C H A P T E R

16

SYSTEMS CONSTRUCTION AND IMPLEMENTATION

Chapter Map

Source: System Analysis and Design Methods, 5th Edition, McGraw Hill.
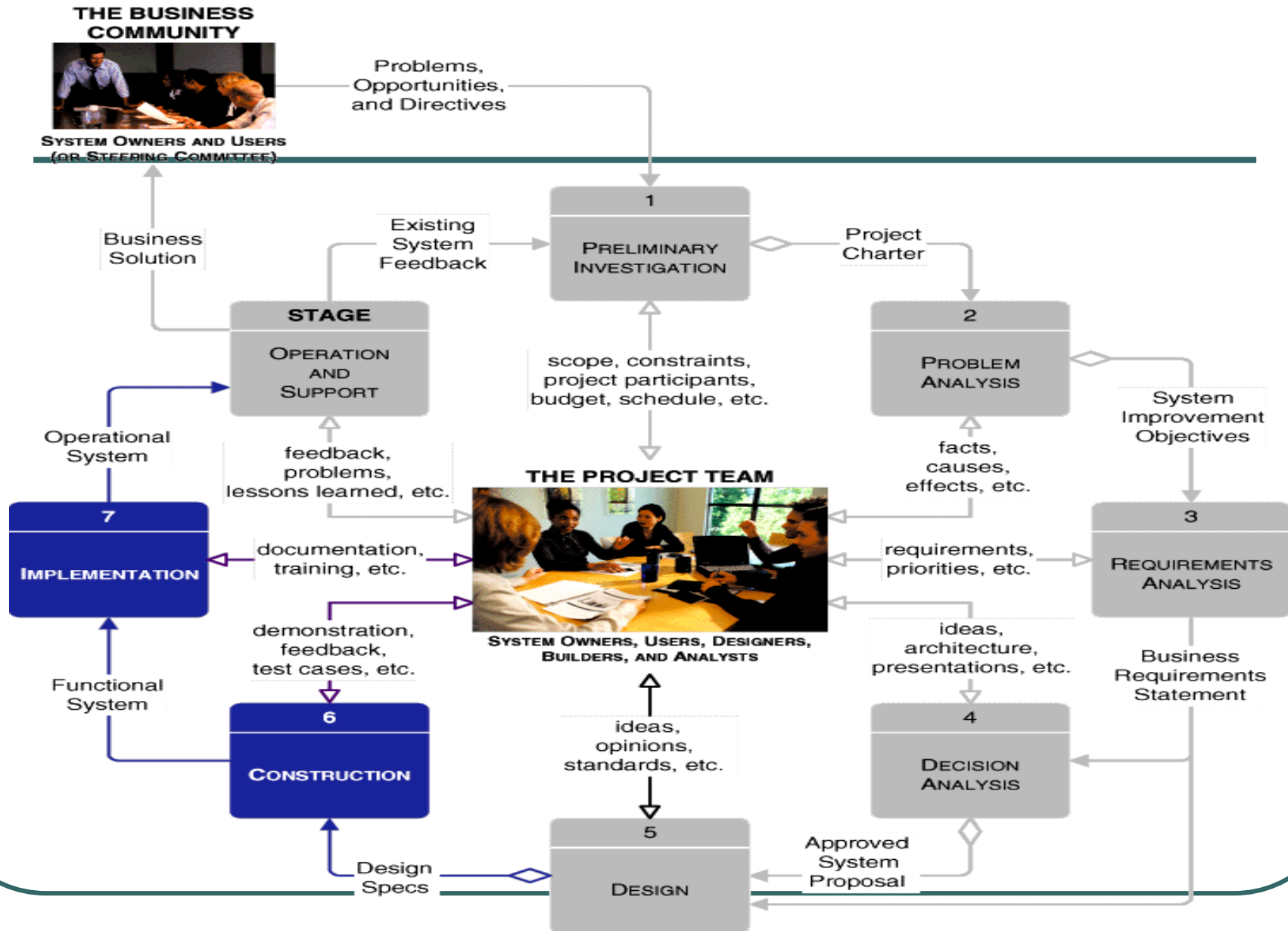
What Is System Construction and Implementation?

Systems construction is the development, installation, and testing of system components.

