



**TRƯỜNG ĐẠI HỌC BÁCH KHOA HÀ NỘI**  
HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

# Introduction to Systems analysis and design

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[trungtv.github.io](https://trungtv.github.io)

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# About this course

Tên học phần:	Phân tích thiết kế hệ thống thông tin (Systems analysis and design)
Mã số học phần:	IT3120
Khối lượng:	2(2-1-0-4) <ul style="list-style-type: none"><li>– Lý thuyết: 30 tiết</li><li>– BTL: 15 tiết</li><li>– Thí nghiệm: 0 tiết</li></ul>
Group sinh viên	– <a href="https://www.facebook.com/groups/trungtv.students/">https://www.facebook.com/groups/trungtv.students/</a>
Website môn học	– <a href="https://trungtv.github.io/courses/SAD">trungtv.github.io/courses/SAD</a>

# Outline

# Team Project

- Objective
  - to gain first hand knowledge of the challenges of systems analysis
  - to gain experience working in a team on a project
  - to learn to properly document a project
- All students must fully participate in a team project
  - attend all team meetings
  - participate in all demonstrations
  - participate in all presentations
  - complete a fair share of:
    - Planning
    - Analysis
    - Design
    - Development
    - Documentation

# Team Project

- All students will be assigned to a team
- Documentation
  - Each team member is responsible for documenting their contributions
    - Weekly timesheets
    - Weekly contributions details
- Presentations:
  - mandatory attendance
  - failure to give a presentation will result in a 0

# Team Project

- Documentation
  - Time sheets (individual)
  - Contributions (individual)
  - Meeting minutes (group)
- Submission
  - using gitlab (to be set up later on)
  - all teams must commit and push their team repo every Sunday
  - all individuals must commit and push their individual files every Sunday
  - Individual marks will be largely based on these pushes

# Course motivation

# Motivation

- We live in a world of ubiquitous computing
- Despite the fact that we are familiar with using
  - Mobile, computers, internet, AI
- Most of us are unfamiliar with building information systems



# What is a system

- Systems are created to solve problems
  - A collection of components that work together to realize some objectives forms a system
- Basically there are three major components in every system, namely input, processing and output
  - different components are connected with each other and they are interdependent

