

**INSTRUCTOR'S MANUAL
TO ACCOMPANY**

David M. Kroenke and David J. Auer

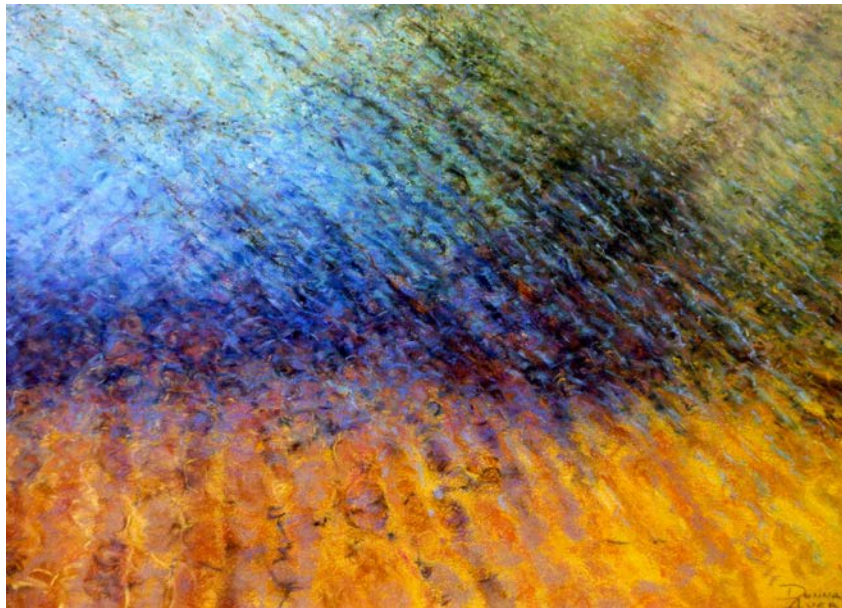
Database Processing

Fundamentals, Design, and Implementation

14th Edition

Appendix B

Getting Started with Systems Analysis and Design



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Instructor's Manual to accompany:

Database Processing: Fundamental, Design, and Implementation (14th Edition)

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❖ CHAPTER OBJECTIVES

- To understand information systems
- To understand business processes
- To understand and be able to apply the systems development life cycle (SDLC) model
- To understand business process modeling using Business Processing Modeling Notation (BPMN)
- To be able to gather data and information during requirements analysis
- To understand use cases
- To understand business rules
- To be able to create a user requirements document (URD)
- To be able to create a statement of work (SOW)
- To understand how the topics in this appendix link to *Database Processing (14th Edition)*

❖ ERRATA

There are no known errors at this time. Any errors that are discovered in the future will be reported and corrected in the Online DBP e14 Errata document, which will be available at <http://www.pearsonhighered.com/kroenke>.

❖ TEACHING SUGGESTIONS

- The general purpose of this appendix is to provide a context for the study of data models in Chapter 5 and database designs in Chapter 6. It can be used as an introduction to or in conjunction with DBP Part II – Database Design, and you should assign it as a reading before your students read Chapter 6 or Chapter 5 depending on how it fits into your presentation of this material.
- However, there is enough significant overlap with Chapter 5 and Chapter 6 topics that you may want to assign it in parts, or, alternatively, have your students reread appropriate sections as you work through the chapters.
- There is also material (on the SDLC Implementation and System Maintenance steps) that can be used with Chapter 9 on database administration and managing multiuser databases. You can tie many of the topics in that chapter back to the SDLC.

❖ **ANSWERS TO REVIEW QUESTIONS**

B.1 What is a **decision**?

A **decision** is a selected action that we should take in our current situation.

B.2 What is **data**?

Data are recorded facts and numbers.

B.3 What is **information**?

We can now define **information** as:

- Knowledge derived from data.
- Data presented in a meaningful context.
- Data processed by summing, ordering, averaging, grouping, comparing, or other similar operations.

B.4 What is a **system**? What is an **information system**?

