

Verbish Models: How to Coax Semantics into Your Data Models

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by Ronald G. Ross

Co-Founder & Principal
Business Rule Solutions, LLC
www.BRSolutions.com

Executive Editor
Business Rules Journal
www.BRCommunity.com

Reference: **Business Rule Concepts** (3rd Ed), 2009, www.BRSolutions.com



Are You Verb Challenged?



Business Rule Solutions, LLC
The Business Rule Technique Company

▶ About Ronald G. Ross



Ronald G. Ross is Co-Founder and Principal of Business Rule Solutions, LLC (***BR**Solutions.com*). BRS provides workshops, consulting, publications, and methodology supporting business analysis, business rules, business vocabulary, decisioning, and rule management. His popular public seminars, the first on business rules (starting 1996) and the longest-running in the industry, are given through AttainingEdge in North America and IRM-UK in Europe.

Mr. Ross co-develops **Proteus**[®], BRS's landmark methodology, featuring numerous innovative techniques including the popular *RuleSpeak*[®] (free on *RuleSpeak.com*, now also in Spanish, German and Dutch). These are the latest offerings in a 35-year career that has consistently featured creative, business-driven solutions.

Mr. Ross is also Executive Editor and regular columnist of *BRCommunity.com* and its flagship on-line publication, *Business Rules Journal*. Sponsored by BRS, BRCommunity.com is a non-commercial vertical community for professionals working in the field. Mr. Ross was formerly Editor of the *Data Base Newsletter* from 1977 to 1998.

Mr. Ross is recognized internationally as the “father of business rules.” He has served as Co-Chair of the annual **Business Rules Forum Conference** since 1997. He was a charter member of the Business Rules Group (BRG) in the 1980s, and an editor of the two landmark BRG papers, “The Business Motivation Model: *Business Governance in a Volatile World*” (2000, revised 2005, 2007) and the “Business Rules Manifesto” (2003). He is also active in OMG standards development for business rules and business models, including SBVR.

Mr. Ross (*RonRoss.info*) is the author of eight professional books. His newest are: *Business Rule Concepts* (2009), a third edition of his popular, easy-to-read handbook, and *Principles of the Business Rule Approach*, Addison-Wesley (2003). An earlier work, *The Business Rule Book* (1994, 1997), was the seminal work in the field. Mr. Ross received his M.S. in information science from Illinois Institute of Technology, and his B.A. from Rice U.



What is the world's leading cause of ambiguity?



Business Rule: *An order must not be shipped if the outstanding balance exceeds credit authorization.*

... something seems to be hidden or missing.

Ask: Outstanding balance *of what?*

↳ order? ...customer? ...account? ...shipment?

Credit authorization *of what?*

↳ order? ...customer? ...account? ...shipment?





Hidden or missing facts ... *... are not good!*

Original Rule: *An order must not be shipped if the outstanding balance exceeds credit authorization.*

Facts:

- customer places order
- customer has credit authorization
- customer holds account
- account has outstanding balance

Revised Rule: *An order must not be shipped if the outstanding balance of the account held by the customer that placed the order exceeds the credit authorization of the customer.*

Example from: www.RuleSpeak.com



The Message ...

Facts → verbs

- ◆ You need *verbs* to write good business rules.
- ◆ You need *verbs* to write good requirements.
- ◆ You need *verbs* to write good business communications.

In short, you need verbs to write *anything*.

... *So why aren't we using verbs more fully?!*

"A verb, then, is not just a word that refers to an action or state but the chassis of a sentence. It is a framework with receptacles for the other parts ... to be bolted onto."

The Stuff of Thought, by Steven Pinker, Viking, 2007, p. 31



The Pedigree ...

- ◆ Sjr Nijssen, “An Architecture for Knowledge Base Software”, paper presented at the Australian Computer Society conference, July 1981, pp.1-96. Available at www.FBMf.eu. ... [CogNIAM]
- ◆ Terry Halpin (with Tony Morgan), 2nd Ed., Information Modeling and Relational Databases. San Francisco: Morgan Kaufmann, 2008. ... [ORM]
- ◆ Semantics of Business Vocabulary and Business Rules (SBVR) 1.0, 2007, OMG.

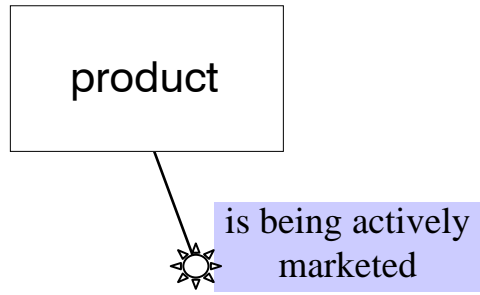
For background on the SBVR and the consortium that produced it, refer to the *SBVR Insider* section of *Business Rules Journal* www.BRCommunity.com

For explanation of SBVR modeling constructs, refer to: Business Rule Concepts (3rd Ed), Part II, by Ronald G. Ross, 2009, www.BRSolutions.com



1. Unary Facts ...

Verbs about only one thing



A **unary fact type** always provides a simple *yes-or-no* answer (i.e., is assumed Boolean).

The fact type *product is being actively marketed...*

- ◆ Involves only a single term, *product*, and is therefore *unary*.
- ◆ Indicates that a given product either *is or is not* being actively marketed.
- ◆ Like any fact type, could be relevant to business rules.

Example

Rule: A briefing may be given only for a product that is being actively marketed.

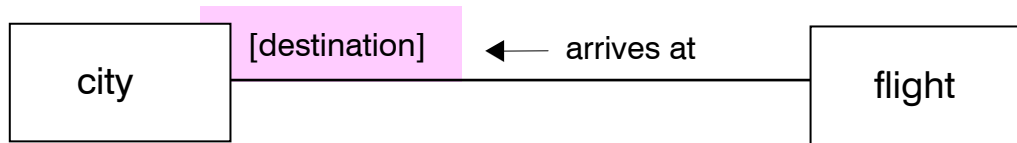
Legend
☀ = fact type



➤ Issues That Can Be Handled Well Only Using Verbs

2. Roles ...

Nouns whose meaning (semantics) is all tied up with verbs



Business people often have a special term for a concept they use only in the context of some particular fact type.

