This is a sample of the instructor resources for *Austin and Boxerman’s Information Systems for Healthcare Management, Seventh Edition* by Gerald Glandon, Detlev Smaltz, Donna Slovensky. This sample contains PowerPoint slides and instructor answers to the discussion questions for Chapter 3.

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Answers to Discussion Questions for
Chapter 3
IM/IT Governance and Decision Rights

1. With the change in the definition of IM/IT governance, why is the external focus of healthcare IM/IT orientation important?
IM/IT governance may bestow a competitive advantage to the organization that many have determined to be essential for organizational success. Today, more than in the past, successful IM/IT governance and planning must address challenges from outside IM/IT operations. The importance of information system planning has grown as healthcare organizations have grown in size and complexity and as information technology has become increasingly sophisticated. More than assigning management to coordinate an orderly planning process, healthcare IM/IT governance has become managers’ priority. They must expand beyond IM/IT operations to ensure that information technology is used to effectively support the strategic priorities of the organization.

2. What factors should be considered when developing a consistent IM/IT strategy?
The consistent IM/IT strategy should encompass the following:

- The IM/IT plan must be closely aligned with the strategic plans of the organization. Organizations must make choices and set priorities for their information systems.
- The plan should identify the major types of information required to support strategic objectives and establish priorities for installation of specific computer applications, the architecture upon which the systems function, and the detailed rules that drive IM/IT operations.
- Development of a broad set of policies related to the acquisition of computer hardware, software, and networks communications equipment for the organization.
- The IM/IT function must also effectively oversee the purchase and implementation of IM/IT infrastructure consistent with the needs of the organization.
- The final purpose of strategic IM/IT planning is to provide data to estimate the budget and resources required to meet the objectives and priorities established through the planning process.
3. **Should the IM/IT strategy be developed with the IM/IT department in mind and then aligned with the organization, or should the IM/IT strategy be developed with the organizational strategy in mind?**

The discussion focuses on the idea that planning is the responsibility of the CEO as bestowed by the board of trustees. In that context, the primary focus will probably be the organizational strategy. The CIO and/or IM/IT steering committee implement the details of the plan, focusing on how that implementation supports organizational needs. In fact, the first element of the IM/IT strategic plan is corporate goals and objectives.

4. **Why is data standardization becoming increasingly important in healthcare?**

Data standardization has always been important for healthcare organizations as they strive to share information between and among the many components of the delivery system. Nursing, labs, emergency department, and radiology all collect, store, analyze, and transmit important patient information, for example. Assembling those data into usable information at the organization level requires standardization of format and of terminology. As healthcare delivery organizations increasingly become part of integrated delivery systems, that need for standardization increases because the data and information needs to be shared both within and across organizations (multiple hospitals, hospitals, and clinics, etc). More recently, the push to share healthcare data across systems has grown so that the need for standardization increases further. Voluntary and mandatory interoperability requirements for reporting will keep standardization important for the foreseeable future.

5. **Several reasons for central review of software and hardware standards were presented. What other ways would central review assist the organization?**

Compelling reasons for requiring central review and approval include the following:

- Compatibility with enterprisewide data standards, such as HL7
- Data terminals and workstations use a common operating system, such as Windows
- Cost advantages through the acquisition of site licenses for multiple users of common packages (word processing, spreadsheets, database-management systems, etc.)
- Hardware and software will be of a type that can receive technical support and maintenance from the information systems staff
6. **The need for a master plan for information systems development was discussed. What factors/concepts should be included in this plan?**

The master plan should be supported by the board and the CEO as discussed above and should address three broad topics overall: (1) new and replacement IM/IT priorities, (2) infrastructure specifications, and (3) capital and operating budget. With this in mind, the planning effort should entail the following seven key elements:

1. Statement of corporate/institutional goals and objectives
2. Statement of information systems goals and objectives
3. Priorities for the applications portfolio
4. Specification of overall systems architecture and infrastructure
5. Software development plan
6. Information systems management and staffing plan
7. Statement of resource requirements

