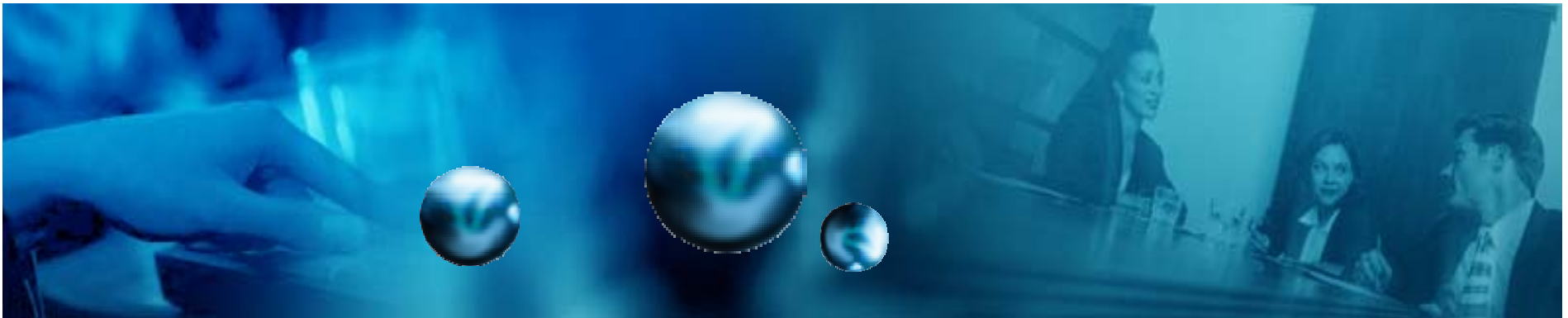


Requirements,  
a crucial ingredient of any successful project.



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# Why projects fail?



How the customer explained it



How the project leader understood it



How the analyst designed it



How the programmer wrote it



What the beta testers received



How the business consultant described it



How the project was documented



What operations installed



How the customer was billed



How it was supported



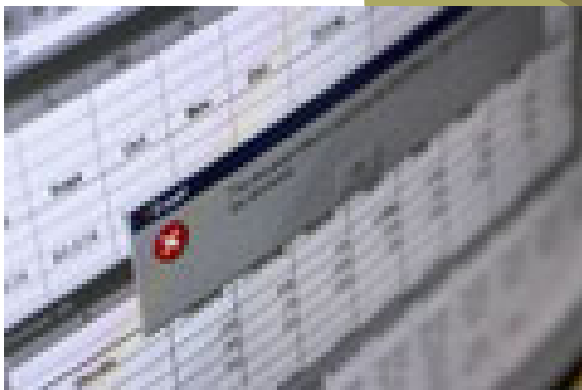
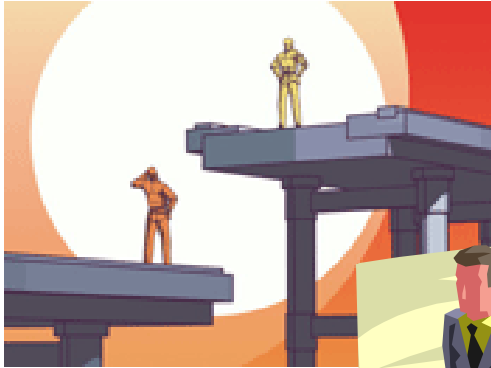
What marketing advertised  
iSwing



What the customer really needed



# Why projects fail?



**That's not what I wanted!**



# Agenda

1. Overview
  - a) Requirements Facts
  - b) What PMI, SEI, IIBA and others say about requirements
2. The Business Analyst role
3. Creating a Requirements Plan
4. Categorizing Requirements
5. Ways to Gather Requirements
6. Modeling and Documentation
7. Requirements Communications
8. Questions & Answers



# Requirements Facts

- What is a requirement?
  - **Main Entry:**
    - Re-quire-ment
  - **Pronunciation:**
    - \- kwī(-ə)r-mənt\
  - **Function:**
    - *noun*
  - **Date:**
    - 1662
  - : something required: **a:** something wanted or needed : **necessity** <production was not sufficient to satisfy military *requirements*> **b:** something essential to the existence or occurrence of something else : **condition** <failed to meet the school's *requirements* for graduation>



# Requirements Facts

- Top 9 Causes for project failure
  - 28.0% Poor communication
  - 18.0% Insufficient resource planning
  - 13.2% Unrealistic schedules
  - **09.8% Poor project requirements**
  - 06.7% Lack of stakeholder buy-in
  - 05.2% Undefined project success/closure criteria
  - 04.8% Unrealistic budgets
  - 04.4% Insufficient or no risk planning
  - 04.3% Lack of control/change process



# Requirements Facts

- **What are the main difficulties with gathering and documenting requirements?**
  - Lack of time/availability on the part of the customer
  - Lack of customer knowledge
  - Lack of buy-in to scope
  - Lack of skilled business analysts
  - No repeatable process from which to learn



# What PMI says about requirements



PROJECT MANAGEMENT INSTITUTE

Making project management indispensable for business results.®

## What is Project Management?

Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing. The project manager is the person responsible for accomplishing the project objectives.