Example

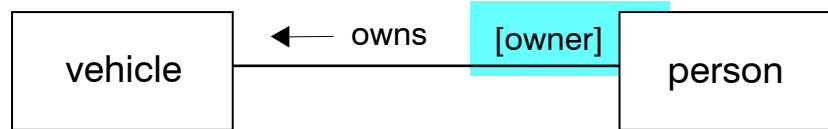
Business people might say:
flight arrives at destination

- ◆ *Destination* is simply a special name given to a *city* where a flight arrives.
- ◆ Such a **role** name designates the part the concept *city* plays in the context of the fact type.



2. Roles ... (*cont*)

Role names are a particularly good way to handle terms that simply reflect the wording of a fact type.



Owner simply reflects the wording *owns*.

Like any term, a role name could be relevant to business rules.

Example

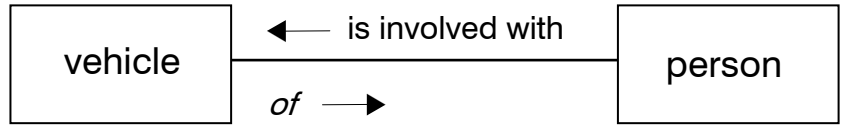
Rule: *A parking citation may be given only to the owner of a vehicle.*



3. Reversal ...

Verbs of the opposite persuasion

Data Model ...



What are you going to do with ...

Business Rule: *A vehicle must not transport more than 4 passengers.*



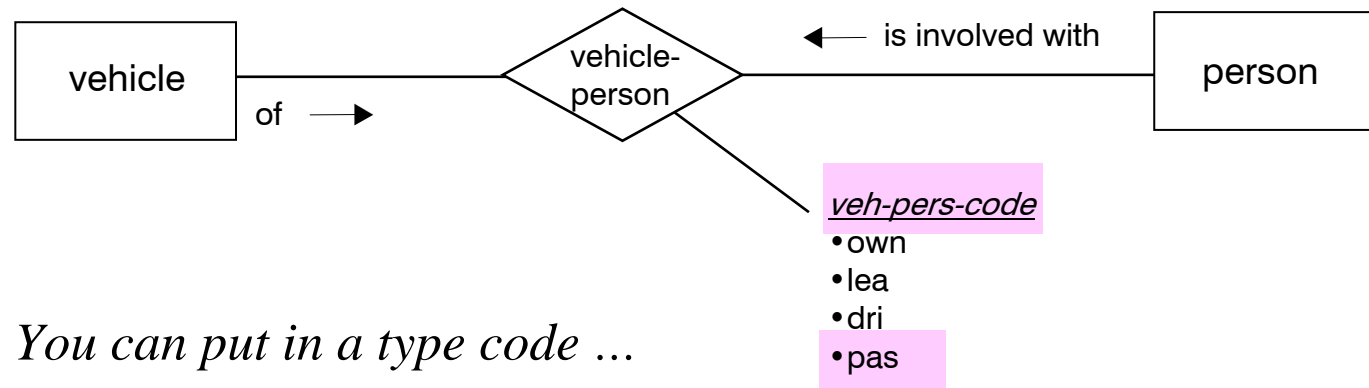
➤ Issues That Can Be Handled Well Only Using Verbs

“Intersection data” in data models

Business Rule: *A vehicle must not transport more than 4 passengers.*

↳ But people can *own, lease, drive or ride in* vehicles.

Data Model ...



You can put in a type code ...

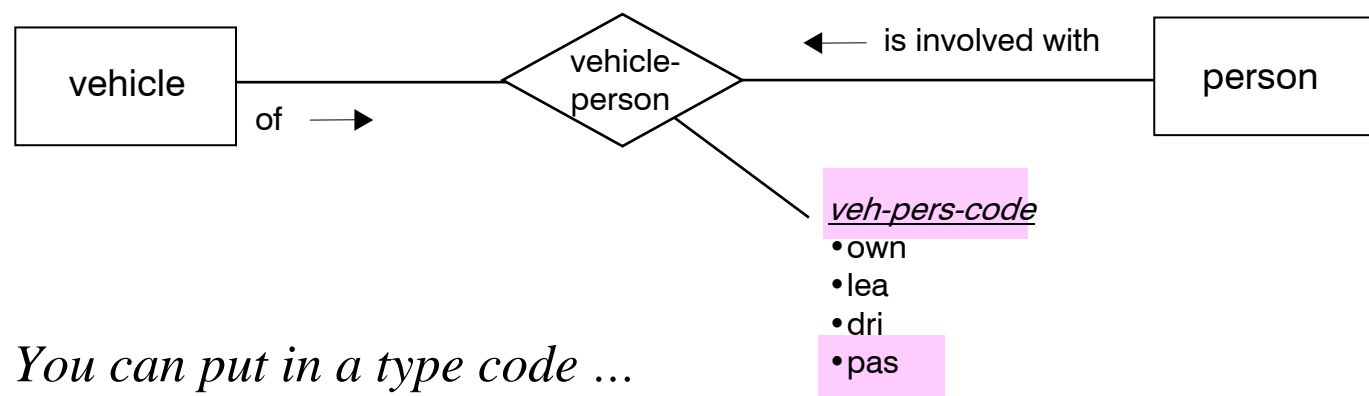
‘Data’ Rule: A vehicle must not be of more than 4 people where veh-pers-code = “pas”.

Yuck!

“Intersection data” in data models (cont)

Business Rule: *A person must not lease a vehicle the person owns.*

Data Model ...



