



DEPARTMENT OF INFORMATION TECHNOLOGY

FACULTY OF MANAGEMENT STUDIES AND COMMERCE

UNIVERSITY OF SRI JAYEWARDENEPURA

ITC 1370

Introduction to Information Technology

Chapter 03

Software



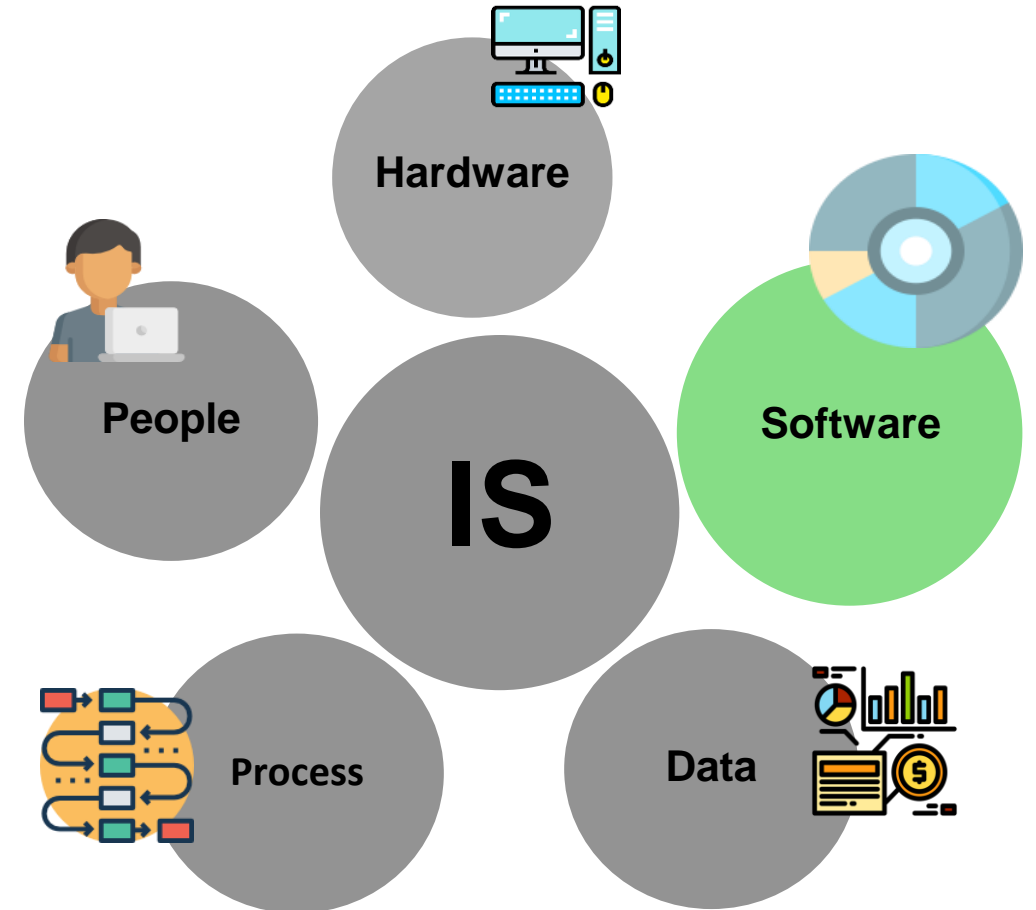
Learning Objectives

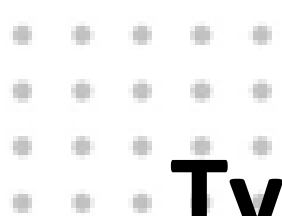
Upon successful completion of this chapter, you will be able to:

- Define the term software
- Describe the two primary categories of software
- Describe the role ERP software plays in an organization
- Describe SaaS (cloud computing) and its advantages and disadvantages for use in an organization
- Define the term open source and identify its primary characteristics

Software

Software is a set of instructions that tells the hardware what to do.

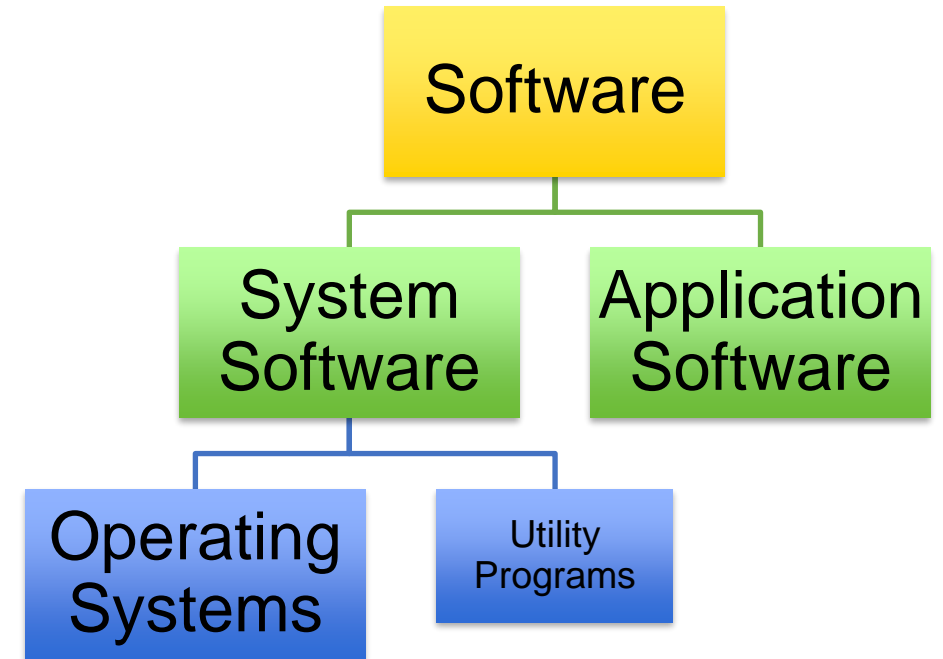




Types of Software

Two main types of software:

1. Operating Systems
2. Application Software
 - Productivity software
 - Utility software
 - Programming software
 - Applications for the Enterprise (ERP)



Note: *System software and Application software are another popular categorization.*



System Software

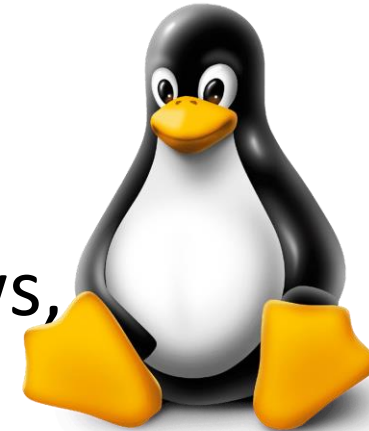
System software consists of the operating system and utility programs that control your computer and allow you to use it.

The main system software is the **operating system**, which starts up the computer and controls its operation.

