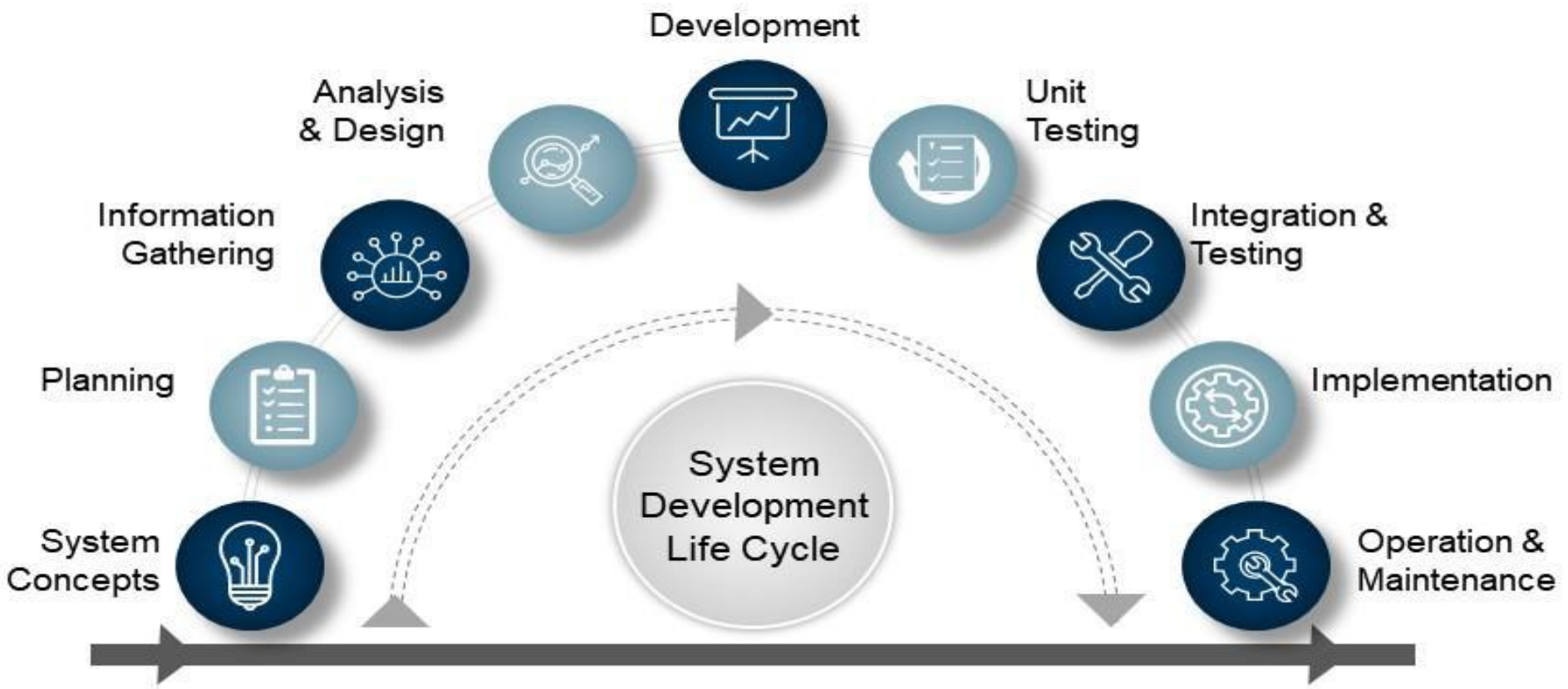
CS4050 – WEEK 9: INFORMATION SYSTEMS AUDIT AND CONTROL

FAST NUCES – SPRING 2024

BS COMPUTER SCIENCE

System Development Life Cycle Best Practices



CHAPTER 2 - PART B: INFORMATION SYSTEMS IMPLEMENTATION

Information systems implementation is when the system is installed and moved into the production environment after appropriate system and users' acceptance testing. This is the stage at which:

- End users are notified.
- Data entry or conversions occur.
- Training takes place.
- Post-implementation reviews occur.

TESTING METHODOLOGIES - CLASSIFICATIONS

- Unit Testing
- Interface or Integration Testing
- System Testing - Recovery, Security, Load, Volume, Stress & Performance Testing
- Final Acceptance Testing – QAT and UAT
- Other Testing – Alpha & Beta Testing, Pilot Testing, White-box testing, Black-box testing, Functional/Validation Testing, Regression Testing, Parallel Testing, Sociability Testing

SOFTWARE TESTING APPROACHES

- **Bottom up**: Testing begins with atomic units, such as programs or modules, and works upward until a complete system testing has taken place. The advantages follow:
  - There is no need for stubs or drivers.
  - Testing can be started before all programs are complete.
  - Errors in critical modules are found early.
- **Top down**: Testing follows the opposite path, either in depth-first or breadth-first search order. The advantages follow:
  - Tests of major functions and processing are conducted early.
  - Interface errors can be detected sooner.
  - Confidence in the system is increased because programmers and users actually see a working system.

DATA INTEGRITY TESTING

- **Relational integrity tests** — Relational integrity is enforced through data validation routines built into the application or by defining the input condition constraints and data characteristics at the table definition in the database stage. Sometimes it is a combination of both.
- **Referential integrity tests** — Define existence relationships between entities in different tables of a database that needs to be maintained by the DBMS. It is required for maintaining interrelation integrity in the relational data model. Whenever two or more relations are related through referential constraints (primary and foreign key), it is necessary that references be kept consistent in the event of insertions, deletions and updates to these relations.

APPLICATION SYSTEM TESTING – ASSIGNMENT # 2

- Review the table 3.20 in the CISA Review Manual, highlighting different ways to test application systems. Answer the following:

Q1: Which testing model is the best to ensure the data processing is performed correctly.

Q2: Which testing model you will use to test the flow of data in procurement application, processing the Purchase Orders, Invoices and Payments?

Q3: You are auditing the application to verify that fuel pump is recording the volume of oil correctly. Which testing model you will use for this purpose and why?

CONFIGURATION & RELEASE MANAGEMENT

Configuration management tools will support change management and release management through the:

1. Identification of items affected by a proposed change to assist with impact assessment (functional, operational and security)
2. Recording configuration items affected by authorized changes
3. Implementation of changes in accordance with authorization records
4. Registering of configuration item changes when authorized changes and releases are implemented
5. Recording of baselines that are related to releases (with known consequences) to which an organization would revert if an implemented change fails
6. Preparing a release to avoid human errors and resource costs

SYSTEM MIGRATION, INFRASTRUCTURE DEPLOYMENT AND DATA CONVERSION

- Data Migration - the key points to be taken into consideration in a data conversion project are to ensure (i) Completeness of data conversion; (ii) Data integrity; (iii) Storage and security of data under conversion; (iv) Consistency of data; (v) Continuity of data access
- Changeover techniques – (i) parallel; (ii) phased; (iii) abrupt
- Systems Implementation – planning; knowledge transfer plan, training plan;
- System change procedures – critical success factors, end-user training,
- Certifications and Accreditations

POST-IMPLEMENTATION REVIEW

Measurement of Critical Success Factors	
Productivity	Dollars spent per user Number of transactions per month Number of transactions per user
Quality	Number of discrepancies Number of disputes Number of occurrences of fraud/misuse detection
Economic Value	Total processing time reduction Monetary value of administration costs
Customer Service	Turnaround time for customer question handling Frequency of useful communication to users