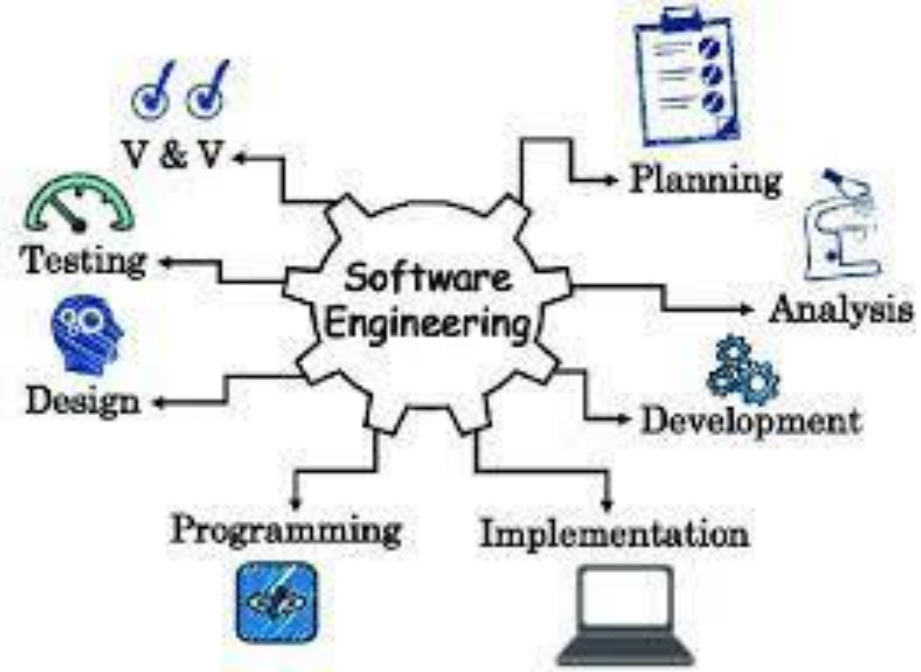
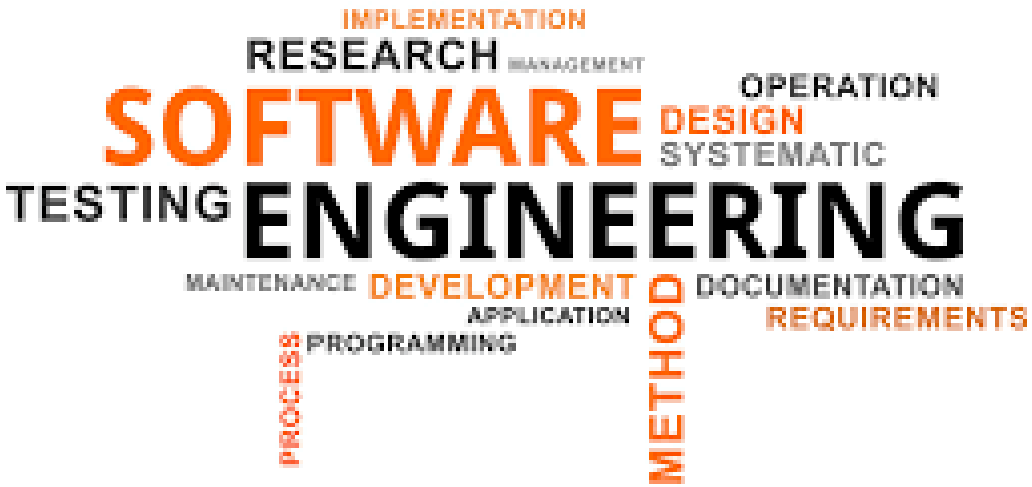
# INTRODUCTION TO SOFTWARE ENGINEERING



