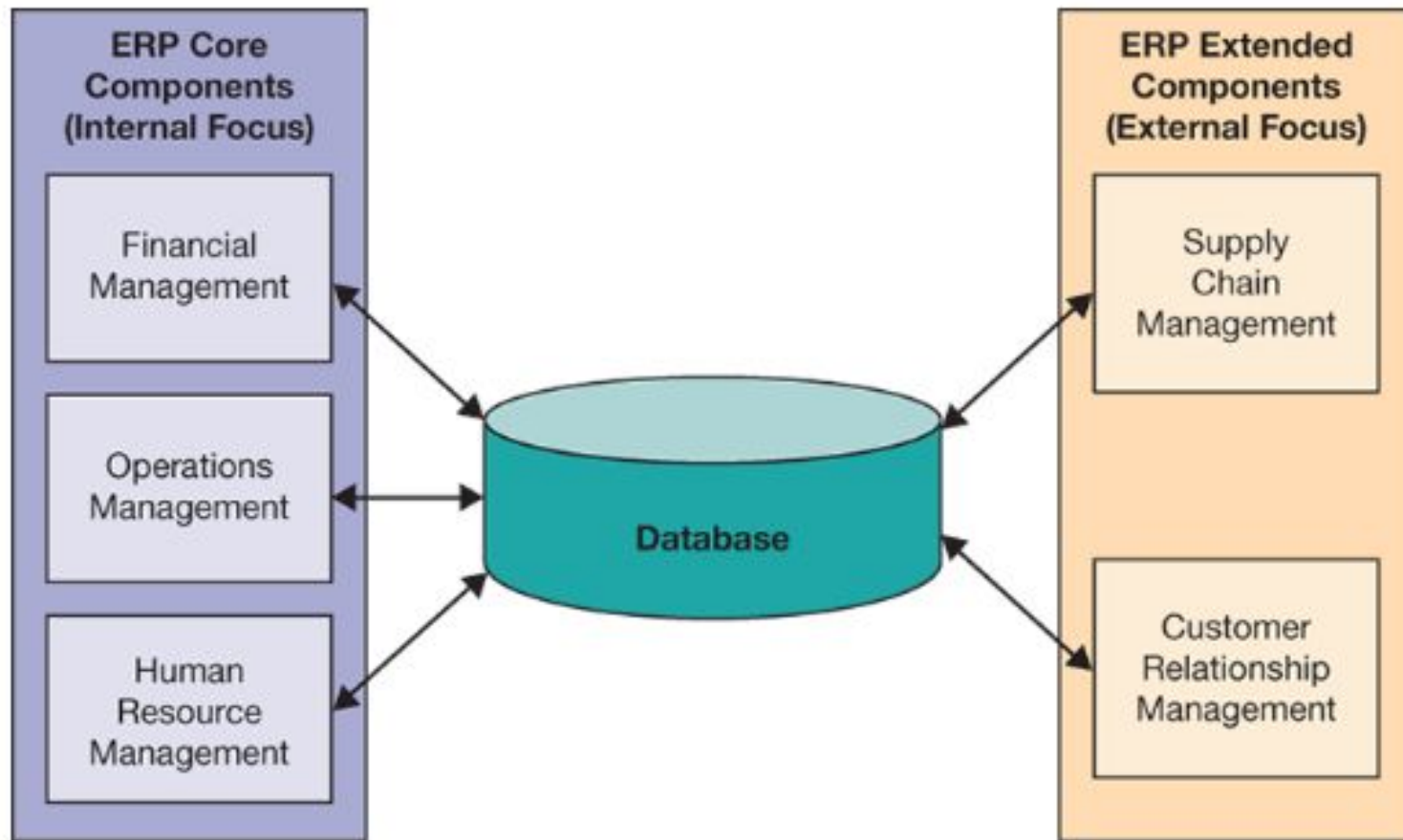
Invoice  
verificat.

Vendor  
payment

Logistics Controlling

Sales, Production, Purch., Warehouse Mgmt

# ERP: Components



# ERP: Components



- **Core Components** support the important internal activities for producing its products and services
  - Financial Management
    - Accounting, financial reporting, performance management, and corporate governance
  - Operations Management.
    - Inbound and outbound logistics, product development, manufacturing, and sales and service
  - Human Resource Management
    - Employee recruitment, performance reviews, payroll
- **Extended Components** support external activities for dealing with suppliers and customers
  - Supply chain management
  - Customer relationship management

# ERP: Components

## 6 MAIN COMPONENTS OF ERP SOFTWARE



**Human Resources**



**Customer Relationship  
Management**



**Business Intelligence**



**Supply Chain  
Management**



**Inventory Management**



**Financial Management**

# ERP: Reasons To Implement

## 1 Top Reasons for implementing ERP

Source: Panorama ERP Report



- 35% reported implementation costs of 1% to 3% of their organization's annual revenue
- 20% reported implementation costs of 3% to 5% percent of their organization's annual revenue.
- On average, organizations spend 6.5% of their annual revenue on their ERP project

<https://financesonline.com/erp-trends/>

<https://www.linkedin.com/pulse/erp-facts-statistics-trends-2017-k-c-pushye>

# ERP: Implementation Strategy

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- **Commercial Application Package**
  - Can be purchased and customized to meet the business requirements of a large number of organizations or a specific industry
  - Off-the-shelf (packaged) system.
- **Custom software**
  - Developed by contractors
  - Designed for a specific organization.

# ERP: Implementation Strategy

- Types of ERP Deployment



Cloud ERP



On-premise ERP



Hybrid ERP

## On-Premises vs. Cloud-Based ERP Solutions

# ERP: Implementation Strategy

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- **Cloud ERP**

- The software runs on a provider's cloud computing platform.
  - The maintenance of the system is handled by the provider

- **On-Premise ERP**

- The software is installed in your data center at the locations of your choice.
  - The installation and maintenance of the hardware and software is your staff's responsibility.



