White Paper

Defining Good Requirements for Business Process Improvement

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Joan is the Director of Education on the Board of the IIBA®-SA Chapter that she co-founded. Joan lectures in Business Analysis for ESI-International (an IIBA™ Endorsed Education Provider) and is an Executive Consultant in Business Architecture and Analysis, consulting to organizations at a strategic level and providing mentoring and coaching at a tactical level.

Much has been written by industry experts who identify poor or incomplete requirements as the root cause of most project failures, and much has been written about the practice of business analysis and the unique skills required for Business Analysts to get requirements right. This white paper will focus on how to define good requirements rather than who defines the requirements.

The IIBA® defines a Business Analyst as:

"any person who performs business analysis activities no matter what their job titles or organization role may be, these include: business systems analysts, systems analysts, requirements engineers, process analysts, product manager, product owners, enterprise analysts, business architect, management consultants, or any person who performs the tasks described in the BABOK® Guide vs2"

For further reading on this topic, see writings by International Institute of Business Analysis®; OMG; Modern Analyst website; CIO Research Groups, Alexander, Ian and Neil Maiden 2002 – Writing Better Requirements; Scott Ambler – Agile Model-Driven Development with UML; Kathleen Hass – Translating Business Strategies into Valuable Solutions, Karl Wiegers (various), to name a few.

What is a Requirement?

A requirement is:

1. A condition or capability needed by a stakeholder to solve a problem or achieve an objective.
2. A condition or capability that must be met or possessed by a solution or solution component to satisfy a contract, standard, specification or other formally imposed documents.
3. A documented representation of a condition or capability as in (1) or (2).

IEEE 610.12-1990: IEEE Standard Glossary of Software Engineering Terminology.

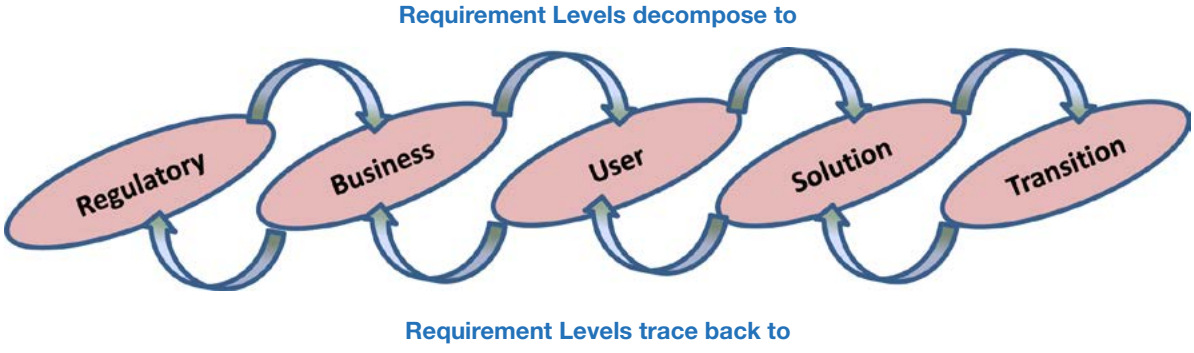
One of the most common assumptions made by most organizations is that requirements describe only what is expected of an information technology system that has been selected to solve a business problem. This is a narrow and dangerous view to take, because requirements may be seen from different perspectives based on the type of project initiative.

For example, on a large scale innovation project, when documenting a Request for Proposal (RFP), your requirements will cover a broader description and understanding of the current state of the organization to which the vendor solution must comply, including the IT environment. In the context of a BPM initiative, requirements may describe the business processes currently in use in the organization. On other projects, requirements may describe the features a solution must have to enable an Actor to perform his or her job.

Therefore, the Business Analyst engaged on a project must have a clear understanding of the project type and focus in order to ensure a holistic view and understanding of the requirements that are to be elicited, analysed and assessed and the appropriate level of detail necessary.

Level of Requirement

Whether an analyst is doing a Top/Down approach (Innovation project) or Bottom/Up approach (maintenance type project) it is the responsibility of the analyst to ensure all level of requirements have been considered and are traceable to the business need.