Managing a project includes:

- Identifying requirements
- Establishing clear and achievable objectives
- Balancing the competing demands for quality, scope, time and cost
- Adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders.

Project managers often talk of a “triple constraint”—project scope, time and cost—in managing competing project requirements.



# What PMI says about requirements

- The Project Management Body of Knowledge (PMBOK) 3.0 has 403 instances of the word “requirements”.
- About 25 of the 256 resources found in the “everywhere or product search” had high relevance.
- Library of PMI Standards does not has a Requirements Management Process standard.
- PMI 2008 Professional Development Catalog
  - Effective Requirements Management



# What SEI says about requirements



**Software Engineering Institute**

**CarnegieMellon**

- CMMI v1.2– a maturity model that evaluates the capability of an organization to implement repeatable development processes.
- Two of the key activities identified, as they relate to business analysis, are requirements management and requirements development.
- A requirement is:
  - “something that the product must do or a quality that the product must have”.



# What IIBA says about requirements



- The International Institute of Business Analysis is an independent non-profit professional association serving the growing field of Business Analysis.
- IIBA assists professionals involved in analysis for systems, business or process improvement like, requirements management, systems analysis, business analysis, requirements analysis, project management, or consulting.
- Business Analysis Body of Knowledge (BABOK) v1.6



# What IIBA says about requirements

- A requirement is:
  1. A condition or capability needed by a stakeholder to solve a problem or achieve an objective.
  2. A condition or capability that must be met or possessed by a system or a system component to satisfy a contract, standard, specification, or other formally imposed document.
  3. A documented representation of a condition or capability as in (1) or (2).

