NANYANG TECHNOLOGICAL UNIVERSITY

CZ3002 - Advanced Software Engineering

Change Management

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Quick Review Sheet of Previous Lesson

In the last lesson:

- Sub-disciplines of software engineering include:
  - Configuration management, engineering management, quality management, software maintenance, software testing, etc.
- Release is:
  - A tested and approved baseline that is usually installed at a client site.
- A tool of Release management is VCS:
  - **Version Control Software (or Version Control Systems)** can be used to manage releases.
- Release management can rely on continuous integration:
  - A software development practice where members of a team integrate their work **frequently.**

Lesson Objectives

At the end of the lesson, you should be able to:

- Explain the reasons for software system changes and for change control, with the help a real world example introduced
- Understand why change management is important and the roles in change management
- Understand change prediction
- Understand the steps in change control process

Software Systems Change

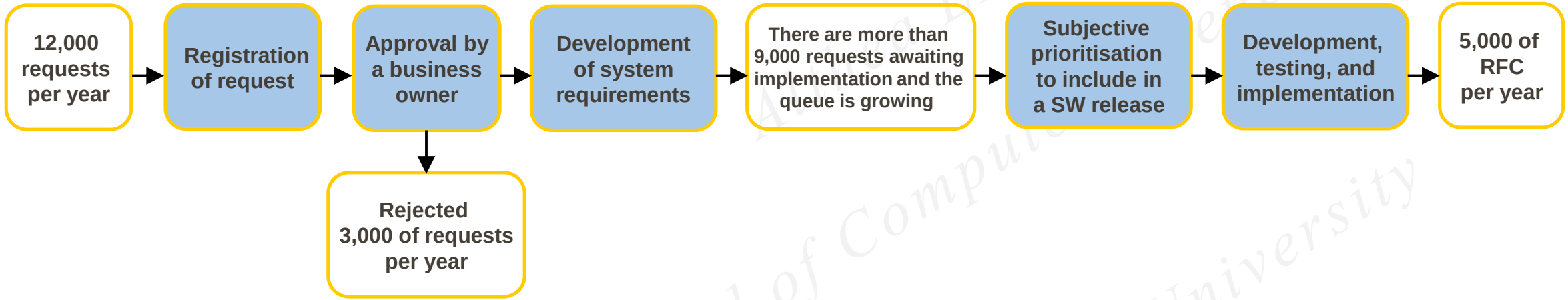
- Software change is inevitable:
  - Errors must be repaired.
  - The performance or reliability of the system may have to be improved.
  - The business environment changes.
  - New requirements emerge when the software is used.
  - New computers and equipment are added to the system.

Important:

A key problem for organisations is implementing and managing change to their existing software systems.