# ERP Trends



## New ERP Trends

- 1 Cloud Acceleration
- 2 Integration of AI and Other Intelligent Tech
- 3 Mobile Application
- 4 More Powerful Analytics
- 5 Support for Real-Time Data
- 6 More Involvement in Finance
- 7 More Attention to Digital Marketing
- 8 Personalized ERP Solutions
- 9 Increased ERP Adoption in Additive Manufacturing
- 10 IoT Integration

- **[Top 7 ERP Trends](https://financesonline.com/erp-trends/)**  
<https://financesonline.com/erp-trends/>



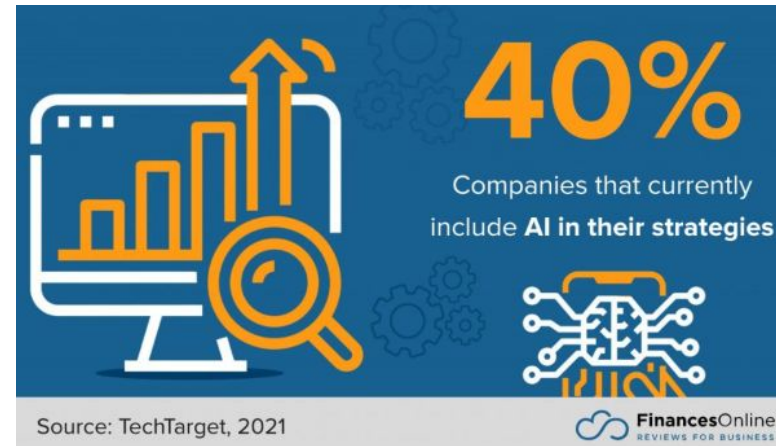
# ERP Trends

- Rise in Cloud ERP Solutions
  - SaaS ERP uses a modular approach
    - Greater control over the budgets
  - Lack of infrastructure required to run them
  - Scalable for growth
  - Pay for what you use
    - Most of the 22% of the companies that go for cloud-based ERP solutions appreciate cost savings as a result
  - Top-notch data protection
    - 94% businesses believe their security is better due to cloud services
  - More hybrid ERP systems in the future



# ERP Trends

- Integration of AI
  - New ways of analyzing Big Data
  - Reduce errors related to data processing
  - Automate routine processes
- Mobile Application
  - On-the-go access to data
  - Conduct business operations from any place, anytime
  - Productivity increase
  - Streamlined, accurate, and real-time capture of data straight from the field
  - Enhanced communication minimizes production delays.



# ERP Trends

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- More Attention to Digital Marketing
  - Marketing modules with real-time information on customer data and company processes.
  - Easier to consolidate the monitoring of digital marketing campaigns.
  - Social Media Integration
    - Social Media functionality
    - Integration of most of the social media platforms
- Internet of Things (IoT)
  - Gather, analyze, and process a vast amount of information through sensors
  - Solution to fast-track operations while reducing costs
    - Fewer manual input means less reliance on technicians and faster, more automated operation.
  - Increased efficiency
  - Introduction of new services and business models

# ERP: Major Vendors

- SAP Market Share  
20.3%
  - SAP Business One
    - [http://en.wikipedia.org/wiki/SAP\\_Business\\_One](http://en.wikipedia.org/wiki/SAP_Business_One)
    - <http://www.sap.com/solutions/business-suite/erp/demos/index.epx>
- Oracle e-Business Suite 13.9%
  - PeopleSoft
    - <https://en.wikipedia.org/wiki/PeopleSoft>
    - <https://www.oracle.com/applications/peoplesoft/>
- Microsoft 9.4%
  - Microsoft Dynamics
    - [https://en.wikipedia.org/wiki/Microsoft\\_Dynamics](https://en.wikipedia.org/wiki/Microsoft_Dynamics)
    - <https://dynamics.microsoft.com/en-us/>