# Upcoming Industry in Sri Lanka

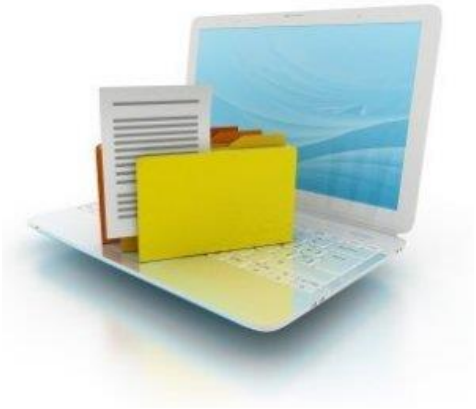
- Data Science
- Data Warehouse and Big Data
- Ethical Hacking
- E-Commerce
- ERP (Enterprise Resource Planning), Oracle, SAP
- Android/IOS Development
- Internet of Things with Arduino
- Game Development

# What are we going to Learn?

- The Important of Software
- Software Applications
- Emerging Technologies
- Software Characteristics

# What is a Software?

Software is **not only** the computer programs, but also associated documentation and configuration files, needed to make the programs operate correctly.



# What is a Software ?

- Software is a collection of computer programs, procedures, rules and associated documentation and data pertaining to the operation of a computer system.

- Software products may be developed to for a particular customer or a particular reason or for a general market.

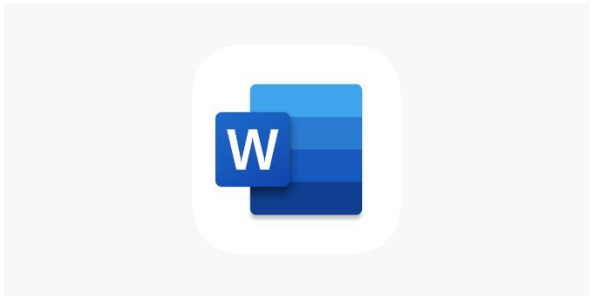
- Software is developed or engineered. It is not manufactured.

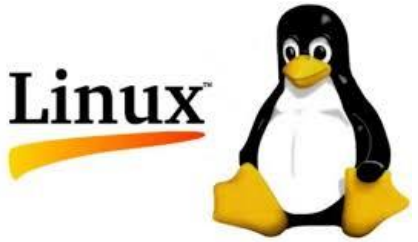
- Software is traditionally divided into two categories.

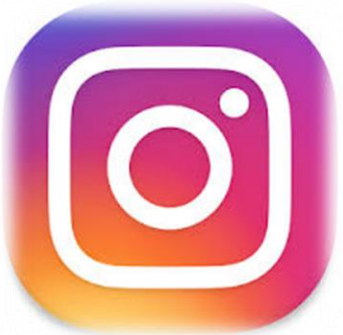
  -System Software

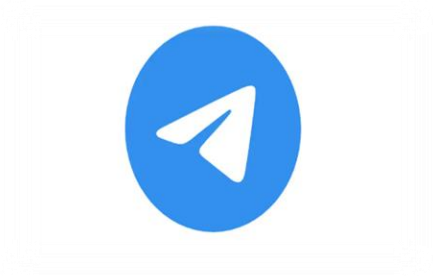
  -Application Software

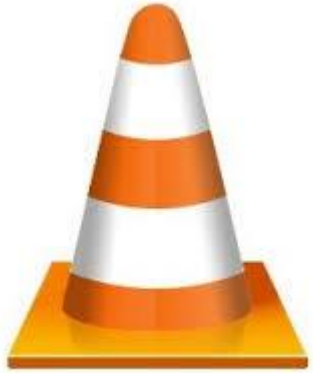
# Popular Software



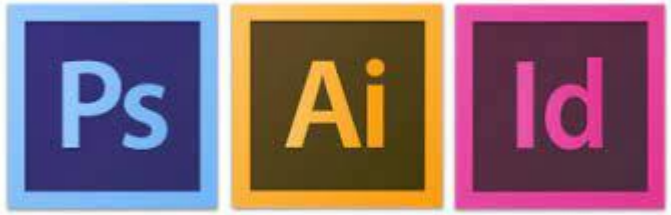










# Programs Vs. Software Products

- **Program**
- Small
- Single developer
- Small in size
- Limited Functionality
- Single user (author)
- Simple user interface
- Sparse documentation
- No user manual

- **Software Product**
- Large
- Team of developers
- Multiple users (customer)
- Complex user interfaces
- Detailed documentation
- User manual

# Software Application Domains

- **System Software** : Designed to operate and control the computer hardware and provide a platform for running the application software. Operating Systems and computer drivers.

