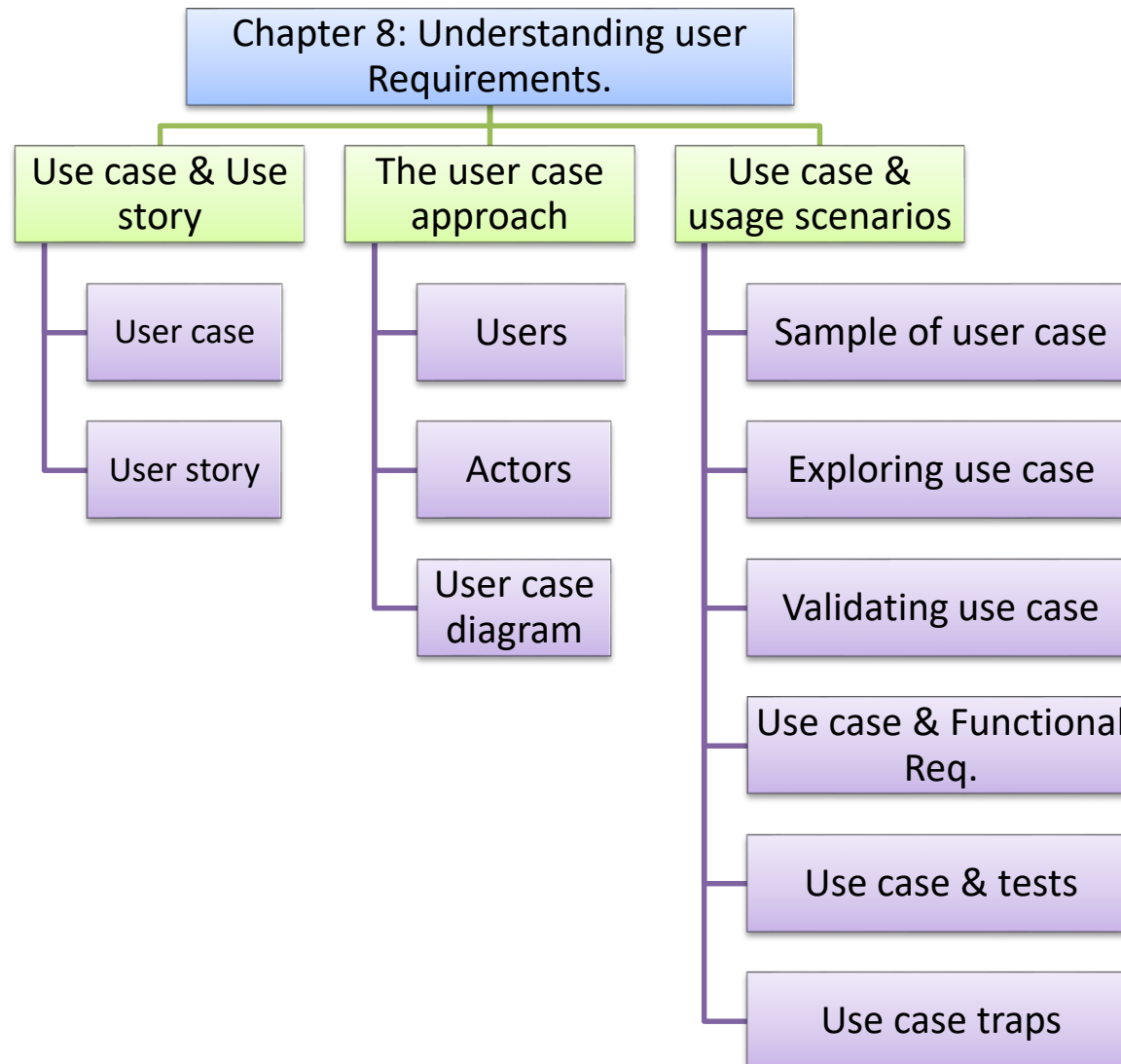




## CHAPTER 9

# Playing by the rules

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- After finish this chapter, student should understand the influence of business rule on many type of software requirements.
- Student could identify at least one of each business rule type from the taxonomy in Figure 9-1 for student's project.
- Set up a traceability matrix to indicate which functional requirements enforce each business rule that student identified.
- Identify the rationale behind each functional requirements to discover other, implicit business rules.

