

Workshop: Writing Business Rules

- Introduction to Business Rules
- Writing Good Business Rules
- The Challenges



Workshop Plan

**In this workshop you
will learn how to:**

- Leverage your knowledge
- Maximize effort and avoid pitfalls
- Ensure high quality



Main Message

High quality business rules are necessary to communicate the business process to software developers. Here's why and how.

Tales From the Trenches



\$100 = \$10,000



Introduction to Business Rules

Section One

- What are business rules?
- Where are the business rules?
- Sample business rules
- Rule independence



What are Business Rules?

If you have a driver's license...

If you cook...

If you...

**You know what
business rules are.**

You Know to Stop



Business rule
Stop on red

You Know to Move and let it Pass



Business rule

Move right and
stop until it passes



Workshop exercise #1



Workshop Exercise #1

Business rules for safe driving:

2. Stop on red.
 3. Move right and stop until emergency vehicle passes.
 4. Your rule goes here.
-
-

Ideas:

- Keep to the speed limit.
- Stop for pedestrians.
- Slow traffic stays right.
- Wear a seatbelt.



Business Rule Power

Business rule = No need to
contemplate action

What about situations with no business rule?

Without Business Rules

No business rule = FUD

FUD is fear, uncertainty and doubt



A Solution to New Situations?

Create new business
rules for each situation?

New Business Rule?: Vehicles stopped at a red traffic light must proceed cautiously through the intersection when blocking emergency vehicle progress

How Many?



1,000's of rules
to cover all
possible cases



Better: Prioritize and Analyze

- Rule precedence
- Abstraction



Business Rule Defined

Definition: From the business point of view, it's a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an engineering perspective, a business rule is an atomic piece of reusable business logic.

Workshop exercise #2

Workshop Exercise #2

Definition: From the business point of view, it's a directive intended to influence or guide behavior. Business rules are literally the encoded knowledge of your business practices. From an engineering perspective, a business rule is an atomic piece of reusable business logic.

Write a business rule to use a family kitchen

Ideas:

- Don't leave a fire unattended.
- Wash hand immediately before preparing food.
- Put things back where you found them.
- When you are done snacking, wash your dishes.

My first pass at the business rule: After Business Rule Defined

My second pass at the business rule: After Example 4 rule independence:

My third pass at a business rule: After Nice to know



Business Rule Test

- As a useful application pop up?
- Is it outside strictly software?

Candidate Business Rules?

1. User selected text can be printed from the "File" menu.

Yes / No This is a functional requirement.
Something the software must support.

2. Active Orders must be closed within 30 days, or be canceled.

Yes / Yes A pop up would give explanation why canceled.

3. Tax calculations shall be provided by a third-party component.

No / Yes This is a non functional requirement

More Candidate Rules

4. Offers "shopping cart" paradigm for order processing.

No / No What would the hint be? In a brick and mortar, the shopping cart is an implementation of a business rule.

5. Invoice notifications must be sent in real-time.

No / No A market requirement, not a business rule.

6. Sales clerks must have their own accounts.

Maybe / Maybe It depends on the meaning of an account



Business Rules In Our Business

Found in Credit and Collections Policy

- Credit references must not be issued on any customer
- Payment terms for new accounts must be 30 days
- Customer “bill to” and “ship to” addresses must be verified identical

Programmer Implementation of the Business Rules

- Nothing
- If account is new then set payment terms = 30
- If “bill to” address not = “ship to” address then raise a warning

Business Documents Containing Rules

- Marketing Plans
- Pricing Policies
- Customer Relations Management Practices
- H/R Activities
- Government Regulations
- Operation Work Flows

Do not overlook interviewing employees

Do not overlook the existing system

Advanced Preview

Components of a Business Rule

NOUN – VERB – NOUN is a common structure for business rules.

TERM – FACT – TERM is the formal semantic for this type of business rule template.

It is used throughout in workshop examples.

Glossary

A list of terms and meanings used in business rules. This reduces ambiguity and synonym use.

