Information Systems Analysis & Modeling

Lecture 5: System Requirement Analysis

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Example: The RMO Consolidated Sales and Marketing System Project

- Ridgeline Mountain Outfitters has an elaborate set of information systems applications developed over the years to support operations and management.
- However, there is a growing gap between customer expectations, current technological capabilities, and existing RMO systems that support sales and customer interaction.

Existing RMO Information Systems and Architecture

- RMO's Information Systems Department has always been forward looking.
- RMO has adopted new technology as soon as it became cost effective.
- At present, RMO has a disparate collection of computers dispersed across home offices, retail stores, telephone centers, order fulfillment/shipping centers, and warehouses—everything connected by a complex set of local area networks (LANs), wide area networks (WANs), and virtual private networks (VPNs). This constitutes RMO's current **technology architecture**.

Technology and application architectures

- **Technology architecture** refers to the set of computing hardware, network hardware and topology, and system software—such as operating and database management systems—employed by an organization.
- **Application architecture** refers to the set of information systems (the software applications) the organization needs to support its strategic plan. Each information system supports the work that needs to be carried out by the organization.

RMO’s application architecture

- **Supply chain management (SCM).** This application was deployed five years ago as a client/server application using Java and Oracle. Currently, it supports inventory control, purchasing, and distribution, although integration of functions needs improvement.
- **Phone/mail order system.** This modest client/server application was developed 12 years ago using Visual Studio and Microsoft SQL Server as a quick solution to customer demand for phone and mail orders. It is integrated with the SCM and has reached capacity.
- **Retail Store System (RSS).** This is a retail store package with point-of-sale processing. It was upgraded eight years ago from overnight batch to real-time inventory updates to/from the SCM.
- **Customer Support System (CSS).** This system was first deployed 15 years ago as a Web-based catalog to support customer mail and phone orders. Four years later, it was upgraded to an Internet storefront, supporting customer inquiries, shopping cart, order tracking, shipping, back orders, and returns.

RMO’s existing systems shortcomings

- Treating phone, Web, and retail sales as separate systems rather than as an integrated whole
- Employing outdated Web-based storefront technology
- Not supporting modern technologies and customer interaction modes, including mobile computing devices and social networking

Supply Chain Management (SCM)

Consolidated Sales and Marketing System (CSMS)

Suppliers

Shipments

Warehouses

Shipments

Customers

Orders

Online Sales

Orders

Shipments

Phone Sales

Buyers

Retail Stores

Retail Sales

Customers

Trade Show System (TSS)

Subsystems of the new CSMS

- The Sales subsystem:
  - provides such basic functions as searching the online catalog, purchasing items, and paying for them online. However, it has many new capabilities including specific suggestions about accessories that go with the purchased item, images and videos of animated models, related purchases made by other shoppers, customer ratings and comments.
- The Order Fulfillment subsystem:
  - performs all the normal tasks of shipping items and allows customers to track the status of their orders and shipments. Customers can rate and make comments about particular merchandise and their shopping experience.

Subsystems of the new CSMS (continue…)

- The Customer Account subsystem
  - provides services that enhance the customer experience. Customers can view and maintain their account information. They also can “link up” with friends who are also customers to share experiences and opinions on merchandise. The system will keep track of detailed shipping addresses, including payment information and preferences.
- The Marketing subsystem:
  - Is primarily for employees to set up the information and services for customers. This subsystem is also fed by the SCM system to maintain accurate data on the inventory in stock and anticipated arrival dates of items on order. Employees also set up various promotional packages and seasonal catalogs by using the functions of this subsystem. Furthermore, RMO is experimenting with a new idea to enhance customer experience and satisfaction: building partner relationships with other retailers so customers can earn “combined” points with RMO purchases or a partner retailer purchase.

Systems analysis activities

- Gather detailed information.
- Define requirements.
- Prioritize requirements.
- Develop user-interface dialogs.
- Evaluate requirements with users.

Detailed information gathering

- Obtain information from people who will be using the system, either by interviewing them or by watching them work.
- Obtain additional information by reviewing planning documents and policy statements; study existing systems, including their documentation; look at what other companies have done when faced with a similar business need.
- Understand an existing system by identifying and understanding the activities of all the current and future users.

What are requirements?

- Most of the analyst's time is devoted to requirements: gathering information about them, formalizing them by using models and prototypes, refining and expanding them, prioritizing them, and generating and evaluating alternatives.
- **System requirements** are all the activities the new system must perform or support and the constraints that the new system must meet.
  1. *Functional requirement*
  2. *Non-functional requirement*