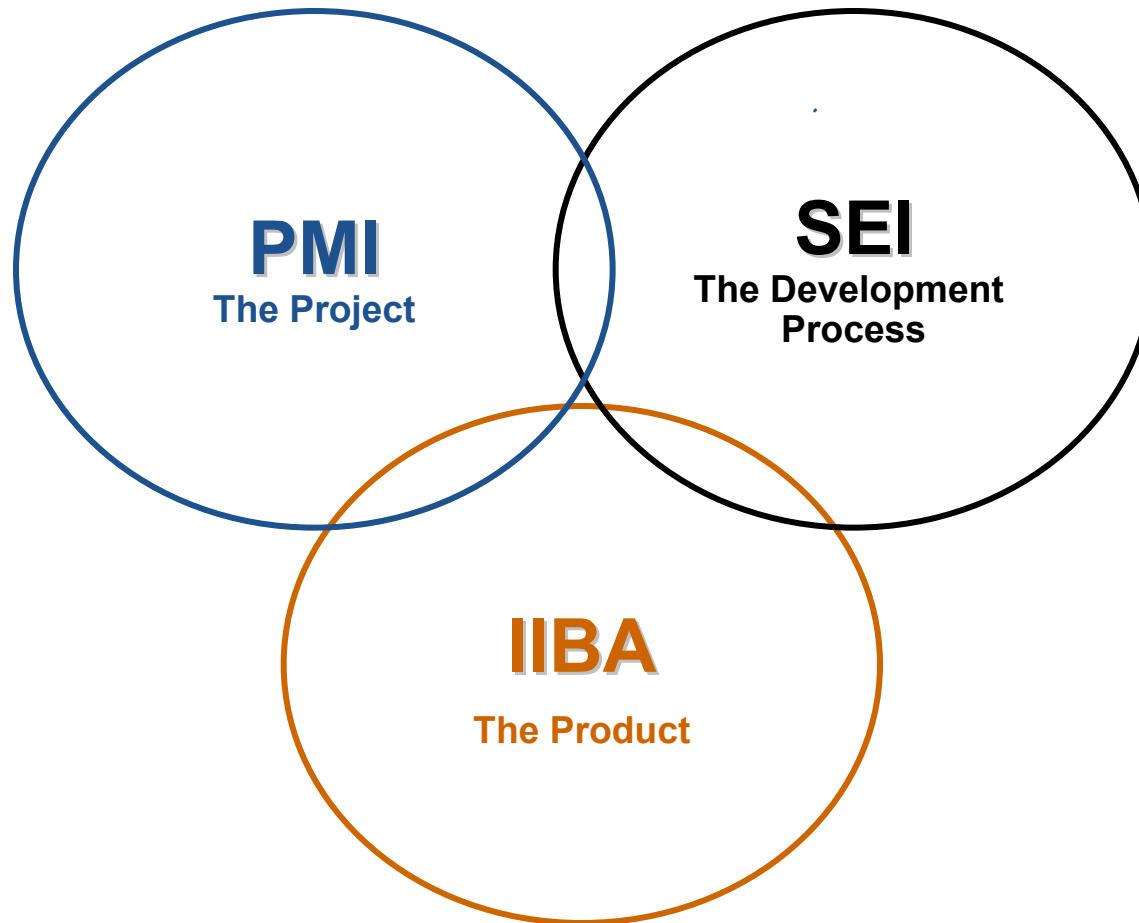


# Other standards & practices

- Six Sigma
  - A set of practices originally developed by Motorola to systematically improve processes by eliminating defects. A defect is defined as nonconformity of a product or service to its specifications.
- Total Quality Management (TQM)
  - A management strategy aimed at embedding awareness of quality in all organizational processes.
- PRINCE2
  - **Projects in Controlled Environments (PRINCE)** is a project management methodology. It covers the management, control and organization of a project. “PRINCE2” is a registered trademark of the U.K.'s Office of Government Commerce (OGC).



# Which standard to use?





# The Business Analyst role

- The Business Analyst's
  - Works as a liaison among stakeholders in order to elicit, analyze, communicate and validate requirements for changes to business processes, policies and information systems.
  - Understands business problems and opportunities in the context of the requirements and recommends solutions that enable the organization to achieve its goals.



# The Business Analyst role

- The Business Analyst's skills
  - Analysis
  - Business knowledge
  - IT knowledge
  - Meeting & presentation
  - Decision making
  - Negotiation
  - Conflict resolution
  - Escalation
  - Questioning
  - Systems Thinking and Logic
  - Leadership



# The Business Analyst role

- A common subset of BA's roles are:
  - Facilitator
  - Modeler
  - Technical writer
  - Tester
  - Test case writer
  - Planner
  - Interviewer



# Creating a Requirements Plan

*In preparing for battle I have always found that plans are useless, but planning is indispensable.*

**-Dwight D. Eisenhower**



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Project Overview and Background
  - Scope and Deliverables
  - Stakeholder Analysis
  - Communications Plan
  - Project Activities
  - Roles and Responsibilities
  - Resource Plan
  - Requirements Risk Plan
  - Manage changes to requirements





# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Project Overview and Background
    - Origination of the project idea
    - Previous attempts to develop this product
    - Competitive forces
    - What will success do for the organization
    - What will failure do for the organization
    - Initiatives that are dependent on this project
    - Key business integration point



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Scope and Deliverables
    - Business Requirements Document
    - Requirements Plan
    - User Acceptance Plan
    - Others, depending on the specifics of the project
  - Stakeholder Analysis
    - Identification, prioritization, level of influence
    - User Profiling
      - Primary/secondary user
      - Experienced/novice user
      - Full-time/Part-time user
      - Organizational entities
      - Internal/external user
      - Language and cultural differences
      - Geographical differences



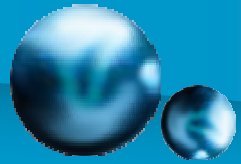
# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Communications Plan

<i>What</i>	<i>Who (Responsible)</i>	<i>Who (Audience)</i>	<i>Why</i>	<i>When</i>	<i>Where</i>	<i>How</i>
<i>BRD approval</i>	<i>Business Analyst</i>	<i>Customer, developer, sponsor</i>	<i>Go/ No-go decision for the analysis phase</i>	<i>April 10, 2007</i>	<i>Executive conference room</i>	<i>In Person</i>

## – Project Activities

- This could be in the form of a Work Breakdown Structure (WBS) or in a list format, and will be input into detail scheduling and estimating.



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Roles and Responsibilities

Task \ Responsible	Project Manager	Business Analyst	Project Sponsor	Technical Writer
Analyze stakeholder	A	R	I	
Create requirements plan	A	R	I	
Elicit requirements		R	A	I
Document requirements		C	A	R
Get Sign-off	R	I	A	I

R= Responsible, A=Approve, C=Concur, I=Inform



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Resource Plan
    - What resources are needed for the completion of the analysis activities?
    - This includes human, tools, software, and equipment resources.



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Requirements Risk Plan
    - Requirements gathering risks
      - Customers not knowing what they want
      - BA's not understanding the business
      - Lack of skills on toolset
      - Customers not willing to dedicate enough time for requirements process
      - Customers defining solution, not requirements
    - Product related risks
      - Product not meeting business need
      - Users not accepting product
      - Product pricing not competitive
      - Product too complex for user
      - Technology outdated by the time the product is released



# Creating a Requirements Plan

- Elements of a Requirements Plan
  - Manage Changes to Requirements
    - Establish responsibilities up front and follow a repeatable process that is know to all:
      - Submit change request
      - Assign for analysis
      - Evaluate impact of change
      - Forward request with recommendation to the Change Control Board
      - Approve or reject
      - Track changes



# Categorizing Requirements

*How many legs does a dog have if you call the tail a leg? Four; calling a tail a leg doesn't make it a leg.*