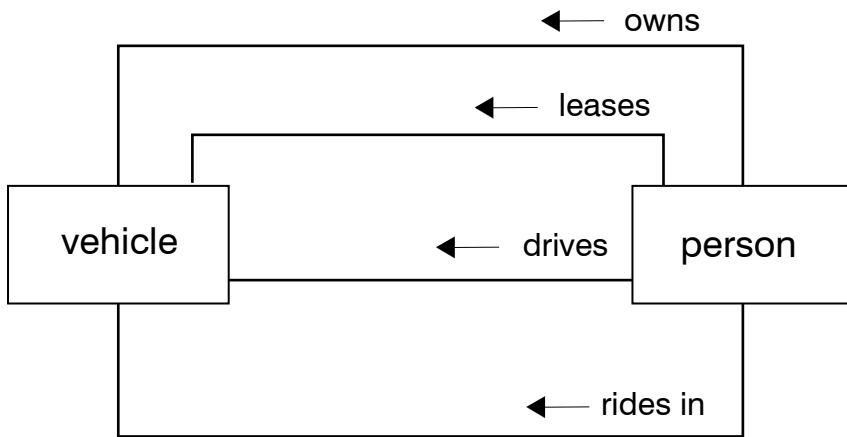
You can put in a type code ...

‘Data’ Rule: A person must not be involved with the same vehicle where **veh-per-code = “lea”** and **veh-per-code = “own”**.

Double Yuck!

➤ What Fact Types Are About

Fact models are really verbal models



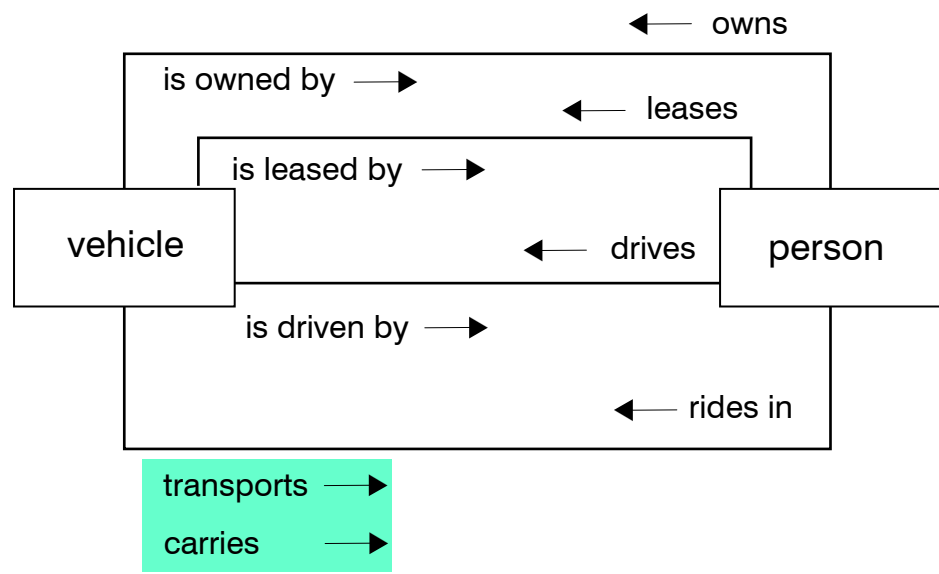
Associative fact types are expressed using verbish *wording(s)* indicating how (usually two) concepts relate.

- ◆ Fact types are never ‘mandatory’ ...
They simply indicate what *can* be known or what *can* happen.
- ◆ Two or more concepts can be related more than once ...
... if the meanings (semantics) of the verbs are different(!).



➤ What Fact Types Are About

Opposite-direction wordings ...

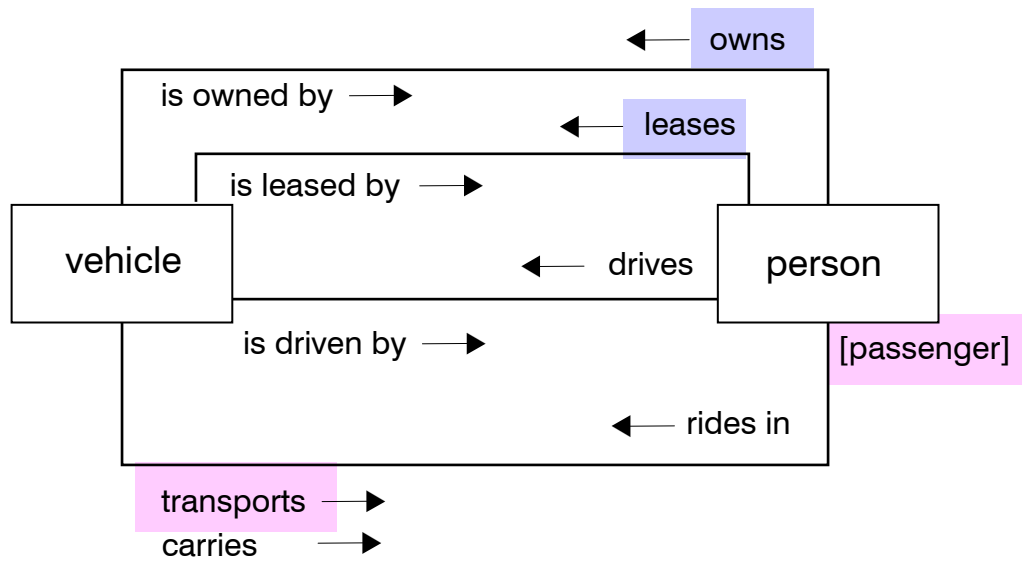


Binary fact types are always **bi-directional** (even if not worded explicitly).

- ◆ The “direction” of the little arrow indicates how to “read” the fact type (and nothing more!).
- ◆ Any verbish concept can have **synonyms** ...
... if the meaning (semantics) is 100% the same(!).