Managing Changes: A Real Example

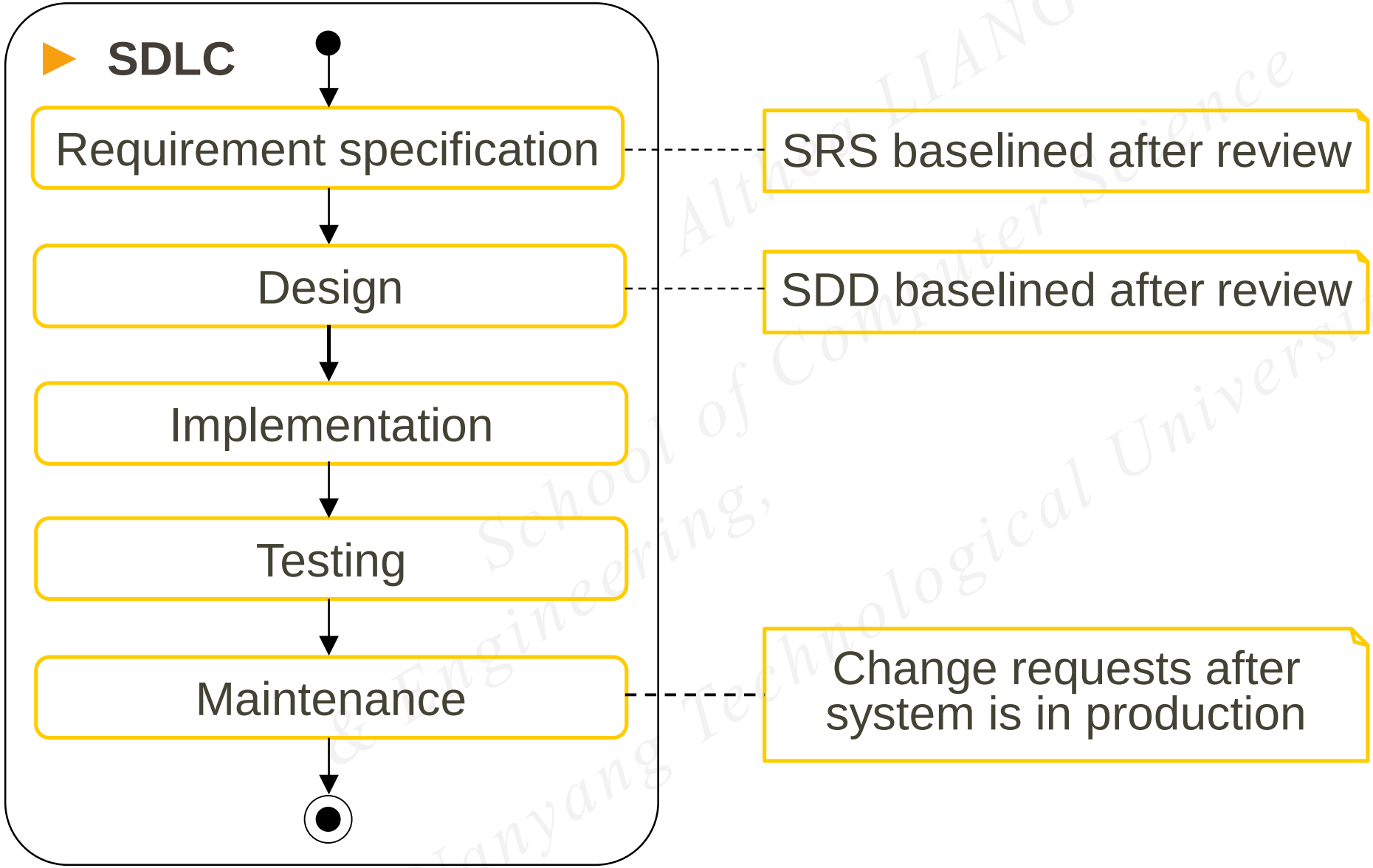
- Why managing changes is a must?



A change management case of Accenture for a big Russia bank

- Managing amount of changes.
- Managing potential impacts of changes.

Points in Software Development Life Cycle (SDLC)



Change Prediction

- Predicting the number of changes requires an understanding of the relationships between a system and its environment.
- Tightly coupled systems require changes whenever the environment is changed.
- Factors influencing this relationship are:
  - Number and complexity of system interfaces.
  - Number of inherently volatile system requirements; volatile refers to requirements that reflect organisational policies rather than domain characteristics.
    - E.g. only the HR manager can view the employee records.
  - The business processes where the system is used.

Change Control Boards (CCB)

- On moderate or large projects
- Two types:
  - Project Level CCB
  - Software Change Control Board (SCCB)
- Role
  - Assesses impact of change and approve change before it is implemented.
  - Determines when the change will be released.

