

The Long And Winding Road: Object Analysis & Object Design to Data Modeling

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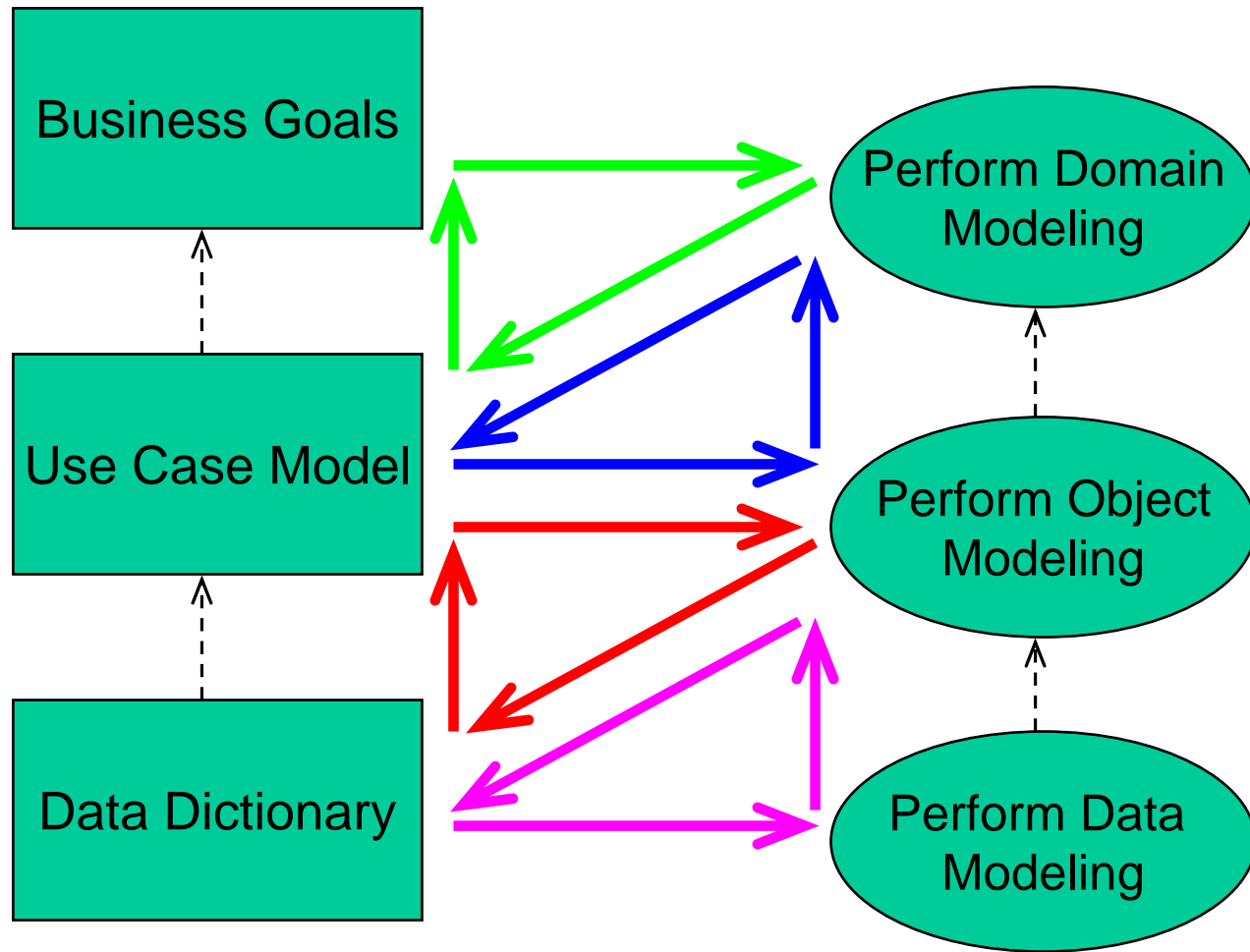
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Roadmap

