Cloud Computing

CHAPTER 2

PART A : WHO USES THE CLOUD?

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Who Uses the Cloud?

Cloud Computing has broad appeal for:

People operating at the individual level

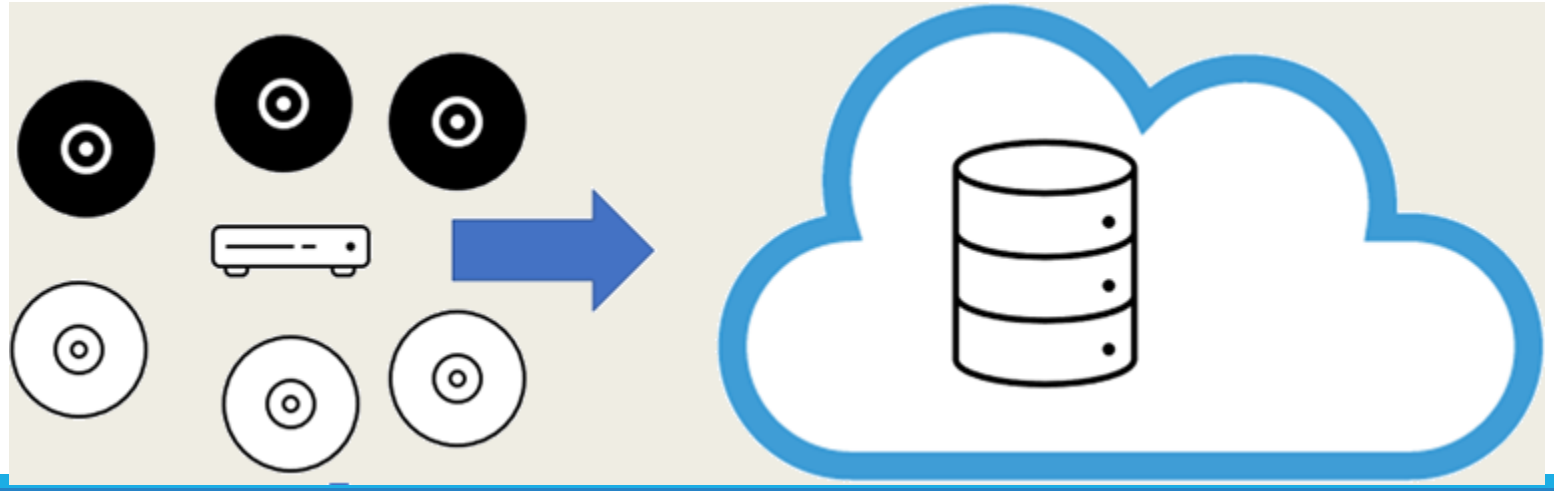
Employees of small and medium businesses

People in corporate environments

Individual Users

Personal storage of digital resources has grown tremendously

People store photos, videos, movies, music collections, eBooks, documents, family records, recorded television programs, digitized art, souvenirs, digital keepsakes, correspondence, text message streams, and countless other artifacts



Individual Motivations for Cloud Use

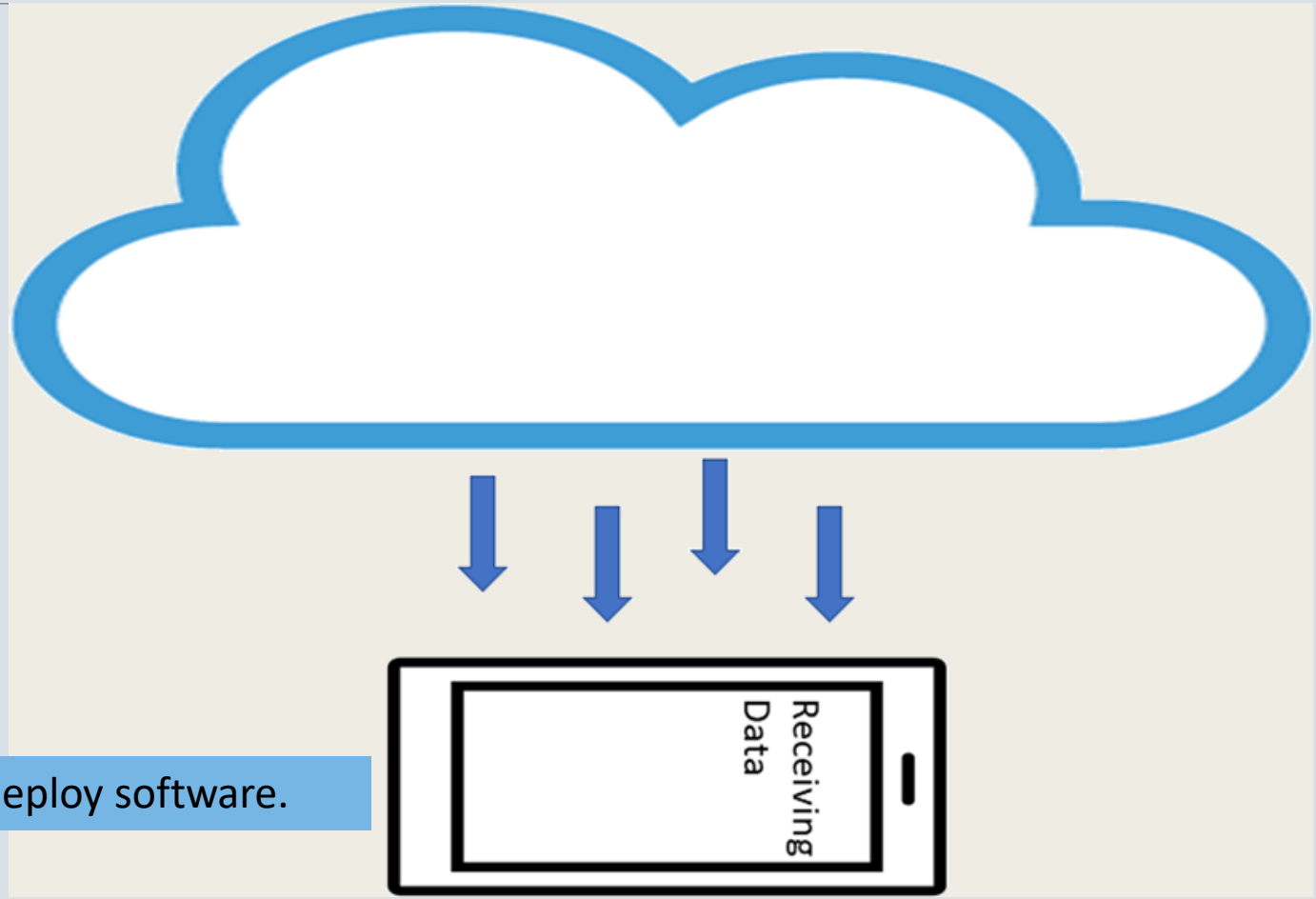
All digital resources handily stored in a single place