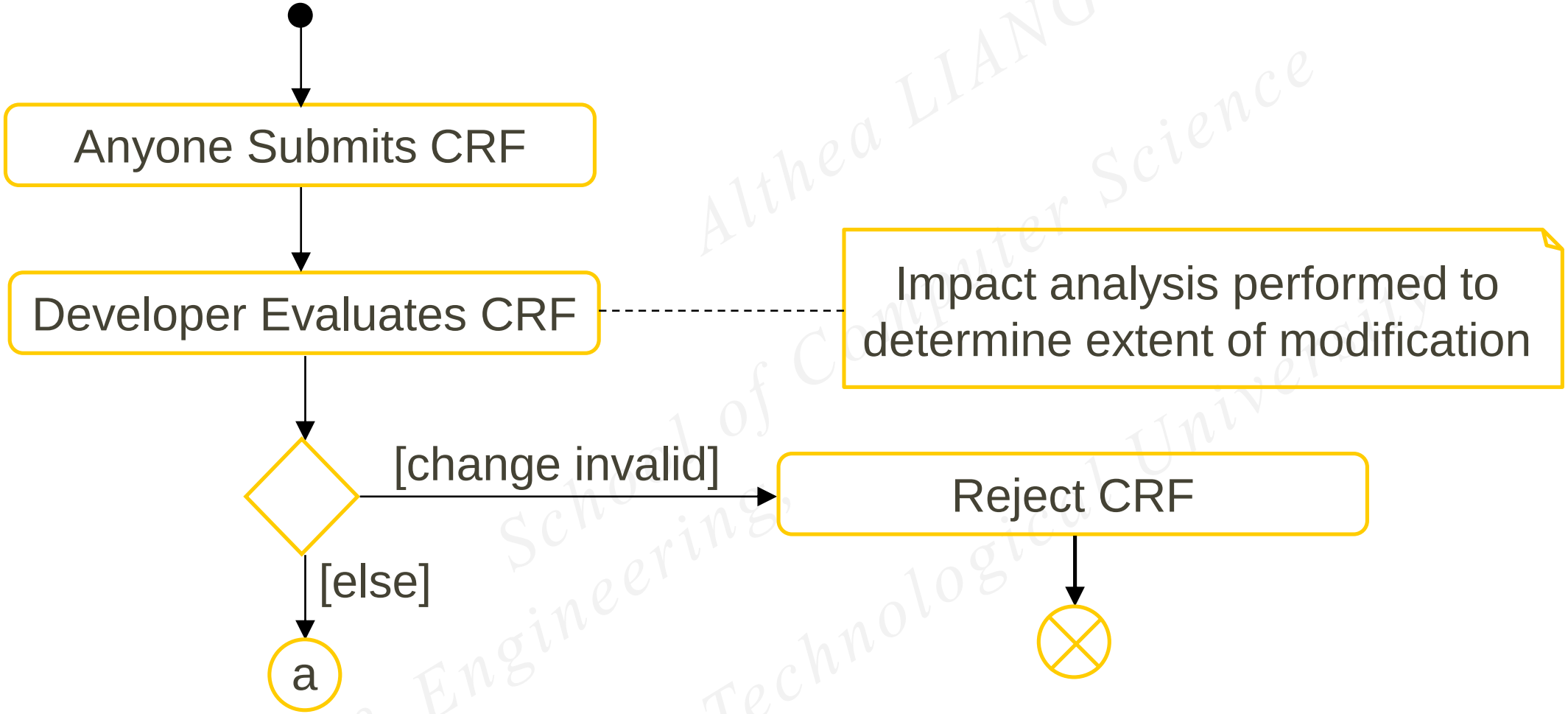
Steps of Change Control Process

0. Software Configuration Identification
1. Change Request (CR) Initiated
2. CR Analysed
3. CR Approved (or Rejected or Deferred)
4. Change Implemented and Unit Tested
5. Change Integrated
6. Change Validated
7. CR Closed