# ERP: Other Vendors

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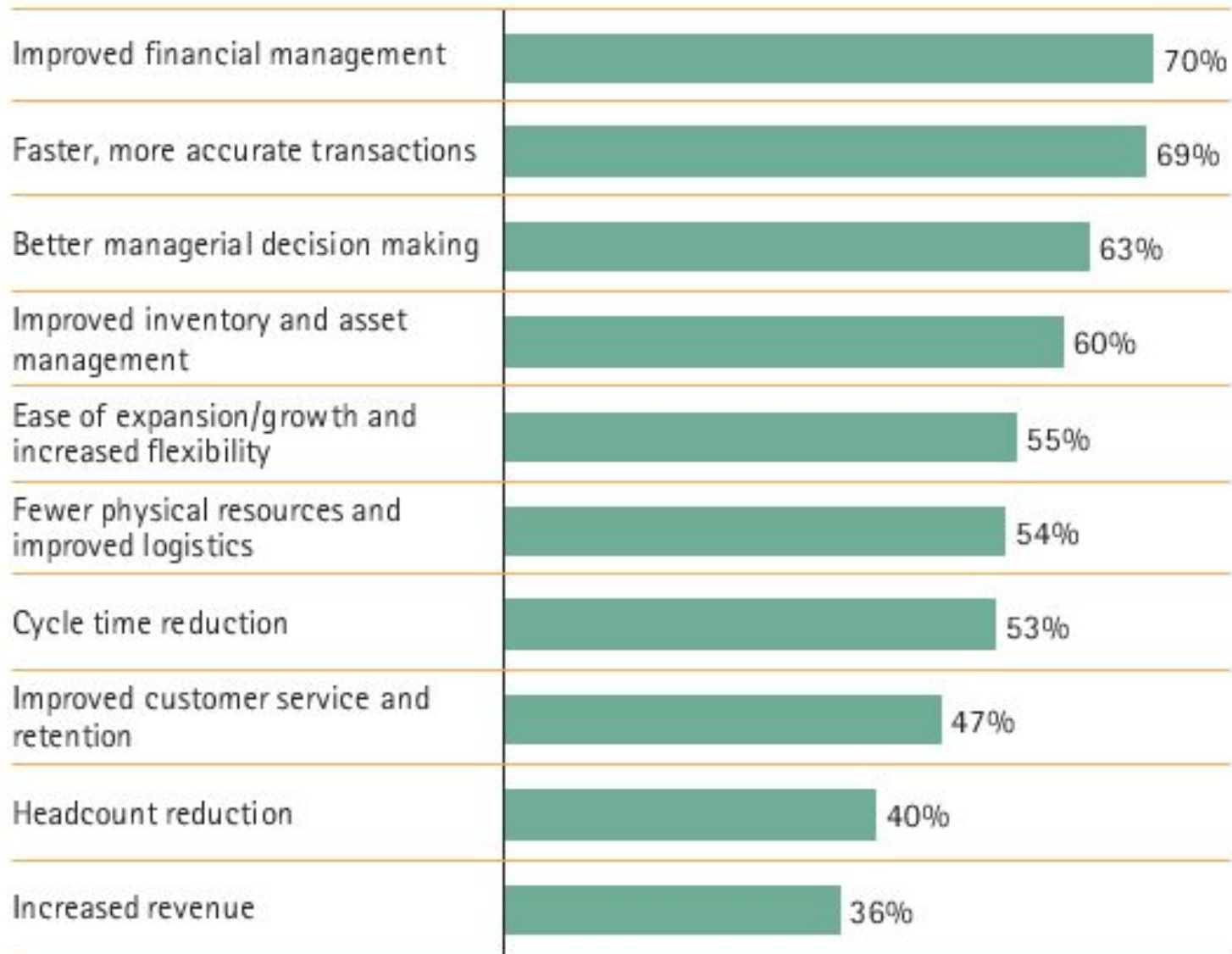
- QAD: Providing innovative enterprise software and services for global manufacturers
  - <http://www.qad.com/erp/>
- Salesforce.com for CRM
  - Software as a service (SaaS)
  - Cloud computing
    - <http://www.salesforce.com>
- Oracle NetSuite
  - <http://www.netsuite.com/portal/home.shtml>
- QuickBooks
  - <http://quickbooks.intuit.com/index.jsp>

# ERP: Open Source Vendors

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- Flexible, feature-rich, and cost-effective
- Open Source ERP Systems
  - Ofbiz Apache\*
  - Dolibarr
  - Odoo
  - Weberp\*
  - Xtuple

# ERP Implementation: Benefits





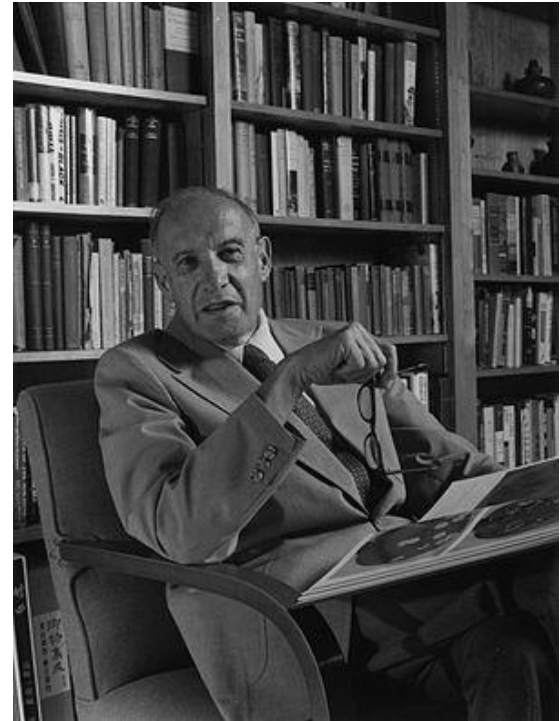
# Customer Relationship Management (CRM)

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**“The purpose of a business is to get and keep customers.”**

**- Peter Drucker**

[CRM vs ERP - What's the Difference?](#)



# Customer Relationship Management

- The measures an organization takes to

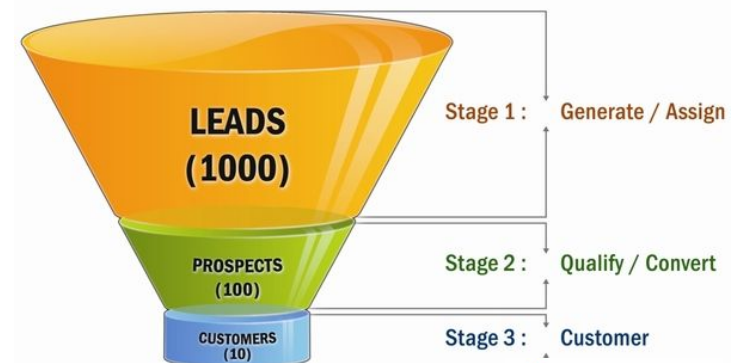
- Identify,
- Select,
- Acquire,
- Work with,
- Retain
- Grow  
its customers



- Companies spend 2 to 20 times as much finding new customers as they do keeping old ones.