Sample Business Rules

- Feature X must be included in all product descriptions.
- Competitor coupons must be honored.
- Customer return calls must be made within 1 business day.
- Employees must be allowed 4 hours free time for a spouse's birthday.
- Work accidents must be reported within 24 hours.
- Obsolete equipment must be recycled.

Workshop exercise #3

Workshop Exercise #3

The business needs are implied, use your imagination and derive possible business rules.

Find a Business Rule:

Strategic Need: The client, prior to signing with us, experienced negative customer feedback and margin loss due to slow processing times for customer returns and slow turnaround time for vendor returns. The client was taking fifteen days to process a customer return and thirty days to return product to the vendor, resulting in customer credits being delayed and revenue being lost due to vendor return time lines. They wanted to reduce the customer return processing time and to maximize the window for returning product to vendors.

Sample Business Rules

- Shipment credit progress status shall be updated daily.
- Shipment credit progress status unchanged for 72 hours shall automatically cause promotion of the return to the next higher level of priority.
- Returned orders shall be prioritized and processed as outlined in the table below. Higher value processed first.

Priority\ Value \$	0 < 2,000	2,000 <10,000	10,000+
Urgent	10	11	12
High	7	8	9
Medium	3	4	6
Low	1	2	5

Tales From the Trenches



3 Shippers and Used Only 2

General Types of Rules

- **Restriction** – must or must not happen
- **Heuristics** – guideline, but not a must
- **Inference** – given a condition, assume other conditions (state change)
- **Timing** – activity based on elapsed time (polling)
- **Triggers** – cause and effect relationship (event)

Sample Business Rules

- **Restriction** – Dishes must be washed when done being used.
- **Heuristics** – Write down on the grocery list items that are nearly depleted
- **Inference** – A name brand version will be purchased if there is a discount coupon.
- **Timing** – At intervals of 1 minute, check if the macaroni boiling in the pot on the stove is soft.
- **Trigger** – Smoke identified, check if something is burning.

Rule Independence



Rules are distinguishable from procedures

Abstract out the processes

Processes remain and business rules change.

Examples from an Order Management

Example 1

Statement: As a result of recent changes within the US Government regarding APO/FPO postal addresses, the client will ship to these addresses under certain conditions.

Rule: Orders rejected because of unauthorized "Ship To" addresses must be checked for special approval.

Example 2

Statement: All new and existing customers' shipping in a high risk zip area must be verified. The "high risk" flag is turned on in the zip code maintenance screen and controlled by the CCS Department.

Rule: Shipments addressed to high risk locations must be delivery verified.

Rule: High risk locations have a postal theft reports of greater than 1 in 100

Glossary: Delivery verified: A recipient picture ID and signature to complete delivery.

Example 3

Statement: All costs associated with the running credit checks will be paid for by the client.

Rule: Credit check costs are charged to the client.

In the glossary define the associated costs. For example, the entry might be “Credit check costs” and the definition includes the list of these possible costs.

Example 4

Statement: Each sheet is updated daily by the AR team, and verified monthly by the AR Supervisor, and signed and forwarded to The Client.

Rule: Sheet must be approved before submission to the client.

Rule: Sheet must be updated daily

Sheet is defined in the glossary or alternate word

Workshop exercise #2 revisited



Rules Will Conflict

- Customers requesting an unsecured open account credit must complete a credit application
- Customers exempted from completing a credit application are not required to complete a credit application
- Customers refusing to complete a credit application must be submitted for review

Rules 2 and 3 contradict rule 1, precedence solves this

Break



Workshop Exercise #4

Exercise: Write business rules of each general type of rule. Use these examples as a basis or create your own.

Example **Restriction** – Dishes must be washed when done being used.

Your rule:

Example **Heuristics** – Write down on the grocery list items that are nearly depleted

Your rule:

Example **Inference** – A name brand version will be purchased if there is a discount coupon.

Your rule:

Example **Timing** – Check from time to time if the noodles boiling in the pot on the stove are soft.

Your rule:

Example **Trigger** – if you smell smoke, check to see if something is burning

Your rule:

Select a peer to critique the work. Independently write rules from the statements. When finished, critique the work.