Transition
Construction
Elaboration
Inception

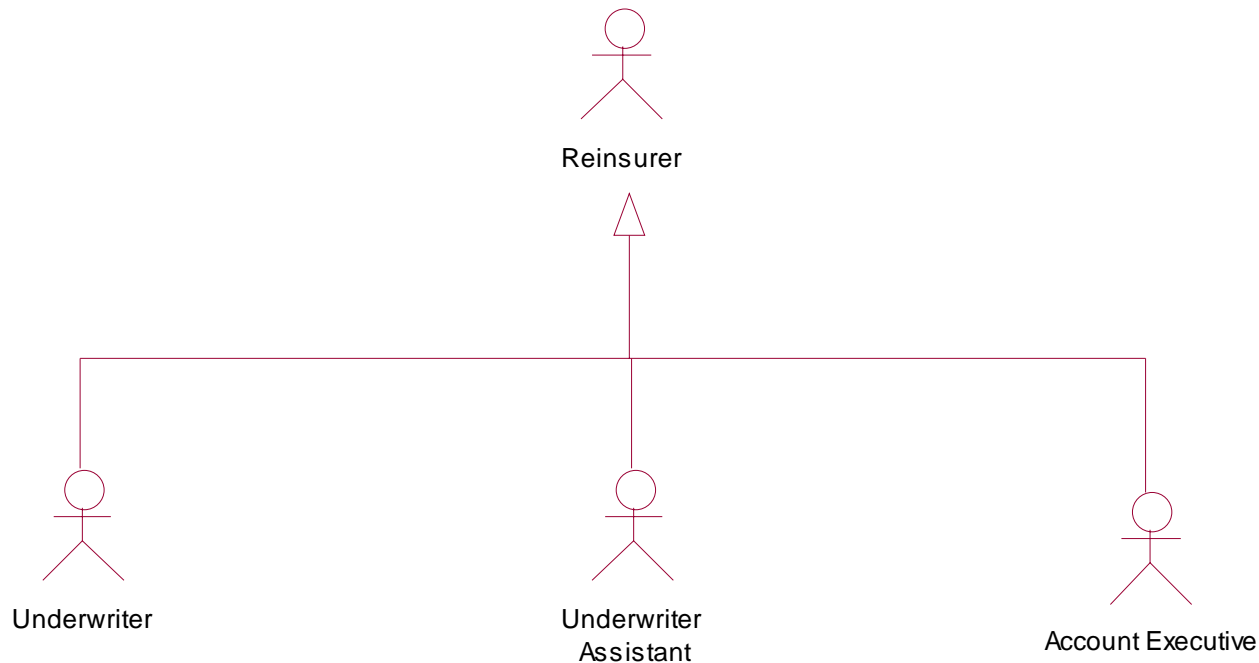


Functional versus Technical
Business versus Development

Use Case Model

- Use Case Diagrams

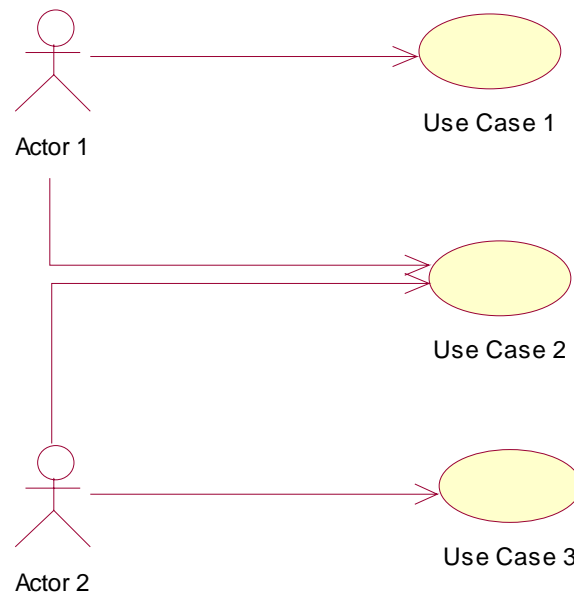
- Actor: the person performing the use case work
 - May use roles to generalize