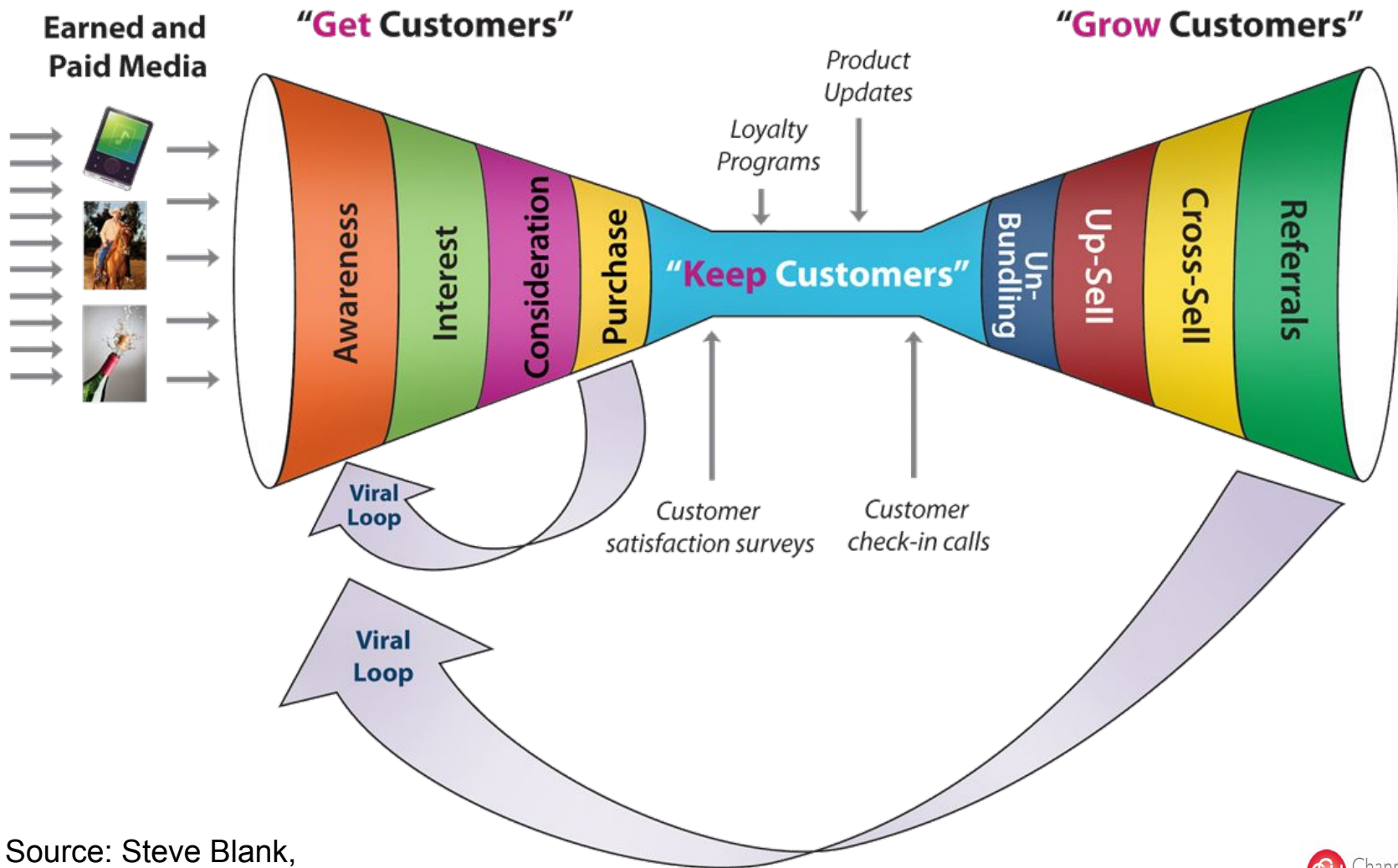
# CRM: Objectives

- The right offer
  - Products or services
- To the right person
  - Target marketing
- At the right time
  - Spacing outbound calls
- Through the right channel
  - Direct vs. channel
- Via appropriate media
  - Phone, email, Web



# CRM: Objectives

- Get, Keep, and Grow Customers



Source: Steve Blank,  
The Startup Owner's Manual.

# CRM System: Benefits

| Benefit                                    | Examples  |
|--|---|
| 24/7/365 operation                         | Web-based interfaces  |
| Individualized service                     | Learn how each customer defines product and service quality   |
| Improved information                       | Integrate all information for all points of contact   |
| Improved problem identification/resolution | Improved record keeping and efficient methods of capturing customer complaints help to identify and solve problems faster |
| Optimized processes                        | Integrated information removes information handoffs   |
| Improved integration                       | Information from the CRM can be integrated with other systems to streamline business processes                            |
| Improved product development               | Tracking customer behavior over time helps to identify future product and service offerings                               |
| Improved planning                          | Provides mechanism for managing and scheduling sales follow-ups   |

# CRM System: Strategy

- Successful CRM strategies need to integrate:

- Policies and Business Processes

- Reflect a customer-focused culture

- Customer Service

- Quality, satisfaction, enhanced customer experience

- Employee Training

- For employees from all areas

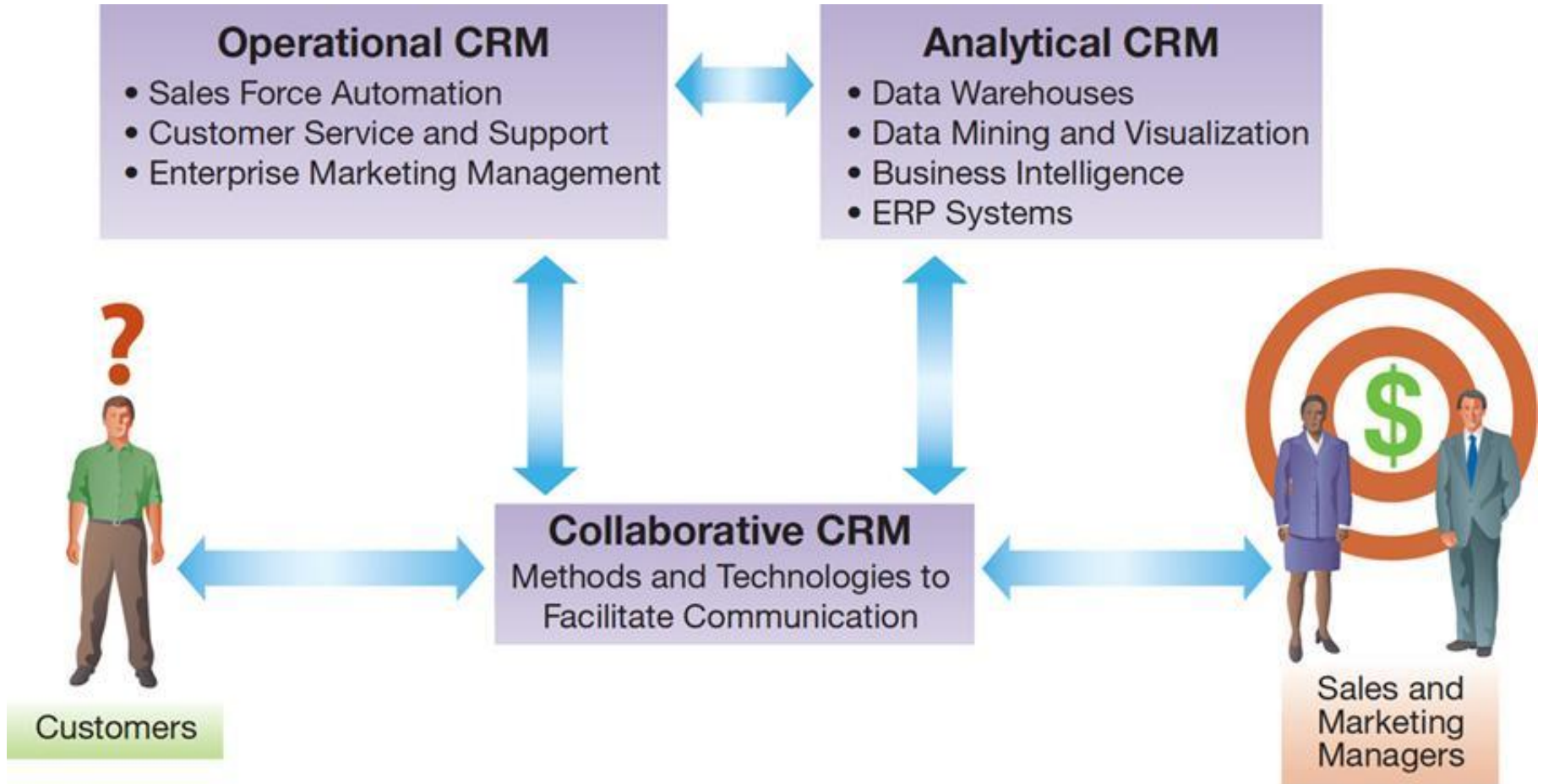
- Data Collection, Analysis, and Sharing