Operating Systems



MacTM OS



- All devices have an operating system
- Software which manages the hardware
- Creates the interface between the hardware and the user
- Most popular are Microsoft Windows, Apple Mac OS, and Linux

Android

41.61%

Windows

29.02%

iOS

18.18%

OS X

6.41%

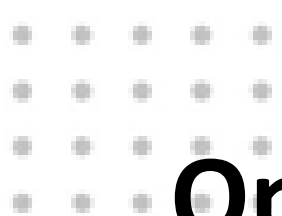
Unknown

2.21%

Linux

1.51%

Operating System Market Share Worldwide - January 2024



Operating Systems

Operating systems provide you with these key functions:

1. **booting** the computer and providing the **user-interface** components;
2. managing the **hardware resources** of the computer;
3. **managing the software** and providing a **platform for software developers** to write applications.
4. managing the **network** connection and **security**

History of OSs

Year	1981 - 1988	1990	1991	1992	1993	1994	1995	1997	1998	2000	2001	2002	2003	2005	2006	2007	2009	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
DOS	1981-1x 1983-2x 1984-3x 1988-4x		5x		6x																							
Windows		3.0		3.1		3.2	95		98	Me	XP				Vista		7		8	8.1	10							11
Mac								Grail 124/ Titan 1U	Mac OS X Developer Preview	Mac OS X Public Beta	Mac OS X 10.x								OS X 10x				Mac OS 10x				Mac OS 11 Big Sur	Mac OS 12 Monterey
											10.0 Cheetah Mac OS X 10.1 Puma	10.2 Jaguar	10.3 Panther	10.4 Tiger		10.5 Leopard	10.6 Snow Leopard	10.7 Lion	10.8 Mountain Lion	10.9 Mavericks	10.10 Yosemite	10.11 El Capitan	10.12 Sierra	10.13 High Sierra	10.14 Mojave	10.15 Catalina		
Linux			Linux	Different distributions with different new versions are available																								