Provides backup for digital resources

Cloud storage separates data from fragile digital devices

Safeguards valuable digital holdings.

Provides access to software and services for individuals



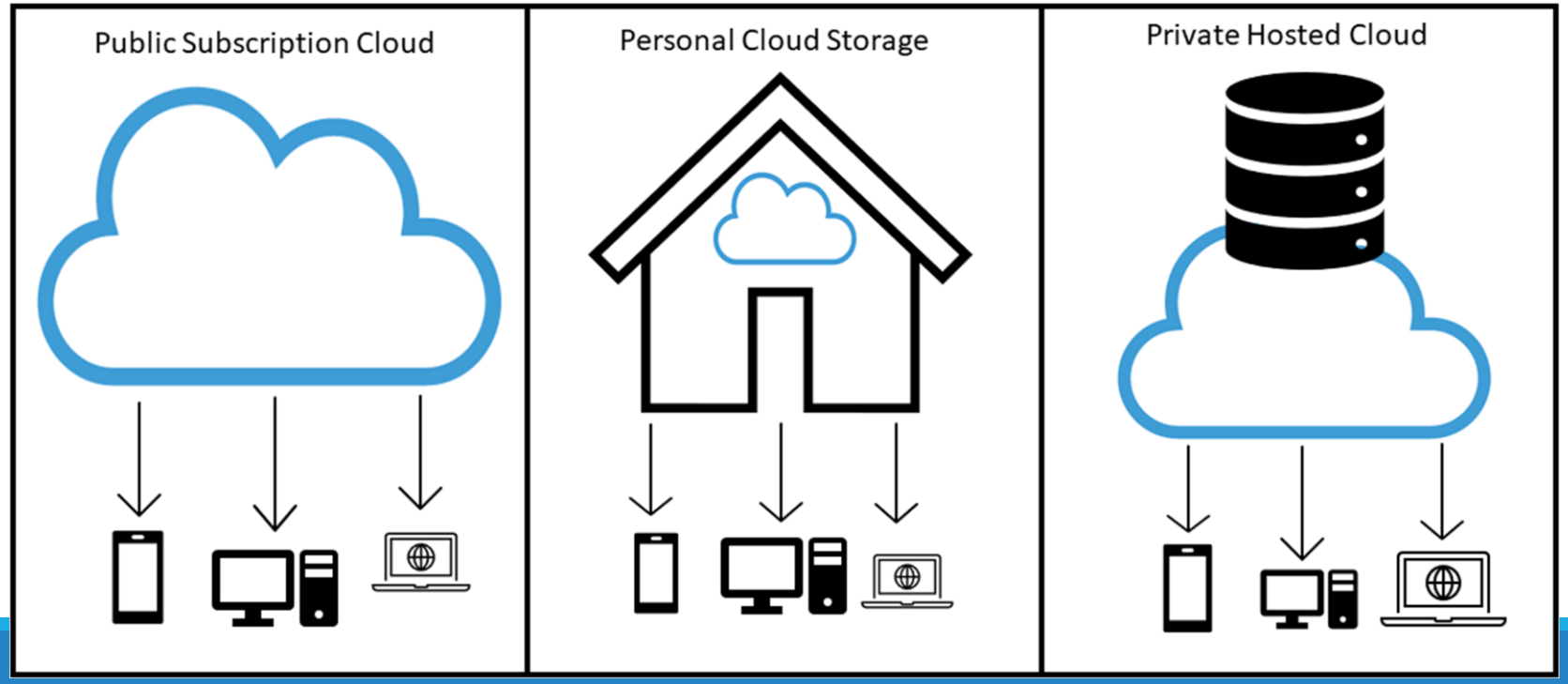
Provides access to low cost, easy to maintain and deploy software.