7. **What would be the functions of the roles of the individuals in the steering committee, such as medical, nursing, financial management, human resources management, facilities management, clinical support services staff? Why is it important to have all these areas represented on the steering committee?**

The steering committee should be formed with representatives from major elements of the organization contributing to and benefiting from IM/IT functions. Their participation is essential at the planning stage to facilitate buy-in from the major constituencies. Having representatives from these user groups gives them a voice in the decisions and a direct role in planning IM/IT activities. The key functions of these members include:

- overseeing the development of a set of enterprisewide policies that govern the design, acquisition, and operation of information systems throughout the organization, including such common policies as data security, data definition standards, and policies on use of the Internet;
- setting requirements for data interchange, including HIPAA mandates as well as a policy on data standardization for the organization;
• overseeing the development of a broad set of policies related to the acquisition of computer hardware, software, and networks communications equipment for the organization; and
• approving the network communications plan for the enterprise.

8. There are several reasons to prefer centralized computing over decentralized computing, and vice versa. Which would you prefer, and why?
The arguments are generally valid on both sides. The specific decision may depend upon environment and is most certainly a matter of degree rather than either/or. As technologies evolve, the balance of benefits from being more or less centralized will shift as well. The key is to be aware of what to consider in each case and to make an informed decision.

The benefits of centralized information technology include the following:
• Variability reduction
• Security improvement
• Human resource requirements reduction
• Enhanced flexibility
• Procurement costs reduction
• Total cost of ownership reduction
• End-user satisfaction improvement
• Effective and efficient alignment of IM/IT to business needs

Decentralization places control of information systems back where it belongs—in the hands of users. Decentralization fosters innovation in system design and develops increased user interest and support. Local flexibility is maintained, and the frustrations of lengthy programming and processing backlogs at a central facility are avoided.

9. What are your opinions on end user computing? What are the advantages and disadvantages?
End-user computing consists of the active involvement of the ultimate or end users in the planning, design, modification, and implementation of data analysis and reporting. End-user computing, like other concepts, is not an either/or condition, but more a continuum. At one extreme, developers control all aspects of report design, preparation, and execution. End
users’ input may be a part of the creation of the reporting system, but they are generally limited to a passive, receiving role. At another extreme, the end users are provided the capacity to reformulate data to meet changing end user needs.

While there may be no clear answer to this question, as application software becomes easier to use and as end users become more data savvy, end-user computing will grow. End-user computing offers the potential to expand the base of IM/IT development and overcome problems of low priority assigned to certain applications that are viewed as important to units within the organization.

However, most activities in healthcare organizations are interrelated, and computer applications must be able to exchange information for efficient operations. If a department’s system will need to exchange information with other units of the organization, central control and planning is needed before the end-user department should be authorized to acquire and modify the system. Data compatibility—use of common codes and data definitions for electronic information exchange across the organization—should be mandatory.

10. What is the importance of data warehouses/clinical data repositories?
Data warehouses/clinical data repositories are becoming important communication and coordination elements in the modern healthcare organization. Data can be defined at the patient, diagnosis, unit, provider, organization, or other unit to accommodate any type of analysis or for any reporting purpose. The growing complexity of types of data and the explosion of the sources of those data make centralized storage, along with reliable access, essential. End users, from senior management to clinical department directors, need to be able to access relevant information from a secure, reliable source on a regular basis. The warehouse concept provides that access because, at the creation stage, issues of integration and standardization of terms must have been resolved.

11. Give five different examples of simple systems and include the input(s), conversion process, and output(s)? Ensure that there is some feedback between your examples. Examples may come from most any environment that the student has been exposed to. Mechanical systems will probably be the most popular because they have work and home applications. Heating and/or cooling systems are simple systems with a monitoring of current
temperature as the input; conversion process decides if the temperature is too high (or too low), and, based on that decision, a mechanical change process begins to either cool (or warm) the local environment. The output is the new air temperature.

