



Using Rich Definitions to Improve Customer Communication

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Abstract

This paper describes rich definitions and shows their value in providing clear, precise-enough, contextual definitions of customer terminology.

Introduction

Among the many challenges in requirements development is the need to understand a customer's goals and enterprise requirements. This entails understanding the customer's words, both spoken and written.

Many basic texts on requirements development advise the use of a glossary. However, most glossaries only contain **plain definitions** (i.e., a phrase or sentence defining a word acronym). Although plain definitions have value, they are inadequate when precision is needed.

Rich Definitions

Short Story – Chapter 1

Naomi is a Business Analyst with Automated Insurance (AI). She just received an e-mail from an AI marketing manager asking for a (data mining) program to “accurately identify potential customers for the new *umbrella coverage policy*”. Among the many issues raised by this request, Naomi realizes that she needs clear, detailed definitions for several phrases including: **potential customers** and **accurately identify**.

End Chapter 1

If Naomi creates *plain definitions* for the phrases, she would have a glossary containing:

potential customer	expected to become a customer
accurately identify	to establish identity with few mistakes

These entries are created by combining common, nontechnical definitions and are of little value in stakeholder communication. Since Naomi – any other analyst – is unlikely to create such entries, the phrases will remain undefined.

If we think about the program to be written: **potential customer** refers to the Boolean expression used for output selection, and **accurately identify** refers to measures of program effectiveness.

These phrases need to be defined clearly, precisely-enough, and contextually to avoid misunderstandings between information consumers and providers. By **clearly**,

we mean easily and accurately understood by customers (with a minimum of training) so they can help develop and check the definitions.

By **precisely-enough**, we mean detailed enough to satisfy the information needs of the community of information consumers e.g. developers, testers, and technical writers. One experienced power engineer talking to a second experienced power engineer, who is going to develop a VAR control system, would need to communicate few details because of the congruent and detailed knowledge both possess. The same power engineer talking to a software engineer, who does not know the meaning of VAR, would need to provide more details.

By **contextual**, we mean definitions that are specific to the situation. For example, defining potential as “expected to become or be” distinguishes this usage from “the difference in electrical charge between two points in a circuit” and is therefore a context-sensitive definition. However, what is needed is a definition of potential customers in the context of “**potential customers** for the new umbrella coverage policy”. This context determines the elements of a Boolean expression in the program. Contextual definitions would be different for “**potential customers** for our existing travel coverage policy” (i.e., the Boolean expression would be different). And different still for “**potential income** from the new umbrella coverage policy” which would be defined by a mathematical formula.

Short Story – Chapter 2

While Naomi considers her definitional problems, she remembers some technical papers she found at www.clearspecs.com. The first was a PowerPoint presentation titled “Let Me Be Perfectly Clear” describing seven patterns for rich definitions. The second was an MS Word template for a rich glossary with examples.

She decides to see if rich definitions can help and chooses to start by defining (the pre-modified noun) **potential customers** with a Derived Condition pattern. She works with the marketing manager to develop the following draft.

Begin Derived Condition

potential customers

for the newly created umbrella coverage policy

= carries-a-lot-of-insurance-with-us
OR carries-a-lot-of-home-insurance
OR carries-a-lot-of-business-insurance
OR carries-a-lot-of-auto-insurance

carries-a-lot-of-insurance-with-us

= (sum-of-all-forms-of-our-insurance \geq \$1M)

sum-of-all-forms-of-our-insurance

= SUM OF policy-value FROM all-policies
WHERE (customer-id = *current-customer*)
AND (policy-status = *in-force*)

[Note: This is an example of a Derived Value pattern]

carries-a-lot-of-home-insurance

= sum-of-all-home-policies-is-a-lot OR value-of-one-home-policy-is-a-lot

sum-of-all-home-policies-is-a-lot

= (sum-of-all-home-policies ≥ \$750K)

sum-of-all-home-policies

= SUM OF policy-value FROM home-policies
WHERE (customer-id = *current-customer*)
AND (policy-status = *in-force*)

value-of-one-home-policy-is-a-lot

= (greatest-home-policy-value ≥ \$500K)

greatest-home-policy-value

= GREATEST OF policy-value FROM home-policies
WHERE (customer-id = *current-customer*)
AND (policy-status = *in-force*)

[**carries-a-lot-of-business-insurance** and
carries-a-lot-of-auto-insurance are defined similarly]

Source: Guy Sales, AI marketing manager.

Comments:

End Derived Condition

The marketing manager notes that all this detail is tedious, but it helped him recognize information that he had not provided or had not considered.