▶ What Fact Types Are About

Verbalizing business rules ...



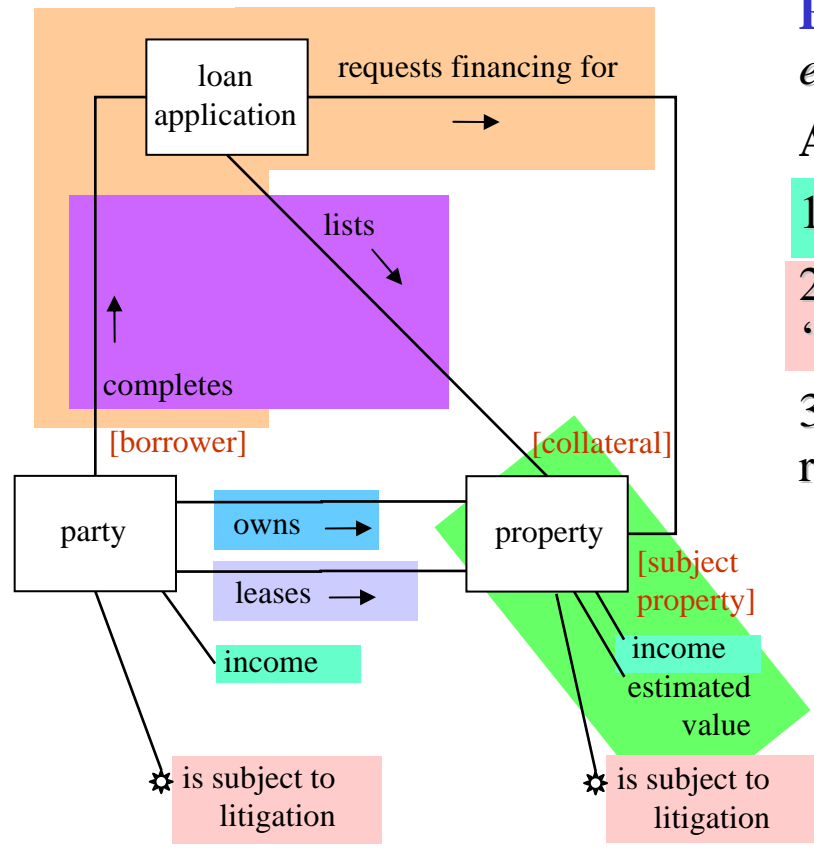
Back to the business rules ...

Rule: A vehicle must not transport more than 4 passengers.

Rule: A person must not lease a vehicle the person owns.



Mortgage applications

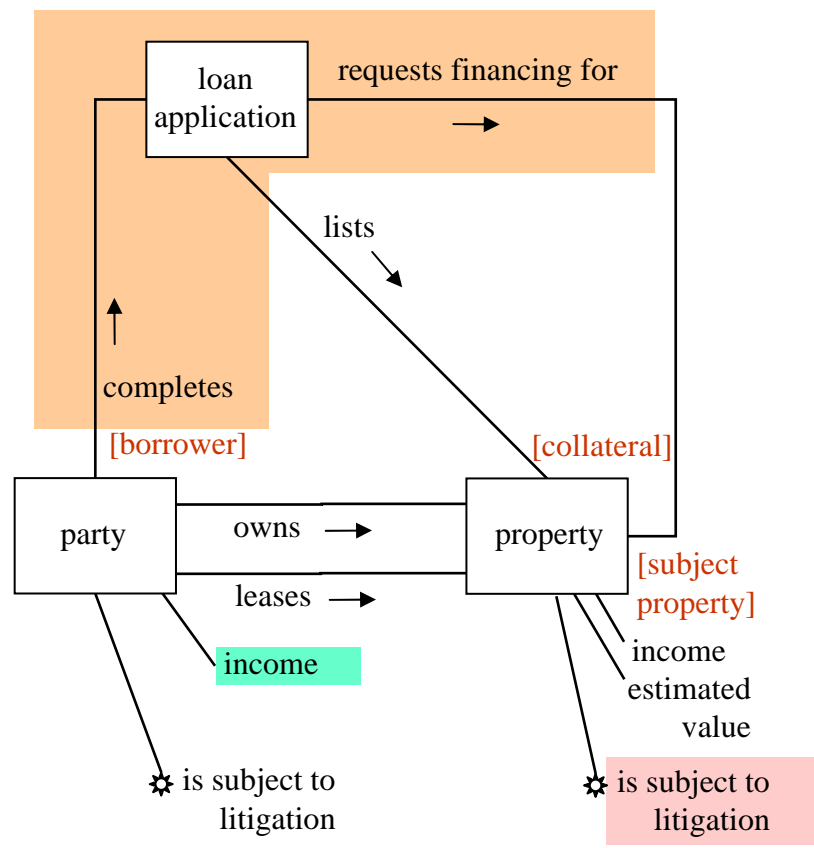


Business Rule: *Income must be GT 20% of the estimated value if subject to litigation.*

Ambiguities ...

1. Which 'income'?
2. Which is 'subject to litigation' ... 'party' or 'property'?
3. Which *fact types* should be used to interpret the rule correctly?
 - a. Income and estimated value of the property?
 - b. Income of the party who owns the property?
 - c. Income of the party who leases the property?
 - d. Income of the party who completes the loan application listing the property as collateral?
 - e. Income of the party who completes the loan application requesting financing for the property?

Mortgage applications



Solution 1. Embedding the fact types ...