Type 1	Type 2	Source	Description
Regulatory Requirements	External	Governing Body; Internal Legal/ Financial and Compliance Units.	These are stated policies that ensure the organisation complies with industry regulations and standards.
Business Requirements	Strategic	Executive Management Team	High level strategic goals and objectives of the organisation usually documented in the Business Case during the Enterprise Analysis exercise to define why the project must be initiated.
	Tactical	Middle Management (Senior Management Group)	Define the needs of a particular stakeholder group
	Operational	First Line Managers	Define the tactical needs into operational procedures
User Requirements		Users	Describe the needs of how end user stakeholders will interact with a solution during the execution of a business process
Solution Requirements	Functional	Users	Describe the features, behaviour and information capabilities the solution must provide to enable the achievement of a business goal. Usually identified through the use of words such as “The system must…” (Mandatory need); “The system should….(Optional need); “The system may…….” (Nice to have or low benefit).
	Non-functional	Users	Describe the quality attributes/conditions a functional requirement must provide to remain effective.
Transition Requirements		All	All Transition requirements are temporary in nature and cannot be defined until both the existing state and new state are defined. They define the capabilities that must be in place to transition the organisation from the old state to the new state and are not needed once the transition is completed. Typical examples are data conversions from the old to the new system; user training; organisation facilities improvement and so on. Failure to consider transition requirements in the development of the Business Case is a significant cause of failed projects as they are likely to be excluded from the project work plan, budget, and schedule

Characteristics of 'Good' Requirements

1. Requirements must be contained within the boundaries (scope) of the solution.

2. Requirements must trace back to business goals.

3. Requirements must be SMART:
    a. **Specific** - clear, concise, unambiguous and free from bias and personal interpretation.

    b. **Measurable** - ensure each statement is measurable, i.e. reduce customer complaints by 10% by end of 2011.

    c. **Assignable** – requirements must have an 'owner'.

    d. **Relative** – A cohesive set of requirements relates to only one thing such as a business process, use case, business rule, etc.

    e. **Testable** – there must be a way to prove the requirements have been fulfilled.

4. Requirements must reflect business rules, validation rules.

5. Requirements must be categorised, organised and prioritized. Prioritisation is based on the following elements:

    a. **Non-discretionary** – requirements that must be implemented to meet regulatory, legal, financial, health and safety or policy needs and usually take precedence over other requirements.

    b. **Business Value** – the most valuable requirements are targeted for development first.

    c. **Urgency** – time sensitivity.

    d. **Business or Technical Risk** – the requirements that present the highest risk to project failure.

    e. **Implementation difficulty** – the requirements that are easiest to implement.

    f. **Stakeholder consensus** – of the requirements that are most useful or valuable to the organization.

6. Each individual requirement must be complete and self-contained without any missing information For example, a requirement set must include model/s (behaviour and structure models), textual descriptions, screen prototypes (Data lists, validation rules), Inputs (Triggers), Outputs (Reports, correspondence, etc.) and Business Rules.

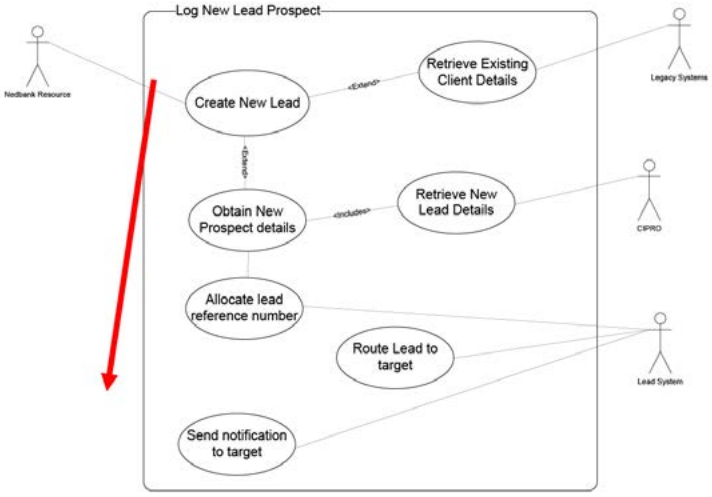
7. Requirements must be consistent (consistent use terms, naming and

numbering conventions with a consistent level of detail). Requirements must not contradict each other or describe the same requirement using different wording. The level of detail in a model or requirement pack should be the same.

8. Each requirement must be feasible, that is to say, the requirement must be implementable within the constraints of the existing technology, budget, timeline and resources available to the project team.

9. Requirements must be described from a business perspective and must not imply technology.

A Requirement Set



Name Create New Lead

Unique Identifier

The identifier is often a number, and is essential for requirement traceability. It is used to cross reference requirements to design and test artefacts, and needed to verify delivery of the requirements. The identifier must be unique in both the scope of the project and the scope of the solution.

Actors

Identifies the primary and secondary actors (human and system) that will interact with the use case/s.

Brief Description

The description provides an informal, natural language description of the use case and the goal that is being satisfied. Functionality may be implied in this section, but no designs or tests should trace to it. All functionality must be identified in the elements below.

Preconditions

Preconditions describe what must be true for the use case to be triggered or started. They can relate to conditions either within the solution or outside of the solution under study. For example, when withdrawing money from an ATM at a specific bank, the customer must be an existing customer of that bank.

Event/s

Identify the event/s that will trigger this use case, e.g. new customer application.