Human systems are the next most complex, and examples might come from that domain. Most students, however, will discuss man-machine systems because they generally involve information systems. A good example comes from the text, and students will find variants to this: Consider, for example, the appointment-scheduling process of an ambulatory care center as a simple system. Inputs to the system consist of appointment requests from patients; physician schedules; and clinic resources, including personnel, treatment rooms, and supporting materials. The conversion process includes a set of actions: The scheduling clerks collect information from patients, match patient requirements to available time slots, and make appointments. Output of this simple system consists of patients scheduled for service in the clinic. Note that the output of this system becomes the input for several other functional systems of the clinic—medical records, patient accounting, and others.

12. Why do closed systems eventually die, while open systems may continue to be upgraded and modified?

Answer is in adaptability. A closed system will eventually consume or dissipate its energy, and, because it is closed, it cannot respond to this loss. An open system, by definition, can influence and be influenced by its environment and thus can more readily adapt to underlying changes. Exogenous social, economic, political, and environmental factors can all influence open systems.

13. Find examples of the use of cybernetic systems in healthcare, other than the examples provided.

The world economy is the most global cybernetic system, but most students will find examples less expansive. More relevant would be clinical decision support systems for quality improvement, error reduction, or cost control as typical cybernetic systems with many healthcare applications.
14. What other challenges exist with systems integration between/among healthcare organizations? What are the solutions to these problems?

Any management control system is information dependent. Information requirements permeate the system diagrams. For health programs to be properly managed, information is needed about each major system component. This information must be collected to monitor demand and to measure the resources consumed in the provision of services. Operational procedures must be constantly observed for exceptions, error rates, system malfunctions, and similar performance measures, and output information on the quantity and quality of services rendered must be gathered. This does not include environmental information monitoring.

Management control or even communication across organization entities creates complex information challenges. Different organizational delivery types and dimensions of space are the first level of complexity. More important are the political barriers that challenge efficient healthcare information collection, storage, and reporting. Integrated delivery systems have struggled with these challenges for years. Now, RHIOs are being developed to foster broader health information exchange. While these organizations have great plans, it is too soon to determine their ultimate effects on cost, quality, or access to care.

15. Find two RHIOs currently in existence. Provide an overview of each RHIO and then determine the differences between them.

The answer is user specific.

16. What governance challenges do RHIOs pose for healthcare organizations in general and specifically for healthcare IM/IT?

The business case for integration either within or across systems stems from the vital role that comprehensive information has on clinical and administrative decision making. Strategic growth through fully utilizing the joint inpatient, ambulatory, and physician practices relies upon seamless information flows among and between these entities. RHIOs will require access to and sharing of clinical and financial information among organizations. Managing security, privacy, and internal user needs while learning to share across entities poses a major challenge, especially in an era of significant cost constraints for healthcare and information technology.
Chapter 3

IM/IT Governance and Decision Rights
Learning Objectives

- Explain why strategic planning has become more important for healthcare organizations.
- Summarize the five major components of IM/IT governance.
- Describe the major elements of a healthcare organization’s planning elements.
- Assess the major elements of a healthcare IM/IT strategic plan.
- Describe systems theory and explain why it is vital to healthcare IM/IT governance and planning.
Responsibilities for IM/IT management
- Board delegates to CEO
- CEO delegates to CIO

Important due to expanding size and complexity of healthcare organizations
IM/IT governance helps the organization make business decisions more accurately and in a more timely manner.
Steering Committee

- Designed to engage key user groups
- Assures diversity of input to governance function
Steering Committee Membership

- Executive management (CIO)
- Medical staff
- Nursing staff
- Financial management
- Clinical support services
- Planning and marketing
- Other major system users
Challenges Faced by Steering Committee

- New and replacement IM/IT priorities
- Infrastructure specifications
- Capital and operating budgets
Components of Successful Governance

- Consistent strategy development
- Support organizational strategy
- Develop IM/IT infrastructure, architecture, and policies
- Set IM/IT project priorities and monitor infrastructure investments
- Implement IM/IT benefits assessment to enhance accountability
Historically, IM/IT supported day-to-day operations.