Systems implementation is the delivery of that system into production (meaning day-to-day operation).

System Construction and Implementation

THE BUSINESS COMMUNITY

SYSTEM OWNERS AND USERS
(OR STEERING COMMITTEE)

Problems, Opportunities, and Directives

Business Solution

Existing System Feedback

1
PRELIMINARY INVESTIGATION

Project Charter

STAGE
OPERATION AND SUPPORT

Operational System

feedback, problems, lessons learned, etc.

scope, constraints, project participants, budget, schedule, etc.

2
PROBLEM ANALYSIS

System Improvement Objectives

facts, causes, effects, etc.

THE PROJECT TEAM

SYSTEM OWNERS, USERS, DESIGNERS, BUILDERS, AND ANALYSTS

7
IMPLEMENTATION

documentation, training, etc.

requirements, priorities, etc.

3
REQUIREMENTS ANALYSIS

demonstration, feedback, test cases, etc.

Functional System

6
CONSTRUCTION

ideas, architecture, presentations, etc.

Business Requirements Statement

ideas, opinions, standards, etc.

4
DECISION ANALYSIS

Design Specs

5
DESIGN

Approved System Proposal

Tasks for Completing The Construction Phase

1 Build and Test Networks

2 Build and Test Databases

3 Install and Test New Software Package

4 Write and Test New Programs

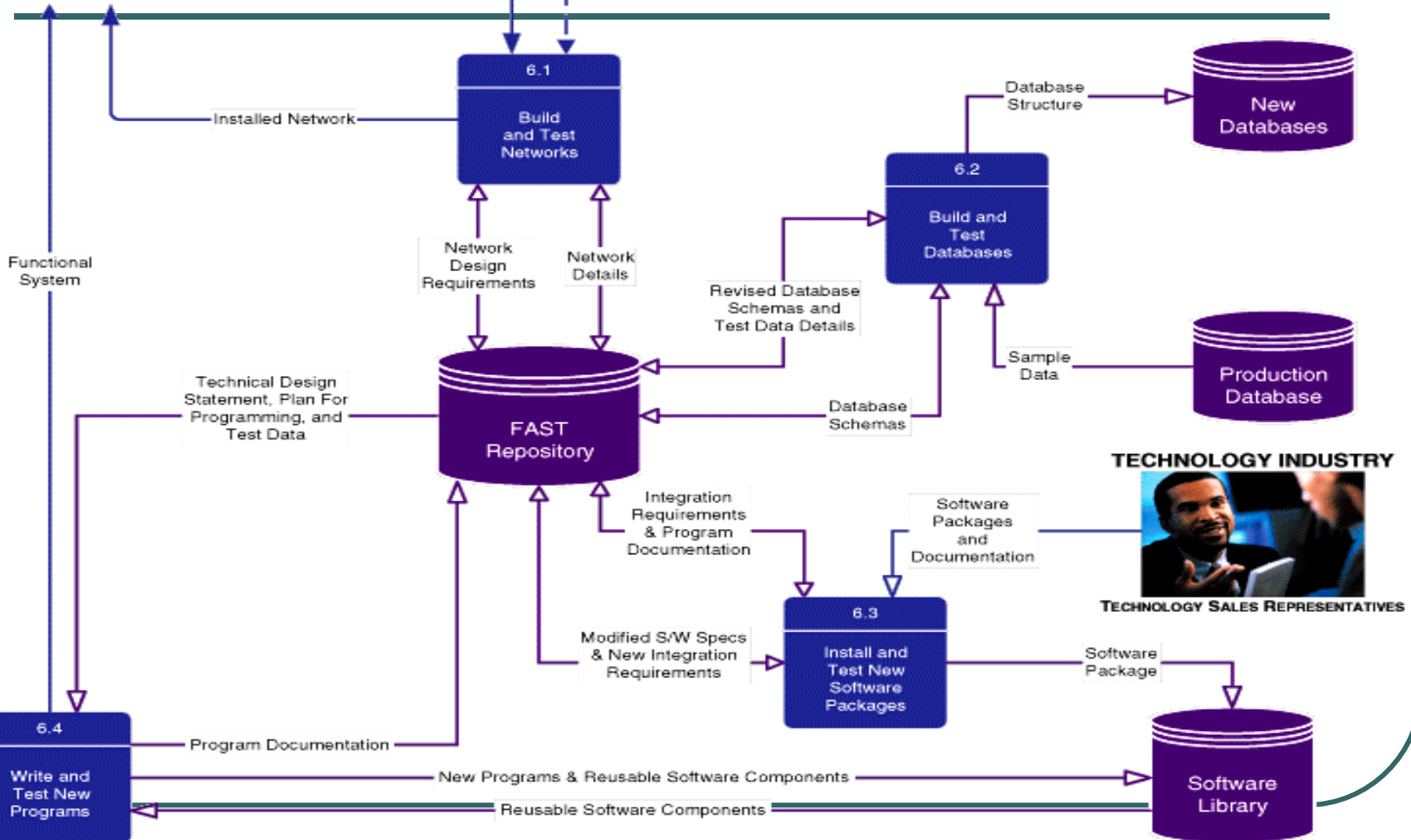**THE BUSINESS AND TECHNICAL COMMUNITY**

(approval to continue project after design phase)

Design Specifications

6.1
Build and Test Networks