Linux OS and it's distributions



Ubuntu



hanthanalinux
feel the freedom



SUSE®

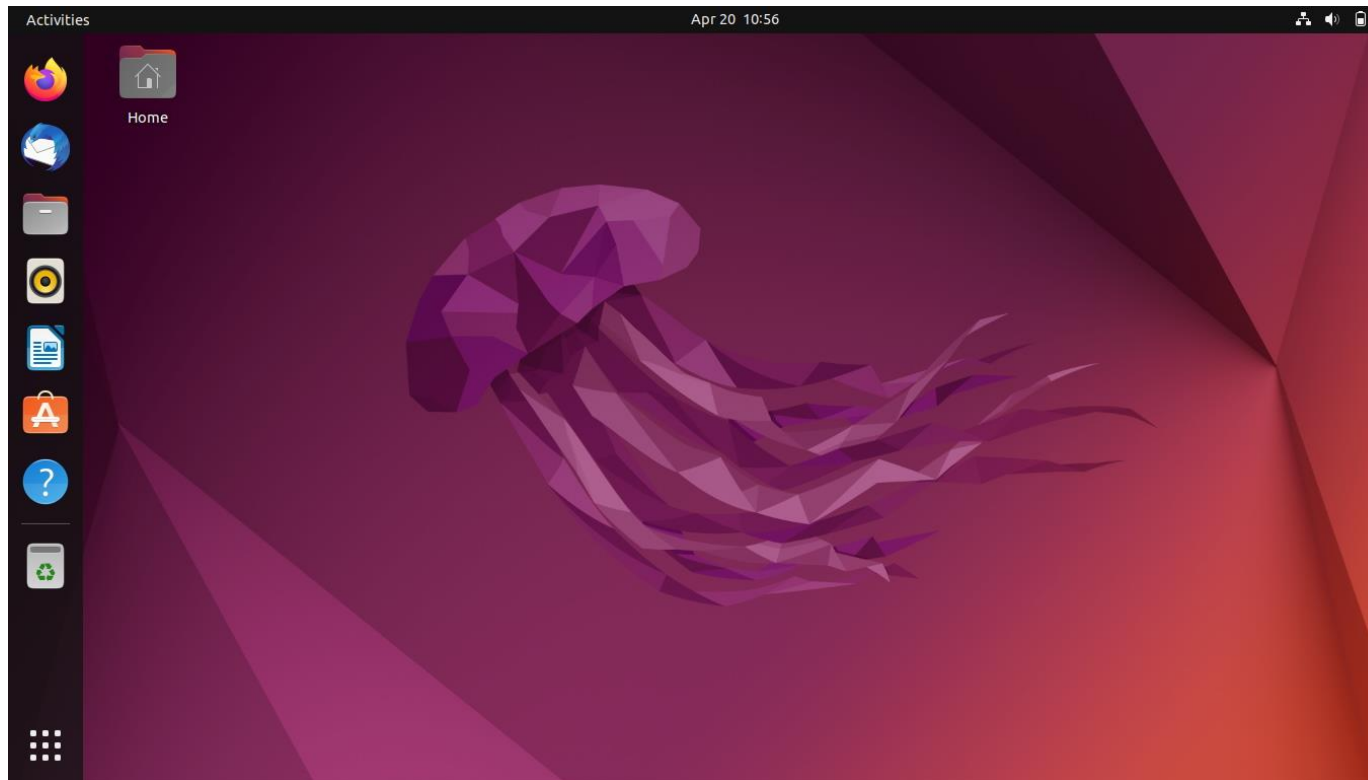


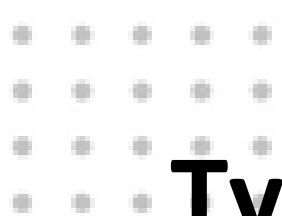
Ubuntu OS



Ubuntu

- Free and Open-Source Software
- Latest version is Ubuntu 22.04.3 LTS



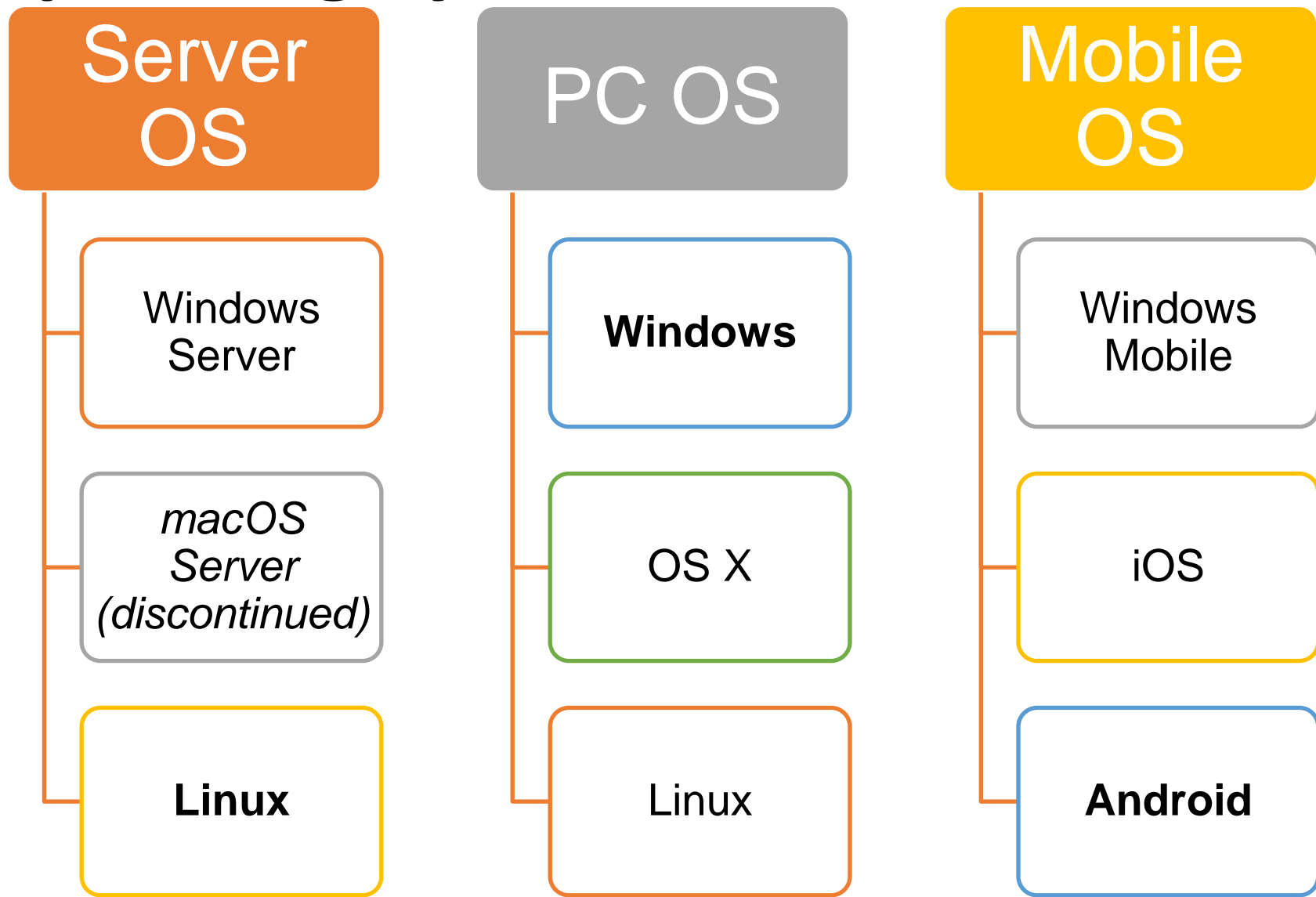


Types of Operating Systems

Operating systems are typically designed for a particular **type of device**.

- **Personal operating systems/desktop operating systems**
 - Operating systems used with personal computers are typically referred to as personal computer operating systems (also called desktop operating systems) and they are designed to be installed on a single computer.
- **Server operating systems/network operating systems**
 - Also called network operating systems are designed to be installed on a network server to grant multiple users access to a network and its resources.
- **Mobile operating systems**
 - That is designed to be used with mobile phones and other mobile devices
- **Embedded operating systems**
 - That is built into consumer kiosks, cash registers, cars, consumer electronics, and other devices. It is a specialized operating system designed to perform a specific task for a device that is not a fully functioning computer.

Types of Operating Systems





Application Software

- Application software is utilized directly today to accomplish a specific goal or purpose such as word processing, calculations on a spreadsheet, or surfing the Internet using your favorite browser.
- Categories:
 - **Productivity software** to help employees complete their job duties such as Microsoft Office
 - **Utility software** allows you to fix or modify your computer
 - For example, antivirus software
 - **Programming software** makes more software
 - Programmers can code, test, and convert into a format that the computer will understand

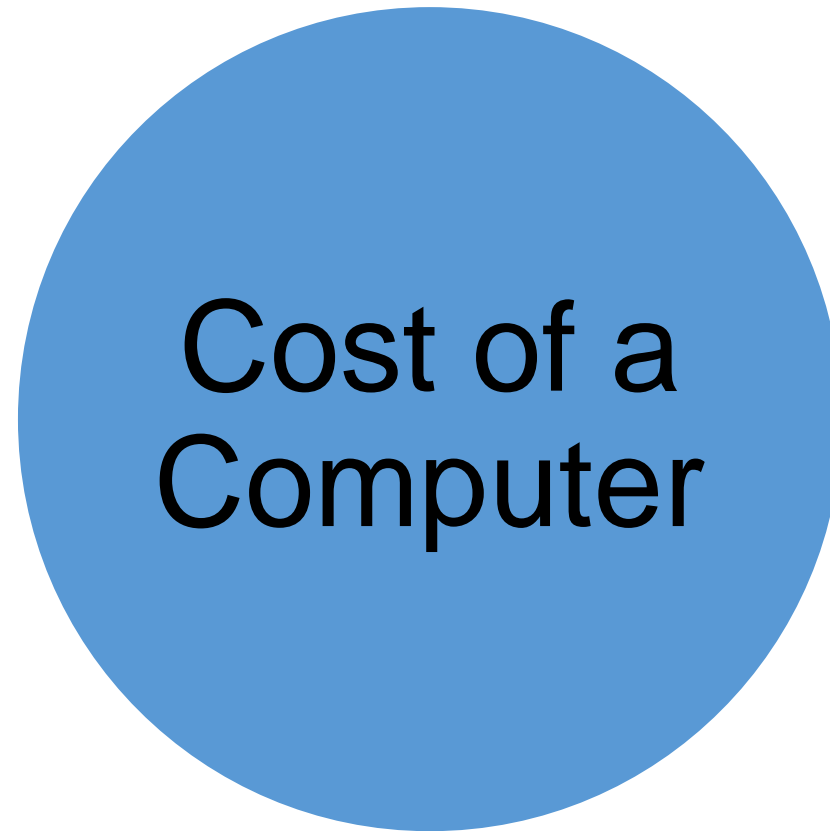
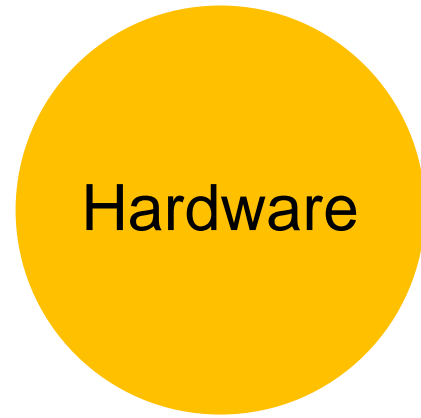
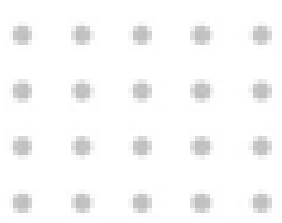
Cost of a Computer

Reducing the Software Cost



LibreOffice
The Document Foundation





From Paid to Free Software



Commercial

Windows
(66,100.00)