Rule: *The income of the party who completes a loan application requesting financing for a property must be GT 20% of the estimated value of the property if the property is subject to litigation.*

Now unambiguous ... *but a bit wordy.*

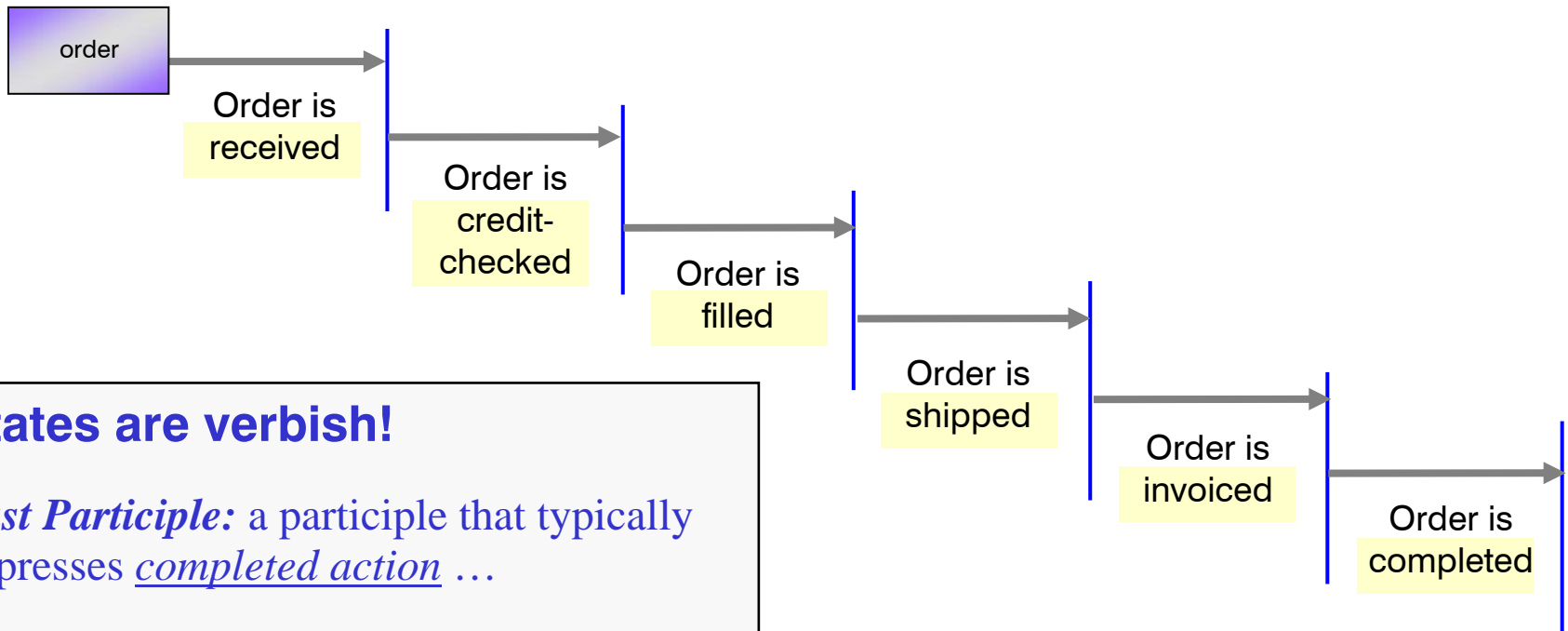
Solution 2. Using roles ...

Rule: *The income of a borrower must be GT 20% of the estimated value of the subject property if the subject property is subject to litigation.*

Now unambiguous ... *and to the point.*

➤ A Closer Look at Past Participles

States in the life cycle ('happy life') of orders ...



States are verbish!

Past Participle: a participle that typically expresses completed action ...

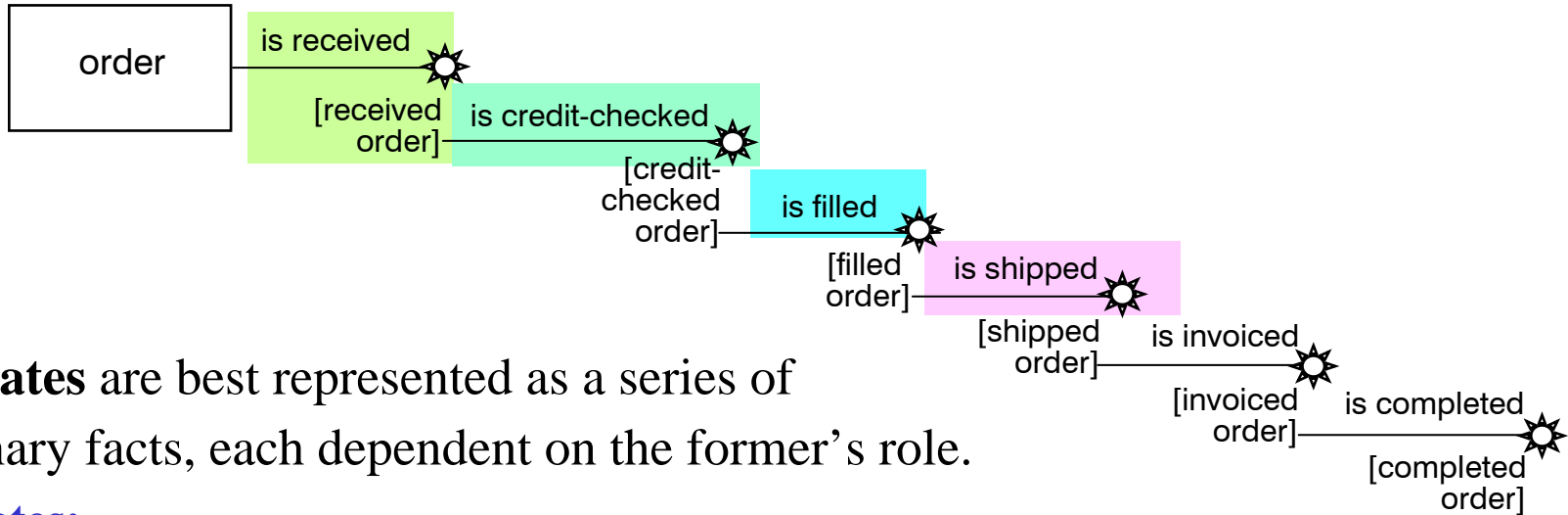
Participle: [1]: a word having the characteristics of both verb and adjective; especially: the English verbal adjective ending in -ing or in -ed, -d, -t, -en, or -n

From: Merriam-Webster Unabridged Dictionary (emphasis added)

➤ A Closer Look at Past Participles

Modeling states verbishly

Order Status



States are best represented as a series of unary facts, each dependent on the former's role.