Use Case Model

- **Use Case Diagram**

- Use Case: the name reflects the goal of the actor
 - Typically a verb phrase (i.e. Maintain Insured)
- Context: a system perspective
- Notation



Use Case Model

- **Use Case**

- A textual/functional requirement
- Project decides what structure is right for it
- Typical contents
 - Description – brief summary
 - Actor – roles who interact with the system
 - Goal – end result
 - Pre-conditions – circumstances that must exist prior to the execution of the Use Case
 - Main Success Scenario – what is required to be done under normal circumstances (steps of the flow through system)
 - Alternate Flow – what is required to be done under exception situations, branching logic, and mutually exclusive situations (the variations, not just exceptions)
 - Post-conditions – circumstances that must exist following the execution of the Use Case

Use Case Model - Example

- **SUC350 – Maintain Insured**
- **Project** Opportunity Tracking and Quote Generation
- **Level** System Level
- **Priority** High - Required
- **Actor** Underwriter, Underwriter Assistant, Account Executive
- **Status** Project Definition - Not approved
- **Description** This Use Case describes the process of adding and updating the Insured table. This is an administrative (table-maintenance) Use Case and is called from the “SUC002 – Maintain Opportunity” Use Case.
- **Goal** To add new Insured information to the Insured’s table or make changes to existing Insured’s information.
- **Trigger** The actor invokes the Maintain Insured function from the Maintain Opportunity window
- **Usage** n times : Daily, Weekly, Monthly (peak period month m – month n)
- **Pre conditions**
- The user is authenticated by the system.
- The user is authorized to execute this Use Case.

Use Case Model - Example

- **Main Success Scenario (MSS)**

1. The system responds by displays the maintain opportunity window and asks the actor to enter the Insured's name (or ID). **Alternative Flow** – AF001 – Insured does not exist. **Note:** The actor may enter partial name (**or ID**) as well
2. The Use Case extends to SUC100 – Search
3. The actor selects an Insured
4. The actor wants to Delete an Insured. See **BR007** (cannot be deleted if there are opportunities, quotes, etc.).
5. The actor wants to Update an Insured and tells the system he/she wants to Update
6. The system responds by displaying all the fields for the selected Insured which are allowed to be changed (See data dictionary) and asks the actor to make their required changes
7. The actor makes the required changes and asks the system to save the information. **Alternative Flow** – “AF002 – Information Invalid”
8. The system saves the information and returns to the Maintain Opportunity main screen
9. Use Case continues from AF001 step e
10. The actor tells the system that he/she wants to delete the Insured selected
11. The system responds by displaying a message asking the actor to verify that this is the correct Insured for deletion and asks for confirmation
12. The actor tells the system YES and the system gathers any information (quotes etc.) which is associated with this Production Source. **Alternative Flow** – “AF003 – Actor Responds NO”
13. The system finds no information associated with the Production Source and asks the actor to confirm deletion and the actor confirms with YES. **Alternative Flow** – “AF004 – Information found for this Production Source”
14. System responds by deleting the Production Source and confirming the action with a “Deleted” message.
15. Use Case Ends