**-Abraham Lincoln**



# Categorizing Requirements

- Classification
  - Stakeholder-Based
    - Internal/External users
    - Based on the stakeholder importance (influence)
    - Sub-categories may be added





# Categorizing Requirements

- Classification
  - Sequence-Oriented
    - Regulations, Industry Standards, and Corporate Policies
    - Business requirements
      - Strategic
      - Tactical
      - Operational
    - User requirements
    - Systems requirements
      - Functional
      - Quality-of-Service (non-functional) – Environmental, interface, operational, performance, privacy, safety, security, training
      - Assumptions & Constraints
      - Implementation



# Categorizing Requirements

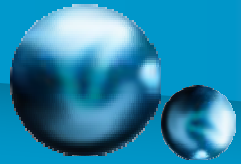
- Classification
  - Purposed-Based
    - Requirements are classified based on the type of functionality desired.
    - Requirements are often tied in with specific job functions.
    - Another approach is to focus on key modules of the product.



# Categorizing Requirements

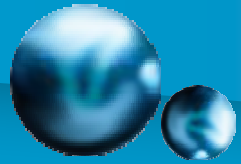
- Requirements are decomposed into attributes:
  - Stability
  - Completeness
  - Clarity
  - Validity
  - Feasibility
  - Precedent
  - Scale

Taken from SEI TR06.93, Risk Taxonomy



# Categorizing Requirements

- How much detail do you need?
  - The user/customer has a responsibility to provide the requirements for the things they care about,
  - but the developer has the responsibility to be able to create a good solution for the areas that the user/customer does not care about.



# Categorizing Requirements

- How much detail do you need?
  - Generally, if the product will be developed **in-house**, then there is less need for a lot of detailed requirements. Unclear areas can be worked out as the effort progresses.
  - If the development will be **outsourced**, the customer is dispersed globally, or the development team is in a different location, then the requirements document must be much more formal.



# Ways to Gather Requirements

*Seek first to understand, then to be understood.*

-Stephen Covey

*It is not a requirement if you cannot afford it.*

- James & Suzanne Robertson



# Ways to Gather Requirements

- How to select the right technique for gathering the requirements? There are three main drivers:
  - Customer
    - Is this a single or multi-stakeholder environment?
    - Are all the customers located together, or are they spread out geographically?
    - Is this a well understood business environment, or is this brand new to the customer?
  - Category
    - The requirements gathering approach for each category should be reviewed independently and evaluated for the best approach.
  - Geography
    - Impact of globalization: language, culture, time zone.



# Ways to Gather Requirements



- Requirements gathering techniques:

Technique	When Used	Comment
Customer Interviews	All situations	Often a subset of other techniques.
Observation Job Shadowing	User requirements. BA new to environment. User not experienced with systems.	Requires time commitment from both BA and user.
Studying Existing Systems	Understand As-Is Pre work to customer interview. Technology change with old business processes.	Can be time consuming. Documentation must be available.
Studying Interfaces	Understand big picture. Understand project impact.	May involve people outside of the project team.



# Ways to Gather Requirements



- Requirements gathering techniques:

Technique	When Used	Comment
Surveys	Wanting to reach a large population. Geographically disbursed population. Wanting consistency in interviewing.	Realistic expectations on return rates.
Discover/JAD/Facilitated Sessions	Multi stakeholder environment. Consensus building is needed.	Large undertaking requires formal planning.
Focus Groups	Gather a lot of ideas without committing to implementation. Early phase of project.	Set realistic expectations.

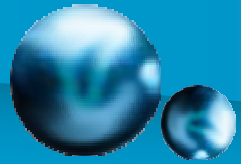


# Ways to Gather Requirements



- Requirements gathering techniques:

Technique	When Used	Comment
Market Research	Early research. Evaluate what is available on the market.	May limit creativity.
Evaluate Best Practices	Early research. Evaluate what the competition is doing.	Information may be hard to find.
Prototyping	Reduce abstractness. Bridge language gaps. Do throughout requirements process.	Use with other techniques from this list.

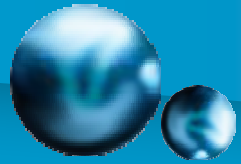


# Ways to Gather Requirements



- Requirements gathering techniques:

Technique	When Used	Comment
Story Boarding	Speak customers' language. Reduce abstractness. Do throughout requirements process.	Subset of prototype but no functionality.
Idea Generating Techniques (Brainstorming)	Early stages. Gather large number of ideas.	Must keep focus.