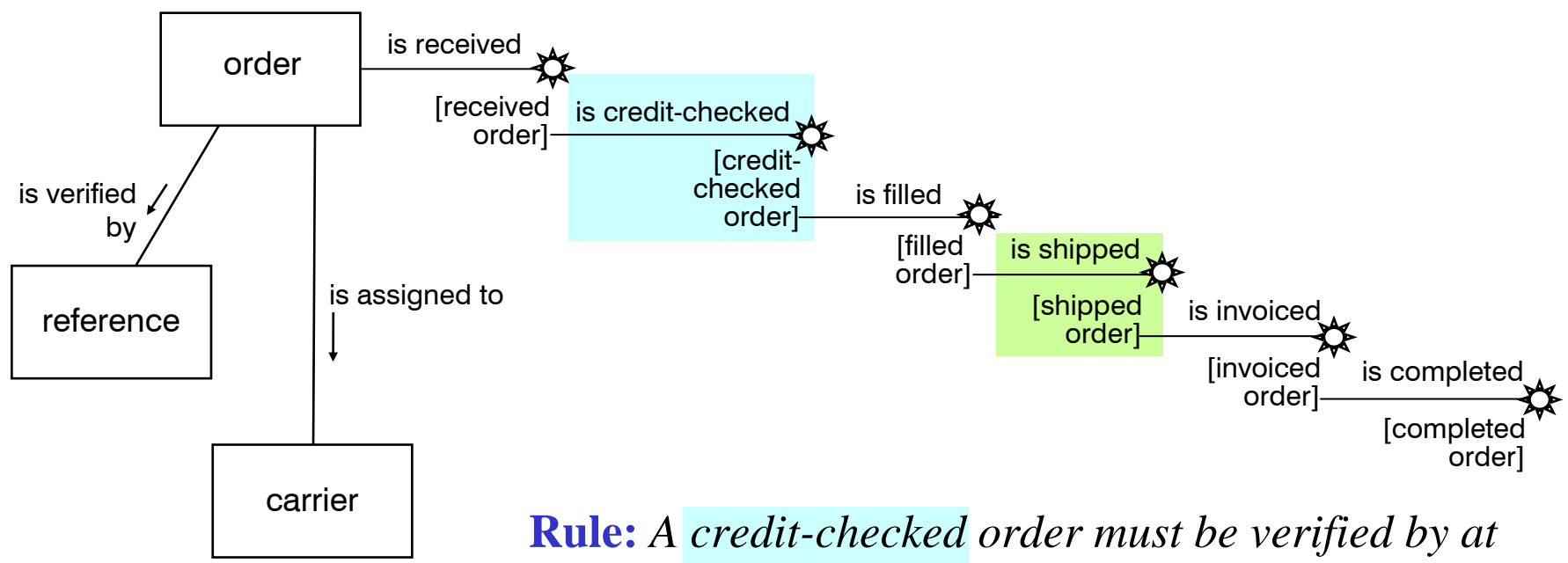
Notes:

- ◆ “is credit-checked” requires that an order “is received” ... that is, is dependent on the role “received order”.
- ◆ “is shipped” implies ... “order is received and is credit-checked and is filled and is shipped”.



Business Rules About States

Ask about *state-specific constraints*



Rule: A *credit-checked* order must be verified by at least 3 references.

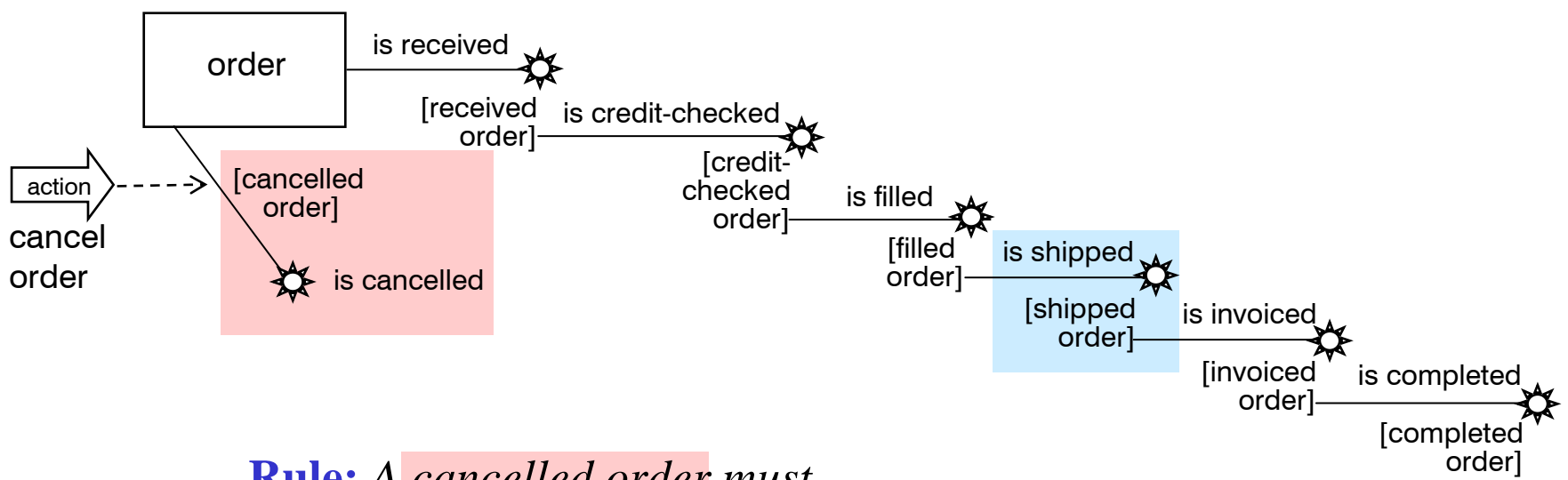
Rule: A *shipped* order must be assigned to a carrier.