MS Office
(229,999.00)

Kaspersky
(1,850.00)

Total
(367,949.00)

Commercial + Free

Windows
(66,100.00)

Open Office
(00.00)

Kaspersky
(1,850.00)

Total
(67,950.00)

Free

Ubuntu
(00.00)

Open Office
(00.00)

ClamAV
(00.00)

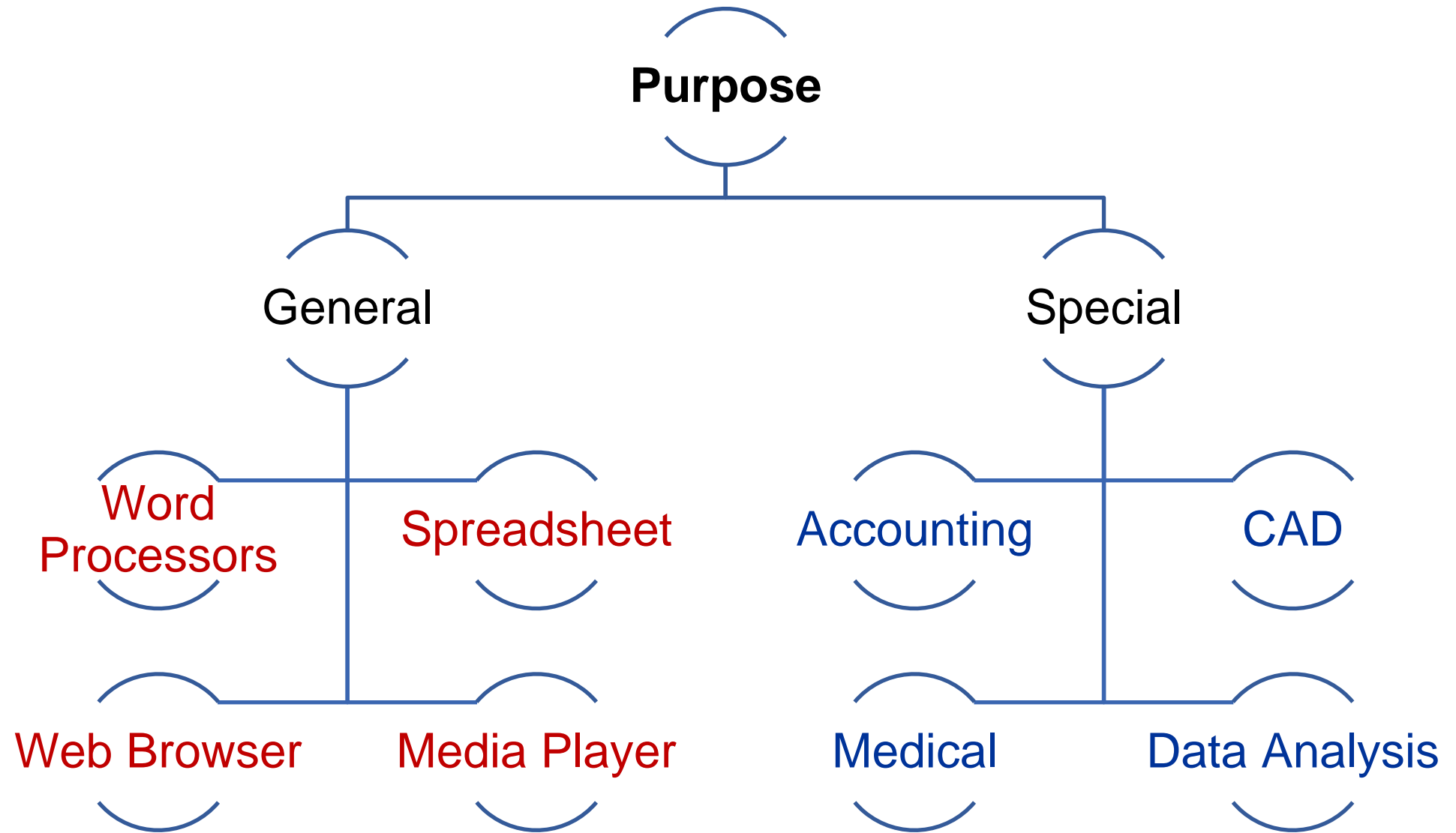
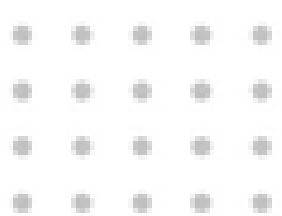
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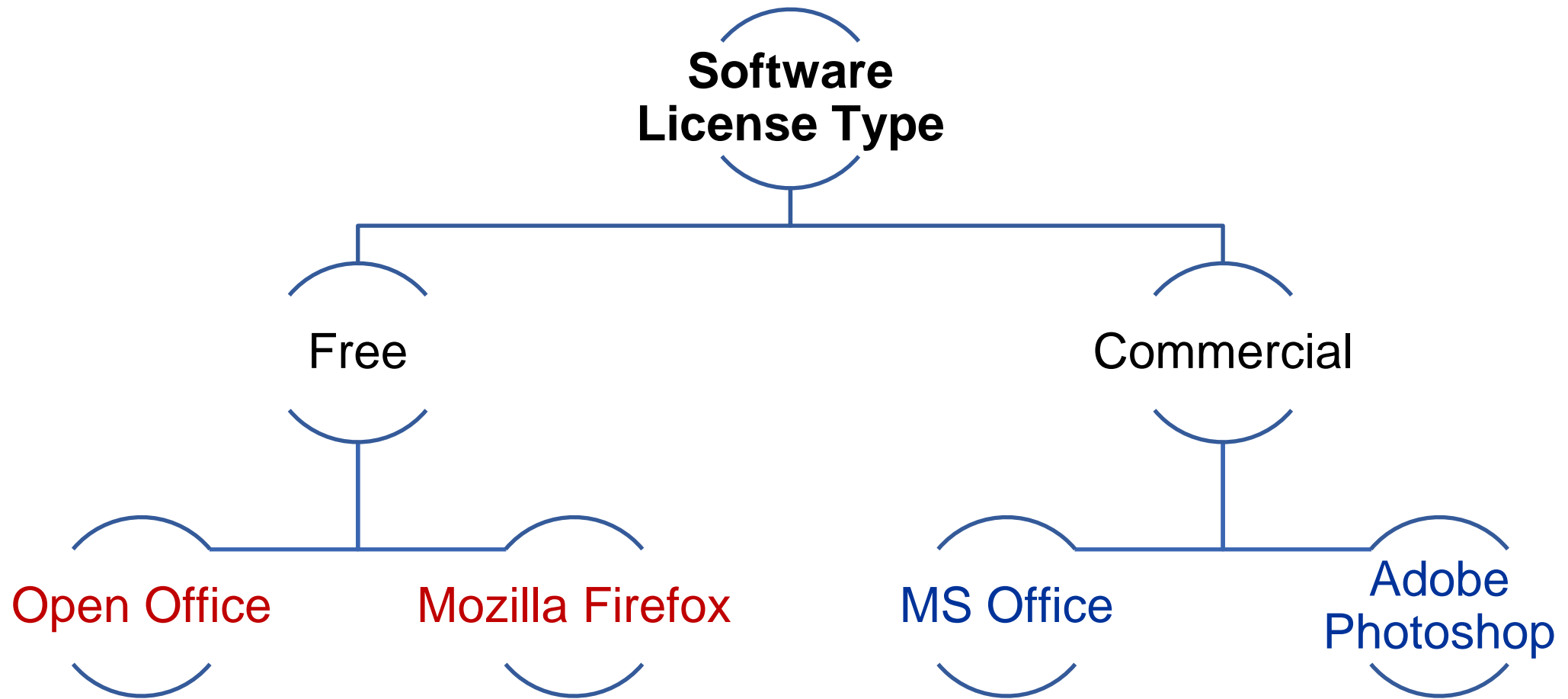