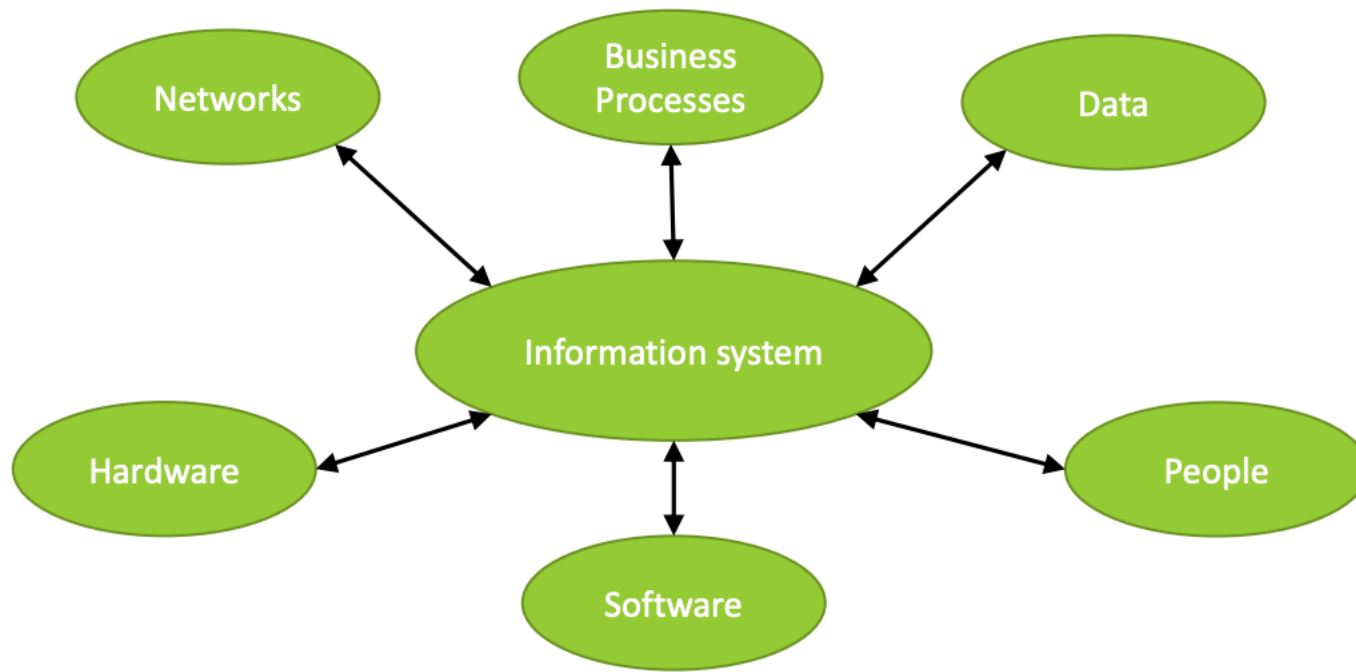


# Examples

- Human body represents a complete natural system
- Political system
- Economic system
- Educational system
- A well-designed system also includes an additional element referred to as 'control' that provides a feedback to achieve desired objectives of the system.

# Information systems

- a set of interrelated components that collect, process, store, and provide as output **the information** needed to complete business tasks