- **Application Software** : Stand alone programs that solve the specific business need. Accounting Software, Office Suits.

- **Engineering/Scientific Software** : Characterized by number crunching algorithms such as automotive stress analysis, space engineering.

- **Embedded Software** : Resides within a product or system and is used to implement and control features and functions for the end user and for the system itself. Ex: Keypad control for microwave oven.

- **Product Line Software** : Focus on a limited marketplace to address mass consumer market. Word processing, Database management systems.

- **Web App** : The network-centric software category spans a wide array of applications.

- **AI** : Makes use of non-numerical algorithm to solve complex problem. Robotics, Expert Systems, Pattern Recognize systems

- **Open World Computing** : Develop system and application software that will allow mobile devices, personal computers and enterprise systems to communicate across vast networks.

- **Net Sourcing** : The WWW is rapidly becoming a computing engine as well as a content provider.

- **Open Source** : Free source and free tools open to the computing community.

# EMERGING TECHNOLOGIES

# Emerging technologies

Emerging technologies are technologies which are currently developing or will be developed with business and social environment.

These technologies are generally new but include older technologies as well.

Emerging technologies are characterized by radical novelty, relatively fast growth, coherence, prominent impact, and uncertainty and ambiguity.

# Invention vs Innovation

Invention can be defined as the creation of a product or introduction of a process for the first time.

Innovation on the other hand, occurs if someone improves on or makes a significant contribution to an existing product, process or service.


"There is a way to do it better - find it"

-Thomas Edison

# Top Emerging Technologies and Products which change the world today

**1. Wearable Technologies** : Wearable technology (also called wearable gadgets) is a category of technology devices that can be worn by a consumer and often include tracking information related to health and fitness.

- **NADI X:** Yoga Pants  embedded with technology. Communicate with apps.
- **Nanowear:** Textile-based nano sensor technology, Monitor medical conditions.
- **Lumo:** The first wearable sensor & app, Acts as a portable running coach.
- **POLO T-Shirt, Hood with Phone Connection, Smart Watch, Google Glass, Wearable Swimming costumes,**

**2. Emergent artificial intelligence :** With next generation robots.

Examples:

- nuclear clean-up robots
- Industrial robots
- Toyota reveals Human Support Robot
- Robots in Retail

**3. Auto Pilot Cars :** Tesla Auto Pilot Car and Audi Auto Pilot Car

Examples:

**Tesla**

**Audi**

**BMW**

**4. Smart Phones :**

Examples:

**Iphone 13 /14**

**5. 5G:** Planning aims at higher capacity than current 4G, allowing a higher density of mobile broadband users, and supporting device-to-device, more reliable, and massive machine.

**6. Toyota Lexus LFA Super Car with Yamaha**

**7. Evolution of TV :**

CRT (B&W) > CRT (Color) > Remote Control > LCD > LED > Smart TV > Voice Control > Curved TV > QLED > Apple TV

8. Amazon Go

9. 3D Printing

10. eSight 3

11. New Ecommerce WebSites: Airbnb, AliExpress, Amazon

12. Ember Mug

13. Adidas Futurecraft 4D

# Failed Innovation Products

- NEW COKE- COCA-COLA
- THE EDSEL- FORD
- FACEBOOK PHONE-FACEBOOK
- SPOT WATCHES - MICROSOFT
- ZUNE, MICROSOFT - Microsoft’s “me too” mp3 player was too late to the iPod party.
- WINDOWS VISTA - MICROSOFT (2007)
- PEPSI AM - This ambitious Pepsi variant contained more caffeine than the usual formula and targeted the “breakfast cola drinker.” It lasted just one year.
- Crystal PEPSI
- Samsung note 7

# Software products can be

- Generic
  - These are stand alone systems that are produced by a development organization and sold on the open market to any customer who is able to buy them.
- Customized
  - These are systems that are developed for a particular customer requirements

# How do we develop a real software?

- There will be a real user (Customer) who would need to use the software.
  1. Feasibly study (whether it is technical feasible and financially worthwhile)
  2. You have to find out what the customer wants (Requirements Gathering)
  3. Analyze the problem
  4. Develop a solution (Design)
  5. Code the solution
  6. Test and Debug
  7. Maintenance