A **system** is a set of components that interact to achieve some purpose or goal.

An **information system** is a system that has the goal of producing information.

B.5 What is a **computer-based information system**? Describe the five components of a computer based information system.

A **computer-based information system** is an information system comprised of five components: Computer hardware, software, data, procedures, and people.

Hardware	Software	Data	Procedures	People
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B.6 What is a **competitive strategy**?

A **competitive strategy** is a company’s organized response to the **industry structure** of the industry in which it operates, and thus defines how the company will compete within that structure. The industry structure can be defined using Michael Porter’s five forces model.

B.7 Describe Michael Porter’s **five forces** model.

According to Porter’s **five forces model**, the structure of an industry is determined by relative strength or weakness within the industry of:

- **The bargaining power of customers:** can the industry’s customers influence the industry?
- **The availability (“threat”) of substitutable products:** what other products do competitors have?

- **The bargaining power of suppliers:** can the industry’s suppliers influence the industry?
- **The ease (“threat”) of new competitors entering the industry:** how easily can a new company get a start in the industry?
- **The rivalry between competitors:** how many competitors are there, and how much do they really compete?

B.8 Describe Michael Porter’s primary activities.

Michael Porter defines the **primary activities** or **operational activities** of a business as:

- **Inbound logistics:** receiving, storing, and distributing product inputs
- **Manufacturing operations:** transforming inputs into the final product
- **Outbound logistics:** collecting, storing, and distributing the product to buyers
- **Sales and marketing:** convincing customers to buy the product and selling it to them
- **Customer service:** assisting the customers in their use of the product

B.9 Describe Michael Porter’s support activities.

Michael Porter defines the **support activities**, which, as the name implies, support the operational activities, as:

- **Procurement:** managing supplier relationships and buying the product inputs
- **Technology management:** product research and development and new procedures, methods, and techniques
- **Human resources management:** managing employee resources
- **Firm infrastructure management:** general management of the firm, finances, accounting, legal services, and government affairs

B.10 What is a business process?

A **business process** is a set of **activities** that transform **inputs** into **outputs**.



B.11 How do information systems support business processes?

Information systems support business processes by providing applications that help the process operate more efficiently.

B.12 Describe how information systems include processes.

A generalized conceptual **process** is **input** → **process** → **output**. Information systems include such processes. For example, an inventory control application may include these steps as:

- **Input data:** Using a computer on-screen form, a user will input data into the system, such as how many parts have been taken out of the raw materials inventory.
- **Process:** Another user may query the raw materials database to determine how many of each part remain in the raw materials inventory.

- **Output:** The answer to the query will be presented to the requesting user as a report detailing the current status of the parts in the raw materials inventory.

B.13 What is *business process modeling*?

Business process modeling is a technique to help us understand a business process before we design an information system to support it. To do this, we study the process and document it using business process modeling notation (BPMN). After documenting the process, we will generally understand something about what sort of information system is needed to support the process, and we can then use systems analysis and design methodology to create and maintain the needed information system.

B.14 What is *systems analysis and design*?

Systems analysis and design is the process of creating and maintaining information systems. The classic methodology used in systems analysis and design to develop information systems is called the **systems development life cycle (SDLC)**.

B.15 Describe the *systems development life cycle (SDLC) model*.

There are different interpretations or conceptualizations of the SDLC, each of which uses a different number of steps. This book uses the same set of steps discussed by David Kroenke, and includes five steps or stages:

1. System definition
2. Requirements analysis
3. Component design
4. Implementation
5. System maintenance

Each step should result in one or more **deliverables**, such as documents, designs, prototypes, data models, database designs, Web screens, and so on.