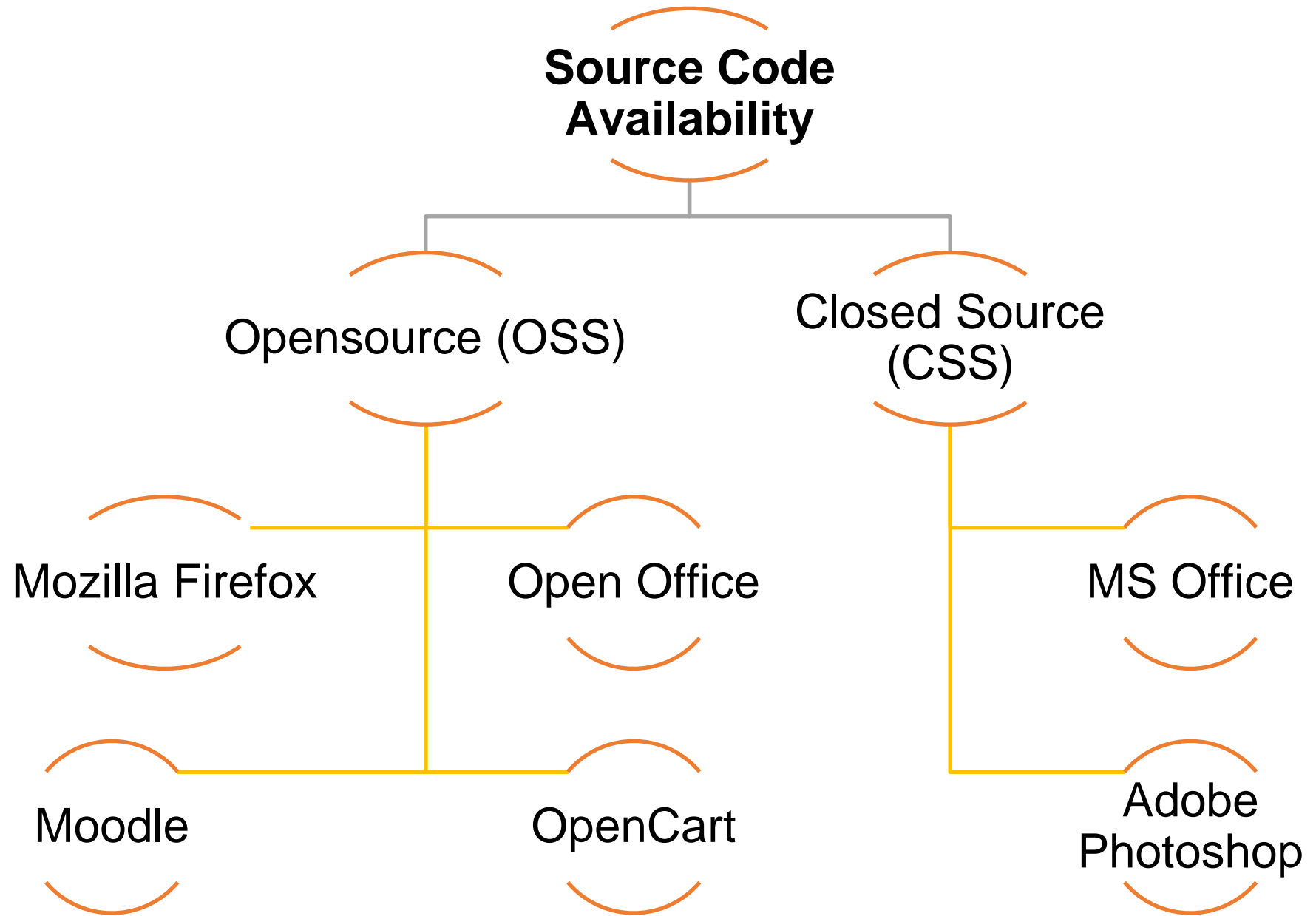
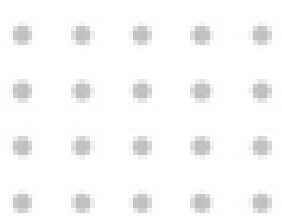
Classifications of Application Software