Writing Great Business Rules

Section Two

- Write for your reader
- Using the 5 “W”s
- What makes a good rule?
- Fundamental concepts
- Icing to make it perfect
- Can you fix this?

Write for Your Reader

Who will read your business rules?

Business Policy Makers

Software Developers



Bridge using:

- Clear and unambiguous language
- Well structured business English



Write for Comprehension

Acceptable Layouts

- Single sentence
- Multiple sentences (paragraph)
- Bullet list
- Table

Use the best layout to express the business rule



Don't Get Lost in the Methodology

The following slides are guidelines. Keep this in mind when writing business rules.

Software developers have a tendency to read things as Boolean logic and policy makers lean towards proper English prose.

Using the 5 W's

The 5 W's

Who ←

Yes → What

Where ←

When ←

~~Why~~ ←

Never

~~How~~ ←

If the rule absolutely requires a who, where or when, then use it.

Workshop exercise #5

Workshop Exercise #5

Circle the who, what, where, why or how that should be removed

Rule: Sales executives must follow all credit policies.

Rule: Bad debt write offs must be approved by the Senior Financial Manager.

Rule: All RMA credit card orders must be verified to match the original purchase order.

Tales From the Trenches



Could not extract the who

W Abstraction Examples

Rule: Sales executives must calculate amortization as (formula goes here).

Alternative: Amortization is calculated as (formula goes here)

Rule: Bad debt write offs must be approved by the Senior Financial Manager as soon as time permits.

Alternative: Remove "as soon as time permits".

Rule: All RMA credit card orders, as initiated by the call centers in Phoenix and Dallas, must be verified to match the original purchase order.

Alternative: All RMA credit card orders must have a authorization code that corresponds to the purchase order number of the original purchase order.

Workshop Exercise #6

Abstract out the 5 W's

1. To reduce fraud, orders on credit over \$1000 must have a credit score over 600

2. A customer may withdraw funds from an active account.

3. Shipments must have a status for customer viewing

4. Shipments must have a status at all times


Sample Alternatives

Exercise #6

The 5 W's abstracted out

1. Orders on credit over \$1000 must have a credit score over 600.
3. Withdrawals shall be permitted only from active accounts.
5. Shipments must have a progress status.
7. Shipments must have a progress status.

BTW: Writing requires subject knowledge as well as sound business rule structure



The Ideal Rule is TERM – FACT – TERM

Terms: Customer, shipment and invoice

Facts: Pays, receives and executes

They could have called it
NOUN – VERB – NOUN,
but they didn't.

Terms are Found in the Glossary

Terms are precise, unambiguous definitions and should be included in the glossary with the definition.

Facts connect terms using verb or verb phrases like customer PLACES order

Business Rule Classification Scheme

Standard Classifications

- Restriction
- Inference
- Toggle
- Trigger

Each classification has unique 'template' guidelines. Identify the type of rule and use the guidelines to format a clear, unambiguous rule.

Examples of Rule Classifications

- **Restriction:** An order must not contain more than 99 items.
- **Inference:** A company is designated bad risk if last payment received is greater than 180 days.
- **Toggle:** Each open issue must be deleted when the case is closed.
- **Trigger:** The product ship date must be determined when order is approved.

Descriptions of Rule Classifications

- **Restriction:** Forces or rejects a condition. Probably the most common.
- **Inference:** Always stated positive that something will happen (response) given a specific event has happened. Commonly known as If/ Then without the "If". More like a state change.
- **Toggle:** Gate controlling processes and data. Commonly known as True/ False.
- **Trigger:** "If" statement that will launch a process if the condition is met.



Why are If/ Then Statements not Good?

In if/then, the true subject may be implicit or less obvious to the reader. Good rules have the explicit subject at the very beginning of the sentence.

Example: If the order is shipped then send the notification.

Alternative: Notification sent on shipped order.

Nice to Know

- Shall vs. must - it's the same, just standardize.
- Avoid should
- Try writing the rule using "not" in place of "no"
- Never, never use double negatives
- Use the right format to define the rule
 - Single sentence
 - Paragraph
 - Bullet list
 - Table
- Try writing rules as Restrictions instead of other classification

Workshop exercise #2 revisited

Break



Exercise #7

Each person select a peer to critique the work. Independently rewrite rules from the statements. When finished, critique the work.

