CSC 501:

SOFTWARE ENGINEERING

SOFTWARE PROJECT MANAGEMENT

By

IKENNA CAESAR NWANDU PhD

Federal University of Technology Owerri (FUTO), Nigeria.

Software Engineering

- **Software**: a collection of executable programming code, associated libraries and documentations.
  - when software is made for a specific requirement, it is called **software product.**
- **Engineering:** development of products using well-defined, scientific principles and methods**.**
- **Software Engineering:** developing software products using well-defined scientific principles, methods and procedures**.**
  - **According to IEEE,**

  Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software; that is, the application of engineering to software.

Software Project Management

- **Software Project** involves developing intended software using a complete procedure, i.e., from requirement gathering to testing and maintenance.
- **Software Project Management** comprises a set of activities meant to spell out the project plan, scope of software product, cost in various terms, as well as schedule of tasks and events.
- **Software Project Management activities include:**
    a. Project Planning
    b. Scope Management
    c. Project Estimation

Project Planning

- This is done before the production of software actually starts.
- Its sub-activities do not have direct connection with the software production. Rather, they facilitate software production.

Scope Management

- This creates boundaries of the project by clearly defining what would be done and what would not be done. This helps in avoiding cost and time overrun. Scope management includes all the processes needed to be done to realize a deliverable software product.
- Project Scope management involves:
    a. Definition of the project scope
    b. Deciding its verification and control
    c. Division of the project into smaller parts for proper management
    d. Verification of the defined scope
    e. Incorporating changes to control the scope

Project Estimation

- This involves estimation of various parameters for effective management.
- Project estimation involves:
    a. **Software size estimation**: in terms of KLOC (Kilo Line of Code) or by calculating number of function points in the software.
    b. **Effort estimation:** in terms of personnel requirement and man-hour required to produce the software.
    c. **Time estimation:** in terms of the total time invested to complete the project. Once size and efforts are estimated, the time required to produce the software can be estimated.
    d. **Cost estimation**: This considers more factors than others, hence the most complex. It considers software size, software quality, hardware, software tools, skilled personnel, communication, travels involved, etc.

Project Estimation Techniques

- Project estimation parameters (– size, effort, time and cost) can be estimated using two techniques:

i. Decomposition Technique:

This technique views software as a product of various compositions. There are two main models –

a. **Line of Code**: Estimation is done using software's number of lines of codes.
b. **Function Points**: Estimation is done using software's number of function points.

ii. Empirical Estimation Technique:

This technique uses empirically derived formulae to make estimation. These formulae are based on Lines of Code or Function Points.

a. **Putnam Model**: Putnam model maps time and efforts required with software size.
b. **COCOMO (Constructive Cost Model)**: This divides the software product into three categories of software: *organic, semi-detached*, and *embedded*.

Review Questions