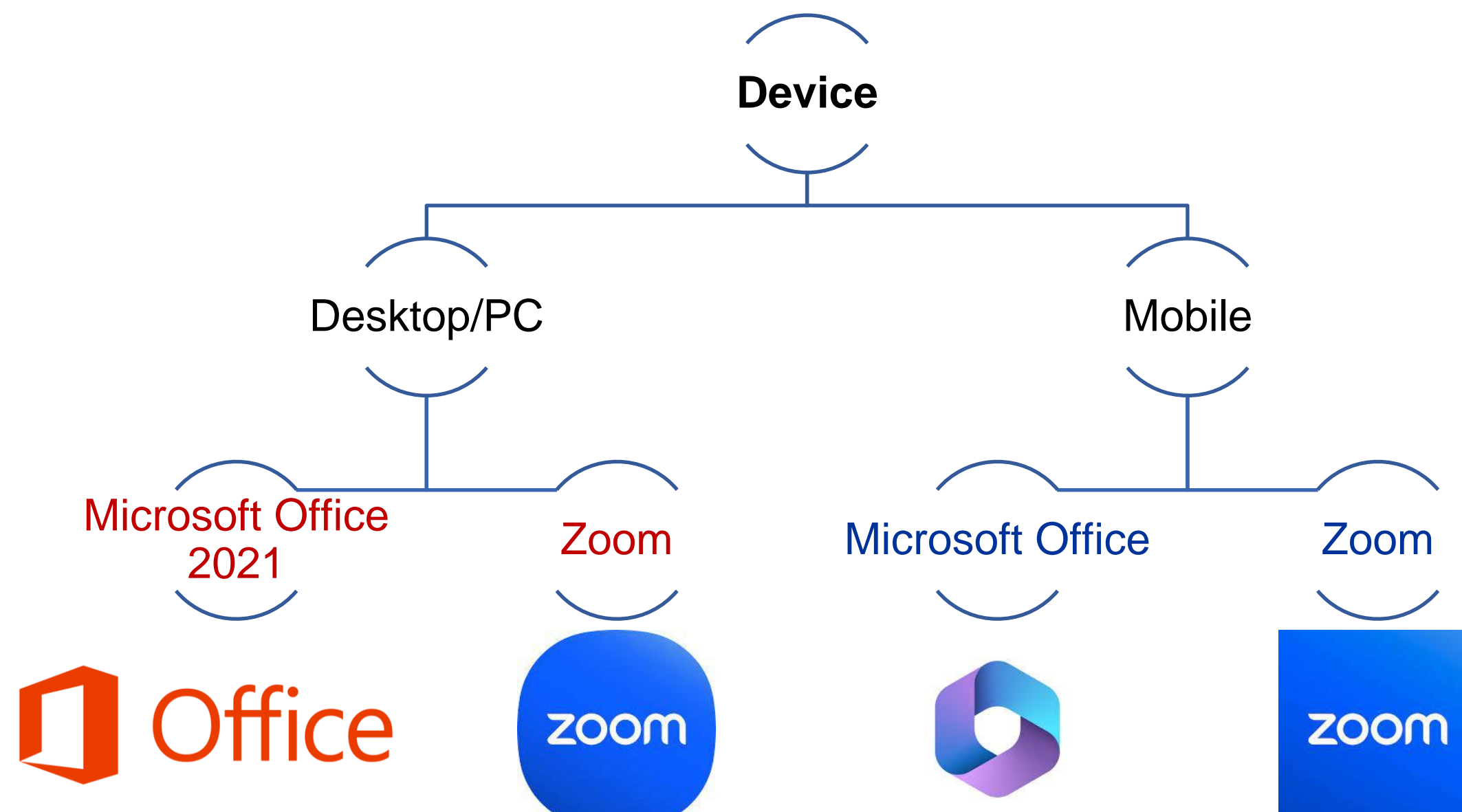
Different bases can be used to classify application software.

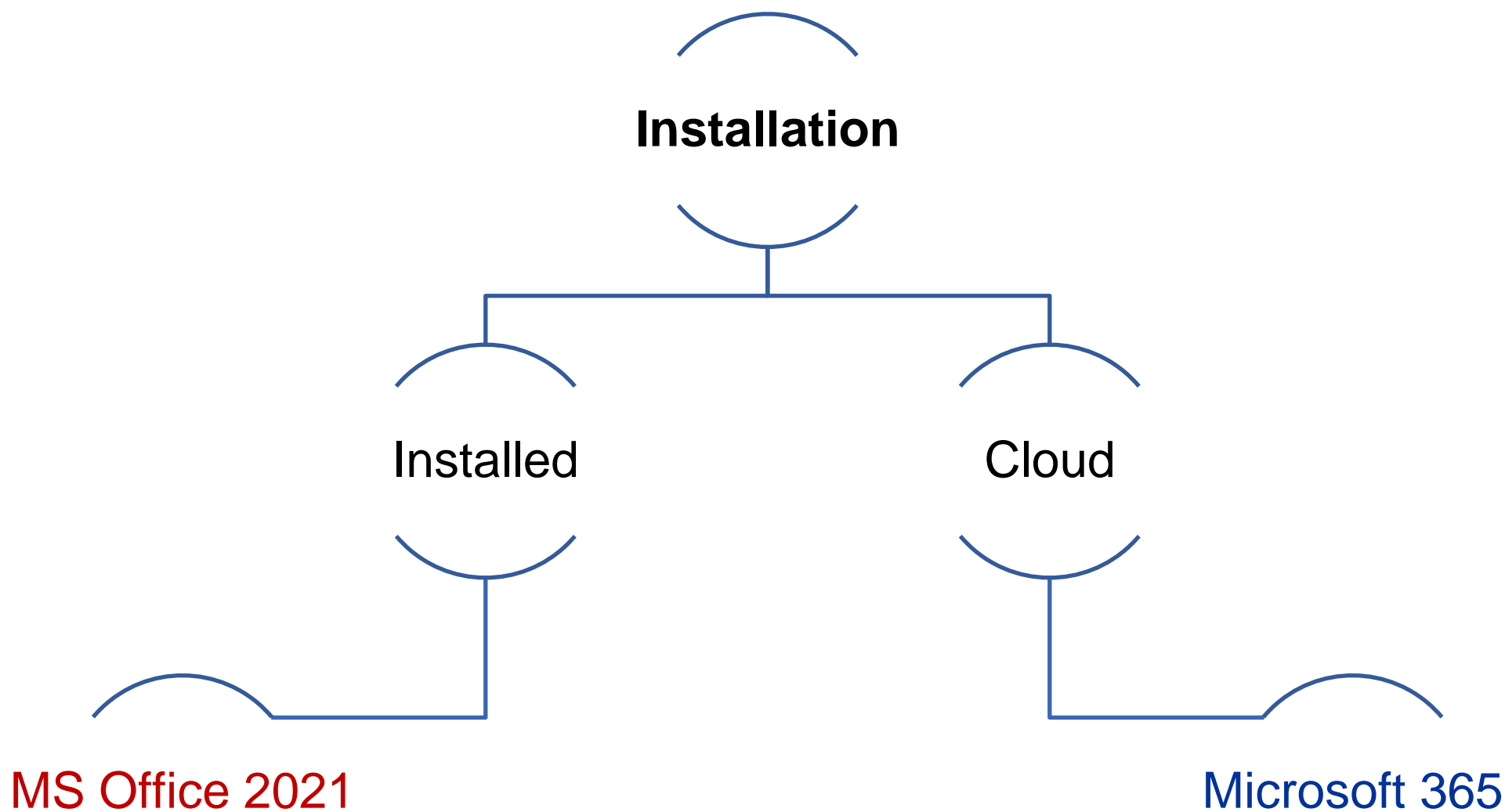
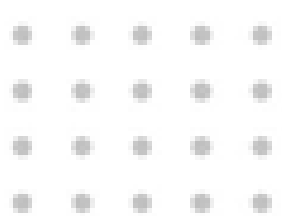
- Purpose
- Software License Type
- Source Code Availability
- Device
- Installation
- Software Ownership