- Track all aspects of the customer experience



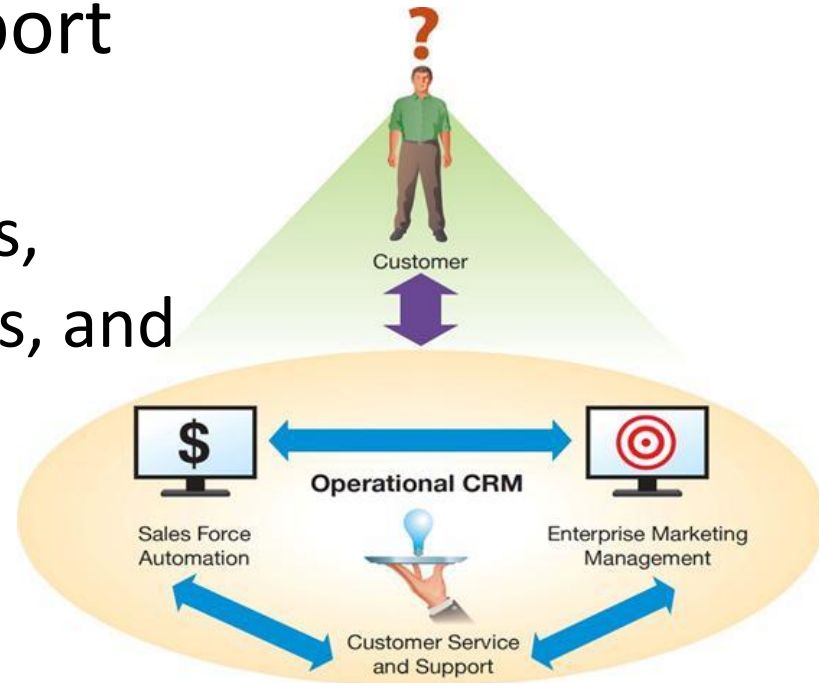


# CRM System: Architecture



# Operational CRM

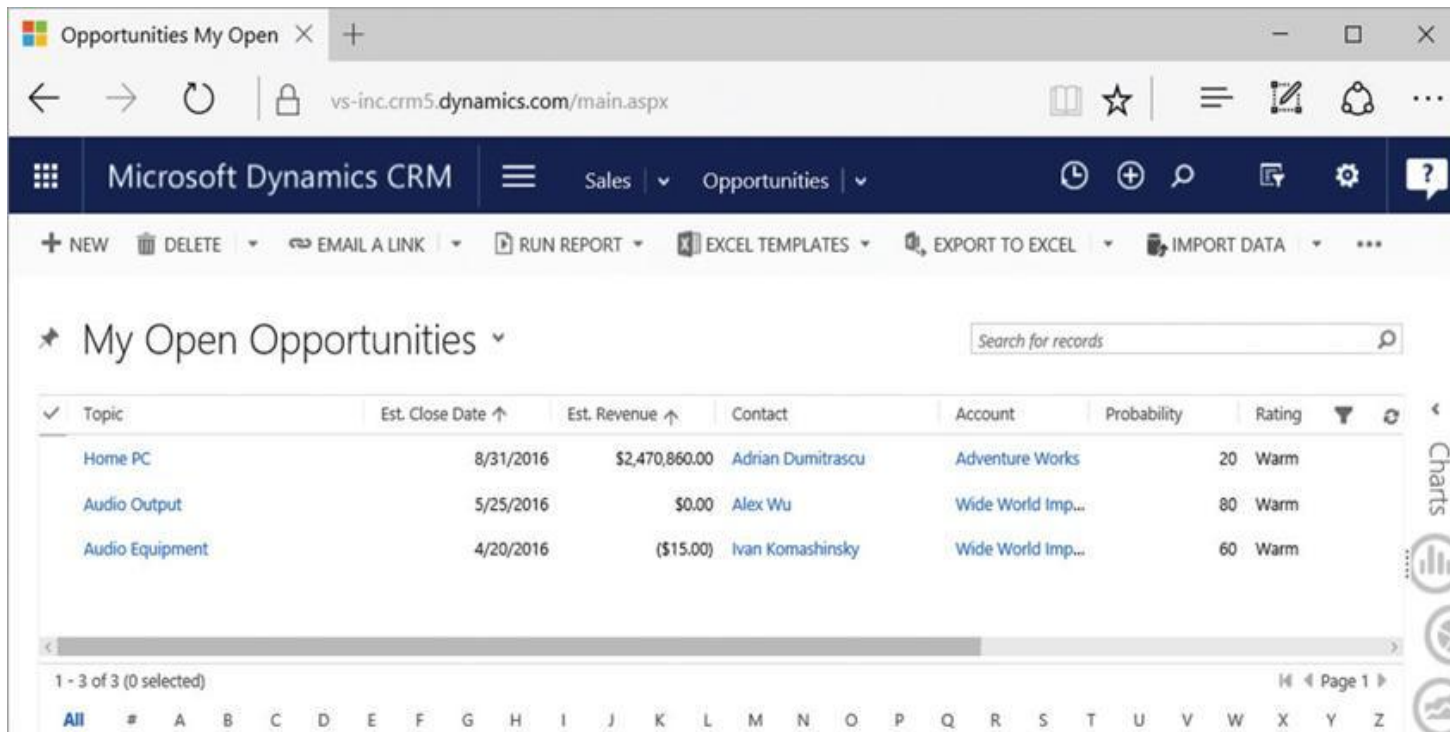
- Sales Force Automation (SFA)
  - Supports day-to-day sales force activities
- Customer Service and Support (CSS)
  - Automates service requests, complaints, product returns, and information requests
- Enterprise Marketing Management (EMM)
  - Improves the management of promotional campaigns





# Operational CRM: Sales Force Automation

- SFA
  - Allow more time to be spent with customers,
  - Reduce errors
  - Ensuring that leads are followed up



The screenshot displays the Microsoft Dynamics CRM 2016 web interface. The browser address bar shows 'vs-inc.crm5.dynamics.com/main.aspx'. The navigation pane on the left includes 'Microsoft Dynamics CRM', 'Sales', and 'Opportunities'. The main content area is titled 'My Open Opportunities' and contains a table with the following data:

| Topic           | Est. Close Date ↑ | Est. Revenue ↑ | Contact           | Account           | Probability | Rating |
|-----------------|-------------------|----------------|-------------------|-------------------|-------------|--------|
| Home PC         | 8/31/2016         | \$2,470,860.00 | Adrian Dumitrascu | Adventure Works   | 20          | Warm   |
| Audio Output    | 5/25/2016         | \$0.00         | Alex Wu           | Wide World Imp... | 80          | Warm   |
| Audio Equipment | 4/20/2016         | (\$15.00)      | Ivan Komashinsky  | Wide World Imp... | 60          | Warm   |

At the bottom of the table, it indicates '1 - 3 of 3 (0 selected)' and 'Page 1'. The interface also includes a search bar, various action buttons (NEW, DELETE, EMAIL A LINK, RUN REPORT, EXCEL TEMPLATES, EXPORT TO EXCEL, IMPORT DATA), and a 'Charts' sidebar on the right.