Steps of the flow through the System

Use Case Model - Example

- **Alternative Flow (AF)**

1. AF001 – Insured does not exist. The system tells the actor (message) that the Insured does not exist and asks the actor if they want to Add a new Insured and the actor answers NO – Use Case continues from step a) below. Actor answers YES – Use Case continues from step c) below.
 - a. System responds by asking the actor if he/she wants to search for another Insured and the actor answers NO – Use Case continues step b) below. The actor answers YES – Use Case continues from MSS step 2
 - b. Use Case continues from MSS step 1 above.
 - c. System responds by displaying the Insured data entry window and asks the actor to enter the Insured information. (**Note:** all mandatory fields will be highlighted on the screen)
 - d. The actor enters the required fields and asks the system to save the data
 - e. The system check for duplicate information against the existing database (See data dictionary for duplicate check fields), (**Note:** is ID system generated or user defined?). **Alternative Flow** – AF002 – Information Invalid. The Use Case continues at MSS step 9 above
2. AF002 – Information Invalid. The system tells the actor that some or all of the required information has not been entered or that information entered is invalid (check data dictionary for invalid data rules) . The actor checks for the required changes. Use Case continues from MSS step 8 above.
3. AF003 – Actor Responds NO. The Insured selected is incorrect and the actor needs to make another selection. The Use Case continues from MSS step 4 above
4. AF004 - Information Found for this Production Source. The system tells the actor that information (quotes etc.) exists in the database which is associated with this Production Source and tells the actor that the Production Source CANNOT be deleted (Business Rule needs to be determined) Use Case continues from MSS step 15 above.

The variations, not just the exceptions

Use Case Model

- Use Case Process

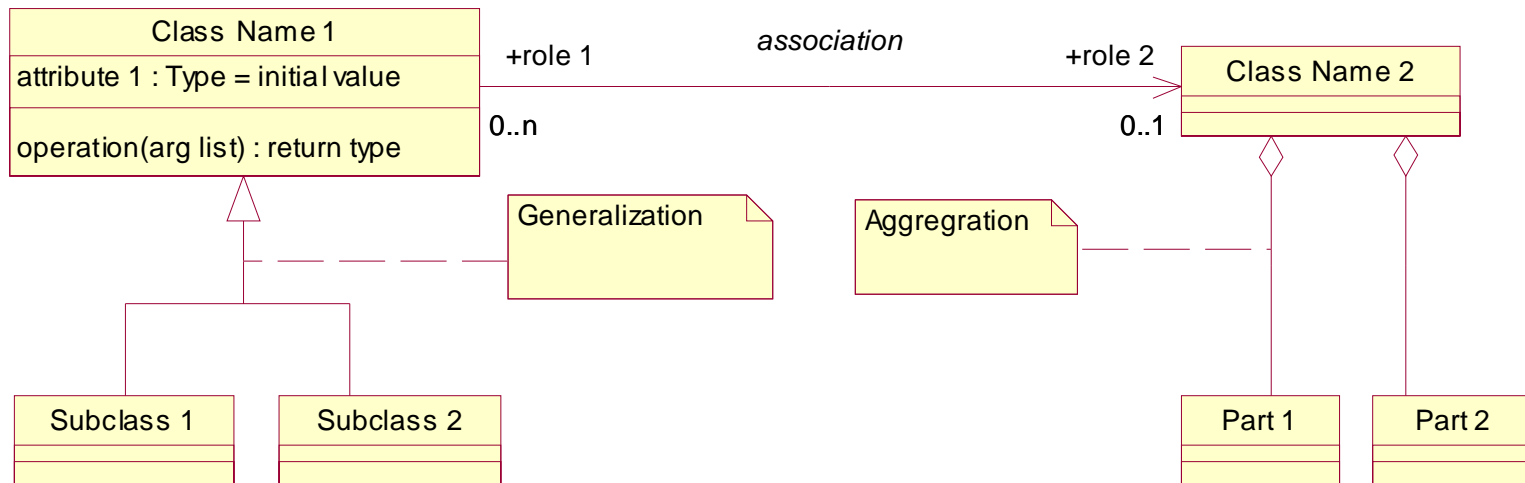
- Work breadth then depth
- Include complete scenarios in an iteration / release
- Model the domain in parallel with writing

Domain Model - Inception

- **Classes – business objects**
 - Potential tables
- **Relationships – use a verb phrase to name**
 - Potential keys
- **Attributes – business requirements from use cases**
 - Potential columns
 - Data dictionary elements