The **system definition** step is a *process* that starts with the need for an information system to support a business process as its *input*, and produces a **project plan** as its *output*. During this process, we will need to:

- Define the information system project goals and scope
- Assess the feasibility of the project (cost, schedule, technical, organizational)
- Form the project team
- Plan the project (specify tasks, assign personnel, determine task dependencies, set schedules)

The **requirements analysis** step is a *process* that starts with the project plan as its *input*, and produces a set of **approved user requirements** as its *output*. During this process, we will need to:

- Conduct user interviews
- Evaluate existing systems
- Determine needed new forms/reports/queries
- Identify needed new application features and functions
- Consider security
- Create the data model
- Consider the five components of an information system—hardware, software, data, procedures, and people

The **component design** step is a *process* that starts with the approved user requirements as its *input*, and produces a final **system design** as its *output*. During this process, we will need to:

- Determine hardware specifications
- Determine program (software) specifications
- Create the database design
- Design business procedures
- Create job descriptions for business personnel

The **implementation** step is a *process* that starts with the final system design as its *input*, and produces a final **system** as its *output*. During this process, we will need to:

- Build system components
- Conduct component tests
- Integrate the components
- Conduct integrated component tests
- Convert to the new system

The **system maintenance** step is a *process* that starts with the implemented system as its *input*, and produces **an updated system** or **a request for system modification using the SDLC** as its *output*. During this process, we will need to:

- Update the system with patches, service packs, and new software releases
- Record and prioritize requests for system changes or enhancements.

B.16 Define **project scope**.

Project scope is the work that needs to be done to deliver a product, service, or result with the required functions and features.

B.17 What is a **use case**? How well does Microsoft Visio 2013 support modeling use cases?

Use cases are descriptions of the ways users will employ the features and functions of the new information system. A use case consists of a description of the roles users will play when utilizing the new system, together with descriptions of activities' scenarios.

Microsoft Visio 2013 does a good job of supporting modeling use cases, and has a UML Use Case diagram template with which to do so.

B.18 What are *business rules*?

Business rules are constraints on database activities. Generally, such rules arise from business policy and practice.

B.19 What is a *user requirements document (URD)*? What purpose does it serve?

A **user requirements document (URD)** is a requirements analysis deliverable that provides an approved set of user requirements. There is no set format for a URD.

Typically a URD may contain:

- a table of contents
- a revision history
- an introduction
- a general description of the project (including project assumptions and dependencies)
- a data model
- functional requirements
- non-functional requirements (speed and time, capacity, and reliability)
- project delivery requirements

The purpose of a URD is to formalize the project team's understanding of the users' requirements so that the users can review the document. Note that the data model for the database is presented as part of the URD.

B.20 What is a *statement of work (SOW)*? What purpose does it serve?

A **statement of work (SOW)** is a possible deliverable for the requirements analysis step of the SDLC. There is no set format for an SOW, and an SOW for an in-company project may be very different from an SOW between a consultant and client.

Typically an SOW may contain:

- A history of the problem or need that generated the project
- An identification of the client for the work
- An identification of who will do the work
- The scope of the work to be done
- The objectives of the work to be done
- Any constraints on the work to be done
- The location of the work (where the work will be done)
- A set of tasks with an associated timeline:
 - An outline of the tasks that will make up the work to be done
 - The time period for the work (start date, finish date, details about how many hours may be worked, etc.)
 - A deliverables schedule
- Criteria for determining whether the project has been successfully completed

- A payment schedule
- Signature blocks to record acceptance of the SOW by all parties

❖ ANSWERS TO PROJECT QUESTIONS

B.21 Review the information about Wedgewood Pacific Corporation (WPC) and the WPC database that has been presented in the Project Questions in Chapters 1 and 2.