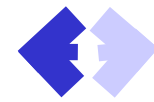
Express state-specific constraints as business rules!

Business Rules About States

Ask about *prohibited antecedents*

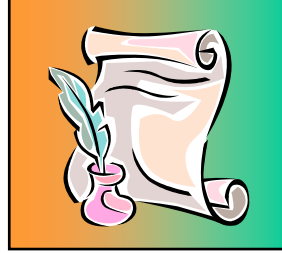


Rule: A *cancelled order* must not have been *shipped*.



Express prohibited antecedents as business rules!





Article 3. Deliberate Knowledge, Not A By-Product

3.1. Rules build on facts, and facts build on concepts as expressed by terms.

3.2. Terms express business concepts; facts make assertions about these concepts; rules constrain and support these facts.

3.3. Rules must be explicit. No rule is ever assumed about any concept or fact.

3.4. Rules are basic to what the business knows about itself – that is, to basic business knowledge.

3.5. Rules need to be nurtured, protected, and managed.

*by Business Rules Group, 2003
www.BusinessRulesGroup.org*

**A building-block approach
... that scales!**



▶ What Good Rules Do For Us

1. Protect us from known or perceived real-life risks

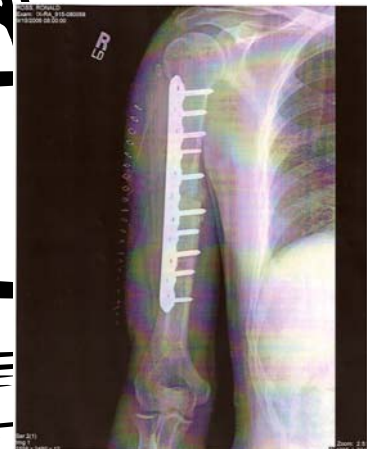
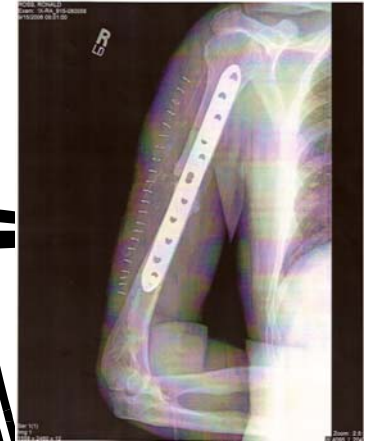
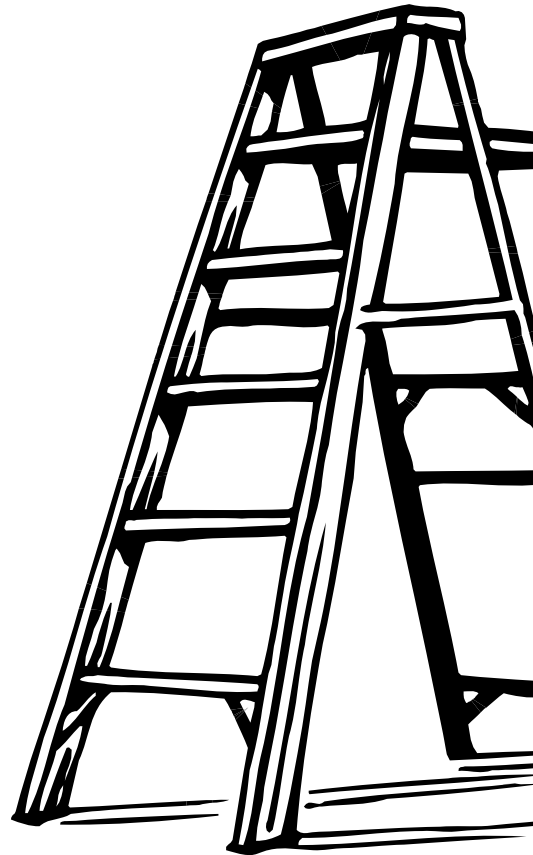
Good operational-level rules ...

- ◆ Provide markers of known dangers.
- ◆ Keep you on 'friendly paths'.

Business rules:

Never stand on the top rung of a ladder.

Never use a ladder by yourself.



2. Provide criteria for making minute-to-minute business decisions

Classifications and Computations

“... criteria for shaping concepts.”

Business rule:

A customer is always considered a gold customer if the customer places more than 12 orders during a calendar year.

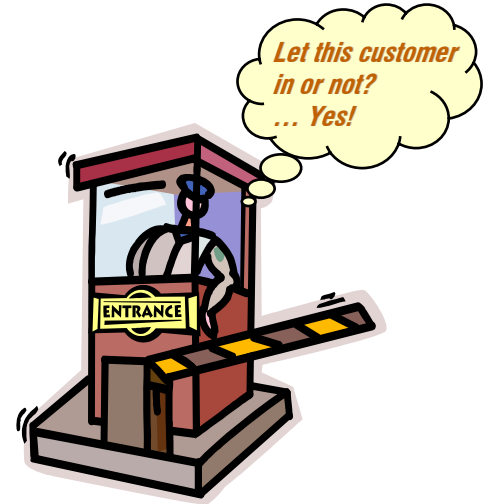


Human Behavior

“... criteria for conduct or action.”

Business rule:

A gold customer must be allowed access to the warehouse.



3. Keep us aligned with business goals and objectives

Good operational-level rules ...