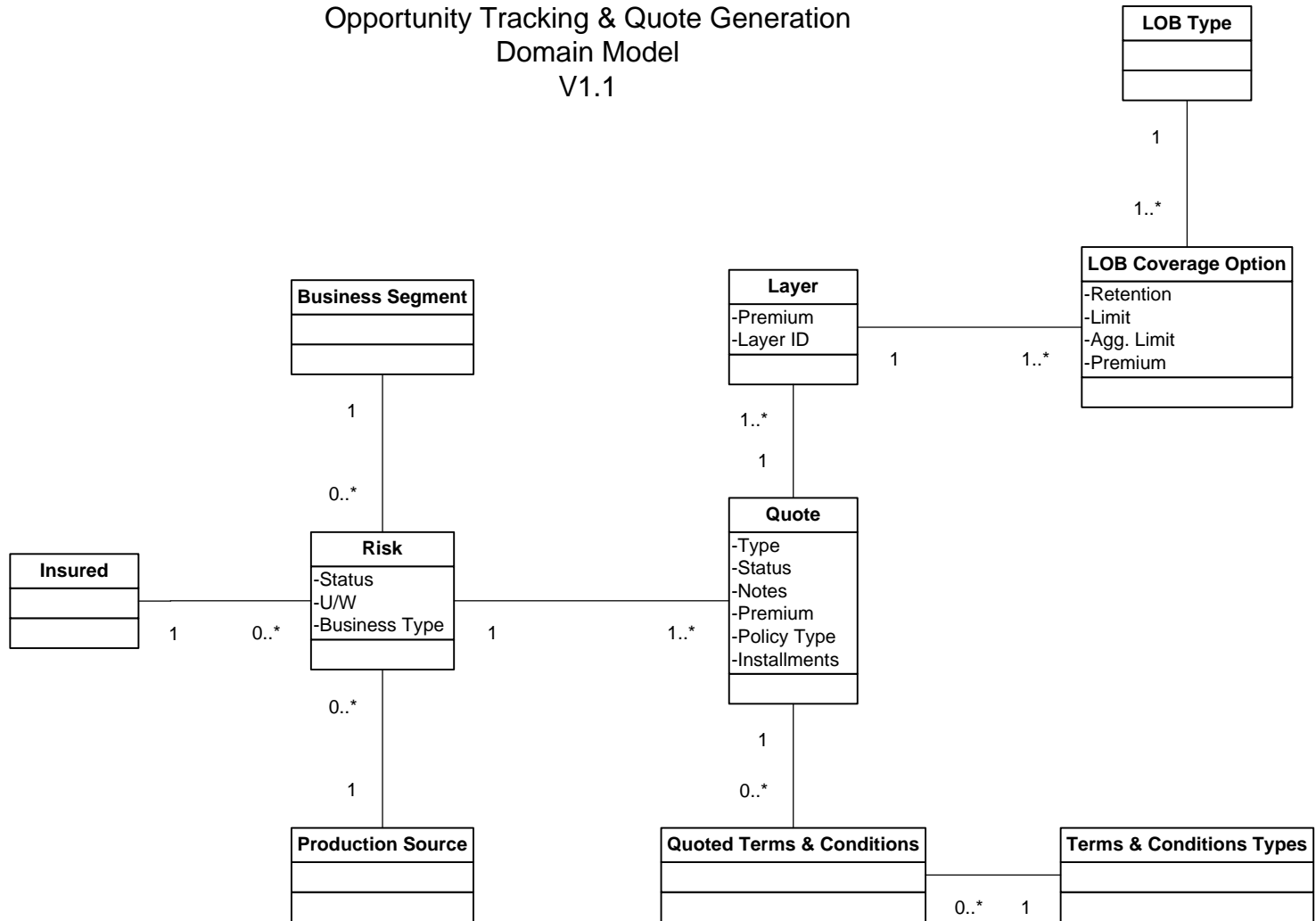
Class Diagram

- Notation



Domain Model - Inception

Opportunity Tracking & Quote Generation
Domain Model
V1.1



Data Dictionary - Inception

- **Data Element – the business term**
 - From the use case
 - Will likely become a column in a table
- **Business Definition**
- **Synonym – alternative name for the data element**