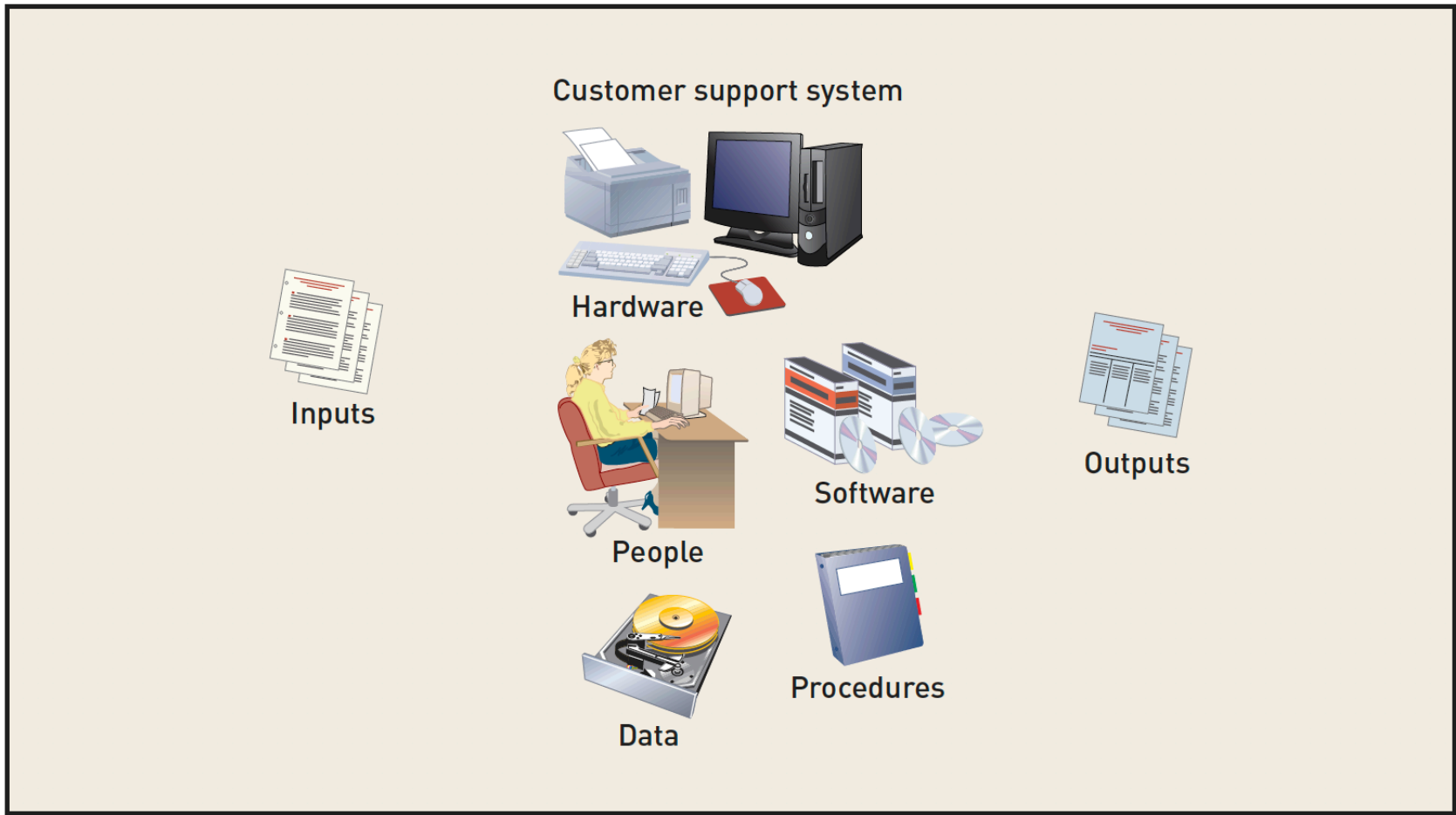


# Computer Applications (apps)



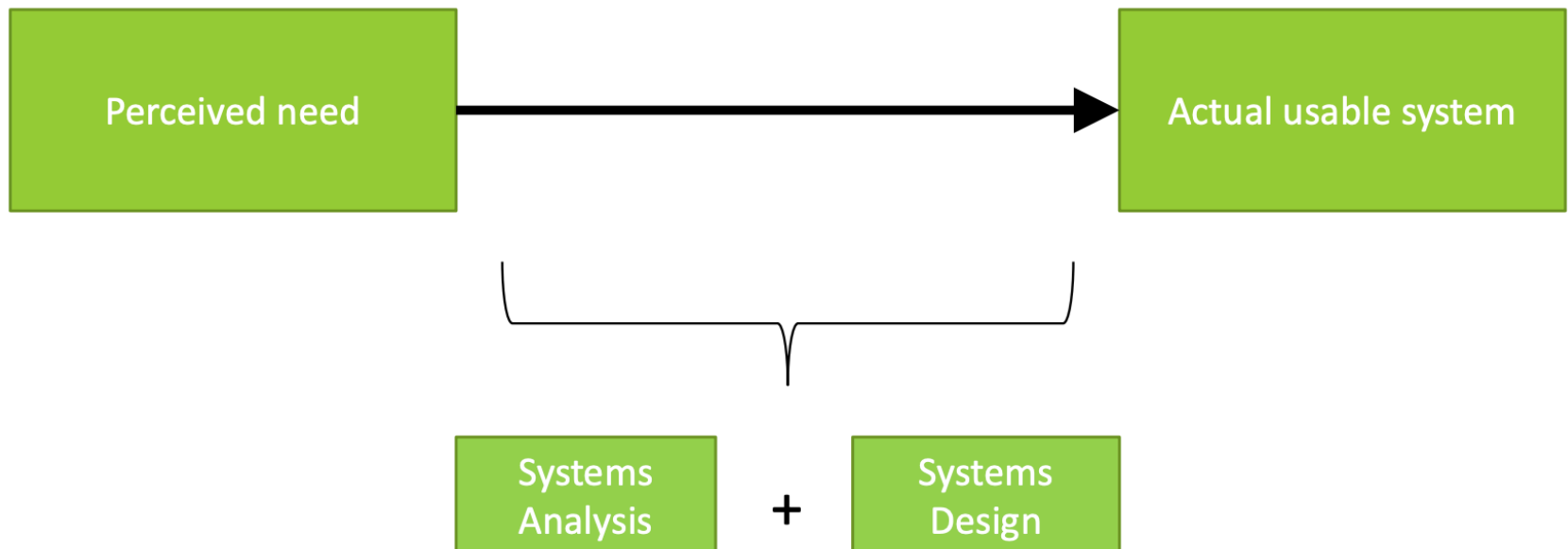
a program that runs on a computer to carry out specific functions or a set of related functions