Three Cloud Models used by Individuals

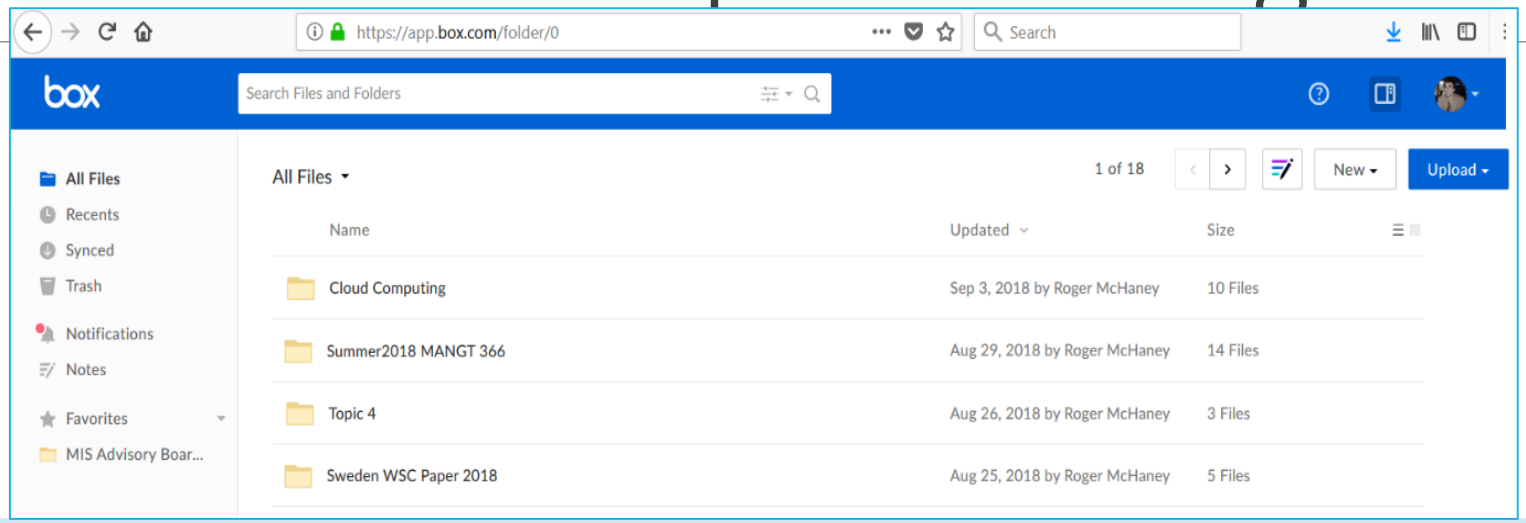
Public cloud subscription

Personal cloud storage (PCS)

Personal hosted solutions



Public Cloud Subscription Storage



- Inexpensive or free services such as Box.net, Dropbox, Google Drive, Carbonite, and Apple iCloud.
- No upfront investment required
- User creates an account, logs in and uploads files
- Host providers update software, perform backups, maintain security, and offer other services such as file sharing, use statistics, and identification of duplicate files
- Most services provide features to sync files from personal devices

Public Cloud Subscription Storage: Concerns

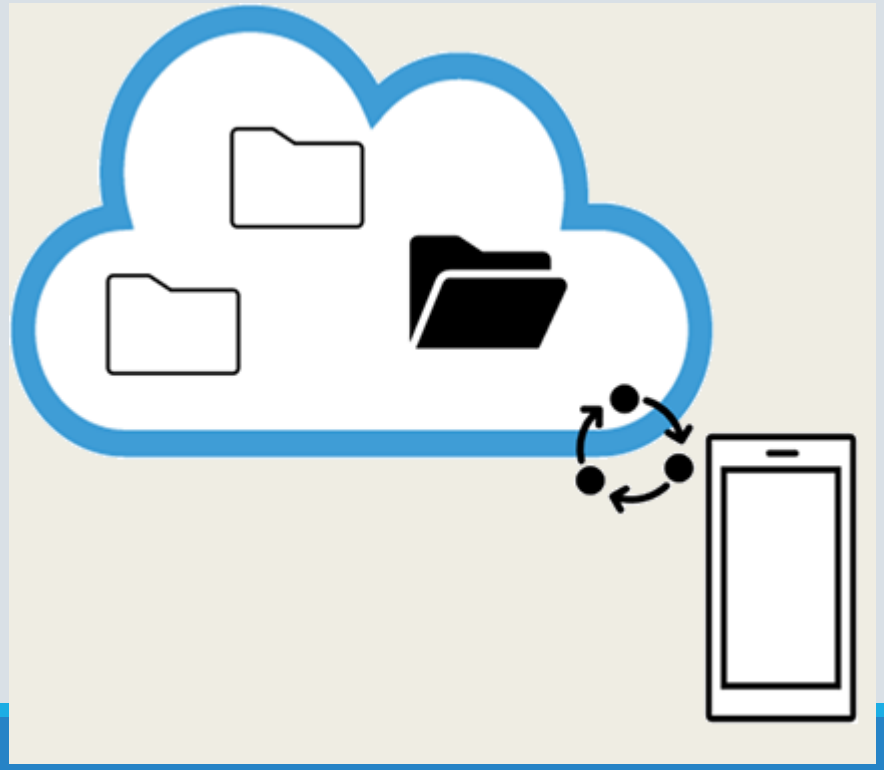
Privacy issues may exist since data is held outside individual's control

