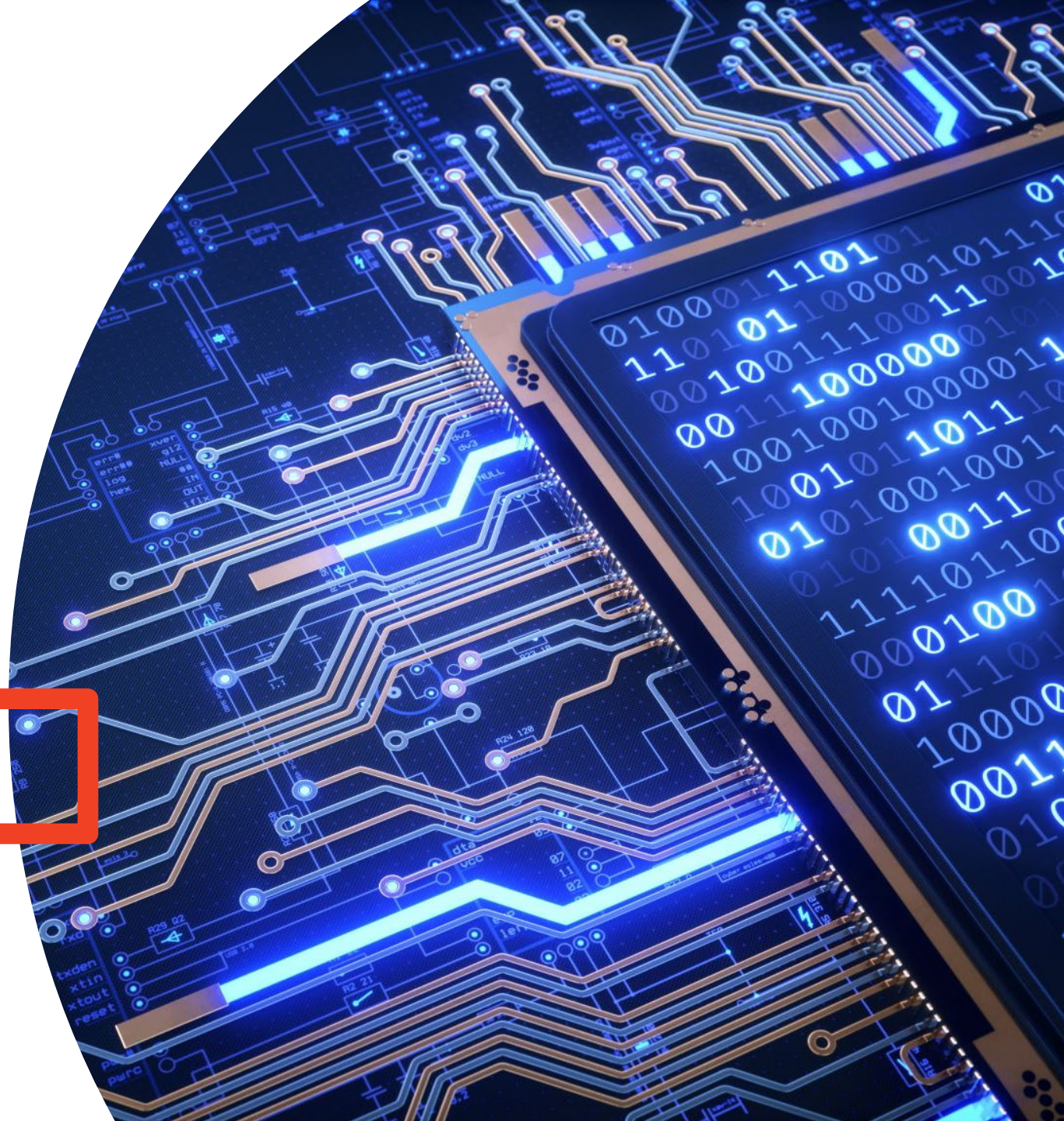
Software Developer



Life Cycle of Software Development Concepts

- Role and function of the software development lifecycle
- Seven generic stages of the software development lifecycle
- Main activities in each stage of the software development lifecycle
- High-level deliverables from each stage of the software development lifecycle