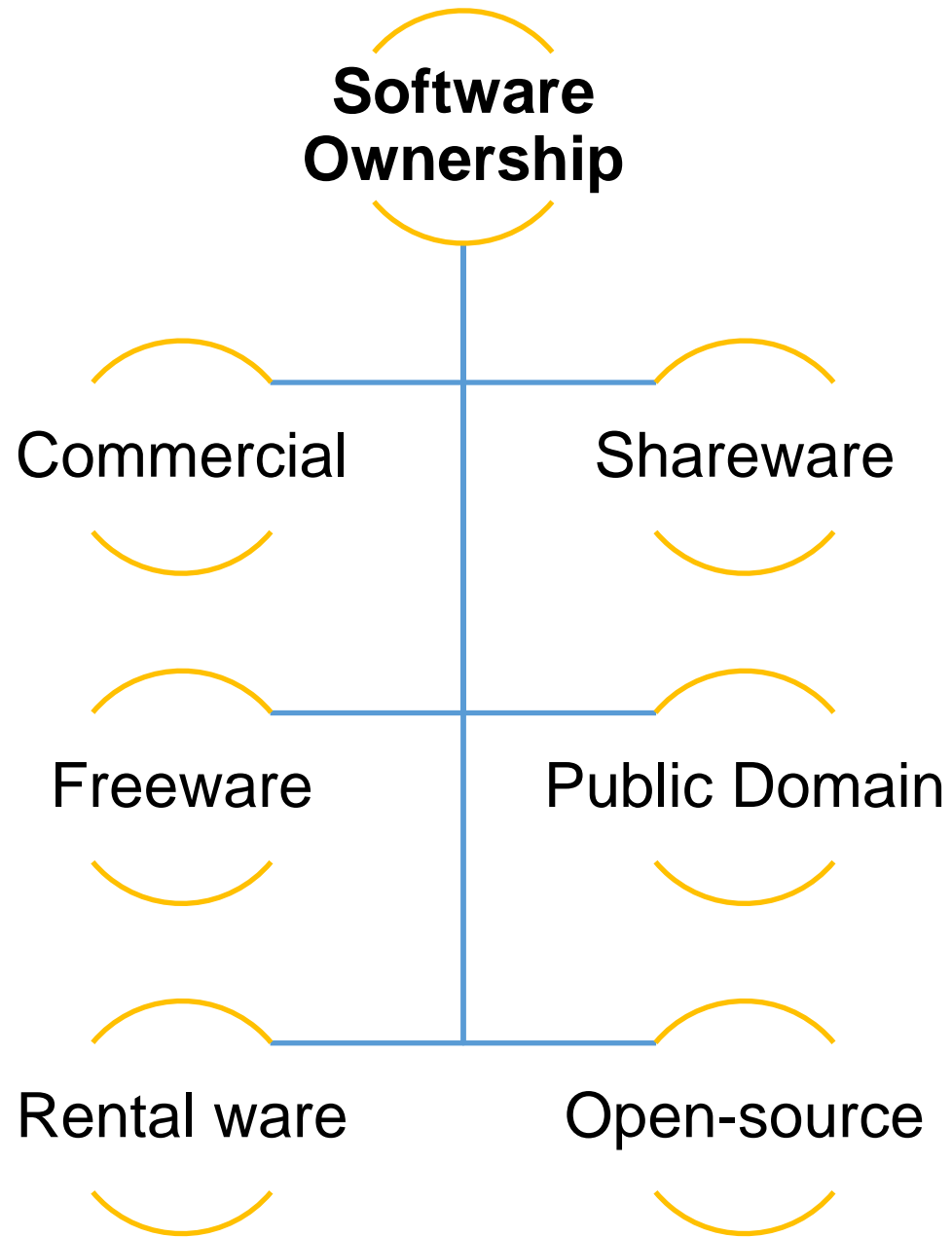












Software Ownership Rights

- When you purchase software, you receive a copy of the software and a license to use it. You don't **actually own the software, ownership rights belong to the software company**, and you're still limited by the terms and conditions of the license.
- Software license
 - Gives you the right to use a software program
 - Specifies the conditions under which the buyer can use the software
 - An agreement, either included in a software package or displayed on the screen when the software is installed or launched





Software Ownership Rights

- **Commercial Software**
 - Copyrighted software developed and sold for profit
 - Typically comes with a single-user license (What are the other type of license?)
- **Shareware**
 - Copyrighted software distributed on the honor system
 - Consumers should either pay for it or uninstall it after the trial period
- **Freeware**
 - Copyrighted software programs that are given away by the author for others to use free of charge
- **Public Domain Software**
 - Software that is not copyrighted and ownership rights have been donated to the public domain



Software Ownership Rights

- **Rental ware:** Programs that mostly used through cloud on a per term rental basis.(Subscription mode)
- **Open-source Software:** Programs with source code available to the general public
 - Use is growing
 - In addition to Linux and other open-source operating systems, there are many open-source apps
 - Open source is typically cheaper
 - Can also be more stable and
 - Secure



Software Ownership Rights

Type of License	Software Example
Commercial software	Adobe Photoshop
Shareware	WinZip
Freeware	Google Chrome, Mozilla Firefox
Public domain software	SQLite
Rental Ware	<u>QuickBooks</u>
Open-Source Software (FOSS)	Linux



Software Suites

- **Software suite:** Collection of software programs bundled together and sold as a single software package
 - Office suites (e.g. Microsoft Office) are used by most businesses and many individuals to produce documents; typically include:
 - Word processing software
 - Spreadsheet software
 - Database software
 - Presentation graphics software
 - Additional productivity tools like calendars, messaging programs, or collaboration tools
 - Provide a common interface among programs in the suite
 - Cost is lower than buying each program separately
 - E.g. Microsoft Office, G-Suite

How does a
general-purpose
software store
data?

- General purpose application software stores data in files.
- For example, a letter, a spreadsheet, a schedule, a song, a video, and so on

How does a special purpose (Custom) software (used in information systems) store data?

In the past, even specialized software that used to use information systems used standard data files to store data.

An information system can have many programs to carry out specific activities. For example, think of software and data in a university system.

- There are software programs that perform specific activities for students.
- General Administration Branch = Registration Software
- Library = library software
- Medical Center = Health Reporting Software
- Welfare Branch = Welfare Software
- Exam Branch = Exam Software
- Faculty = Faculty Student Software



Enterprise Application Software

- Early applications were often independent from other applications
- Consequently, information from one application did not always correlate to information from another application
- Enterprise Resource Planning Applications (ERP) were developed to provide a common application that supports functions across the entire enterprise for the company's employees