Zero knowledge storage and encryption may help alleviate these concerns

Private Cloud Storage (PCS) for Individuals

Offers many features found in public cloud subscription services (e.g. syncing devices, sharing files and accessing content)

Big difference: Individual owns the hardware



PLEX

A **home media server** uses storage on an existing computer for access to music, video clips, movies, and other media from networked computers or hard drives.

PCS Benefits

Privacy: within custody and control of owner

Data duplicated and moved to other devices easily

Can use encryption software

Eliminates recurring costs

Storage easily added when needed

PCS Cautions

Susceptible to damage (e.g fire, flood, tornado, electric surges, and theft of the physical device)

No automatic off-premise backup maintained

Upload speeds can be poor when remotely accessing home network

Redundant Array of Independent Disks (RAID)

Technology that redundantly stores data in different places on multiple hard disks to protect data in the case of a drive failure. Safety measure internal to the device in case part of it fails. Data is kept safer using this technology.

Hosted Personal Cloud Storage

Uses web host that offers cloud software instances preinstalled

Usually, hosting service supports PHP and MySQL or other software

Companies like Bluehost and Dreamhost offer these services

Amazon Web Services can host OwnCloud or similar software

Pros and cons of various cloud storage attributes

Cost Considerations		
Public Cloud Subscription	Personal Cloud	Hosted Personal Cloud
Monthly charges	No Monthly charges	Monthly charges
Data loss potential for non-payment	No potential for non-payment	Data loss potential for non-payment
Storage costs decline each year	Storage costs decline each year	Storage costs decline each year
Very low-cost initial investment	Initial equipment costs	Low cost initial investment
Adding capacity easy	Adding capacity requires equipment purchase	Adding capacity is easy

Security Considerations		
Public Cloud Subscription	Personal Cloud	Hosted Personal Cloud
Hardware secure	Hardware can be stolen or damaged	Hardware secure
Subject to government surveillance	Easier to protect contents against government surveillance	Subject to government surveillance
May be targeted by large scale data theft by hackers	Of little interest to hackers	Not likely to be a hacker target
Encryption requires more work on user side for most providers (exceptions like Sync.com exist)	Can be encrypted securely for full privacy	Can be encrypted but with some end-user knowledge required
Data is not under full control of end-user	Data under full control of end-user	Data not under full control of end-user
Host may collect data on use	No data about use collected by external parties	Unlikely that user meta-data will be collected
No need to configure equipment or software	Must configure software and hardware (e.g. router and NAS device)	Must configure software

Sharing		
Public Cloud Subscription	Personal Cloud	Hosted Personal Cloud
Collaboration easy	Some difficulties sharing data	Collaboration requires more overhead for managing users
Hard to move data to other services	Easier to move data	Hard to move data to other services
Difficult to clone data	Easy to clone data	Somewhat difficult to clone data

Backup and Recovery		
Public Cloud Subscription	Personal Cloud	Hosted Personal Cloud
Secure backups	Must create own backups	Secure backups
Less prone to large scale disasters	Less secure during large scale disasters	Less prone to large scale disasters
Hardware failure not a concern	Hardware may fail	Hardware failure not a big concern
No access without Internet connection	Access without Internet connection	No access without Internet connection
Vendor may go out of business	Less worries about vendor	Vendor may go out of business

Small and Medium Enterprise (SME) Users

Cloud computing embraced by SMEs because it enables saving money, returns focus to core mission, and gives ability to scale up quickly with access to latest technologies

Increases profitability due to agile working processes, task automation, real time information updates, collaborative computing tools, and access to customers via social media

Particularly true for entrepreneurs and start-ups that need to quickly move without upfront investments

How can Cloud Computing save SMEs Money?

SMEs do not need internal IT staff members for many routine tasks

Software costs reduced

Hardware costs reduced

Storage costs reduced

Integration across organizational applications enabled

What Cloud Computing Features Appeal to SMEs?

More than just cost savings

Business users can access software and resources using mobile devices such as tablets and smartphones remotely

Cloud scalability

Benefits of IaaS

Reduces capital expenditures and outlays

Can reduce overall cost of IT function

Users only pay for the services needed

Enterprise-grade IT resources and infrastructure are available even to small organizations

Scalability and elasticity are very easy

Users maintain control over their own application deployment if critical to their business model

Typical SME Cloud Applications

Accounting

Human Resources (HR)

Customer Relationship Management (CRM)

Project Management and Task Organization

Office Software

Data Analytics

Social Media

Help Desk and Service Software

Enterprise Resource Planning (ERP)

Accounting Software

SMEs often manage accounts payable, accounts receivable, payroll, general ledger, financial reporting, maintaining controls, and annual tax returns using SaaS

SMEs pay a monthly fee to use services

Many best practices built into the software.