Total time 15 minutes



The Challenges

Section Three

- Identifying overlapping rules
- Handling conflicting rules
- Covering all the rules
- Testing business rules

The Two Tests

Test for:

- Accuracy
- Completeness

Accuracy: Duplicate rule removal and precedence ordering of conflicting rules.


Completeness: All the rules

Duplicate Rules, a Common Problem

A maintained glossary makes it easier to solve. Verify there are no synonyms and add terms as necessary.

Example:

- Debit card
- ATM card
- Cash card



Types of Identical Rules

Literally: Common in large projects because business rules are reapplied throughout.

Functionally: Synonyms used, common when the glossary is not used, difficult to evaluate because the nuances have not been documented.

Fact Map: can greatly reduce synonyms.

Workshop exercise #8

Workshop Exercise #8

Combine these sets into one rule

Rule 1A: Credit Card Orders require an authorization from the credit card company to be released.

Rule 1B: Leasing Orders may require an authorization code from the leasing company to be released.

Rule 2A: Terms Orders must have enough available credit in order to be release.

Rule 2B: Lease Orders must have enough available lease credit in order to be release.

Why Remove Duplicate Rules



Functionally identical rules will be implemented independently. This means unnecessary work

Rule:

Credit card number must be verified before processing order

Poor Alternatives:

Credit card number must be verified before processing sales order

Credit card number must be verified before processing RMA

A glossary would reduce duplicate business rules

How to Identify Function Equivalence

Check glossary for term definitions.

Example

- Vehicles must stop for a red light
- Pedestrians must stop for a red light

Result: Traffic must stop for a red light

An additional benefit is this rule also applies to horseback riders

Business Rule Conflict

There will be conflict

- Try to remove the conflict
- Set an order for precedence

Failure to set an order will result in deadlocks

Sample Implementation for Tracking Precedence

ID	Rule
25	...Order

...

Precede	Follow
10, 45	2

Rule Coverage

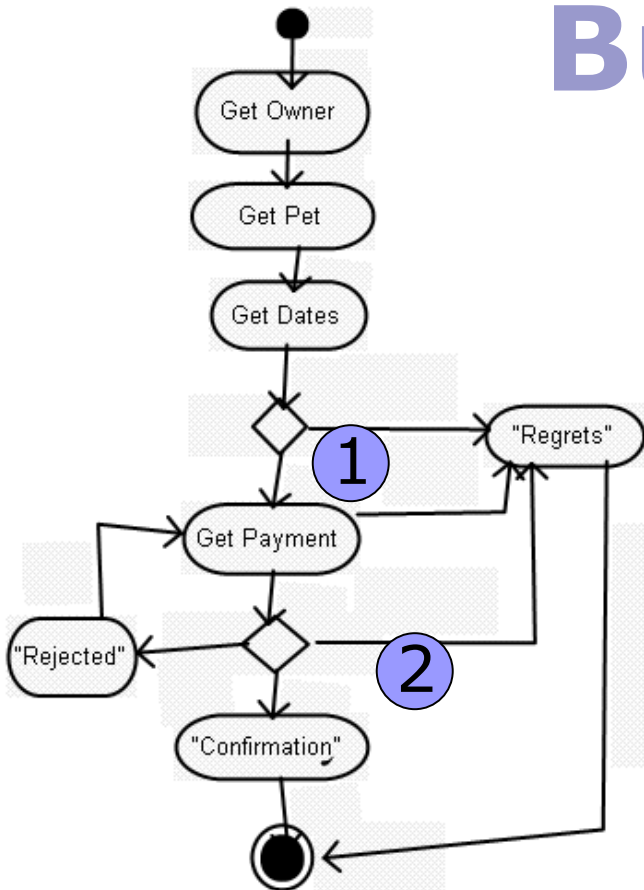
Link the business rules to business use cases:

What comes first?

- Business use case (BUC)
- Business rules

BUC identifies where business rules belong.
Business rules linked build a BUC.