**Source:** Dynamics C R M 2016, Windows 10, Microsoft Corporation.

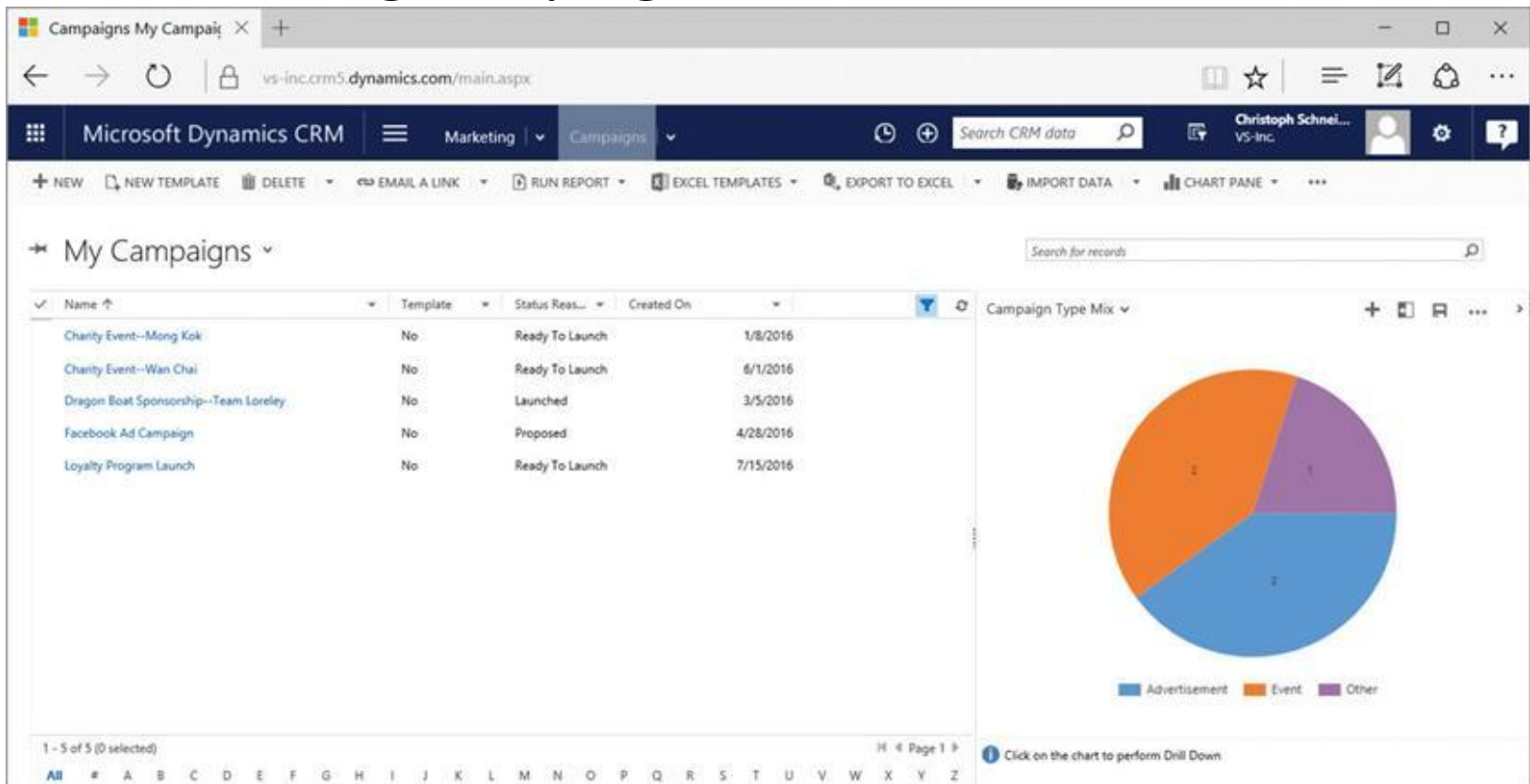
# Operational CRM: Customer Service and Support

- CSS allows customers to use a variety of self-service and assisted technologies to interact with the organization
  - Faster response times
  - Increase of first-contact resolution rates
  - Improved productivity



# Operational CRM: Marketing Management

- EMM
  - Manage the efficient and effective execution of marketing campaigns across different media