# Ways to Gather Requirements

- Requirements Prioritization
  - If the requirements are met by all possible solutions, no need to prioritize.
  - If prioritization is to determine what to build or not, then all requirements should be prioritized.
    - Techniques
      - The Dollar Approach
      - Forced Pair
      - Analytical Hierarchy Process
      - Density Dotting



# Modeling and Documentation

*To succeed in business it is necessary to make  
other see things as you see them.*

-John H. Patterson



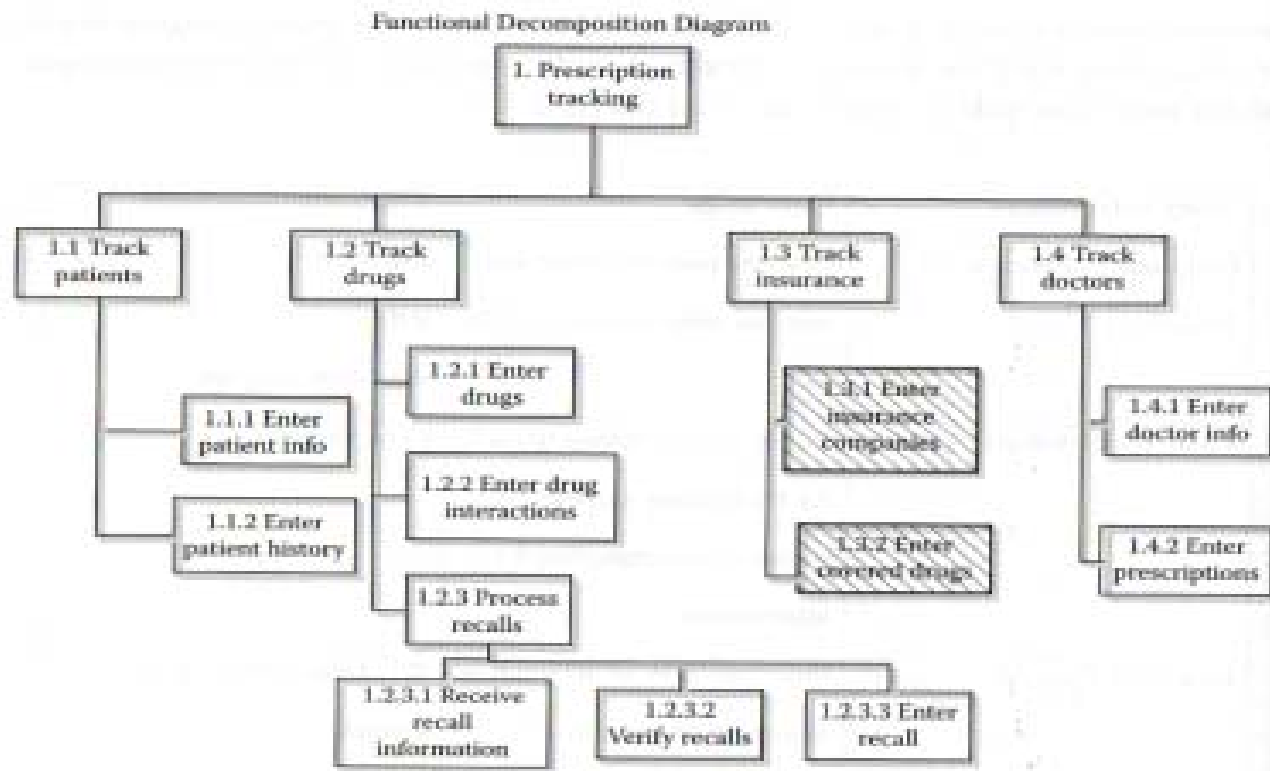
# Modeling and Documentation

- Traditional Techniques:
  - Functional Decomposition Diagram (FDD)
  - Entity Relationship Diagram (ERD)
  - Data Flow Diagrams (DFD)
- Unified Modeling Language (UML or object-oriented models)
  - Structure Diagrams
  - Behavior Diagrams
  - Interaction Diagrams
- Matrix Documentation
- Text Documentation



# Modeling and Documentation

- Traditional Techniques:
  - Functional Decomposition Diagram (FDD)





# Modeling and Documentation

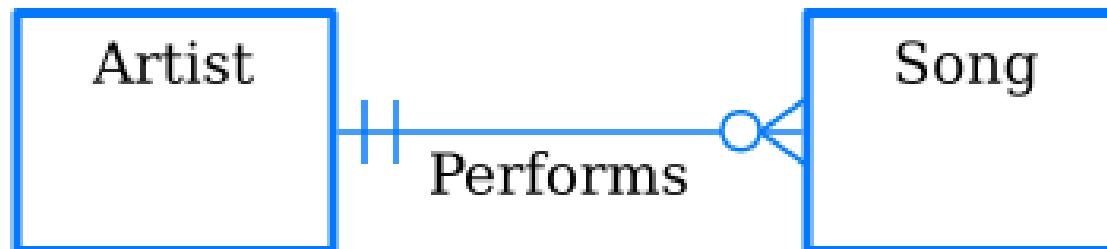
- Traditional Techniques:
  - FDD Process Description

PROCESS DESCRIPTION	
Process Name:	Documented by:
Documentation Date:	Process Owner:
Process Description:	
Process Steps:	
Business Rules:	
Is triggered by (other process or event):	
Is triggered for (other process or event):	
Comments:	



# Modeling and Documentation

- Traditional Techniques:
  - Entity Relationship Diagram (ERD)
    - Entities, Attributes, Relationships, Cardinality, Document.