Business Rules at Decision Points

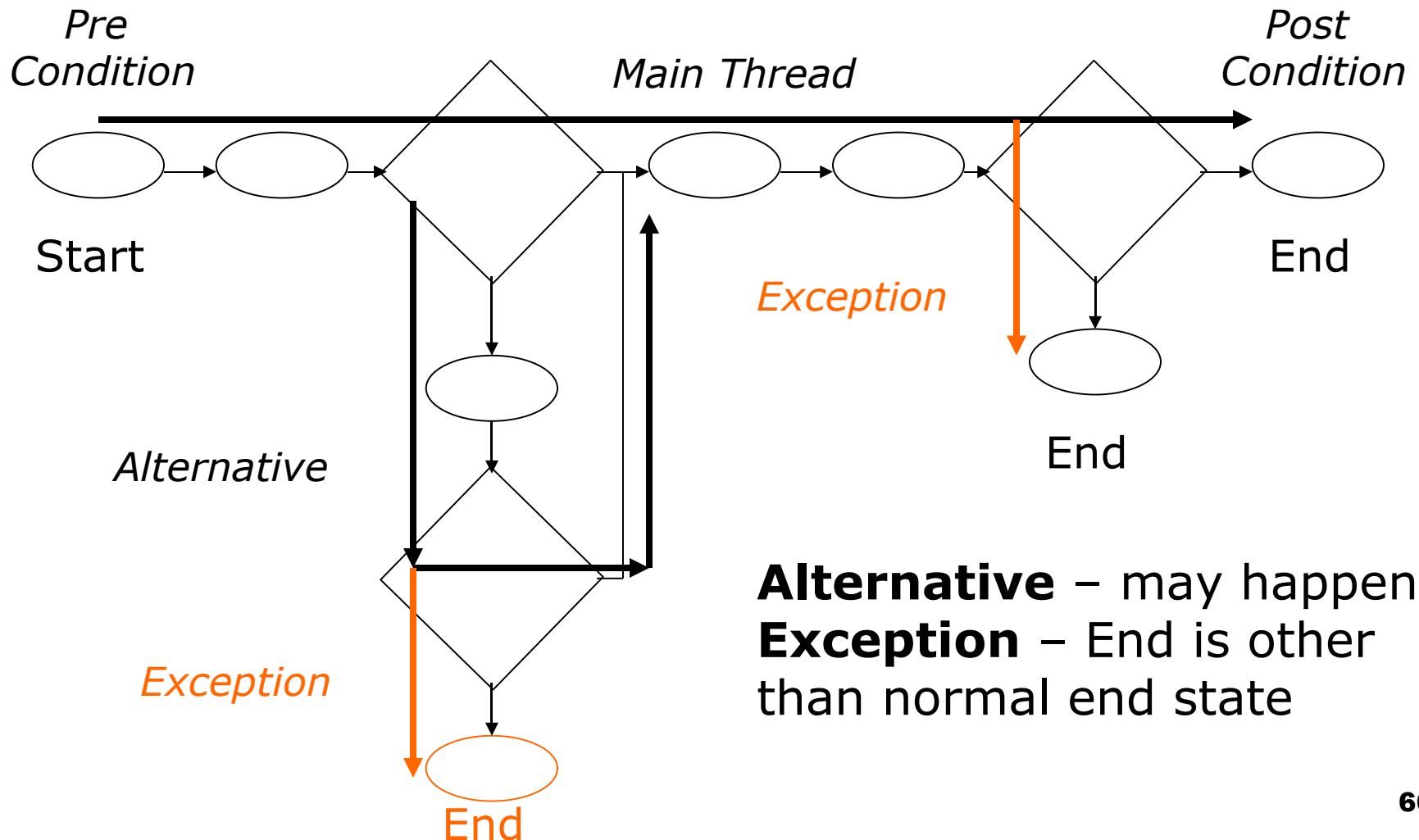


- 1 Owner must pay
- 2 Payment must be valid

Business use case will expose where business rule is required

Business rules have input and output, part of a business use case.