Legal requirements, international conventions, reminders, educational materials, access to user groups, and other benefits come with software subscriptions.

Legal storage requirements for financial records and security backups reduce compliance burdens

SaaS accounting applications often provide mobile apps

Financial versus Managerial Accounting

Information is Main Difference

Managerial accounting focuses on data collection and processing into information reported to internal managers to support planning, controlling, and decision-making

Financial accounting focuses on collecting and reporting information for external users like investors, creditors, regulators, bankers, and auditors

Example Cloud Accounting Applications

QuickBooks: Developed by Intuit, who also offers TurboTax and other software. QuickBooks is a fully featured accounting package offering full reporting, decision support, tracking, and forecasting capabilities. QuickBooks is very popular and is the leading online accounting software package in the USA.

Xero: Provides a wide range of accounting services including invoicing, inventory, payroll, budgeting, and expense tracking. Xero offers tools to import an SME's banking, credit card, and PayPal data. Xero also offers a popular mobile app.

Zoho Books: This is a highly customizable software package that integrates with Zoho's broader suite of office products. It can connect to bank accounts.

Sage One: Accounting package for small businesses offered by a large ERP company. It is fully featured and is built on a powerful database system that can integrate with other business functions.

Human Resources Software

Among functions are storing and updating employee data, payroll, vacation tracking, sick or personal day tracking, training records, certification, recruitment, benefits administration, attendance records, evaluation, legal requirements, and performance management tracking.

Important HR Capabilities

Benefits Administration: Enrollment options for insurance, retirement plans, long term disability, and family leave.

Shift Management: Tools for managing shifts including rules for scheduling, employee managed coverage, trading shifts and vacation planning.

Application Tracking: Manage job postings, track applicants, track applicant source effectiveness, and employee onboarding.

Performance Management: Ensures both employee and manager can keep a record of employee goals and provides ways of tracking goal accomplishment.

Training: Tracks employee training goals, certifications, and completions. This may be crucial where compliance is an important consideration.

Legal: Having a paper trail regarding infractions and rule violations.

Helpful Tools: Many HR managers find themselves writing employee handbooks, job descriptions, preparing company hierarchies, and developing legally binding documents.

Example HR Cloud Vendors

BambooHR. Covers all basic HR functions including a rapid employee performance management module. It has an open API to allow connections to other cloud-based software packages

Zenefits: Integrates with payroll systems from most major vendors including QuickBooks. Its base package is reasonably priced, but add-ons can be expensive.

Namely: Highly customizable package with an outstanding user interface but, it is expensive.

SAGE: Highly configurable and made to handle more complex businesses with multiple divisions or branches in overseas locations.

SAP SuccessFactors: Many consider this the best HR cloud software for SMEs with setup wizards, video tutorials, and other multiple help features. Highly scalable to other SAP products.

EffortlessHR. Created by a team of HR professionals and so it contains solutions for the most time-consuming HR tasks.

Cloud Computing

CHAPTER 2: PART B

Customer Relationship Management (CRM) Software

Strategic approach for tracking interaction with customers

Goals include building relationship with client and ensuring relationship is reinforced positively through each contact, even when different organizational members made the contact

CRMs keep customers connected and provide consistent messages to client from all parts of an organization

Natural fit for SaaS cloud environments since cloud computing removes geographic constraints

Modern CRM

Term now includes CRM systems, processes or software packages that track organizational relationships and interactions with current customers and potential customers.

Keeps companies connected to customers, receive reminders about contact, streamline interaction processes, Improves business relationships, enhances communication, and ultimately creates a path to greater profitability

CRM software includes relationship management with traditional customers, service users, colleagues, suppliers, and other stakeholders

Organizes data into a complete picture of stakeholder to track and build relationships over time

CRM Benefits

Enhanced stakeholder contact management

More effective cross-team interaction and collaboration

Improved sales forecasts

Tools for lead management

Better customer relationships

Consistent handling of stakeholders

Increased productivity

Richer report and decision-making capability

Improved customer retention

Example Cloud CRM Packages

Salesforce Essentials: Salesforce.com among the first to create a SaaS CRM platform that became widespread

Zoho CRM: Flagship Zoho product in a suite of business software

Apptivo: Focuses on customer support with sophisticated security controls

Freshsales: Small business or startup can use for free to jumpstart CRM activities

Pipedrive: Basic CRM package with straightforward, powerful interface

Insightly: Provides email tracking and integration with Microsoft Power BI

Considerations for CRM Software Selection

Price

Customization Capability - Additional contact fields, custom sales records and other key elements

Core Feature Set – Contact management, workflow automation, email tracking, campaign organization, sales pipeline management, lead management, analytics, priorities, and so forth

Platform features – Does the tool work offline, in mobile environments, and using various computing platforms?

Deal and Opportunity Tracking

Workflow Automation – Does the tool manage sales processes, follow-ups, and reminders?

Reporting Tools – What reports and features for decision support are included?

System Integrations – Can the tool be integrated with other software used by SME?

Customer Reviews

Data Management – How is the data stored and managed?