# Modeling and Documentation

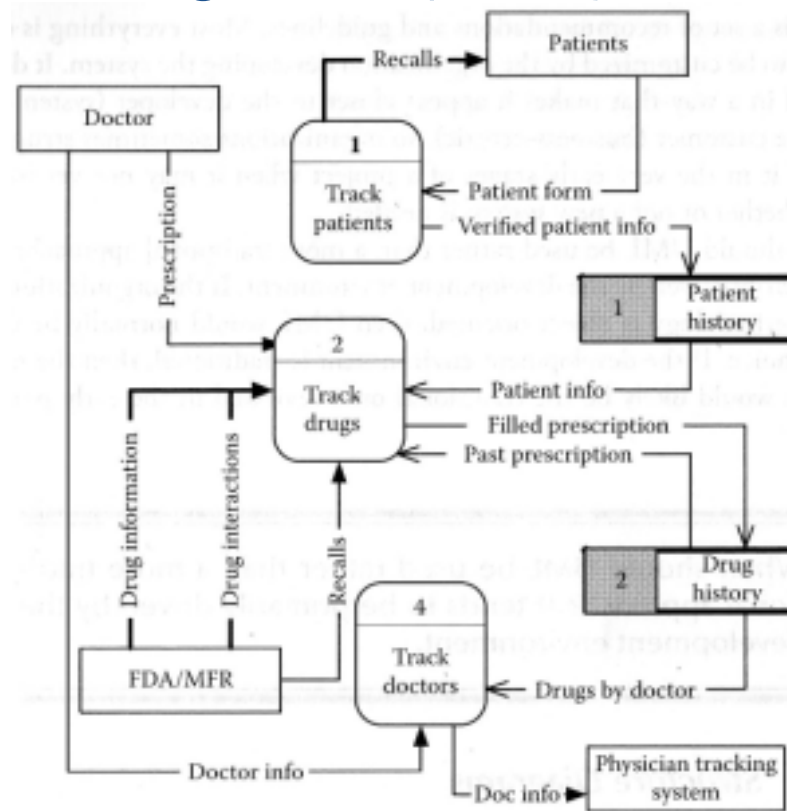
- Traditional Techniques:
  - Entity Relationship Diagram (ERD)
    - Entities, Attributes, Relationships, Cardinality, Document.

ENTITY: _____	
Owned by:	Documented by:
Date:	Reviewed by:
Entity Description:	
Attributes:	
Relationships:	
Comments/Issues:	



# Modeling and Documentation

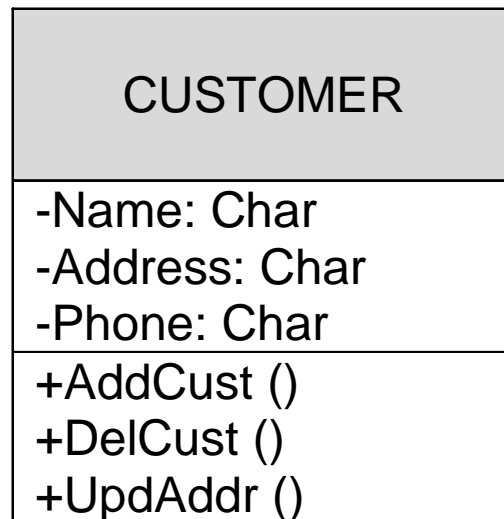
- Traditional Techniques:
  - Data Flow Diagrams (DFD)

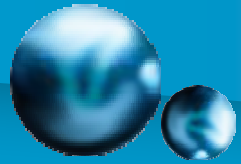




# Modeling and Documentation

- Unified Modeling Language (UML or object-oriented models)
  - Structure Diagrams
    - **Class Diagrams**



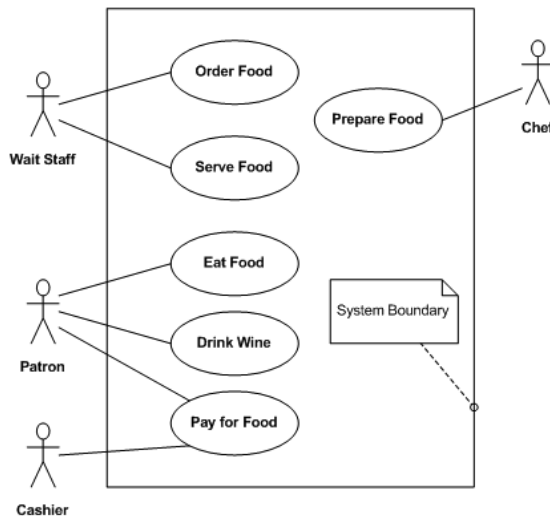


# Modeling and Documentation

- Unified Modeling Language (UML or object-oriented models)