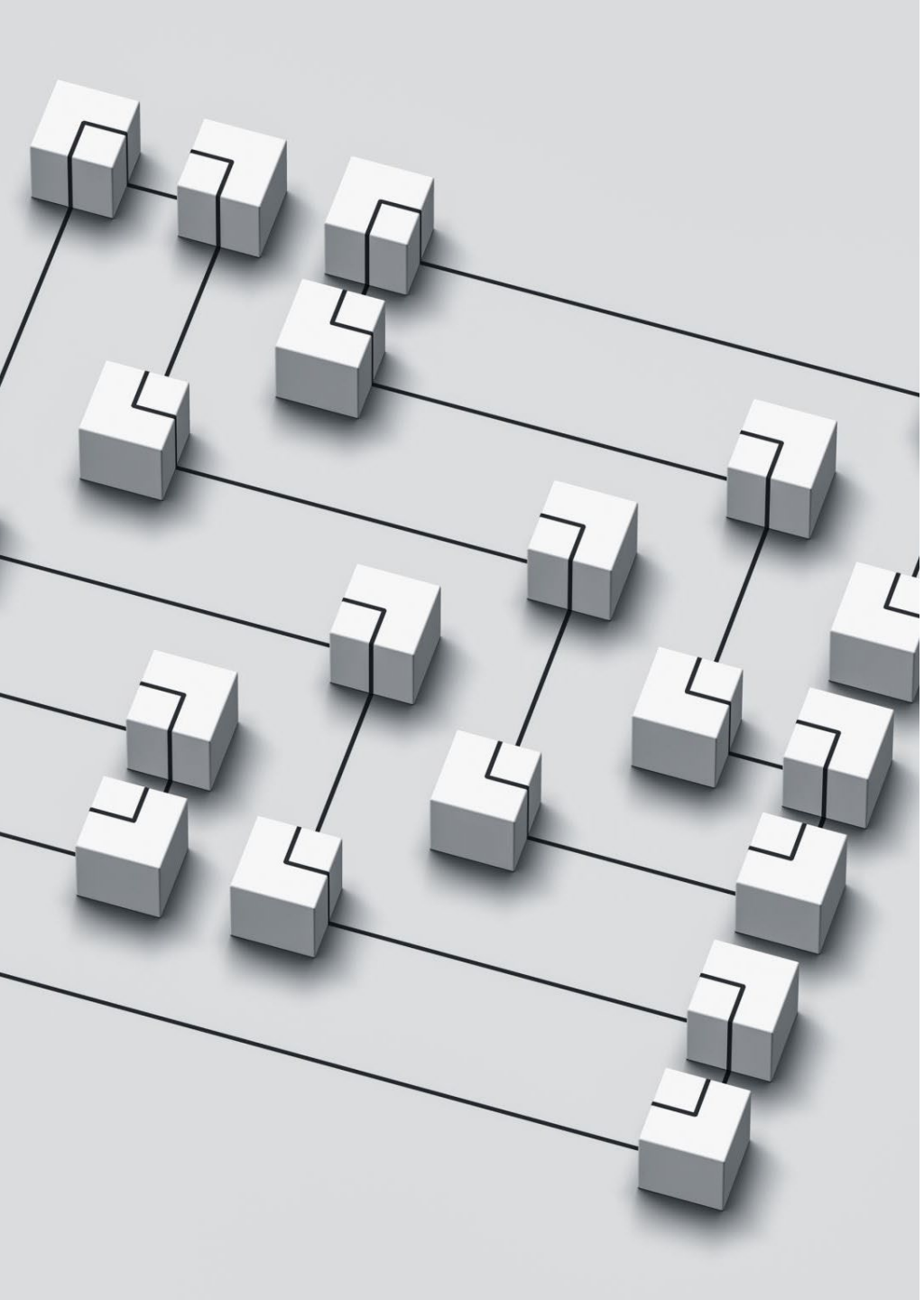
Explain the role and function of the software development lifecycle

Representing the terminology and stages of the SDLC

- Feasibility Study
- Requirements Analysis
- Design
- Implementation
- Testing
- Deployment
- Maintenance

Role of the SDLC

- World accepted and standardised software development methodologies which are utilised during the software development life cycle, also known as 'Software Development Process Models'
- This fixed model follows specific steps to ensure the success in the software development project