Data Dictionary - Inception

Data Element	Synonym	Business Definition
Underwriter		A name of the person charged with evaluating and pricing the exposure to risk, on behalf of an insurance or reinsurance company.
Annual Aggregate Limit	Specific Annual Aggregate Limit	Represents the maximum payable amount that will apply to the aggregation of losses for a specific coverage for the policy term regardless of number of occurrence/claims made
Broker Commission %		The amount paid to an intermediary for the acquisition of a business.
Business Covered	Line of Business	A breakdown of LOB Quoted
Calc Premium		Calculated annual premium
Ceding Commission %		The amount of commission received by a reinsurer for the cession of its business to another reinsurer to help pay some its acquisition costs among other costs. The ceding commission may also include a profit factor for the reinsured.
City		Named insured's primary mailing city.
Claims / Underwriting Administration		Identifies who will be handling the claims (TPA or in house)
Control Number		Policy Number or Reinsurance Agreement Number
County		Named insured's primary mailing county.
Effective Date	EFF_DATE_CERT, Effective Date	The date the coverage incepts. Coverage may be provided via a Certificate or Policy, Endorsement to a Certificate or Policy, or a Treaty.
Exclusion Name		Identifies standard exclusions - group/single risk
Expiration Date		The date upon which termination of coverage is indicated on the Insurance Policy, unless previously canceled.
General Conditions	Underwriting Terms & Conditions, Exclusions	
Insured Name		Name of the company insured on the policy.
Last Modified		Date when the risk status is first entered or updated. Used for tracking purposes
Legal Name		Name to appear on the quote or binder letter.
Member Specific Limit	Insurer Specific Limit, Combined Single Limit or Separate limit	The per occurrence/claims made limit

Data Dictionary - Elaboration

- Valid Value Set / Range
 - Data length
- Default Values
- Type
 - Data type
- Corporate Database Element
- Screen Mapping – mandatory/required attribute
 - Null, not null

Data Dictionary - Elaboration

Data Element	Valid Value Set / Range	Default Value	Type	Synonym	Corp Database Element	Business Definition
Account Basis	(Group Risks Only) Accident Year, Underwriting/Policy Year, Calendar Year				Acct-Basis	
Advance Notice	####	90 days	Integer			
Aggregate Stop Loss Limit	###,###,###					
Underwriter	All Underwriters assigned to the same Business Units as the Underwriter or Underwriter Assistant signed in	If an Underwriter is signed in then Underwriter			Underwriter Name	A name of the person charged with evaluating and pricing the exposure to risk, on behalf of an insurance or reinsurance company.
Annual Aggregate Limit	###,###,###			Specific Annual Aggregate Limit	Coverage Aggregate Limit	Represents the maximum payable amount that will apply to the aggregation of losses for a specific coverage for the policy term regardless of number of occurrence/claims made
Business Type	Certificate of Reinsurance, Reinsurance Contract, Insurance Policy	Insurance Policy when Insurance Type = Insured; Reinsurance Contract when Insurance Type = Reinsured			Agreement	
Calc Premium	###,###,###		Currency		Premium-Min	Calculated annual premium
Ceding Commission %	#####.#####		Percent		Ced Comm Amt	The amount of commission received by Reinsurer for the cession of its business to another reinsurer to help pay some its acquisition costs among other costs. The ceding commission may also include a profit factor for the reinsured.
Combined Single Limit or Separate Limit	Single Limit, Separate Limit, N/A					
Coverage Type	Pro Rata, Excess Of Loss, Primary	Excess Of Loss				
Effective Date		Current Date	Date	EFF_DATE_CERT, Effective Date	Coverage Effective Date	The date the coverage incepts. Coverage may be provided via a Certificate or Policy, Endorsement to a Certificate or Policy, or a Treaty.