Installed Network

Functional System

Network Design Requirements

Network Details

Database Structure

New Databases

6.2
Build and Test Databases

Revised Database Schemas and Test Data Details

Technical Design Statement, Plan For Programming, and Test Data

FAST Repository

Sample Data

Production Database

Database Schemas

TECHNOLOGY INDUSTRY

TECHNOLOGY SALES REPRESENTATIVES

Integration Requirements & Program Documentation

Software Packages and Documentation

Modified S/W Specs & New Integration Requirements

6.3
Install and Test New Software Packages

Software Package

6.4
Write and Test New Programs

Program Documentation

New Programs & Reusable Software Components

Reusable Software Components

Software Library

Source: System Analysis and Design Methods, 5th Edition, McGraw Hill.

Levels of Testing

1 Stub testing is the test performed on individual events or modules of a program. In other words, it is the testing of an isolated subset of a program.

2 Unit or program testing is a test whereby all the events and modules that have been coded and stub tested for a program are tested as an integrated unit. In other words, it is the testing of an entire program.
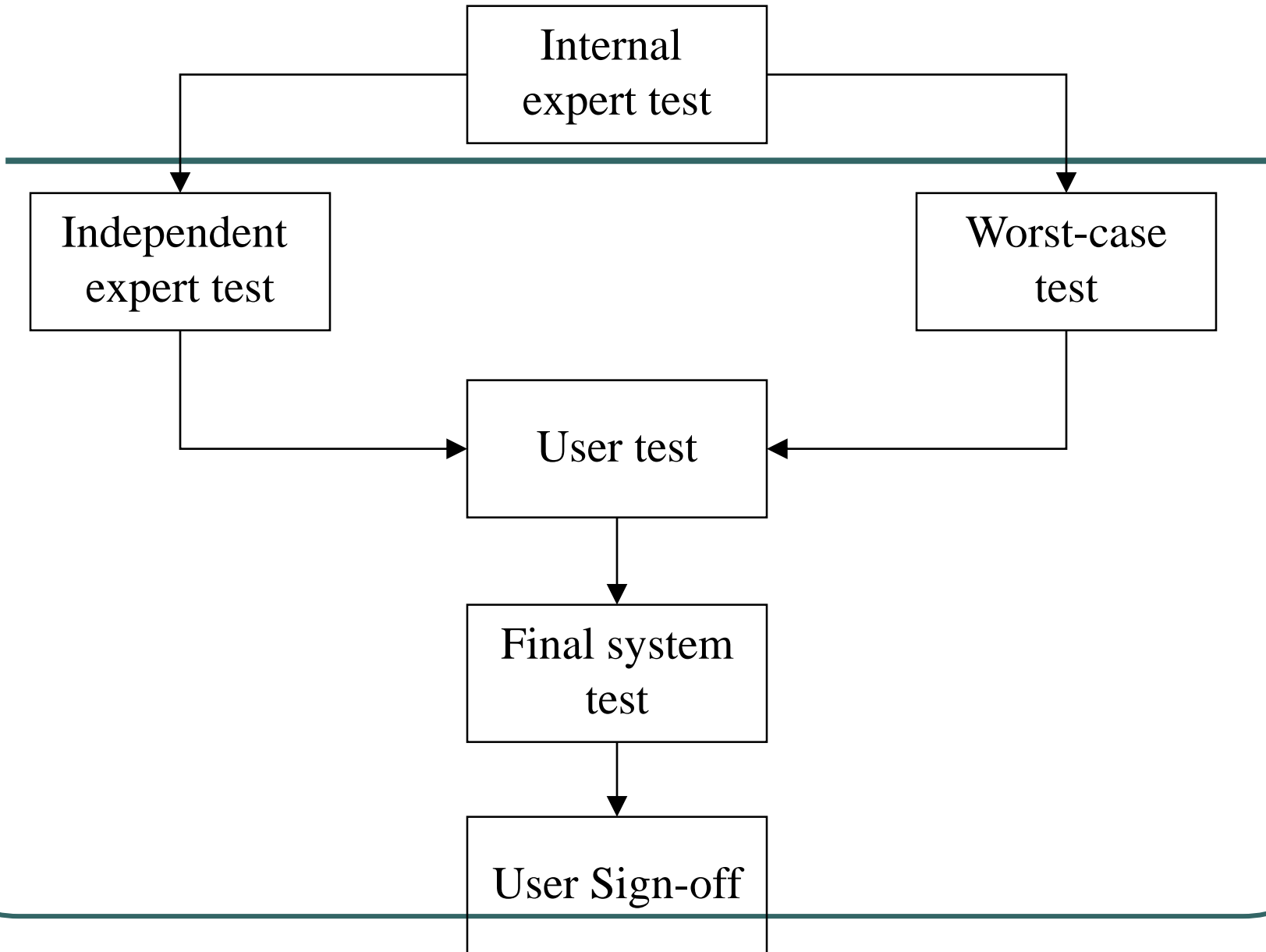
3 Systems testing is a test that ensures that application programs written and tested in isolation work properly when they are integrated into the total system.