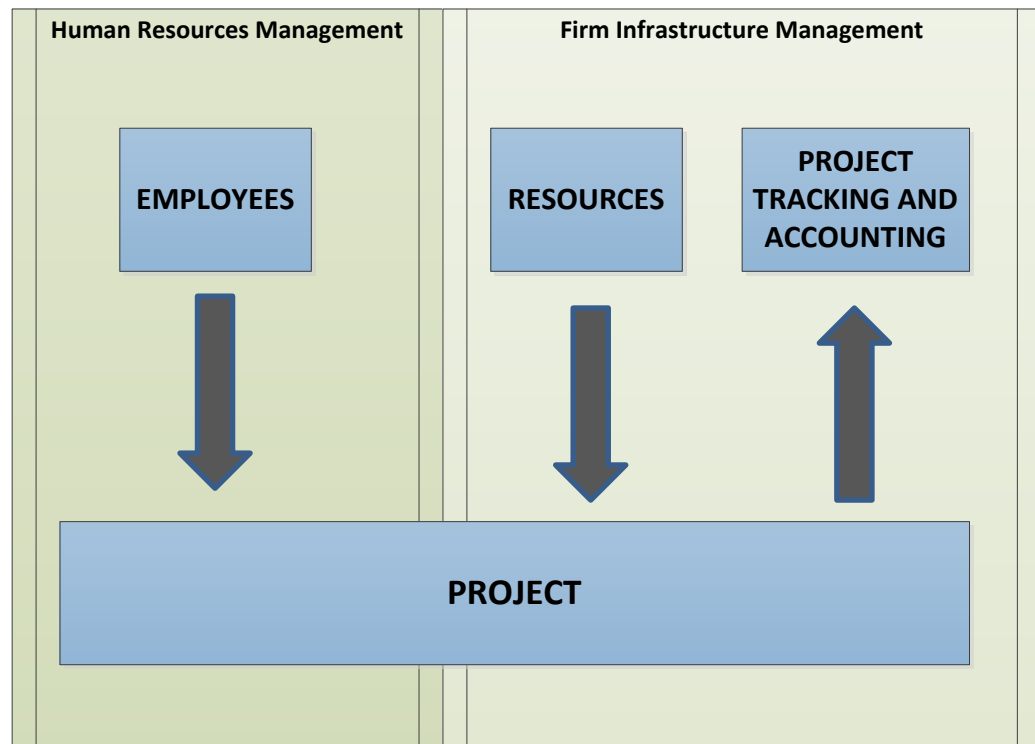
- A. The database is part of an information system to support business operations at Wedgewood Pacific Corporation. What specific business process at Wedgewood Pacific Corporation do you think this information system is being developed to support? How does the WPC database (including the forms and reports, since we are using Microsoft Access 2013 to create the database) support the business process?*

The WPC database is part of an information system being created to support the project management at WPC. This primarily falls under Porter's support activity of **firm infrastructure management**, although there is some overlap with **human resources management** because of the fact that people are assigned to work on projects.

The WPC database keeps track of the WPC projects, the resources allocated to those projects (employees and MaxHours), project expenses (HoursWorked) and progress on those projects (StartDate and EndDate).

- B. How does this business process overlay Michael Porter's set of primary and support business activities? Draw a diagram to illustrate this overlap.

The Sales process overlays two of Porter's support activities, but none of Porter's primary activities. The support activities are firm infrastructure management and human resources management. While primary activities have a natural process flow, secondary activities do not. This can make drawing a diagram a bit more difficult, but we can picture this process as:



- C. *Based on the actual Wedgewood Pacific Corporation database as it has been created through the Chapter 2 Project Questions, what do you think are the approved requirements for the project? What are the business rules (either stated or implied)?*

Approved requirements would include:

	Functional Requirements
R-1	WPC human resources management must be able to enter, modify, and delete department data.
R-2	WPC human resources management must be able to enter, modify, and delete employee data.
R-3	WPC project managers must be able to enter, modify, and delete project data.
R-4	WPC human resources management must be able to enter, modify, and delete employee assignment data.
R-5	WPC human resources management must be able to view and print department and employee reports.
R-6	WPC project managers must be able to view and print project reports.

Business rules would include:

	Business Rules
BR-1	A WPC project must be sponsored by a WPC department.
BR-2	A WPC employee may be assigned to one or more projects.
BR-3	The sum of hours worked on a project by WPC employees may not exceed the total hours allocated for that project.