ORACLE®

Oracle ERP
Cloud



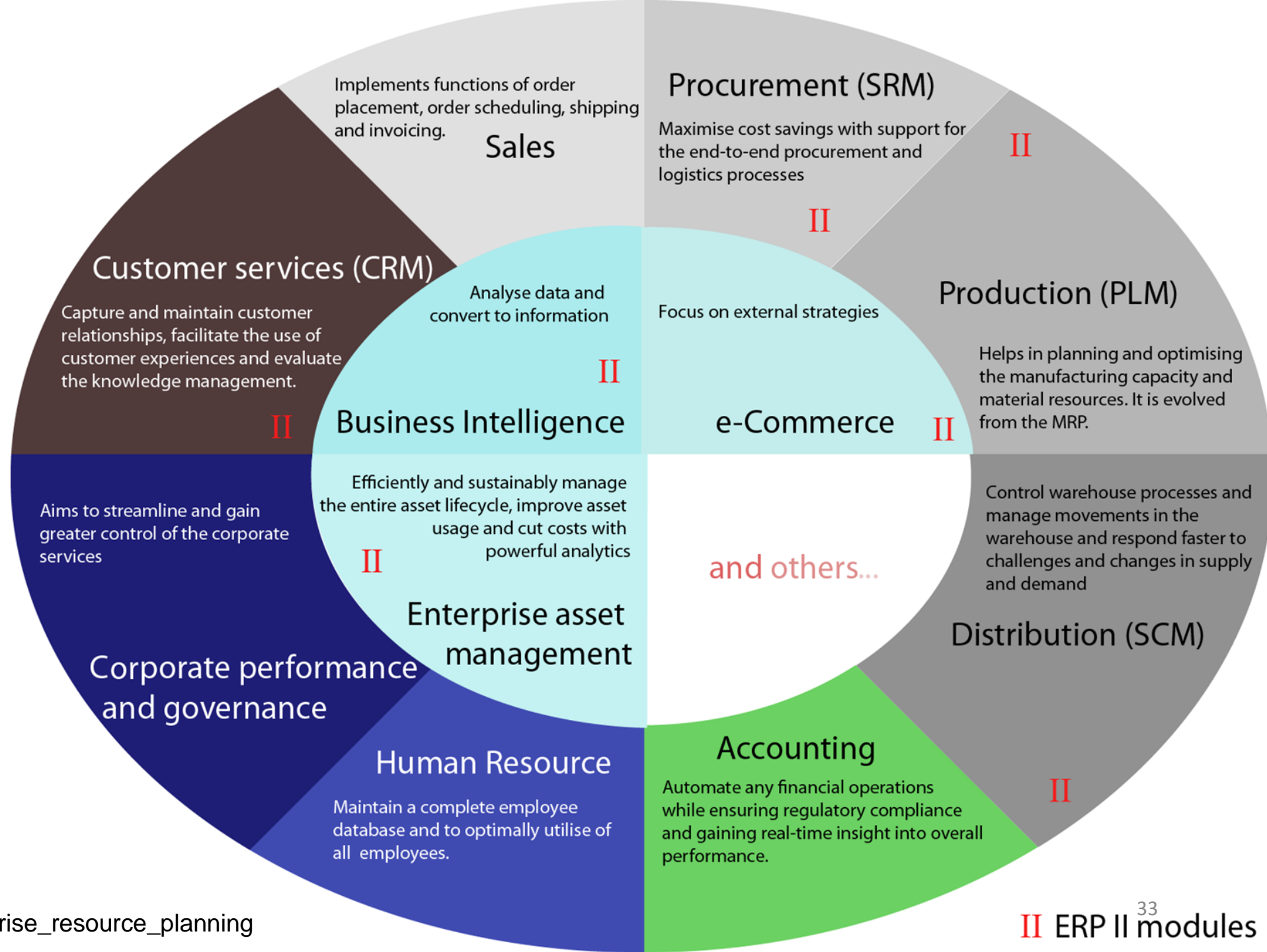
Microsoft
Dynamics® 365



ERP - Key points

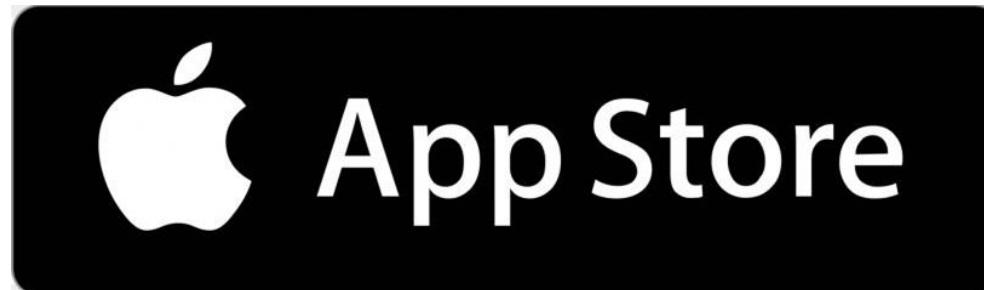
- **A software application:** ERP is an application that is used by many of an organization's employees.
- **Utilizes a central database:** All users of the ERP edit and save their information from the same data source. For example, this means there is only one customer table in the database, there is only one sales (revenue) table in the database, etc.
- **Implemented organization-wide:** ERP systems include functionality that covers all of the essential components of a business. An organization can purchase modules for its ERP system that match specific needs such as order entry, manufacturing, or planning.

Typical ERP Modules



Mobile Applications

- Operate on tablets and smartphones
- Each device has its own operating system (e.g., Android or iOS)
- Each application is developed for the specific mobile device's operating system
- Websites are now offering mobile friendly interfaces to run on mobile devices
 - Independent of the mobile devices' operating system





Cloud Computing - SaaS

- Internet-based *applications, services*, and data *storage*
- SaaS is also known as *on-demand software* and Web-based/Web-hosted software.
- Software as a service (SaaS) is a software distribution model in which a cloud provider hosts applications and makes them available to end users over the internet.
- Software as a service (SaaS) allows users to connect to and use cloud-based apps over the Internet. Common examples are email, calendaring, and office tools (such as Microsoft 365)

Cloud Computing - SaaS



- Advantages:
 - No software to install or upgrade
 - If you have Internet access, you can always use it
 - No restrictions on how much you store and don't have to worry about losing it
- Disadvantages:
 - Your information is stored on someone else's computer – how safe is it?
 - Internet access is required
 - Relying on someone else to provide these services



Business Cloud Usage

- Private Cloud
 - Still uses cloud concepts but allows the business to control over that space
 - Improves who can access it and how it is secured
- Virtualization
 - Using software to simulate a computer or some other device
 - Can create a server without actually purchasing a bare metal server



vmware®





Programming Software

- Programming software's purpose is to produce software. Most of these programs provide developers with an environment in which they can write the code, test it, and convert/compile it into the format that can then be run on a computer.



Software Creation

- Software is written in a programming language
 - Consists of commands organized logically to execute specific functions
 - Written in human-readable format (source code) and converted to machine-readable format (object code)
 - Object code can be interpreted by the computer to allow interaction with the hardware
- Usually done in pieces so several programmers can work together
- **Closed-Source Software** – only object code is available for purchase
- **Open-Source Software:**
 - Code is shared with everyone to use and add features or fix bugs
 - Examples are Firefox browser and Linux operating system



Open vs. Closed Source Software

- Open-Source Software:
 - Software is available for free
 - Source code can be reviewed prior to installing
 - Large programmer groups can fix bugs and add feature
 - May increase risk of attack as everyone knows how your software works
- Closed-Source Software:
 - Company that developed the software provides technical support
 - Employs large number of programmers to enhance the product



Summary

- Defined the term software
- Described the two primary categories of software
- Described the role ERP software plays in an organization
- Described cloud computing (SaaS) and its advantages and disadvantages for use in an organization
- Defined the term open source and identify its primary characteristics