It’s All About the Requirements …Baby

Why Do I Need Requirements?

- Guides the design of the eventual solution
- Without correct requirements, you cannot design or build the correct product

60% of project failures originate with the requirements

What is a Requirement?

Something a product must do or a quality it must have

Categories of Requirements

Functional Requirements

Non-Functional Requirements

Constraints

Categories of Requirements

Functional Requirements

Non-Functional Requirements

Constraints

- Things the product must do
- Action the product must take

Categories of Requirements

Functional Requirements

Non-Functional Requirements

Constraints

- Properties or qualities the product must have
- How the product will behave

Categories of Requirements

Functional Requirements

Non-Functional Requirements

Product Constraints

- Global requirements
  - Purpose of the project
  - Users of a product

Product Constraints

- Purpose of the Product – *reason for building the product*
- Client, Customer, and Stakeholders – *people that interact with the product*
- Users of the Product – *intended end-users and how they affect product usability*
- Requirements Constraints – *limitations of the project and restrictions on design*
- Naming Conventions and Definitions – *vocabulary of the product*
- Relevant Facts – *outside influences that make a difference to this product*
- Assumptions – *assumptions developers are making*

Product Constraint Examples

- The product budget must not exceed $50,000
- The product shall run on the company's existing machines
- Implementation of the product cannot interrupt daily business
- The last 5 years of historical data needs to be made available in the product

Functional Requirements

- Scope of the Product – *defines the boundaries and connections to other products*
- Functional and Data Requirements – *Things the product must do and data manipulated by the functions*

Functional Requirement Examples

- The product must track recipes down the ingredient and quantity level
- The recipes must be editable by an administrator
- The product must display the orders that need to be completed
- The product must display the recipes to make the orders
- The product must track ingredients including their cost, vendors, and quantity in inventory
- The product must interact with the current Point of Sale system

Non-Functional Requirements

- Look and Feel Requirements – *intended appearance*
- Usability Requirements – *based on the intended users*
- Performance Requirements – *how fast, big, accurate, safe, reliable, etc.*
- Operational Requirements – *product's intended operating environment*
- Maintainability and Portability Requirements – *how changeable product must be*
- Security Requirements – *security, confidentiality, and integrity of the product*
- Cultural and Political Requirements – *human factors*
- Legal Requirements – *conformance to applicable laws*

Non-Functional Requirement Examples

- The product shall use the company colors and logos
- The product shall be intuitive, even to first time users
- The product shall only allow bakers and administrators to view recipes
- The product shall be easily upgraded for future business needs
- The product shall be scalable to multiple bakery locations

What Makes a Good Requirement?

Understandable

Allocatable

Measurable

Correct

Necessary

Testable

Design-independent

Attainable

Unambiguous

Concise

Modifiable

Consistent

Feasible

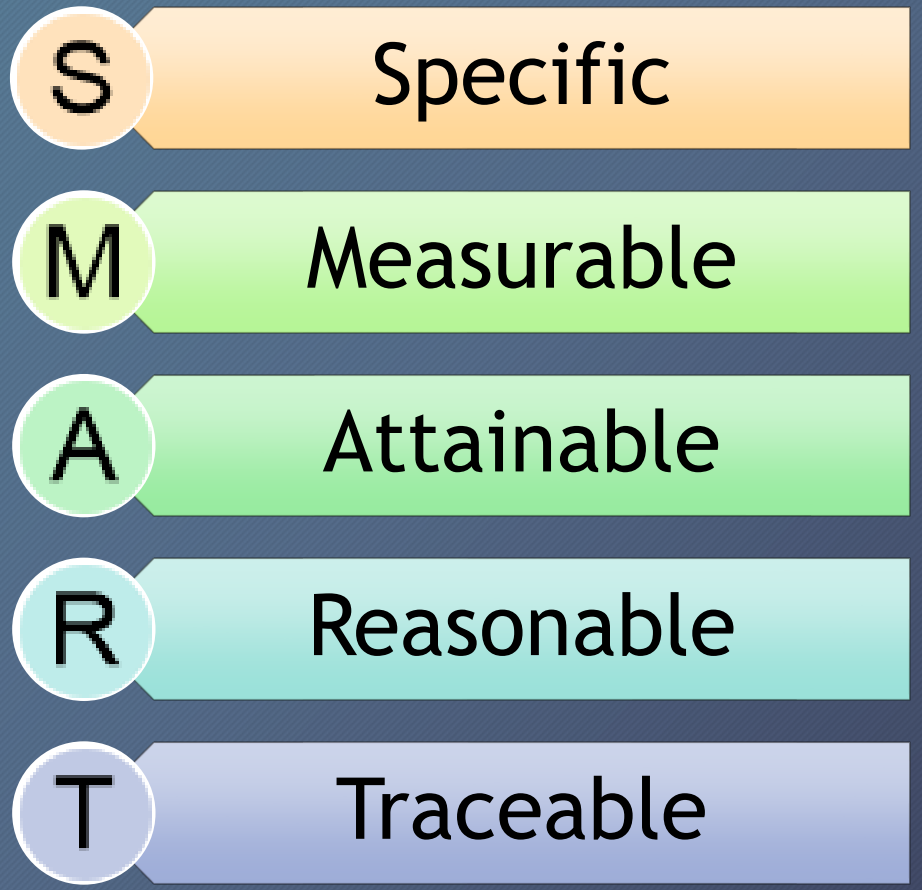
Prioritized

Complete

Organized

Traceable

SMART Requirements



SMART Requirements

S Specific

Overall

- Clear, no ambiguity
- Consistent, same terminology throughout
- Simple

Questions to Ask

- What?
- Why?
- Who?
- Where?