Data Dictionary - Elaboration

Transition

Construction

Elaboration

Inception

Screen / Data Element	Screen Size	Screen Label	Mandatory / Optional / System Populated Action
Create Opp			
Risk Type	6	Risk Type	Mandatory
Insured Name	40	Named Insured	Mandatory
Risk Segment	18	Risk Segment	Mandatory
Risk / Opportunity			
Reference ID	7	Summary For: Quote/Binder Closed	Optional
Trans. Status	11	Reason	Optional
Trans. Status	11	Trans. Status	System Populated
Risk Type	6	Risk Type	System Populated
Trans Type	11	Trans Type	System Populated
Insured Name	40	Named Insured	System Populated
Risk Segment	18	Risk Segment	System Populated
Last Modified	10	Last Modified	System Populated
Quote Issue Date	11	Quote / Bind Issue Date	System Populated
Manage Named Insured			
Insured Name	100	Named Insured	Mandatory
Legal Name	100	Name Insured Legal Name	Mandatory
Street Address	72	Address 1	Mandatory
Street Address 2	60	Address 2	Optional
City	30	City	Mandatory
State	2	State	Mandatory
Zip Code	10	Zip Code	Mandatory
County	40	County	System Populated

Data Dictionary - Construction

- Business Rule
 - Behavior
- Database Table
- Database Column

Transition

Construction

Elaboration

Inception

Data Dictionary - Construction

Data Element	Business Rule	Database Table	Database Column	Business Definition
Broker Commission %	Carry zero value in Quote/Binder	INSURANCE_PRODUCT	BRKER_COMM_PC	The amount paid to an intermediary for the acquisition of a business.
Business Type	When Insurance Type = Insured then Insurance Policy selectable. When Insurance Type = Reinsured, then Certificate of Reinsurance or Reinsurance Contract selectable.	BUSINESS_TYPE	BUS_TYPE_NM	
Calc Premium	Sum of all premium. USD - Whole.	LAYER	TERM_PREM_AT	Calculated annual premium
Common Expiration Date	On Renewal: Blank out value On Endorsement: Carry original value	INSURANCE_PRODUCT	GRP_EXPIR_TS	Group Risks Only List Values - In force, New, Renewal
Effective Date	Date Entry , Time prefill to 12:01 a.m. On Renewal: Reset effective date to value of expiration date of source/copied transaction. (X/Y/OZ - X/Y/OZ+1) On Endorsement: Blank out Effective Date	INSURANCE_PRODUCT	EFFEC_TS	The date the coverage incepts. Coverage may be provided via a Certificate or Policy, Endorsement to a Certificate or Policy, or a Treaty.
Premium	On Renewal and Endorsement: Reset to zero	SPECIFIC_COVERAGE AGGREGATE_COVERAGE	TERM_PREM_AT	Line of Business / Coverage Premium.
Reinsurance Agreement Number	Optionally displayed on the quote/binder.	LAYER	CNTL_NO	This is not a separate field but the same as control number.
Risk Segment	Prefix with the value of Risk Type (Risk Type + Risk Segment)	RISK_SEGMENT	RISK_SEGMNT_NM	
Share %	Carry zero value in quote/binder USD - Whole	LAYER	PARTICN_PC	Insurance/Reinsurance participation (gross)
Total Premium	Zero out value when Endorsement or Renewal transaction from copy. USD - Whole	LAYER	OVRD_PREM_AT	The annual premium due
Trans Status	Select Submission or Quoted or Binder (Open, Sent & Cancelled) or Active (Submission, Quoted and Binder) or All (Active, Declined, Invalid, Not Written, Lost & Accepted)	TRANS_STATUS	TRANS_STATUS_NM ACTV_IN	