# Example of a customer support system



# Systems Analysis and Design

- In this class we will investigate **how an information system is created**



# Systems Analysis

- Systems Analysis is the set of activities that we undergo to understand and specify what a system should be able to do or accomplish

**Understand**

**Specify**

# Example

- A customer management system should
  - track customers
  - register products
  - monitor warranties
  - track service levels
- ... Systems analysis is much more than this list!



# Systems Design

- Systems Design is the set of activities that we undergo to describe in detail **how** the Information System will actually be implemented

# Systems Analysis and Design

Systems Analysis

+

Systems Design

**What** is needed for  
the system to solve this  
problem

**How** the system will  
operate to solve this  
problem

# Building a System

- Building a system is a lot like building a building

```
graph TD; LO[Land owner] --- B[Builder]; LO --- A[Architect]; B --- A;
```

Land owner

Builder

Architect

# Stakeholders

- **System Owners:** are the information system's sponsors and chief advocates. They are usually responsible for funding the project to develop, operate, and maintain the information system.
- **System Users:** are the people who use or are affected by the information system on a regular basis –capturing, validating, entering, responding to, storing, and exchanging data and information. A common synonym is client.

# Stakeholders [2]

- System Designers: translate system users' business requirements and constraints into technical solutions. They design the computer files, databases, inputs, outputs, screens, networks and programs that will meet the system users' requirements.
- System Builders: construct the information system components based on the design specifications from the system designer. In many cases, the system designer and builder for a component are one and the same.

# Stakeholders [3]

- Systems Analyst: facilitates the development of information systems and computer applications.
- A systems analyst studies the problems and needs of an organization to determine how people, data, processes, communications, and information technology can best accomplish improvements for the business.
- Business Analyst: is a systems analyst that specializes in business problem analysis and technology-independent requirements analysis.

# Systems Analyst Roles

- Interaction with an array of people
  - Technical specialists (DBAs, network admins, programmers)
  - Business people (users, managers, steering committee)
  - Others (vendors, consultants)
- Variety of specialized roles
  - People-oriented: change management analyst, project management
  - Business-oriented: requirements analyst, business analyst
  - Technically-oriented: infrastructure analyst
  - Generalist: systems analyst

# Work circle of Systems Analyst

1. Identify the problem.
2. Analyze and understand the problem.
3. Identify solution requirements or expectations.
4. Identify alternative solutions and decide a course of
5. action.
6. Support the design and implementation of the “best” solution.
7. Evaluate the results. If the problem is not solved, return to Step 1 or 2 as appropriate.



# What do System Analysts like about their work?

- Challenge
- Technology
- Variety
- Constant Change
- Problem Solving

# What do System Analysts dislike about their work?

- Management's lack of communication/recognition
- End-user mistakes and demands
- Stress/pressure/burnout
- Ever-changing business technology
- Unrealistic deadlines

# Preparing for System Analyst career

- Working knowledge of information technology
- Computer programming experience & expertise
- General business knowledge
- Problem-solving skills
- Interpersonal communication skills
- Flexibility and adaptability
- Character and ethics
- Systems analysis & design skills

# References

1. Satzinger, John W., Robert B. Jackson, and Stephen D. Burd. *Systems analysis and design in a changing world*. Cengage learning, 2011.
2. Pressman, Roger S. *Software engineering: a practitioner's approach*. Palgrave macmillan, 2005.
3. Kendall, Kenneth E., and Julie E. Kendall. *Systems analysis and design*. Prentice Hall Press, 2010.

**Thank you for your attention!**  
**Q&A**