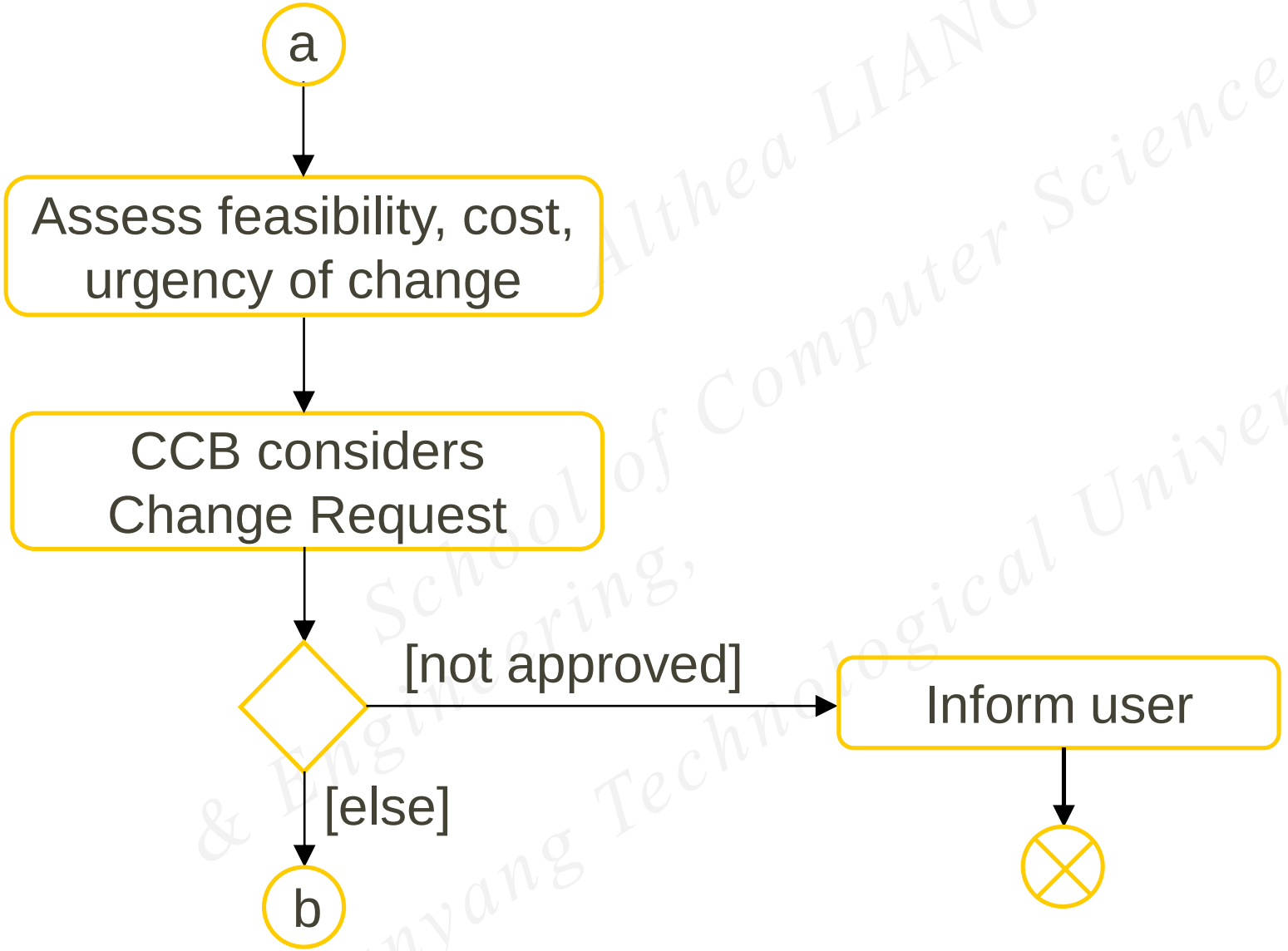
Change Request Form

Change Request Form		
Project: Requester: Requested Change:	Date: ***Nature of Change***	
Change Analyser: Components Affected: Associated Components	***Technical analysis of change***	**Added later**
Change Assessment: Change Priority: Change Implementation:	***Assessment of change***	**Added later**
Change Control Board Decision: Change Implementation: Quality Assurance/ Testing:	***Implementation and Evaluation***	**Added later**