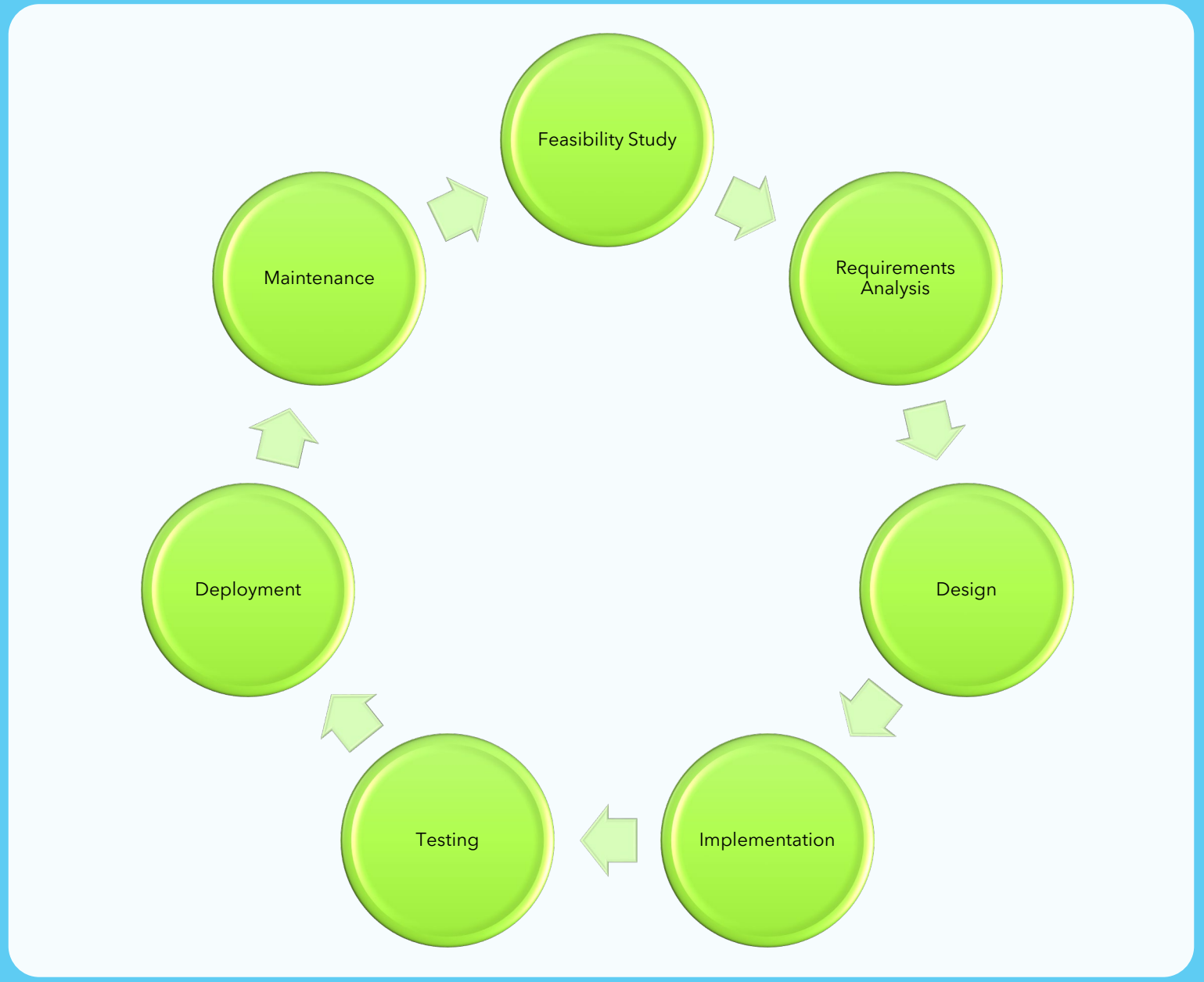


Purpose of SDLC

- An SDLC model maps the software development process from its initial planning through maintenance and eventual retirement of the completed application
- An important goal of SDLC is to quickly and efficiently produce high-quality software in a series of phases that are called steps or phases
- There are 7 steps

Relate the seven generic stages of the software development lifecycle.

Relate the seven generic stages of the software development lifecycle.



Illustrate the main activities in each stage of the software development lifecycle

Feasibility Study

- How software development is initiated when a need or an opportunity is identified
- Purpose and main activities of a feasibility study
- Importance of planning software development
- Purpose of a business case
- Potential tangible and intangible benefits that can be achieved using operational software
- Simple cost benefit analysis for a given case

What is it?

- A feasibility study is a short, focused study that should take place early in the requirements gathering process.
- It should answer three key questions:
    1. Does the system contribute to the overall objectives of the organisation?
    2. Can the system be implemented within schedule and budget using current technology?
    3. Can the system be integrated with other systems that are used?
- If the answer to any of these questions is no, you should probably not go ahead with the project
- Identifies new opportunities
- Narrows the business alternatives
- Provides valuable information for a “go/no go ” decision
- Provides documentation that the idea was thoroughly investigated

How software development is initiated when a need or an opportunity is identified

- An assessment of the practicality of a proposed plan or method
- A feasibility study is an analysis that takes all of a project's relevant factors into account
  - Economic
  - Technical
  - Legal
  - Considerations
- Ascertain the likelihood of completing the project successfully
- Project managers use feasibility studies to discern the pros and cons of undertaking a project before they invest a lot of time and money into it
- Feasibility studies also can provide a company's management with crucial information that could prevent the company from entering blindly into risky businesses

Purpose and main activities of a feasibility study

- Technical feasibility
- Financial feasibility
- Collection of information
- Assessment of risks and implications
- Consideration of alternatives
- Feasibility report writing