**Source:** Dynamics C R M 2016, Windows 10, Microsoft Corporation.

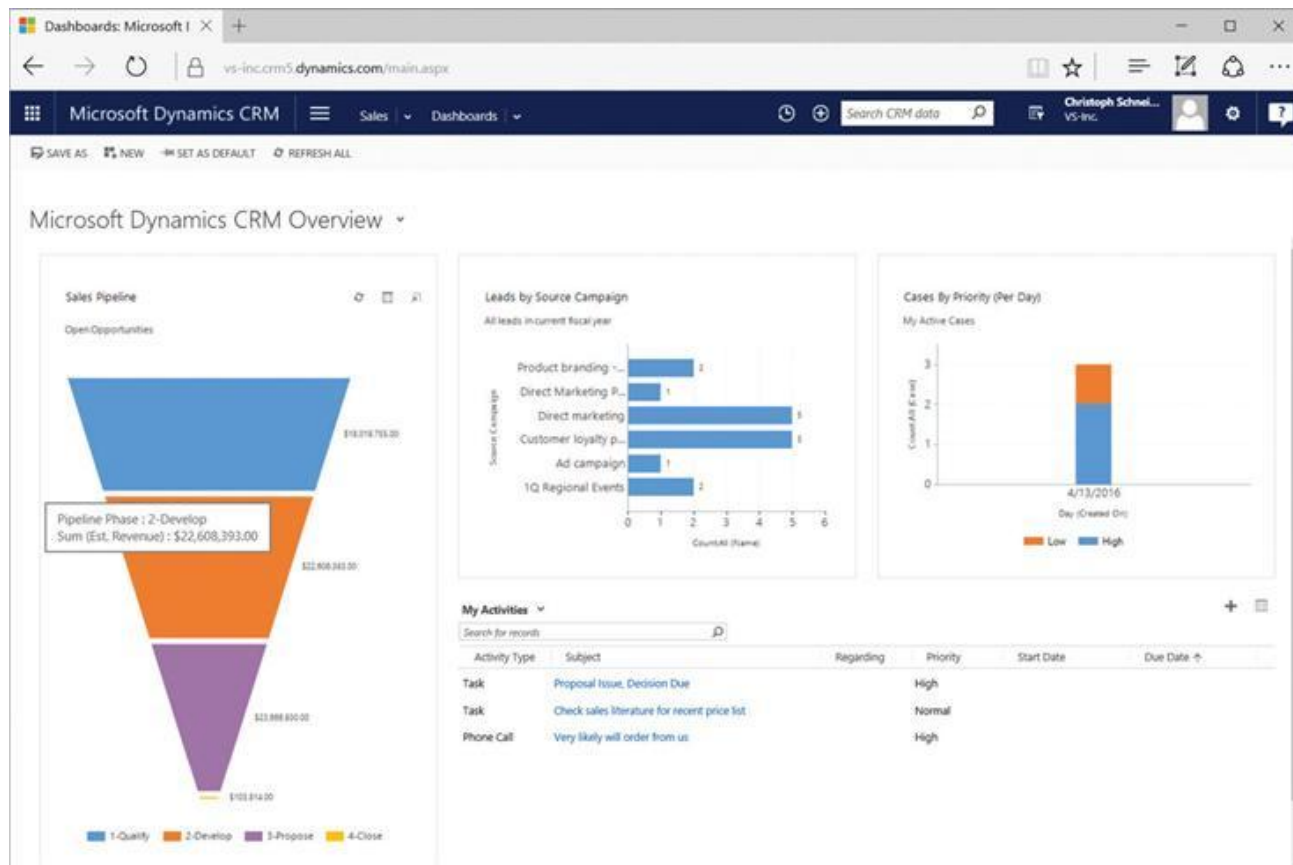
# Analytical CRM

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- Analyzing customer behavior and perceptions in order to provide the business intelligence to identify new opportunities and to provide superior customer service
- Key Analytical Technologies
  - Data mining
  - Decision support
  - Other business intelligence technologies

# Analytical CRM: Digital Dashboards

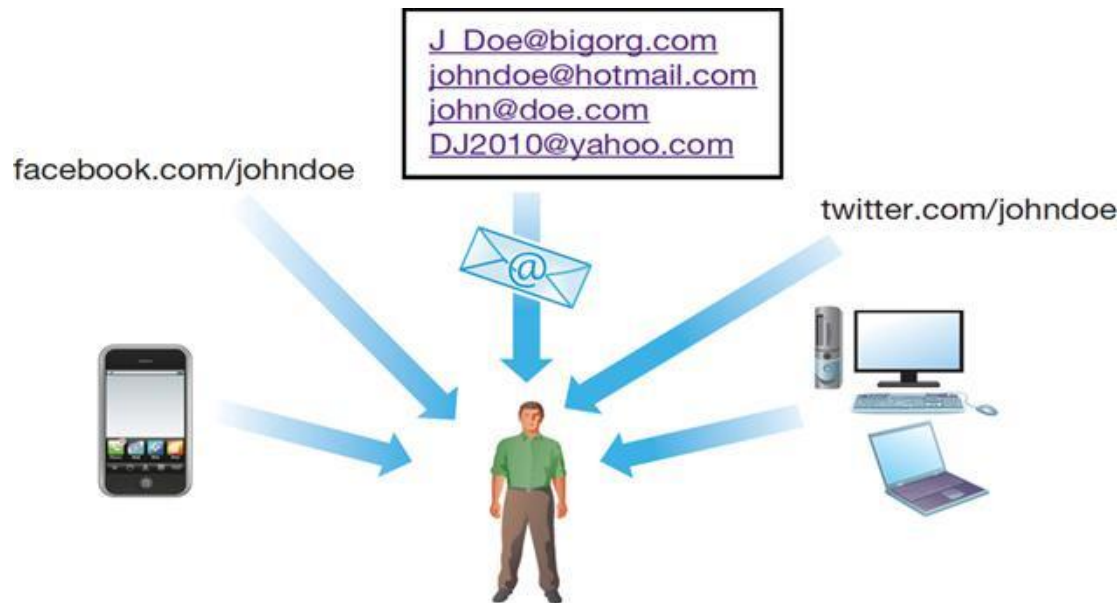
- Allow managers to rapidly see the status of KPIs and evaluate CRM performance metrics



Source: Dynamics C R M 2016, Windows 10, Microsoft Corporation.

# Analytical CRM: Online Identities

- Identity management integrates these so a clear and complete picture of the customer emerges from the data



Name: John Doe  
Age: 46  
Address: 462 Main Street, Pullman, WA 99163  
Occupation: Sales Representative  
Employer: Bigorg, Inc.  
Spouse: Jane Doe

# Analytical CRM: Social Media Monitoring

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- **Social Media Monitoring:** Process of identifying and assessing the volume and sentiment of what is being said about a company, individual, product, or brand
  - Microsoft's Social Networking Accelerator
  - Google Alerts
  - Dell's Social Media Listening Command Center

# Collaborative CRM

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- Systems for providing effective and efficient communication with the customer from the entire organization
- Greater Customer Focus
  - Understanding customer history and current needs
- Lower Communication Barriers
  - Personnel have complete customer information
  - Personnel use customer-preferred communication methods
- Increased Information Integration
  - Personnel know prior and ongoing communication



# CRM Systems to Consider

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- CRM Software Examples
  - Pipedrive
  - Oracle NetSuite
  - HubSpot\*
  - Microsoft Dynamics 365 Sales
  - Monday CRM
  - Freshsales
  - Keap

# CRM System: Ethical Concerns

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- CRM provides a great deal of information about customers, some of which may be considered sensitive or private
- CRM systems may facilitate coercive sales practices
- Systems may categorize customers in a way customers take offense to
- Personalized communication may become too personal

# Discussion Question

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- What trends of ERP Systems are the most important for you Group business? Discuss at least two.

Sources:

Joseph Valacich, Christoph Schneider, *Information Systems Today: Managing in the Digital World*, 8th Edition

John Gallaugher, *Information Systems: A Manager's Guide to Harnessing Technology*, v. 7.0

Minder Chen, Ph.D., Management Information Systems Lectures