1. A business rules taxonomy
2. Documenting business rules
3. Discovering business rules
4. Business rules and requirements
5. Tying everything together

**TABLE 9-1** How business rules can influence various types of software requirements

Requirement type	Illustration of business rules' influence	Example
Business requirement	Government regulations can lead to necessary business objectives for a project.	<i>The Chemical Tracking System must enable compliance with all federal and state chemical usage and disposal reporting regulations within five months.</i>
User requirement	Privacy policies dictate which users can and cannot perform certain tasks with the system.	<i>Only laboratory managers are allowed to generate chemical exposure reports for anyone other than themselves.</i>
Functional requirement	Company policy is that all vendors must be registered and approved before an invoice will be paid.	<i>If an invoice is received from an unregistered vendor, the Supplier System shall email the vendor editable PDF versions of the supplier intake form and the W-9 form.</i>
Quality attribute	Regulations from government agencies, such as OSHA and EPA, can dictate safety requirements, which must be enforced through system functionality.	<i>The system must maintain safety training records, which it must check to ensure that users are properly trained before they can request a hazardous chemical.</i>

- Biz rules often enforced through manual implementation of policies and procedures. In many cases, SW applications also need to enforce these rules.

# Differences bw biz rules, biz processes, and biz requirements

- People sometimes confuse biz rules with biz processes or biz requirements.
- *Biz requirement* states desirable outcome or a high-level objective of the organization that builds or procures a SW solution.
- *Biz process* describes a series of activities that transform inputs into outputs to achieve a specific result.
- *Biz rules* influence biz processes by establishing vocabulary, imposing restriction, triggering actions, and governing (điều chỉnh) how computations are carried out.

# A business rules taxonomy

- Definition for biz rules from perspectives of both the biz and its information systems:
  - From the business perspective: “A biz rule is guidance that there is an obligation concerning conduct, action, practice, or procedure within a particular activity or sphere (lĩnh vực).”
  - From the information system perspective: “A biz rule is a statement that defines or constrains some aspect of the biz. It is intended to assert (nhằm khẳng định) biz structure or to control or influence the behavior of the biz.”
- A simple business rule taxonomy: 5 types of rules.

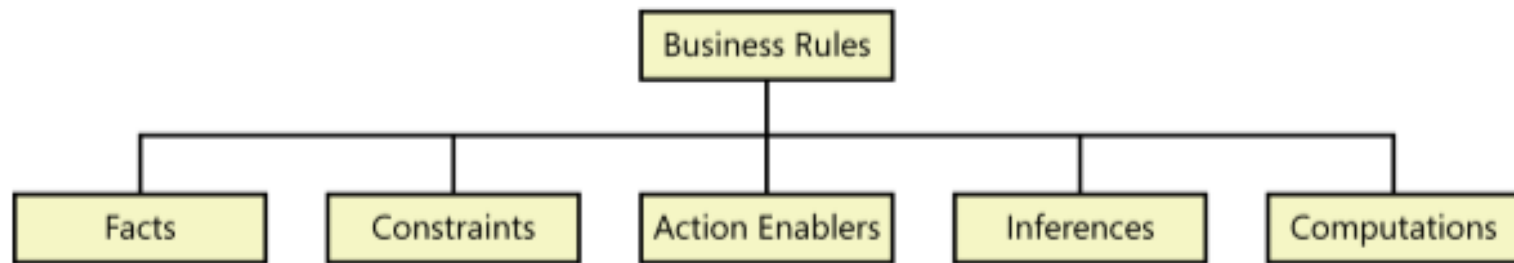


FIGURE 9-1 A simple business rule taxonomy.

# A business rules taxonomy

- **Facts** are simply statements that are true about the biz at a specific point in time. Exs:
  - Every chemical container has a unique bar code identifier.
  - Every order has a shipping charge.
- **Constraints** are statements that restrict the actions that the system or its users are allowed to perform. Exs:
  - Organizational policies: *A loan applicant who is less than 18 years old must have a parent or a legal guardian as cosigner on the loan; A library patron may have a maximum of 10 items on hold at any time.*
  - Government regulations: *All SW applications must comply with government regulations for usage by visually impaired persons (d9o61i vo71i người khiếm thị); Airline pilots must receive at least 8 continuous hours of rest in every 24-hour period....*
  - Industry standards: *Web applications may not contain any HTML tags or attributes that are deprecated according to the HTML 5 standard.*



# A business rules taxonomy

*Constraining business rules sometimes can be represented in a roles and permissions matrix.*