End Chapter 2

Using Derived Conditions produces a diffusing cascade of logic definitions. Including meaningful labels enables the cascade to show the rationale for the elements of the Boolean expression. Derived Values allow quantities compared in a logical expression to be meaningfully named. Presenting the rationale in this way enables the customer and other subject matter experts to check the soundness and completeness of the logic. Remember your math teacher saying “Show your work”?

Short Story – Chapter 3

The marketing manager appreciates the clarification of his e-mail request, so Naomi continues her experiment with rich definitions. She decides to tackle the (pre-modified verb) **accurately identify** using a Quality Profile pattern. She and the marketing manager develop the following draft:

Begin Quality Profile

accurately identify potential customers for the new umbrella coverage policy

QUALITY-A	Accurately identify potential customers – identify with few mistakes
MEASURE1	% of identified potentials who buy umbrella coverage
METHOD1	Count the number of identified potentials and the number of these potentials who buy umbrella coverage up to the end of the first marketing campaign plus 90 days
MIN goal1	5% of the potentials
TARGET goal1	10% of the potentials
Stretch goal1	15% of the potentials
Current results	
Past results	

QUALITY-A	Accurately identify potential customers – identify with few mistakes
MEASURE2	% of unselected customers who buy umbrella coverage
METHOD2	Send an e-mail notice to 500K randomly chosen unselected customers. Count the number of unselecteds who buy umbrella coverage up to the end of the first marketing campaign plus 90 days
MIN goal2	no more than 5% of the unselecteds
TARGET goal2	no more than 3% of the unselecteds
Stretch goal2	no more than 1% of the unselecteds
Current results	
Past results	

Source: Guy Sales, AI marketing manager

Comments:

End Quality Profile

End Chapter 3

Quality Profiles define by specifying ways to measure. Labels starting with all caps signal required fields. New fields can be added and labels can be changed.

Short Story – Chapter 4

Finally, Naomi decides to tackle the entire requirement, using an Event Profile pattern. She and the marketing manager develop the following draft:

Begin Event Profile

Question	Answer
What? – event summary	Accurately identify potential customers for the newly created umbrella coverage policy
Who, Whose or Which? – interactors or system – entities	System analyzes current and former AI customer databases
With what? – instrument of action	Data mining program
Why? – goal or rationale – post-conditions – next events	The resulting potentials file will contain access keys for each current and former customer that satisfies the selection criteria. Potentials will be notified about the new policy by e-mail, snail mail, and phone.
When? – preconditions – constant conditions – triggers – frequency	Program will run several times as the user is expected to adjust the selection criteria.
How many, how much, or how long? – types, quantities, or duration	The marketing manager estimates about 15% of customers are eligible (750K of 5M).
From and To whom or where? – origin and destination	The marketing manager will provide the disposition of the potentials file by June 1st.
How? – action steps or subtasks – variants	

Source: Guy Sales, AI marketing manager

Comments:

End Event Profile

End Chapter 4

Naomi is free to omit obvious or irrelevant information and add new questions or attributes.

Conclusion

Experience in training stakeholders organized in their natural workgroups, has shown the power of rich definitions to catalyze the discovery of serious misunderstandings and major implications. Trying to be precise, catalyzes critical conversations early.

The value of a rich definition in improving understanding is a direct function of the difficulty of its development i.e., no pain, no gain. An easy-to-develop (i.e. inexpensive) rich definition is unlikely to increase understanding. A hard-to-develop rich definition (i.e. expensive) is valuable.

Expensive rich definitions reduce the risk of requirements misunderstanding. Because of their cost, we suggest using just the patterns and just enough detail in each pattern to balance misunderstanding risk. Good judgment in this trade-off comes from experience, both success and failure – success in bringing out important details early and system or project failure caused by requirements misunderstanding.

Previous Work

What is not new?

As mentioned, basic texts on requirements development advise the use of a glossary. These texts also advise the inclusion of “business rules” in a requirements specification. Most rich definition patterns were drawn from (1) business rules (2) basic software engineering and mathematical concepts (3) the basic set of reporter questions and (4) work breakdown structures. Other patterns were drawn from Meyer’s work on Design by Contract and Gilb’s work on Planguage.

What is new?

The following are believed to be original with this work. The ideas of: (1) clear, precise-enough, contextual definitions i.e., rich definitions, (2) defining phrases (modified nouns and verbs) and sentences (events) as well as words, (3) a comprehensive, heterogeneous framework of definitional patterns, and (4) Derived Conditions as diffusing cascades of logical definitions.

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