Guidelines

- Avoid “some”, “several”, “many”
- State pronouns clearly “A calls B, it is updated”
- Specify units all with numbers
- Use pictures to clarify understanding
- Provide explanations for terms like “transmitted”, “sent”, “downloaded”, and “processed”

SMART Requirements

M Measurable

Overall

- Measure progress towards goal
- Indicators should be quantifiable

Questions to Ask

- How much?
- How many?
- How will I know when it is accomplished?

Guidelines

- Ensure measurable during requirement elicitation
- Validate unequivocal success can be proven with that requirement
- Determine tests that will need to be used to verify the requirement was met

SMART Requirements

Overall

- Validate requirement is feasible
  - Within technical expertise
  - Within scope of project
  - Within budget

Questions to Ask

- Is there a theoretical solution to the problem?
- Has it been done before?
- Are there any known constraints (environmental, physical, etc.)?

Guidelines

- Determine who has responsibility for satisfying the requirement and validate they can deliver
- Ensure sufficient time, resources, and budget
- Reuse pieces from previous projects

SMART Requirements

R Reasonable

Overall

- Validate the effort is worth the requirement

Questions to Ask

- Is this worthwhile?
- Is the timing right?
- Does this match our other efforts/needs?

Guidelines

- Run all requirements through a ‘sanity check’
- Ensure the requirement makes sense in context

SMART Requirements

T Traceable

Overall

- Trace requirement through design, implementation, and testing

Questions to Ask

- Can I ensure this requirement has been met in the design solution?
- Can I ensure this requirement has been met in the implementation?
- Can I ensure this requirement has been met during testing?

Guidelines

- Requirements should include
  - Originators
  - Assumptions
  - Business justifications
  - Dependencies on other requirements
  - Importance

Tips for Producing Valid Requirements

- Should use the word *shall*
- Only one *shall* per requirement
- Written in short, simple sentences
- Consistent terminology
- Stated positively
- Accompanied by notes and comments to support and clarify
- Stated imperatively
- Don’t use *will* and *should*

Translations for Requirement Verbiage

- Or – Select one of the options
- Can, should – Expresses desire or suggestion instead of requirement
- Must – 100% reliability
- Are, is, will – Descriptive part to lead into the requirement
- Support, and/or – Confusing
- But not limited to, etc – Incomplete requirement/thought
- Shall – dictates specification and functional capability

Terms to Avoid

- Adequate
- Approximately
- Better than
- Comparison
- Easy
- Maintainable
- Maximize
- Minimize
- Normally
- Optimize
- Quality product
- Quick
- Rapid
- Substantial
- Sufficient
- Timely

Introduction to Requirement Analysis

Phases of the Requirements Process

1. Requirement Elicitation
2. Requirement Analysis
3. Requirement Specification
4. Requirements Approval

Business Rules

Business Rules

- What are Business Rules?
- Business Rules vs Business Requirements
- Best Practices

Business Rules Explained

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Definition:

A business rule is a rule that defines or constrains some aspect of business and always resolves to either true or false.

Purpose:

Business rules are intended to assert business structure or to control or influence the behavior of the business.

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Business Rules Examples

- Entered email addresses must appear valid (contain @ and .)
- Each class must have at least one instructor
- Customers must have a valid driver's license to rent a vehicle
- A quote must be completed prior to an invoice being generated

Business Rules vs Business Requirements

Rule:

- Entered email addresses must appear valid (contain @, then later .)

Possible Requirements:

- Capability to enter email address
- Alert agent when the email doesn’t appear to be valid
- Allow for correction of email if invalid email format is entered

Business Rules vs Business Requirements

Rule:

- Each course must have at least one instructor

Possible Requirements:

- Capability for Dean to assign instructor to course
- Course registration cannot be opened until an instructor is assigned

Business Rules vs Business Requirements

Rule:

- Customers must have a valid driver's license to rent a vehicle

Possible Requirements:

- Employee to inspect driver's license
- Ability for employee to validate driver's license

Business Rules vs Business Requirements

Rule:

- A quote must be completed prior to an invoice being generated

Possible Requirements:

- Capability to enter a quote
- Details from quote must automatically flow to the invoice
- Ability to tie the quote and invoices together for reporting

Business Rules Best Practices

- When documenting business rules, keep it simple
- Business requirements are used to comply with business rules
- Each business rule may need multiple requirements
- Business rules should not be changed
  - Changes can cause major constraints down the road