Roles and Permissions Matrix	Employee	Administrator	Circulation Staff	Library Aide	Non-Employee	Volunteer	Patron
<b>System Operations</b>							
Log in to library system		X	X	X			
Set up new staff members		X					
Print hold pick list		X	X	X			
<b>Patron Records</b>							
View a patron record		X	X				
Edit a patron record		X	X				
View your own patron record		X	X	X		X	X
Issue a library card		X	X				
Accept a fine payment		X	X				
<b>Item Operations</b>							
Search the library catalog		X	X	X		X	X
Check out an item		X	X				
Check in an item		X	X	X		X	
Route an item to another branch		X	X	X		X	
Put an item on hold		X	X	X		X	X

# A business rules taxonomy

- **Action enablers:** A rule that triggers some activity if specific conditions are true is an *action enabler*. Exs:
  - If the chemical stockroom has containers of a requested chemical in stock, then offer existing containers to the requester.
  - If the expiration date for the chemical container has been reached, then notify the person who currently possesses that container.
  - After a customer places a book into the shopping cart, display related books that other customers also bought when they bought this one. (*enhance the commercial success*).
- **Inferences** (*sự luận ra*): Sometime called *inferred knowledge*, or a *derived fact*, an *inference* creates a new fact from other facts. Inferences are written in the “if/then” pattern also, but the “then” clause simply provides a piece of knowledge, not an action to be taken. Exs:
  - If payment is not received within 30 calendar days after it is due, then the account is delinquent (*xem như ko trả đúng kỳ hạn*).
  - If the vendor cannot ship an ordered item within 5 days of receiving the order, then the item is considered back-ordered.

# A business rules taxonomy

- **Computations:** transform existing data into new data by using specific mathematical formulas or algorithms. Many computations follow rules that are external to the enterprise, such as income tax withholding formulas (tạm giữ thuế TNCN). Exs:
  - The domestic ground shipping charge for an order that weighs more than two pounds is \$4.75 plus 12 cents per ounce or fraction thereof.
  - The unit price is reduced by 10% for orders of 6-10 units, by 20% for orders of 11-20 units, and 30% for orders of more than 20 units.

TABLE 9-2 Using a table to represent computational business rules

ID	Number of units purchased	Percent discount
DISC-1	1 through 5	0
DISC-2	6 through 10	10
DISC-3	11 through 20	20
DISC-4	More than 20	30

- The composite biz rules can be hard to understand and maintain. It's better to write your biz rules at the atomic level. This keep your rules short and simple. It also facilitates reusing the rules, modifying them, and combining them in various ways.

**TABLE 9-3** Some atomic business rules for a library

ID	Rule
Video.Media.Types	DVD discs and Blu-ray Discs are video items.
Video.Checkout.Duration	Video items may be checked out for one week at a time.
Renewal.Video.Times	Video items may be renewed up to two times.
Renewal.Video.Duration	Renewing a checked-out video item extends the due date by three days.
Renewal.HeldItem	A patron may not renew an item that another patron has on hold.

- Because biz rules can influence multiple applications, organizations should manage their rules as enterprise-level assets. A simple biz rules catalog is necessary.
- If you're using a requirements management tool, you can store biz rules as a requirements type, provided they are accessible to all of your SW projects.
- Large organizations should establish a database of biz rules.