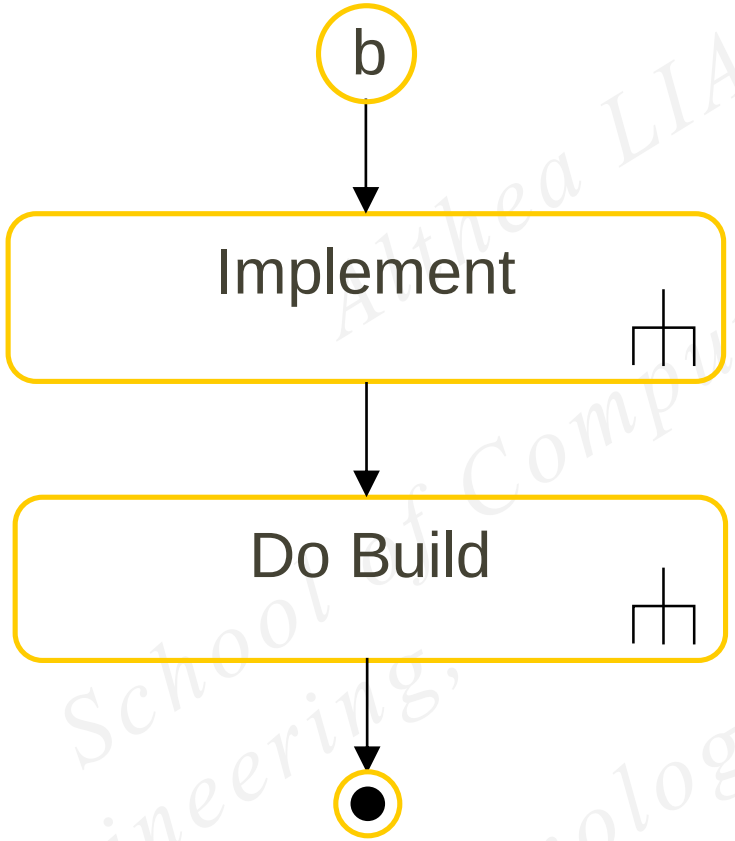
Change Control Process: Evaluate Change



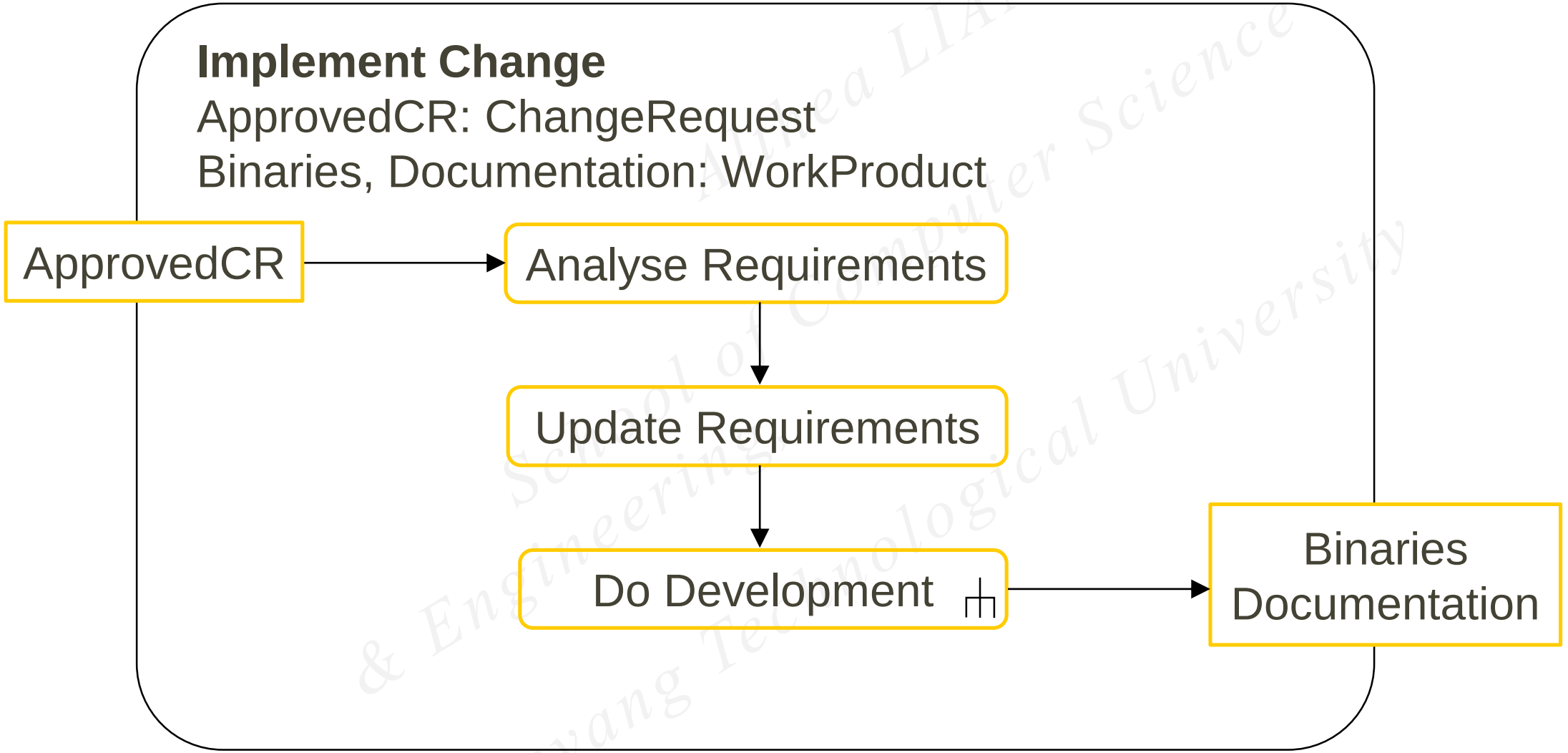
Change Control Process: Approve Change (CCB)



Change Control Process: Implement & Do Build



Change Implementation



Change Control Process: Controlled Implementation

1. Change request is queued for action, e.g. an Engineering Change Order is generated.
2. Individuals are assigned to work on relevant Configuration Items.
3. SCIs are "checked out" of SCM system.
4. Changes are made.
5. Changes are reviewed and audited.
6. New SCIs are "checked in" - new versions are created.
7. Baseline for testing is established.
8. QA and testing are carried out.

Change Control Process: Controlled Build

1. Collect changes ready for next system release.
2. Rebuild new version of the software, i.e., the release version.
3. Changes to all SCIs are viewed/ audited.
4. Include changes in new release version.
5. New release version is distributed to customers/ or other recipients.

Post view: Example Organisation in this Lesson

Example	Slides
Accenture for a big Russia bank	Managing Changes

Summary

Now you should be able to:

- Explain the reasons for software system change
- Understand why change management is important and the roles in change management
- Understand change prediction
- Understand the steps in Change Control Process

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Special Thanks to Kydon during the TEL Efforts of the Lecture

End of Change Management

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