Project Management (PM) / Task Organization

Tools and SaaS systems to ensure people cooperatively complete tasks in a time conscious, organized manner

SaaS Applications for PM and Task Organization

Trello: Enables development of structured to-do lists and project tasks

Asana: Widely used in IT-related organizations and other companies that engage in complex, multi-person projects

Basecamp: Real-time communication tool with built-in project management features that focuses on making sure everyone is on same wavelength regarding tasks and projects

Wrike: Offers tiered solutions perfect for an organization that envisions future or rapid growth

Asana Features:

- Activity feeds
- Automated email messages
- Adding collaborators and attachments to tasks
- Custom calendars
- Custom views
- Task tracking
- Notifications and reminders
- Project and task creation
- Commenting on tasks
- Full mobile support
- Multiple workspaces for team members
- Real-time updates
- Goal, priority, and due date setting
- Ability to view other members' priorities and current tasks when desired
- Project permission customizations
- Task dependency diagrams and Gantt Charts
- Kanban support
- A 'My Tasks' priority list

Office Automation Software

- Includes tools to create documents, spreadsheets, calendars, and presentations.
- SaaS technologies permit greater levels of sharing and collaboration.

Microsoft 365 permits administrators to customize features for their organization. The following components are frequently included:

Component	Features / Functions
Office Suite	Word, Excel, PowerPoint, Outlook, OneNote, Publisher, Skype for Business, Access
Exchange Online	email, calendar, tasks
SharePoint Online	web portal for collaboration
Yammer	enterprise social networking
OneDrive for Business	cloud file storage
Power BI	business intelligence

Microsoft Moves Beyond SaaS

Subset of Azure Components

- **Compute:** IaaS permitting virtual machine deployment
- **Web Apps**: PaaS environment letting developers easily publish and manage websites.
- **Mobile services**: Collects mobile user data and deploys mobile apps.
- **Storage Service**: Provides REST and SDK APIs for storing and accessing data on the cloud.
- **Data Management:** Database, search, data warehouse and other related services
- **Machine Learning:** Services through Cortana to enhance machine learning
- **IOT:** Internet of Things infrastructure
- **Marketplace:** Online applications and services marketplace from Microsoft and partners.

Other Office SaaS Packages

Zoho Office: Integrates with Zoho's software offerings and includes Writer, Sheet, and Show as replacements for Word, Excel, and PowerPoint. Added are Projects and Books.

Google Apps (and G Suite): Google's free online office suite designed to leverage online collaborative work. Mirrors many of 365's offerings and includes Docs, Sheets, and Slides.

Apache OpenOffice: An open-source office software suite with components for word processing, spreadsheets, presentations, graphic design, database, and others.

Online Survey SaaS Companies

Paid features offered by many online survey companies:

- **Survey logic**: This is the option to create multiple paths through the survey based on answers, random selections, or other characteristics.
- **Export data**: Tools can send survey results to various forms and software interfaces.
- **Target audience**: Some survey companies will provide targeted pools of respondents based on desired characteristics. Qualtrics specializes in this area but it can get expensive.
- **Customizable interface**: This option permits an organization to brand the survey with their logo, corporate colors, or other identifiers.
- **More question formats**: Paid tools often offer a wider range of question formats such as sliders and other graphic-oriented measures.

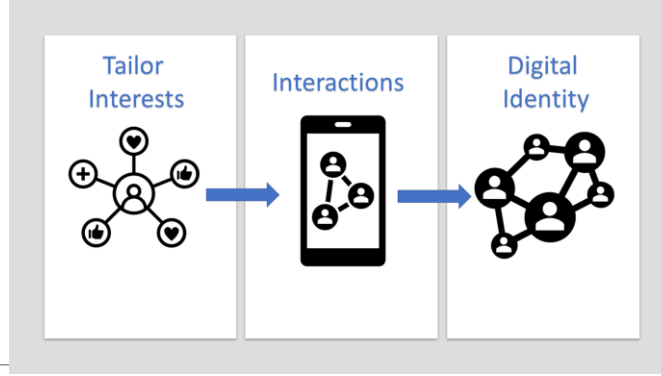
SaaS Data Analytics for SMEs

SaaS applications ideal in this area

Tableau Online hosted in the cloud and allows users to upload data, publish dashboards, and share reports via a cloud interface. Specializes in data visualization and the creation of graphic output to represent data.

Microsoft Power BI comes in both paid and free versions.

Social Media for SMEs



Facebook: Every SME should have a presence (e.g. Page). Offers Business Tools which enable SME to see who visits, market products and services, and access analytics.

Twitter: Excellent for connecting with potential customers.

LinkedIn: Falls into the domain of business professionals. Allows an SME to establish its credibility and make connections.

YouTube: SME can post informational videos that can help develop a reputation. Content is king on YouTube.

Pinterest: Good for SMEs with visually interesting products and services.

Instagram: Connect with stakeholders by sharing photos and other information.

Snapchat: This tool provides a way to connect with customers if an SME focuses on young people. Offers a visually interesting way to share information.

What is a Social Media Strategy?