**TABLE 9-4** Some sample business rules catalog entries

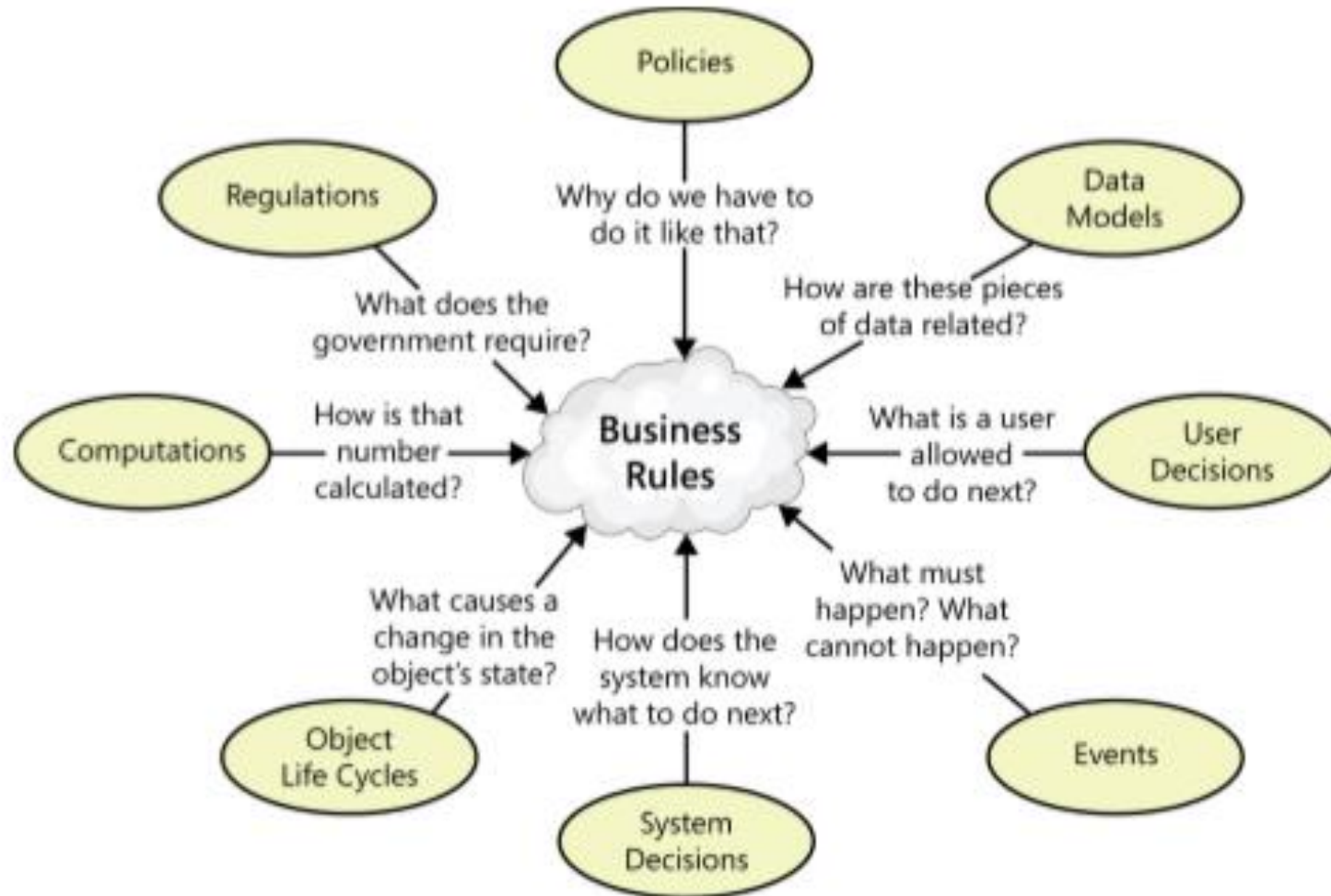
ID	Rule definition	Type of rule	Static or dynamic	Source
ORDER-5	If the customer ordered a book by an author who has written multiple books, then offer the author's other books to the customer before completing the order.	Action enabler	Static	Marketing policy XX
ACCESS-8	All website images must include alternative text to be used by electronic reading devices to meet accessibility requirements for visually impaired users.	Constraint	Static	ADA Standards for Accessible Design
DISCOUNT-13	A discount is calculated based on the size of the current order, as defined in Table BR-060.	Computation	Dynamic	Corporate pricing policy XX

There are some ways to look for biz rules:

- “Common knowledge” from the organization, often collected from individuals who have worked with the business for a long time and know the details of how it operates.
- Legacy systems (hệ thống kế thừa) that embed business rules in their requirements and code. This requires reverse-engineering the rationale behind the requirements or code to understand the pertinent (thích hợp) rules. This sometimes yields incomplete knowledge about the business rules.
- Business process modeling, which leads the analyst to look for rules that can affect each process step: constraints, triggering events, computational rules, and relevant facts.

- Analysis of existing documentation, including requirements specifications from earlier projects, regulations, industry standards, corporate policy documents, contracts, and business plans.
- Analysis of data, such as the various states that a data object can have and the conditions under which a user or a system event can change the object's state.
- Compliance departments in companies building systems subject to regulation.