Technical feasibility

- Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software within the allocated time and budget
- For this, the software development team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements
- Technical feasibility also performs the following tasks.
- Analyses the technical skills and capabilities of the software development team members.
- Determines whether the relevant technology is stable and established.
- Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required

Technical Feasibility (continued)

- Ability to construct the system
- Greater returns from riskier projects – manage risk
  - Fail to attain benefits
  - cost-/time overruns
  - Inadequate system performance levels
  - Unable to integrate with existing hardware or software

Financial feasibility

- Economic evaluation is a vital part of investment appraisal, dealing with factors that can be quantified, measured, and compared in monetary terms
- For any system if the expected benefits equal or exceed the expected costs, the system can be judged to be economically feasible
- In economic feasibility, cost benefit analysis is done in which expected costs and benefits are evaluated
- Economic analysis is used for evaluating the effectiveness of the proposed system.
- As the name suggests, it is an analysis of the costs to be incurred in the system and benefits derivable out of the system
- Cost-benefit analysis
  - estimating the strengths and weaknesses of alternatives used to determine options which provide the best approach to achieving benefits while preserving savings

Collection of Information

- The challenge of collecting software engineering data is to make sure that the collected data can provide useful information for project, process, and quality management and, at the same time, that the data collection process will not be a burden on development teams
- Must be based on well-defined metrics and models, which are used to drive improvements
- Set collection goals early
- Can be expensive

Assessment of risks and implications

- Identify sources of project risk and to estimate the consequences of those risks
- Risks might arise from the use of new technology, prospective users' resistance to change, availability of critical resources, competitive reactions or changes in regulatory actions due to the construction of a system, or team member inexperience with technology or the business area
- You should continually try to identify and assess project risk

Consideration of alternatives

- Investigate a variety of ways of organising the business and positioning your product in the marketplace
- It is like an exploratory journey and you may take several paths before you reach your destination
- Just because the initial analysis is negative does not mean that the proposal does not have merit
- Sometimes limitations or flaws in the proposal can be corrected.

Operational Feasibility

- Useful for identifying operational problems to be solved
- The 'PIECES' framework:
  - Performance
  - Information
  - Economy
  - Control
  - Efficiency
  - Services

Market Feasibility

- Determine facility needs
- Suitability of production technology
- Availability and suitability of the site
- Raw materials
- Other inputs

Environmental Feasibility

- Environmental impact and their assessment
- The environmental feasibility study considers both human and environmental health factors

Legal Feasibility

- Is the project legally feasible?
- Legal requirements
  - Copyright, Designs and Patents Act 1988

Feasibility report writing

- Consists of definitive sections
  - Introduction/Executive Summary
  - Background
  - Outline of project
  - Methodology/method of analysis
  - Overview of alternatives
  - Conclusion
  - Recommendation

Importance of planning software development

- Planning is one of the important activity which plays an important role in the successful delivery of the project
- If proper planning is not done, then the entire project might be at risk
- A good plan helps to manage time, cost, quality, potential risks and to focus on the project goals

"He who fails to plan, is planning to fail"

Winston Churchill

Purpose of a business case

- The business case captures the reasoning for initiating a project or task. It is the information needed for authorisation of the project
- The purpose of the business case is to document the justification for the undertaking of a project usually based on the estimated cost of development and implementation against the risks and the anticipated business benefits and savings to be gained
- Business case development is a step that companies often use for project selection
- It analyses how fulfilling the business case for the project will implement the corporate strategy and sustain the competitive advantage of the company

Potential tangible and intangible benefits that can be achieved using operational software

COST SAVINGS

PRODUCTIVITY GAINS

RISK REDUCTION

TIME SAVINGS

INCREASED INCOME

Simple cost benefit analysis for a given case

A cost benefit analysis (also known as a benefit cost analysis) is a process by which organisations can analyse decisions, systems or projects, or determine a value for intangibles

The model is built by identifying the benefits of an action as well as the associated costs, and subtracting the costs from benefits

Organisations rely on cost benefit analysis to support decision making because it provides an agnostic, evidence-based view of the issue being evaluated—without the influences of opinion, politics, or bias

COST BENEFIT ANALYSIS

Is a systematic approach to calculating and comparing the benefits and costs of a course of action in a given situation.

Cost Benefit Analysis is used to

- Verify that an investment's (or a project's) benefits are more than it's costs

- Select an investment (or a project) by comparing their benefits over costs ratios.

Procedures

- Obtain cost estimates.

- Obtain benefit estimates.

- Compute estimated costs and benefits schedule over time to determine the payback period.

Jules Dupuit

The concept of CBA dates back to an 1848 article by Jules Dupuit

projectcubicle.com