Healthcare managers today recognize the role of information systems for:
- increasing market share,
- supporting quality assessment and improvement, and
- adding value to the organization.

The IM/IT plan must be consistently applied across the multiple operating units with an organization.

It must create consistent applications in an environment that has gown piecemeal.
Support Organizational Strategy

- IM/IT leadership recognizes the importance of the interrelationships between information technology, the rest of the organization, and the external environment.
- Alignment involves three essential elements for success:
  - There must be an alignment of purpose.
  - IM/IT leadership and organizational leadership must agree to work to develop goals and tactics jointly to meet those ends.
  - These two groups must share the responsibility and accountability to achieve the ends.
Healthcare organizations must make choices and set priorities for their information systems.

Planning should identify the:
- major types of information required to support strategic objectives and establish priorities for installing specific computer applications,
- the architecture upon which the systems function, and
- the detailed rules that drive IM/IT operations.

The healthcare organization must develop blueprints for its information technology infrastructure involving decisions about:
- hardware configuration (architecture),
- network communications,
- degree of centralization or decentralization of computing facilities, and
- types of computer software required to support the network.
Set IM/IT Project Priorities and Monitor Infrastructure Investments

- The IM/IT function must effectively oversee the purchase and implementation of IM/IT infrastructure consistent with the needs of the organization.
  - The specialized knowledge and skills of IM/IT staff and the growing complexity of the underlying technology make this role vital to the success of IM/IT operations.
  - The infrastructure upon which software and other applications operate in the systems through which data are transmitted remains in the domain of information technology.
- While end users are vital in the priority setting process for projects, governance of IM/IT requires them to effectively manage the priorities among alternative investment options.
Implement IM/IT Benefits Assessment to Enhance Accountability

- IM/IT planning must provide data to estimate the budget and resources required to meet the objectives and priorities established through the planning process.
- Planning will provide the basis for development of operating and capital budgets for information technology in the organization.
- The importance of this last purpose has increased as CIOs indicate importance of the drive to obtain value from IM/IT.
Major Elements of Technology Plan

- Statement of IM/IT goals and objectives aligned with the strategic goals of the organization
- Priorities for the portfolio of computer applications to be developed
- Specification of overall system architecture
- Software development plan
- Staffing and management plan
- Resource requirements, including capital and operating budget projections
10 Features of Successful Governance

1. Actively design governance
2. Know when to redesign
3. Involve senior managers
4. Make choices
5. Clarify the exception-handling process
6. Provide the right incentives
7. Assign ownership and accountability for IM/IT governance
8. Design governance at multiple organizational levels
9. Provide transparency and education
10. Implement common mechanisms across the six key assets
Systems Theory

• System acquisition and project management: The system development lifecycle
  • Systems analysis
  • Design specifications
  • System acquisition
  • Implementation
  • Operation and maintenance
  • Evaluation and improvement
Systems Analysis

- Systems analysis is the process of collecting information about functional information system requirements and the environment in which the system will operate.
- Systems analysis is needed regardless of whether the system will be developed in-house or will be implemented using vendor software.
Alternatives for System Acquisition

- Purchase or lease of commercial software
- Subscription for use of Web-based software from an applications service provider (ASP)
- In-house design and programming
- Outsourcing
- Combinations of the above
Software Evaluation Criteria

- Functionality
  - Congruence with user requirements
- Ability to interface/integrate with other applications
- Level of satisfaction of users at other organizations
- Financial stability of vendor
- Vendor support available
- Costs
  - Cost to lease or purchase the software and costs of implementation and maintenance