# Discovering business rules

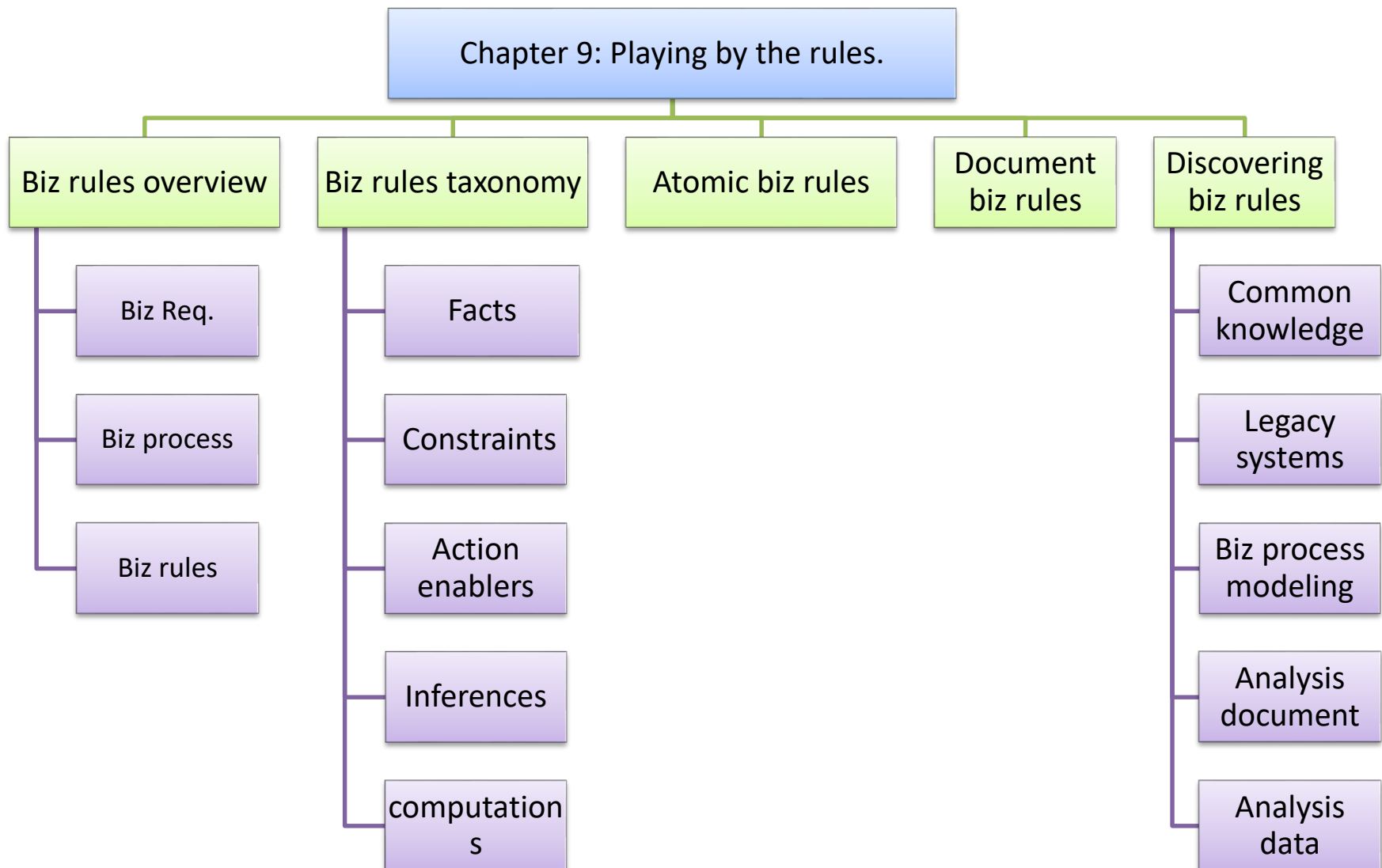


**FIGURE 9-3** Discovering business rules by asking questions from different perspectives.



- After identifying and documenting business rules, determine which ones must be implemented in the software.
- Business rules and their corresponding functional requirements sometimes look a lot alike. However, the rules are external statements of policy that must be enforced in software, thereby driving system functionality.
- Every BA must decide which rules pertain to (liên quan tới) his application, which ones must be enforced in the software, and how to enforce them.

- To prevent redundancy, don't duplicate rules from your business rules catalog in the requirements documentation.
- Instead, refer back to specific rules as being the source of certain functionality or algorithms.
- You can define the links between a functional requirement and its parent business rules in several ways-
  - If you are using a requirements management tool, create a requirement attribute called "Origin" and indicate the rules as being the origin of derived functional requirements.
  - Define traceability links between functional requirements and the connected business rules in a requirements traceability matrix or a requirements mapping matrix.
  - If the business rules and requirements are stored in word processing or spreadsheet files, define hyperlinks from business rule ID references in the requirements back to the descriptions of the business rules stored elsewhere. Be aware that hyperlinks are prone to (dẽ) breaking if the location of the rules collection changes.



**THE END**  
**THANK YOU!**