Object (Logical) Model

- **Classes** – add system objects (reference tables, types)
 - May be renamed or moved
- **Relationships** – refine multiplicity
 - Add generalization (kind of)
 - Party, Product
 - Add aggregation (part of)
- **Attributes** – refine and add more detail
 - May be moved
 - From another class
 - Up or down in the generalization hierarchy
- **Operations** – calls to implement behavior (use cases)

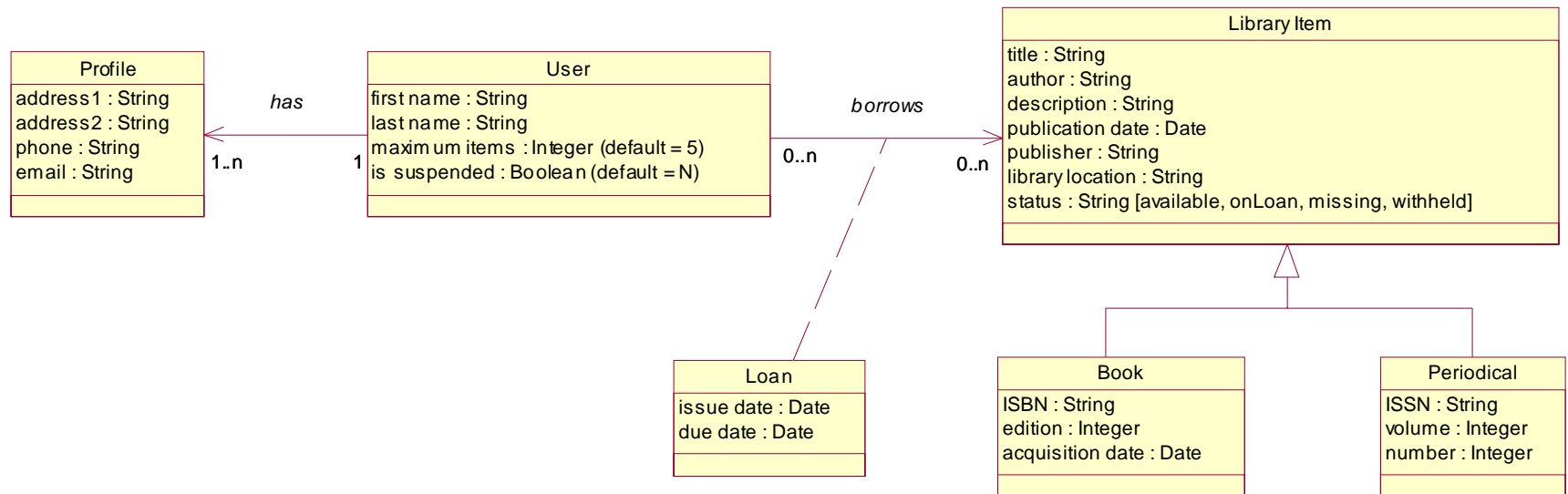
Object Model – Library System

Transition

Construction

Elaboration

Inception



Data (Physical) Model

- **Classes – become tables**
 - Primary key: chose attribute or use surrogate ID
- **Attributes – become columns in tables**
 - Null: optional or multiplicity of 0..1
 - Not Null: required or multiplicity of 1
- **Relationships – become the foreign keys**
 - Null or Not Null attributes of foreign keys
- **Many to Many Relationships – insert table to resolve**
- **Generalization – decide which classes to implement**

Data (Physical) Model

- Object to Data Mapping

- Classes not implemented

- Inheritance – non leaf classes

- Party, Organization, Distribution Channel

- Did not need business detail

- Country, SIC Major, SIC Minor

- Tables implemented

- Many to many tables

- County To Postal Code

- Employee To Unit

Data (Physical) Model