The heart of any test plan is the *test data*.

- Set input data
- Define the test logic.
  - E.g who will conduct each test and who will evaluate the result.
- Develop a test schedule, a set of operating procedures, testing environment, and necessary resources.
- Indicate the criteria for passing the test
- Examine expected results
- Examine expected errors

The system test includes several stages.

Internal expert test → Independent expert test

Internal expert test → Worst-case test

Independent expert test → User test

Worst-case test → User test

User test → Final system test

Final system test → User Sign-off
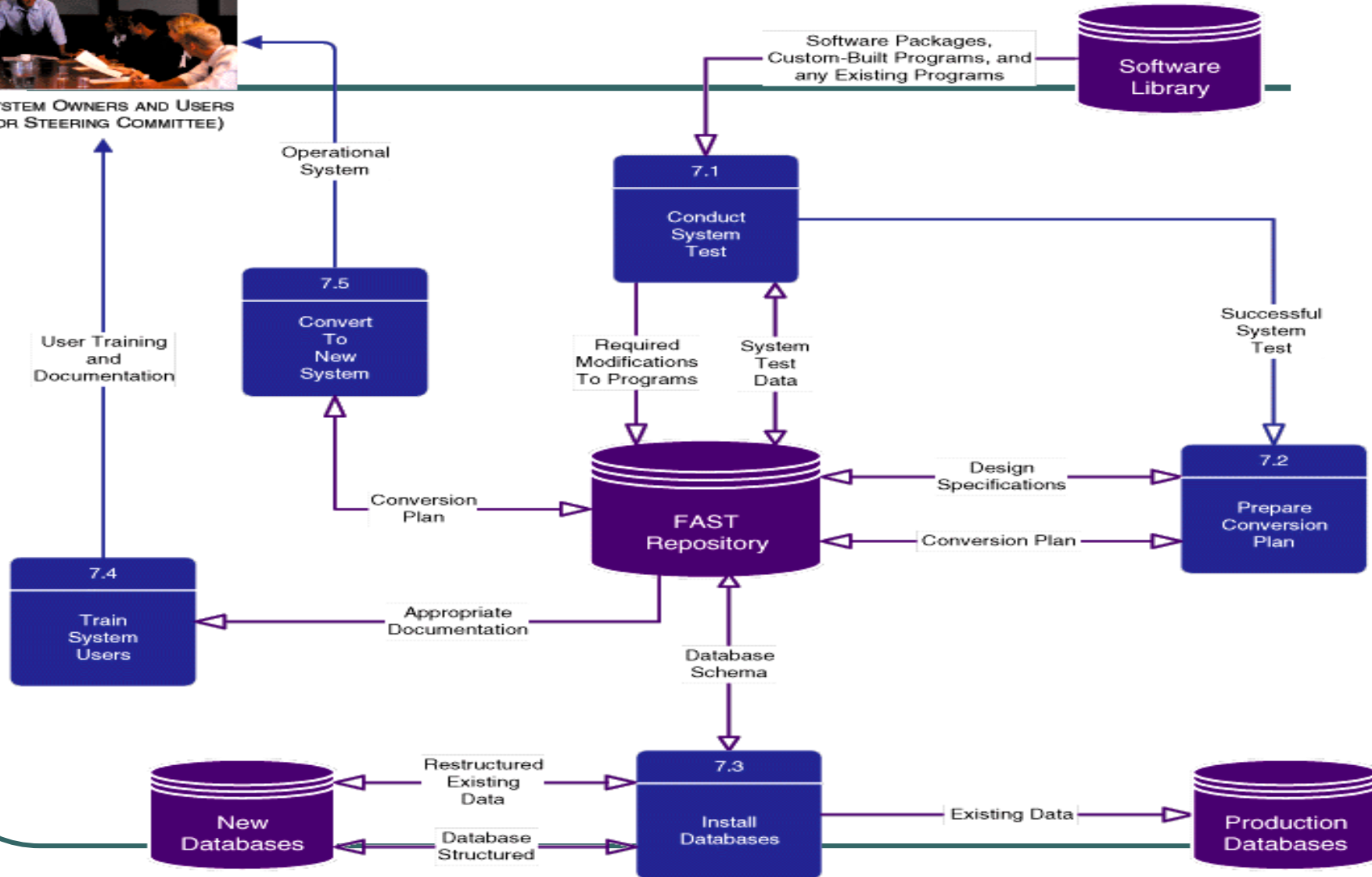
Tasks for Completing The Implementation Phase