Functional requirements

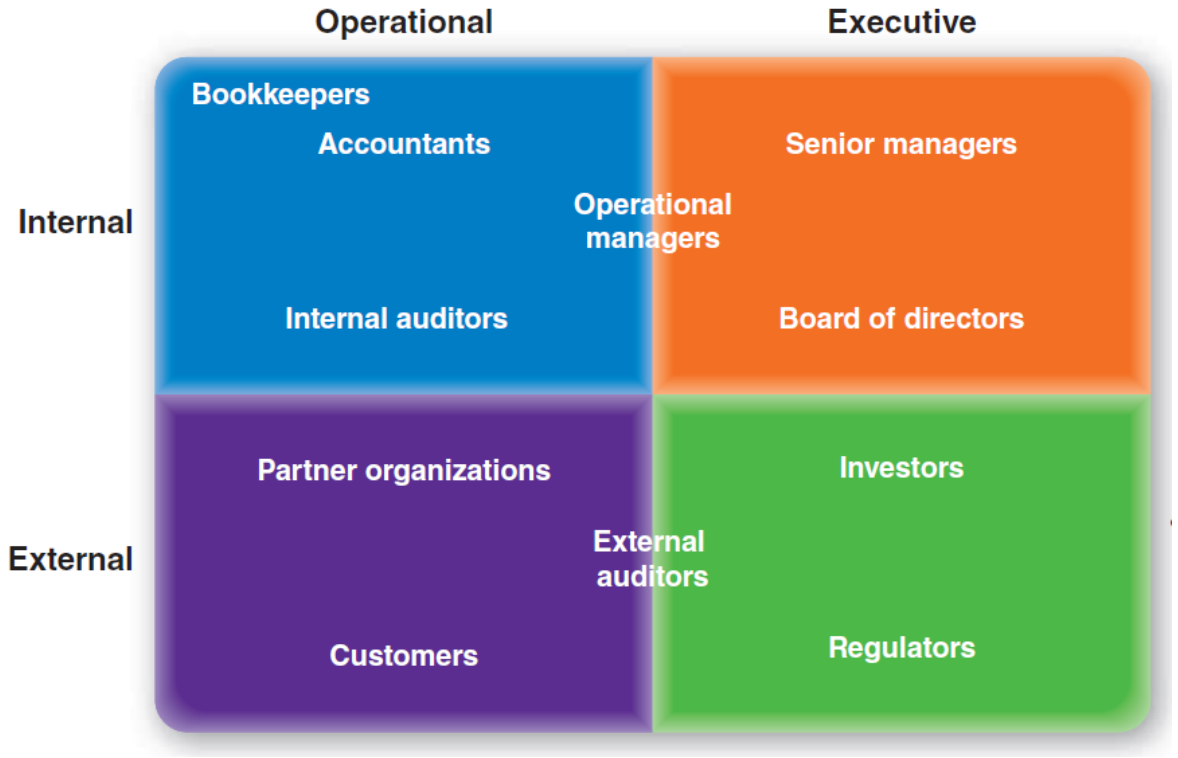
- The activities that the system must perform (i.e., the business uses to which the system will be applied).
- For example, functional requirements of “payroll system”
  - “generate electronic fund transfers,”
  - “calculate commission amounts,”
  - “calculate payroll taxes,”
  - “maintain employee-dependent information,”
  - and “report tax deductions to the IRS.”

Non-functional requirements

- Characteristics of the system other than those activities it must perform or support.
- **FURPS:** a framework for identifying and classifying requirements.
  - *F*unctional: business rules and processes
  - *U*sability: operational characteristics related to users, such as the user interface, related work procedures, online help, and documentation.
  - *R*eliability: dependability of a system—how often a system fails and how it detects and recovers from those problems.
  - *p*erformance: operational characteristics related to measures of workload, such as throughput and response time
  - *S*ecurity: how access to the application will be controlled and how data will be protected during storage and transmission.

Stakeholders

- All the people who have an **interest** in the **successful** implementation of the system.
  - Stakeholders are your primary source of information for system requirements.
- Example: Accounting system



The Stakeholders for RMO

- Phone/mail sales order representatives
- Warehouse and shipping personnel
- Marketing personnel who maintain online catalog information
- Marketing, sales, accounting, and financial managers
- Senior executives
- Customers
- External shippers (e.g., UPS and FedEx)

Information-Gathering Techniques

- Interviewing users and other stakeholders
- Distributing and collecting questionnaires
- Reviewing inputs, outputs, and documentation
- Observing and documenting business procedures
- Researching vendor solutions
- Collecting active user comments and suggestions

Themes for information gathering questions

Theme	Questions to users
What are the business operations and processes?	What do you do?
How should those operations be performed?	How do you do it? What steps do you follow? How could they be done differently?
What information is needed to perform those operations?	What information do you use? What inputs do you use? What outputs do you produce?

The focus of Questions—Current System or New?

- How much effort to spend studying and documenting the existing system (if one exists)
- Excess attention to an existing system can consume considerable time and can result in simply updating that system with newer technology.
  - reimplement the procedures that are already in place.
  - missing important requirements through the insufficient study of the existing system.
- To minimize both risks, analysts must balance the review of current business functions with the discovery of new system requirements.
- No time or money to review all the old systems and document all the inefficient procedures.
- A good analyst should bring a new perspective on the problem.

Discussion and Interview Agenda

Setting

Objective of Interview
Determine processing rules for sales commission rates

Date,Time, and Location
April 21, 2016, at 9:00 a.m. in William McDougal's office

User Participants (names and titles/positions)
William McDougal, vice president of marketing and sales, and several of his staff

Project Team Participants
Mary Ellen Green and Jim Williams

Interview/Discussion

1. Who is eligible for sales commissions?
2. What is the basis for commissions? What rates are paid?
3. How is commission for returns handled?
4. Are there special incentives? Contests? Programs based on time?
5. Is there a variable scale for commissions? Are there quotas?
6. What are the exceptions?

Follow-Up

Important decisions or answers to questions
See attached write-up on commission policies

Open items not resolved with assignments for solution
See Item numbers 2 and 3 on open items list

Date and time of next meeting or follow-up session
April 28, 2016, at 9:00 a.m.