- Behavior Diagrams

- Class Diagrams
- Use cases

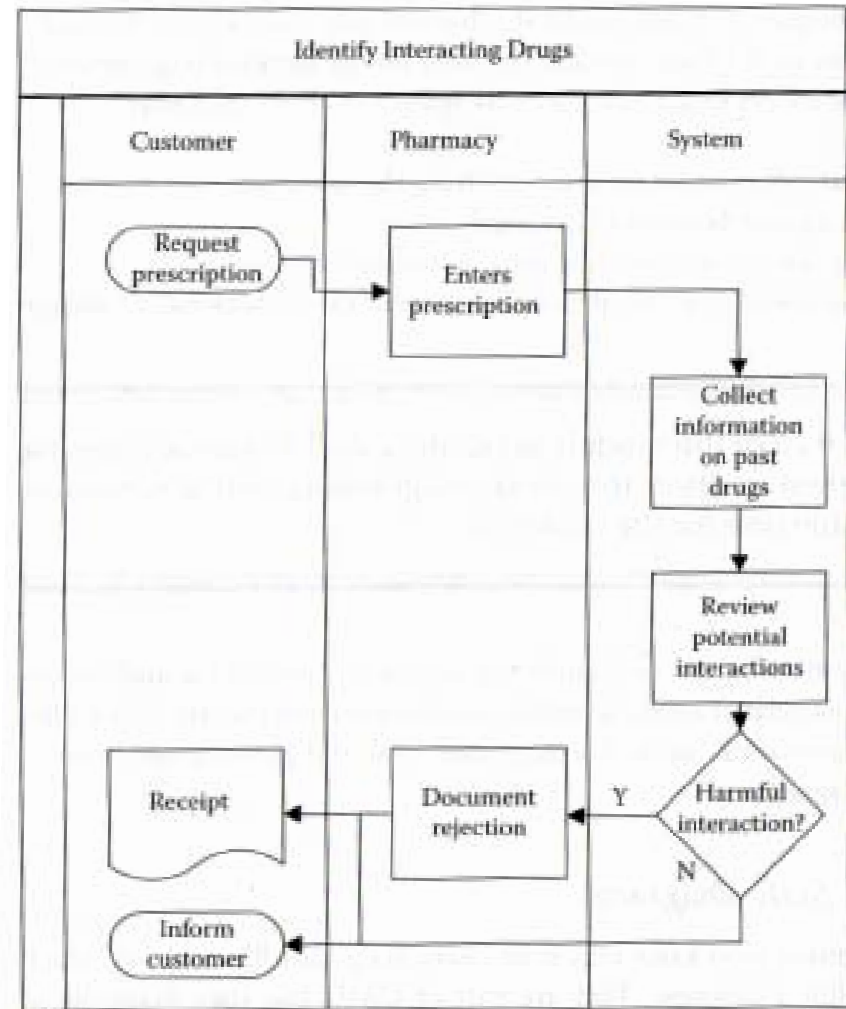


GENERAL CHARACTERISTICS	
<b>Use Case ID</b>	Unique identifier
<b>Description</b>	What is the use case intended to do
<b>Pre-Condition</b>	What has happen prior to the use case being started
<b>Post-Condition</b>	What will happen after the use case is completed
<b>Success Criteria</b>	How will successful completion be judged
<b>Main Scenario</b>	What will the flow be most of the time
<b>Alternative Scenarios</b>	Variations on the main flow
<b>Exceptions</b>	Errors
<b>Includes</b>	Common subroutines
<b>Applicable Business Rules</b>	What business rule applies to this use case
<b>Frequency</b>	How often will the use case be executed
<b>Primary Actor</b>	Who will initiate the use case
<b>Secondary Actor</b>	Who is involved with the completion of the use case
<b>Security</b>	Special security consideration for the system
<b>Backup and Recovery</b>	What happens if the system is not available
<b>Assumptions and Constraints</b>	What environment is assumed What are the system constraints
<b>Version Control</b>	What version of the use case is this
<b>Author</b>	Who wrote this document



# Modeling and Documentation

- Unified Modeling Language (UML or object-oriented models)
  - Behavior Diagrams
    - Class Diagrams
    - Use cases
    - **Activity Diagrams**