1 Conduct System Test

2 Prepare Conversion Plan

3 Install Databases

4 Train Users

5 Convert to New System

Tasks for Completing The Implementation Phase

THE BUSINESS AND TECHNICAL COMMUNITY
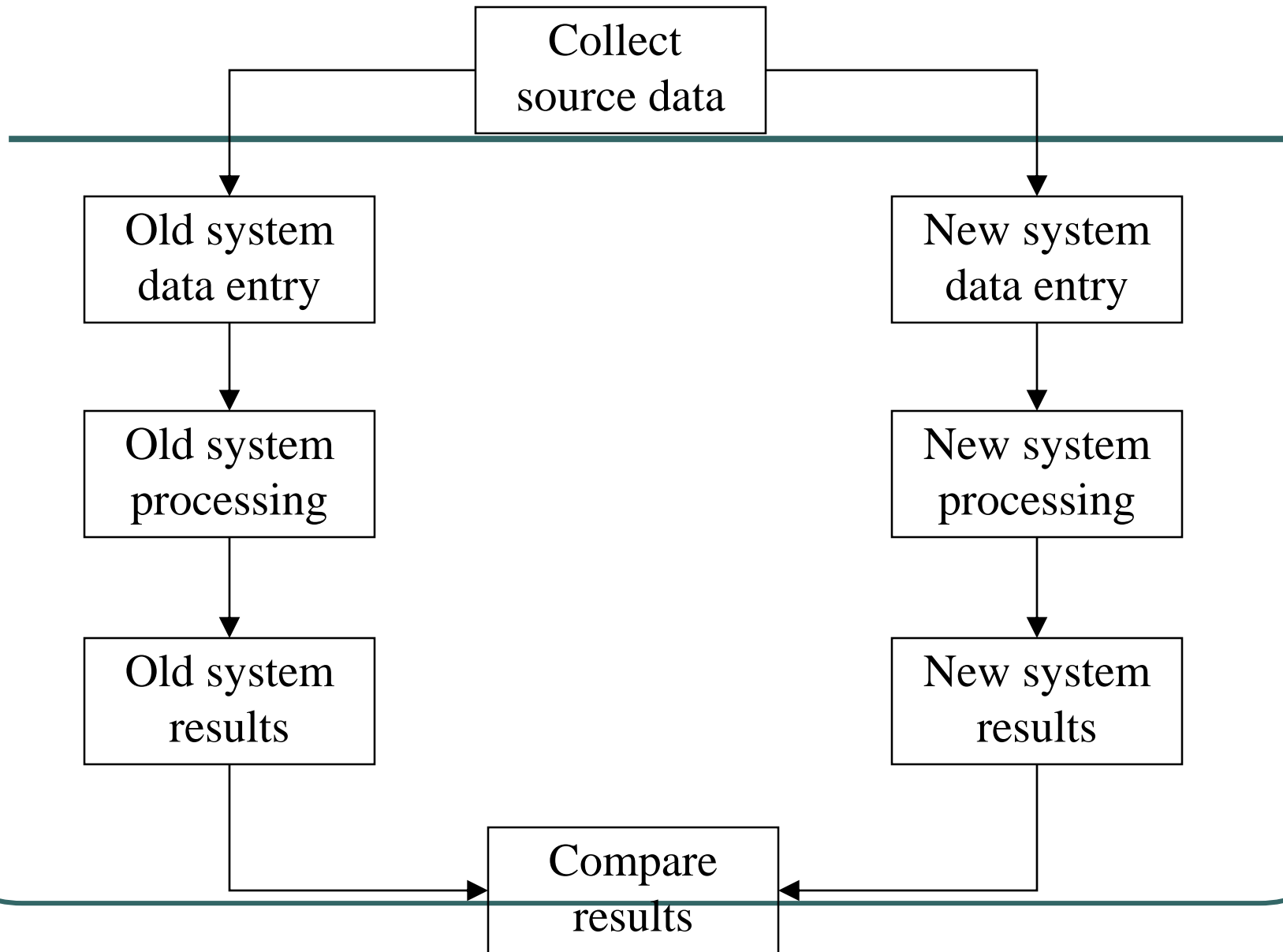
SYSTEM OWNERS AND USERS (OR STEERING COMMITTEE)

Software Library

Software Packages, Custom-Built Programs, and any Existing Programs

7.1 Conduct System Test

Operational System

7.5 Convert To New System

Required Modifications To Programs

System Test Data

Successful System Test

User Training and Documentation

Conversion Plan

FAST Repository

Design Specifications

Conversion Plan

7.2 Prepare Conversion Plan

7.4 Train System Users

Appropriate Documentation

Database Schema

7.3 Install Databases

New Databases

Restructured Existing Data

Database Structured

Existing Data

Production Databases

Source: System Analysis and Design Methods, 5th Edition, McGraw Hill.

Installation Strategies

1 Abrupt cutover

2 Parallel conversion

3 Location conversion

4 Staged conversion

In parallel run, both the old system and new system process the same data and the results are compared.

Collect source data

Old system data entry → Old system processing → Old system results

New system data entry → New system processing → New system results

Compare results

From David

Systems Acceptance Test

A **systems acceptance test** is a final system test performed by end-users using real data over an extended time period. It is an extensive test that addresses three levels of acceptance testing: verification testing, validation testing, and audit testing.

Systems Acceptance Test

Verification testing runs the system in a simulated environment using simulated data.

Validation testing runs the system in a live environment using real data.

Audit testing certifies that the system is free of errors and is ready to be placed into operation.

An Outline for a Training Manual

Training Manual End-Users Guide Outline

I. Introduction

II. Manual

    A. The **manual system** (a detailed explanation of people's jobs and standard operating procedures for the new system).

    B. The **computer system** (how it fits into the overall workflow).

        1. Terminal/keyboard familiarization.

        2. First-time end-users.

            a. Getting started.

            b. Lessons

    C. **Reference manual** (for non-beginners).

III. Appendixes

    A. Error messages.

Summary

- Construction and implementation phases
  - Information building blocks.
  - Major tasks, roles, inputs and outputs.
- Application program and system tests.
- System conversion strategies.
- Tasks of systems construction and implementation.