Social media strategies should be used to show that your SME understands its stakeholders

- *Define a consistent and relevant voice*
- *Listen*
- *Respond*
- *Post new content regularly*
- *Balance postings*. Specialists in this area refer to the 30/60/10 approach. 30% = New Content; 60% = Reposts; and 10% = promotional material
- *Use scalable, cloud-based platforms that grow as the SME grows*

Purchasing and Procurement

Find, buy, and manage supplies and services required to conduct business

Procurify: Tracks and controls inventory to manage costs. Enables teams within an organization to make purchases and then consolidates all organizational purchasing information to help find volume discounts and the best vendors.

Snapfulfil: Provides procurement and purchasing from a warehouse management perspective. Meant for Business-to-Business (B2B) as well as Business-to-Customer (B2C) use. Ties tightly to physical space management within an organization.

Infoplus: Specialized for industries such as consumer goods, food and beverage, and retail. Offers physical inventory-related features including demand forecasting, inventory optimization, kitting, vendor-managed inventory, and lot sizing tools.

Help Desk and Service Software

SMEs save time and resources using software developed for tracking and managing customer issues.

Enables SMEs to resolve customer concerns or problems by managing tickets generated to track problems from receipt to resolution.

Example Help Desk and Service Software

LiveAgent: Unique features like self-service tools and help items, and multiple service level capabilities so particular customers can be given more help or priority service.

Zendesk: Focuses on communication and keeping customers in the loop.

Freshdesk: Built to quickly scale upwards with easy data import and storage features.

Desk: Part of the Salesforce software family. Widely considered the most powerful and fully featured helpdesk package. Uses a ‘customer health’ metric which helps identify frustrated customers needing extra attention.

Key help desk software features:

- *Ticket management*: Tickets are essentially a customer request for help. Good help desk software filters and categorizes tickets so they can be assigned to team members, prioritized, and tied to customer history. Tickets can be viewed by all relevant people and ensure everyone is on the same page regarding resolution and customer communication.
- *Support for multiple communication channels*: Customers may contact the support team via email, phone, messaging, posts, chats and so forth. Good help desk software permits all that make sense and helps to ensure consistent documentation no matter what channel is used.
- *Customer help and FAQ area*: Many issues can be quickly resolved with standard help documents. Videos and other customer education options can be helpful too.
- *Collaboration*: Enabling a team to work on tickets through SaaS features is a helpful addition to most help desk systems.
- *Reporting*: A series of reports and statistics regarding resolution times and other key metrics is important.
- *Deadline tracking*: Having notifications and reminders about overdue tickets is a useful feature in these software systems.
- *Mobile interface*: Having a good mobile interface gives both customers and help team members added capabilities.

Enterprise Resource Planning (ERP) Software

Suite of business tools to automate all basic business functions.

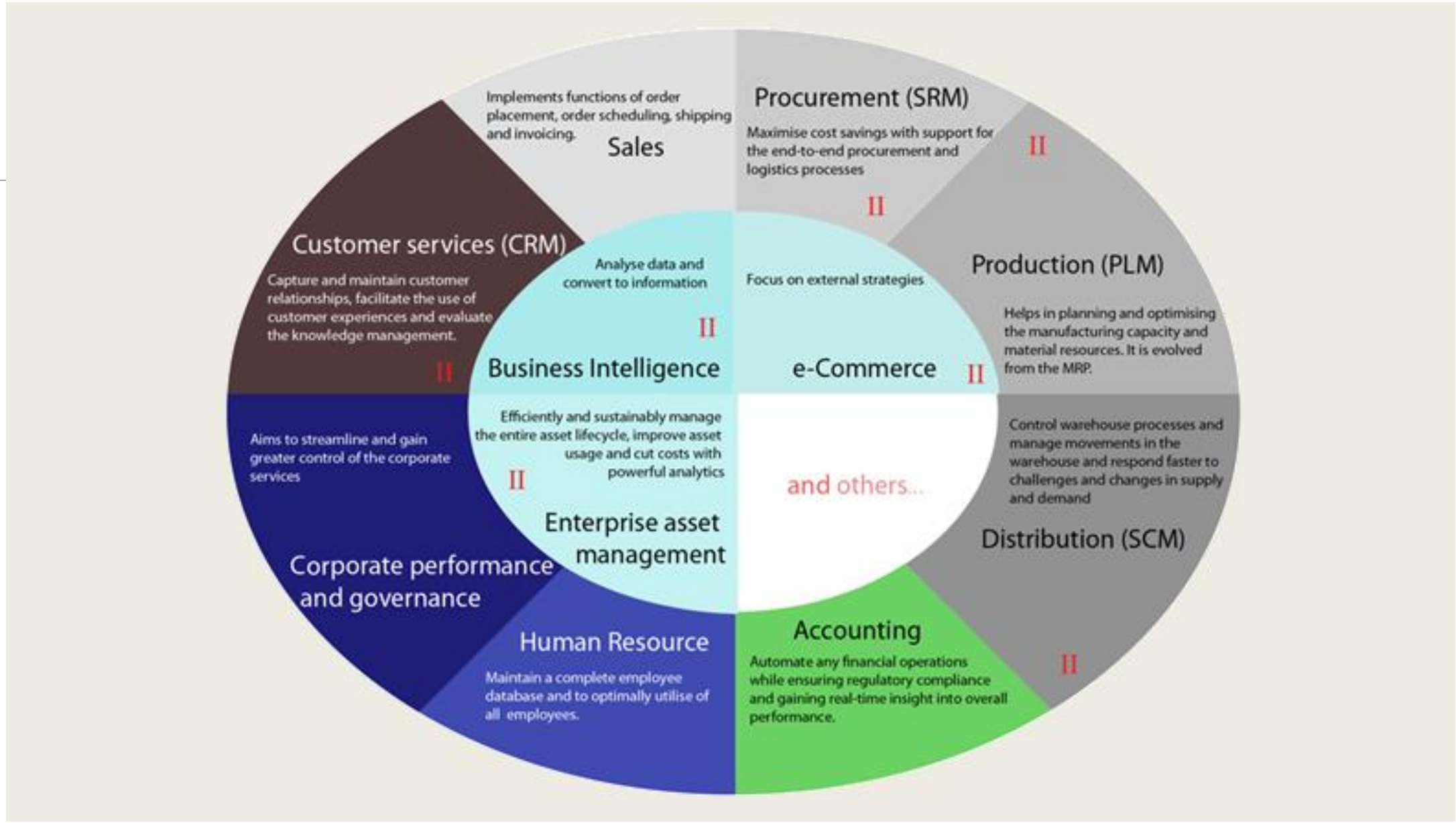
Integrates applications using a consolidated database and ties all business functions to an accounting system.