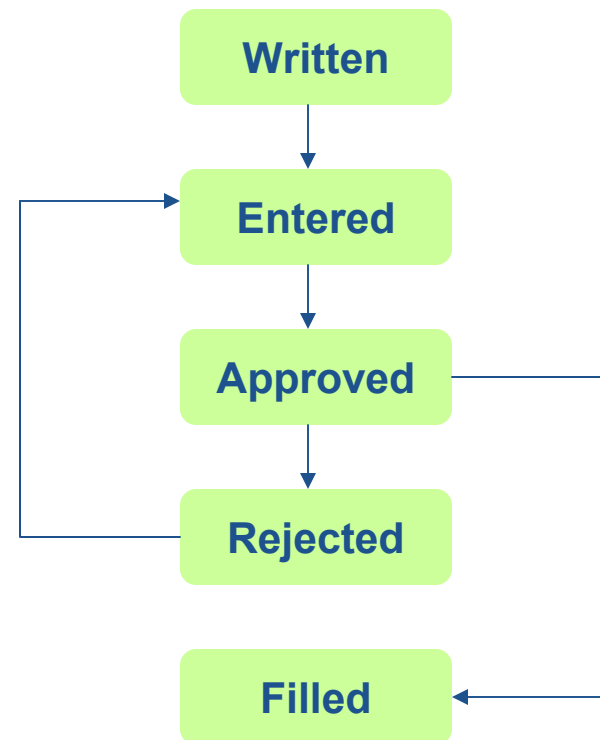




# Modeling and Documentation

- Unified Modeling Language (UML or object-oriented models)
  - Behavior Diagrams
    - Class Diagrams
    - Use cases
    - Activity Diagrams
    - **State Diagrams**

State Diagram for a Prescription





# Modeling and Documentation

- Unified Modeling Language (UML or object-oriented models)
  - Interaction Diagrams
    - Collaboration Diagram
    - Sequence Diagrams



# Modeling and Documentation

- Matrix Documentation
  - CRUD (create/read/update/delete) for data models

Entity \ Organization	Pharmacy	Inventory	Customer Support
Customer	CRU		RUD
Doctor	CRUD		R
FDA	CRUD		R
Prescription Drugs	R	CUD	R



# Modeling and Documentation

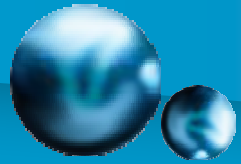
- Text Documentation
  - Requirements should be:
    - Specific
    - Unambiguous
    - Verifiable
    - Traceable
    - Consistent
    - Agreed to
    - Realistic



# Modeling and Documentation

- Requirements Documentation

Document Type	Business Requirements	Requirements Model	Current Business Model	User Requirements	Functional Requirements	Quality of Service requirements	Assumptions and Constraints	Requirements Attributes	Traceability Matrix	Other*
Vision	●									
Software Requirements Specification		●		●	●	●	●	●	●	●
Business Requirements Document		●		●	●	●	●			
RFQ/RFP	●									●
Business Process Description			●	●	●					
Other: Requirements Tool/Repository		●			●	●	●	●	●	



# Requirements Communications

- Requirements Communication Plan
  - Describes how and when the BA will work with project stakeholders.
  - Brings the stakeholders to a common understanding of the requirements.
  - Includes presenting, communicating, verifying, and gaining approval of the requirements from the stakeholders and implementers of the project.



# Requirements Communications

- To develop the requirements Communications Plan we should think about each deliverable in terms of:
  - What needs to be communicated and what is the appropriate delivery method?
  - Who is the appropriate audience?
  - When the communication should occur?
- Additionally, we should be aware of the stakeholder needs and constraints for each communication deliverable in terms of:
  - Time available to commit to the project
  - Physical Location/time zone/communication approach for the stakeholder
  - Authority level (signoff authority or review only)



# Requirements Communications Plan (sample)

What	When	Who
Requirements Phase Kick-off Method: Formal presentation at business location	00/00/0000 (Prior to any formal requirements sessions)	All stakeholders Project Manager
User Survey Method: web survey tool	00/00/0000	Key users
Requirements Elicitation	00/00/0000 (could be one or many sessions depending on the size and scope of the project and requirements to be gathered)	John Doe Jane Smith (Key users and Subject Matter Experts)
Requirements Elicitation session #1 Method: JAD Session	00/00/0000	Facilitator John Doe Jane Smith Scribe (Key users and Subject Matter Experts)
Requirements Elicitation session #2 Method: Group Brainstorm	00/00/0000	Jane Smith John Doe (Key users and Subject Matter Experts)
Requirements Validation Method: Group presentation	00/00/0000 (could be one or many sessions depending on the size and scope of the project and requirements to be validated)	Jane Smith John Doe (Key users and Subject Matter Experts)
Requirements Sign-off Method: Email, voting button confirmation	00/00/0000	Project Manager Business Project Sponsor (Key users and others as necessary)



# Requirements Communications

- Requirements Conflicts
- Requirements Package
- Requirements Presentation
- Formal Requirements Review
- Requirements Sign-off



# Requirements Communications

- Business Requirements Document Templates
  - Comprehensive
  - Simple

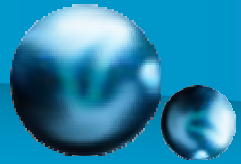


# Requirements, a crucial ingredient of any successful project.

*Requirements must be correctly understood before the right product can be built.*

*Requirements are the way of communicating between the people who commission a product on behalf of anticipated users and builders of that product.*

- James & Suzanne Robertson



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