Sidebar: The Use Case

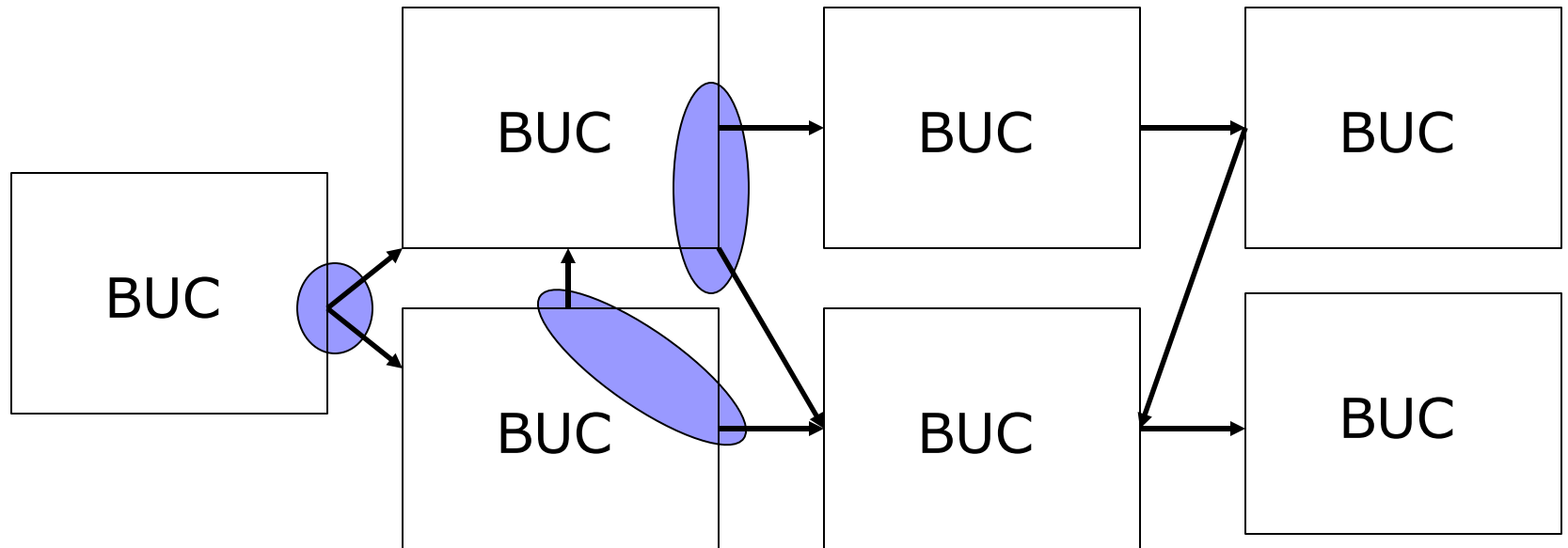


Tales From the Trenches



Is this what I do?

Business Cases Make Maps



 Business rules that control flow

Summary

Leverage your existing knowledge

- Term – Fact – Term (Noun – Verb – Noun)
- Rules are distinguishable from procedures
- Abstract out the processes

Tips and pitfalls

- Remember your audience
- Clear and unambiguous structured business English
- Of the 5 W's always "WHAT" and never "WHY" or "HOW"

Validate prior to publication

- The cost to fix is high
- Review for duplication
- Review to prioritize

Business Rules Are More Than FACT - TERM - FACT



A thread to untangle the
business processes.

If You Ask...

General Types of Rules vs. Rule Classification

- **Restriction** – must or must not happen
 - **Heuristics** – guideline, but not a must
 - **Inference** – given a condition, assume other conditions (state change)
 - **Timing** – activity based on elapsed time (polling)
 - **Triggers** – cause and effect relationship (event)
- Note: Rule classification has no heuristics because it would not be possible to implement. Timing causes toggling, but timing could cause triggers too.
- **Restriction:** Forces or rejects a condition. Probably the most common.
 - **Inference:** Always stated positive that something will happen (response) given a specific event has happened. Commonly known as If/ Then without the “If”. More like a state change.
 - **Toggle:** Gate controlling processes and data. Commonly known as True/ False.
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