Typical items range from purchasing to order fulfillment. Often included are human resources, CRM, invoicing, supply chain, inventory control, finance, project management, procurement, accounting, and many other business functions.

Typically domain of large organizations

SMEs often use a subset of ERP features and scale up into a broader set of functions.

SME ERP marketplace has many choices: Microsoft Dynamics, NetSuite ERP, and SAGE are among the leaders. For smaller businesses, Apptivo and Work[etc] are good choices.


Implements functions of order placement, order scheduling, shipping and invoicing.
Sales
Procurement (SRM)
Maximise cost savings with support for the end-to-end procurement and logistics processes
Production (PLM)
Helps in planning and optimising the manufacturing capacity and material resources. It is evolved from the MRP.
Distribution (SCM)
Control warehouse processes and manage movements in the warehouse and respond faster to challenges and changes in supply and demand
Accounting
Automate any financial operations while ensuring regulatory compliance and gaining real-time insight into overall performance.
Human Resource
Maintain a complete employee database and to optimally utilise of all employees.
Corporate performance and governance
Aims to streamline and gain greater control of the corporate services
Customer services (CRM)
Capture and maintain customer relationships, facilitate the use of customer experiences and evaluate the knowledge management.
Analyse data and convert to information
Business Intelligence
Focus on external strategies
e-Commerce
Efficiently and sustainably manage the entire asset lifecycle, improve asset usage and cut costs with powerful analytics
Enterprise asset management
and others...

Corporate Managers and Users

Primary focus of Chief Information Officers (CIOs), IT managers, and others.

Large organizations use SaaS platforms to reduce the cost of software ownership and use.

Corporate managers rely on cloud computing to reduce volatility and enhance elasticity.

Corporate users of SaaS services find applications quickly and efficiently scale to meet changing capacity needs.

Translates to stable, predictable savings and reduced budgets.

PaaS Users

PaaS has transformed DevOps in organizational settings

DevOps (which stands for development and operations) focuses on enterprise software configuration and development in a way that tightly links it to IT operations in the form of an agile relationship

PaaS provides development and deployment cloud-based environment

DevOps has become the acronym that represents a combination of philosophies, practices, and cloud-based tools used to enhance an organization's capability to design, build, configure and rapidly deliver applications and services. DevOps seeks to improve products at an accelerated pace. It is an evolutionary step past traditional systems development and IT infrastructure management. DevOps offers best practices to achieve its goals. Among these are:

- *Continuous Integration*: Combine development and operations in a constructive and facilitative manner.
- *Continuous Delivery*: Updates are ongoing. Problems are fixed and enhancements are offered transparently to users.
- *Microservices*: Applications are a loosely coupled collection of services which can combined to enhance business operations (e.g. Lego blocks).
- *Infrastructure as Code (IaC)*: Data center provisioning and management is conducted with rule-based script files rather than physical hardware configuration.
- *Monitoring and Logging*: User activity is monitored to identify problems or potential areas for optimization. Logs are created and analyzed.
- *Communication and Collaboration*: DevOps focuses on enhanced communication between developers and IT infrastructure specialists.

IaaS Users

IT managers use IaaS to leverage operations resources in many areas

Encompasses web servers, storage, backup and recovery, high performance computing, and number of other areas

Reduces need for capital investment and helps reduce recurring hardware costs

Onsite data centers, physical servers, and other hardware items are virtualized, and replaced with subscription services

Other Corporate Uses

File Storage and Backup

Disaster Recovery

Big Data Analytics

Chapter 2 Summary

Cloud computing is pervasive and ubiquitous.

Users come from businesses and organizations of all sizes, shapes, and forms.

Individual users find the cloud appealing and have incorporated SaaS into their lives using social media, personal software subscriptions, and online storage of media and personal artifacts.

Future Chapters focus on organizational use of cloud computing.