- ◆ Ensure the ‘big picture’ doesn’t get lost in the nitty-gritty of minute-to-minute work.
- ◆ Define the boundaries of desirable and/or optimal behavior.

Business rule:



“Any customer can have a car painted any color that he wants so long as it is black.”

Henry Ford (1863-1947)

My Life and Work (1922), Chapter IV

4. Provide a pragmatic means to express and retain know-how

Good operational-level rules ...

- ◆ Encode knowledge.
- ◆ Communicate that knowledge to people displaced in time, place and activity.

The “gray-hair” problem ...
... and training.



5. Make the business agile

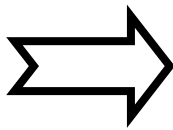


▶ What Good Rules Do For Us

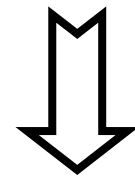
How do you get from here to there ... *fast*?



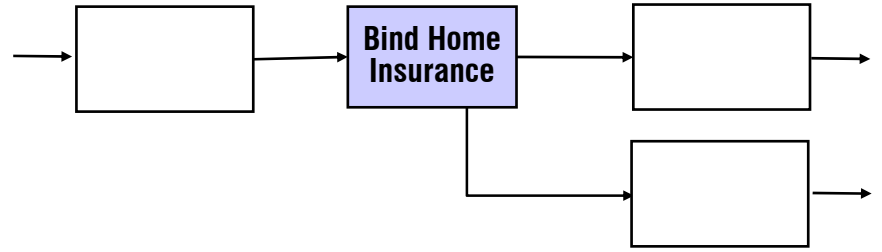
Business Policy: *No new home-owner insurance while a storm like this threatens.*



Business Rule: *A home-owner insurance policy must not be bound for any home within the 4-day cone of uncertainty for any tropical storm.*

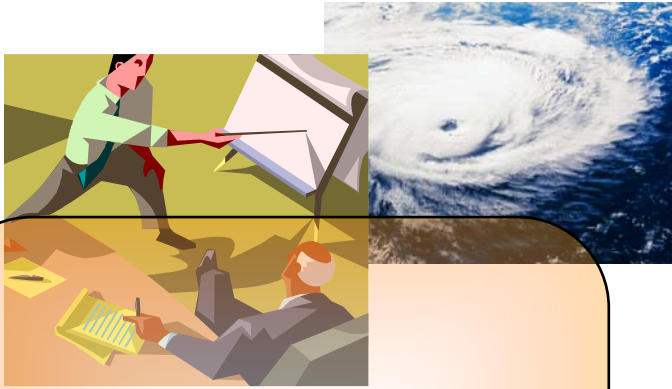


Operational Business Process



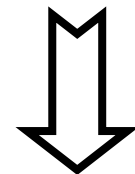
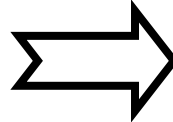
➤ What Good Rules Do For Us

Deployment should be ...

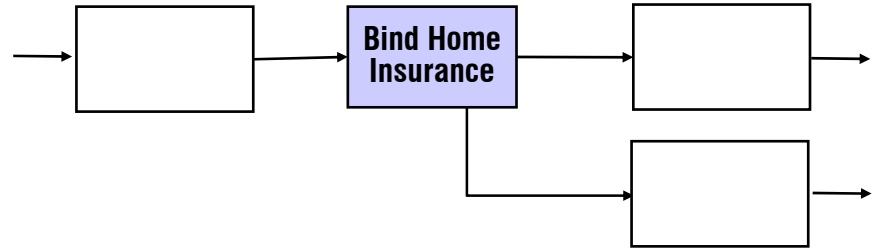


- ✓ timely
- ✓ effective
- ✓ selective
- ✓ traceable
- ✓ repeatable
- ✓ retractable

- ✓ Business Policies
- ✓ Contracts & Agreements
- ✓ Regulatory Constraints
- ✓ Competitive Tactics
- ✓ etc.



**Operational
Business
Process**



Reference: Business Rule Concepts,
(3rd Ed.), Chapter 3.

▶ What Good Rules Do For Us

Is there any alternative?



- ✓ Business Policies
- ✓ Contracts & Agreements
- ✓ Regulatory Constraints
- ✓ Competitive Tactics
- ✓ etc.

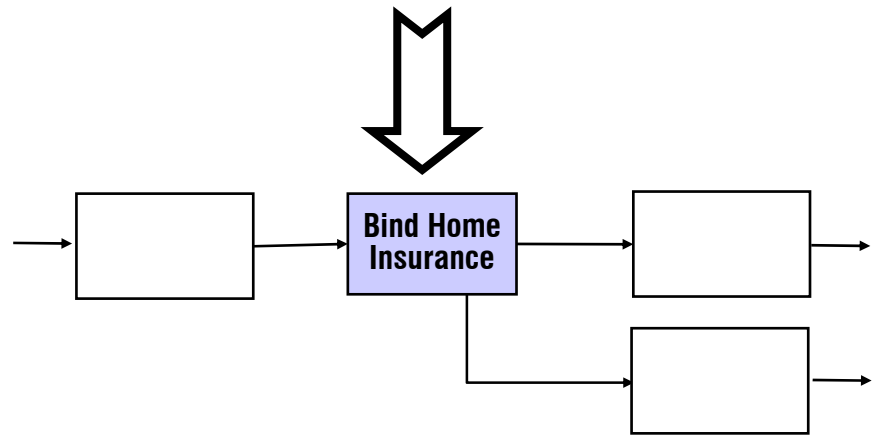
Reference: Business Rule Concepts,
(3rd Ed.), Chapter 3.



- ✓ fast-paced
- ✓ knowledge-centric
- ✓ globally connected

**General Rulebook
System (GRBS)**

**Operational
Business
Process**



➤ Thank You!

Co-Founders



Ronald G. Ross



Gladys S.W. Lam

More Ways to Find Out More ...



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