

Anatomy of a Good Stakeholder Requirement

Defines a user type

"The internet user shall be able to access their current account balance in less than 5 seconds."

Performance criterion

Defines a positive end result

• This requirement sentence identifies a specific user and end result that is wanted within a specified time.

• It also defines the success criteria in measurable terms - "access ... account balance" "in less than 5 seconds."

The challenge is to seek out the user type, end result, and success measure in every requirement you define.

Advice for good requirements practice

Avoid Ambiguity

Write as clearly and explicitly as possible

Use simple language

Ambiguities can be caused by:

- the word "or" to create a compound requirement
- poor definition (giving only examples or special cases)
- unclear definition (use of "etc", "...and so on")—or—
- "shall include but not be limited to..."

Example: *"The pilot and/or co-pilot shall also be able to hear or see a visible or audible caution/warning signal in case of emergency, hazard, etc..."*

Improvements:

- Have individual and specific requirements for the pilot and co-pilot.
- Create single requirements for visual and audible parts.
- Be specific on what emergency or hazard conditions will be sounded.

Avoid Multiple Requirements

Keep each requirement as a single sentence

Requirements which contain conjunctions (words that join sentences together) are dangerous

Dangerous conjunctions include "and", "or", "with", "also"

Example: *"The user shall be notified with a low battery warning lamp light when the voltage drops below 3.6 Volts and the current workspace or input data shall be saved."*

Improvements:

Make separate stakeholder requirements.

"The operator shall be visually notified when the voltage drops to a level where work cannot continue."

"The operator shall be able to recover all data after a power failure."

Make separate system requirements are:

"The system shall provide a low battery warning lamp light when the voltage drops below 3.6 Volts."

"The system shall save the current workspace when the voltage drops below 3.6 Volts."]

Avoid Escape Clauses

Never build in "let-out" or escape clauses!

Requirements with let-outs or escapes are dangerous and useless ; they can be ignored.

Do not ask for something definite, but later back down and allow for other options

Problem will arise in testing

Dangerous let-outs include: ***if, but, when, except, unless, although***

Example: *"The homeowner shall always hear the smoke detector alarm when smoke is detected unless the alarm is being tested or suppressed."*

Improvements:

"The homeowner shall hear the alarm when smoke is detected."

"The homeowner shall be able to suppress the sound generated by the fire alarm when the alarm is in 'Test' mode."

Don't Ramble

Avoid using long sentences with arcane language.

Avoid references to unreachable documents

Example: *"Provided that the designated input signals from the specified devices are received by the user in the correct order where the system is able to differentiate the designators, the output signal shall comply with the required framework of section 3.1.5 to indicate the desired input state."*

Improvements:

"The user shall receive an output signal in compliance section 3.1.5."

"The user shall receive the output signal indicating desired input state."

Don't Mix Requirements

Do not mix up different kinds of requirements! This is another form of rambling!

Avoid mixing up requirements for users, system, and how the system should be designed, tested, or installed

Danger signs are very high level requirements mixed in with database design, software terms, or very technical terms

Example: *"The user shall be able to view the currently selected channel number which shall be displayed in 14pt Swiss type on an LCD panel tested to Federal Regulation Standard 567-89 and mounted with shockproof rubber washers."*

Improvements:

"The user shall be able to view the currently selected channel number."

"The system shall display the selected channels on an LCD Panel."

"The LCD Panel shall be shockproof mounted."

"The LCD Panel shall be tested to Federal Regulation Standard 567-89"

Don't Design

Refrain from designing the system!

Requirements should specify the design envelope for the level required. If you supply too much detail you design the system (and increase the cost of systems)

Danger signs include names of components, materials, software objects, fields & records in the stakeholder or system requirements

Example: *"The antenna shall be capable of receiving FM signals, using a copper core with nylon covering and a waterproof hardened rubber shield"*

Improvement:

"The antenna shall be capable of receiving FM signals."

Don't Speculate

There is no room for "wish lists" – general terms about things that somebody probably wants.

Danger signs include vagueness about which type of stakeholder is speaking, and generalization words: ***usually, generally, often, normally, typically***

Example: *"The alarm system will probably have to operate over normal phone lines."*

Improvement:

"The alarm system shall operate over the household's standard telephone line."

Don't be Vague

Do not use vague indefinable terms!

Many words used informally to indicate system quality are too vague to be verified.

Vague terms include: ***user-friendly, highly versatile, flexible, to the maximum extent, approximately, as much as possible, minimal impact***

Example: *"The user shall be provided with a user- friendly front-end."*

Improvements:

"The user shall be guided through the system with navigation aids and dialog displays."

"The user shall be guided to the next step with labeled instructions."

"The user shall be provided with context sensitive help display."

Don't make suggestions or mention possibilities

Suggestions that are not explicitly stated as requirements are invariably ignored by developers.

Possible options are indicated with terms such as: **may, might, should, ought, could, perhaps, probably**

Example: *"The network manager may be provided with possible network contention points and should instantaneously re-route the traffic."*

Improvements:

Deliberately use the verbs "shall" or "will" to signal a requirement.

Think to make each requirement realistic and achievable!

Avoid wishful thinking

Avoid wishful thinking!

Wishful thinking means asking for the impossible

Wishful terms include: **100% reliable, Safe, Handle all failures, Fully upgradeable, Run on all platforms**

Example: *"The network manager shall handle all unexpected errors without crashing the system and be fully capable of managing future network configurations."*

Improvements:

It is impossible to handle all unexpected errors! One needs to limit and enumerate the requirement to known error types.

There is no way to predict future network configurations much less manage them.