Basic flow of events

The basic flow is the 'guts' of the use case and describes the sequence of user to solution interactions and related solution behaviour or rules. It is commonly referred to as the "primary scenario" or "happy path." It indicates what happens when there are no exceptions or complications.

Alternative flows

These describe what happens when things don't follow the "happy path." Called a variation if the flow rejoins the happy path, and an exception where an error occurs, these prevent the actor from achieving their goal.

Post-conditions

Post-conditions are things that are true at the conclusion of a use case. Traditionally, these things are always true, regardless of what path is taken through the use case. If the use case has many alternate flows, there may be several outcomes with different post-conditions. It is useful to identify postconditions for the basic flow and each of the alternate flows.

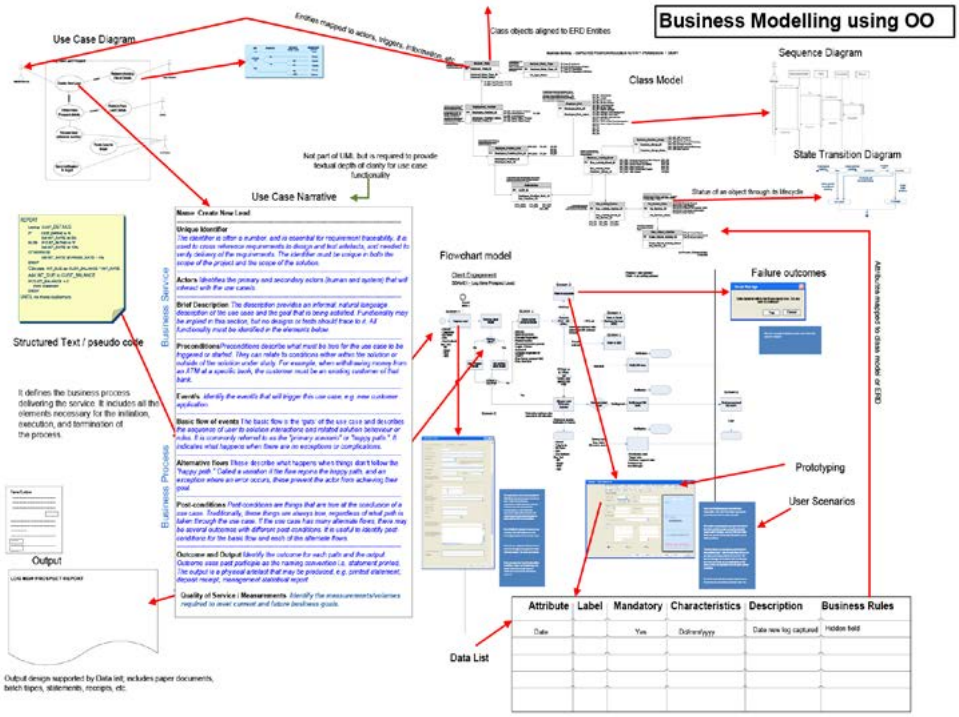
Outcome and Output

Identify the outcome for each path and the output. Outcome uses past participle as the naming convention i.e. statement printed. The output is a physical artefact that may be produced, e.g. printed statement, deposit receipt, management statistical report.

Quality of Service / Measurements

Identify the measurements/volumes required to meet current and future business goals. The Use Case Narrative is supported by a flow diagram visualizing the basic flow of events and the alternative flow paths. By creating a diagram of the processing steps the analyst has the opportunity to 'test' the textual steps and business rules for defects. The diagram will use the stated events to trigger the process. Based on the inclusion of business rules, alternative and exception processing paths will be tested to ensure the stated outcome/s and outputs as documented in the Use Case Scenario will be realized. The next step is to create screen prototypes. This will allow the analyst to again test the

accuracy of processing by creating visualization of the information that needs to be captured, retrieved and stored. The attributes on the screen prototype must be aligned to the Data Models. This includes ensuring that the information required for outputs (reports and correspondence) is stored in the data models. This is of particular importance because if information requirements are not considered, data models will not have the necessary attributes and the organization management will not receive the necessary management information.



The above elements are a set of requirements to realize one requirement use case. The red arrows in the above view indicate consistency and accuracy checks between the different analysis techniques and requirement elements. The above sets of requirements are supported with a stakeholder list of Roles and Responsibilities, defining which stakeholders are involved in the creation, review and approval of the requirements.

The Source of Requirements

A Business Analyst will work iteratively among Business and IT Stakeholders, using facilitation techniques to elicit requirements from the Executive Sponsor, Domain SMEs, End Users, Suppliers, Regulators and Customers. The Business Analyst must include the Architects, Development Team members, Operational Support, Supplier and Testers in the requirements process to ensure their understanding of the business needs and to help stakeholders understand the tradeoffs that may be faced by the project team. Their inclusion also helps to prevent anything from being ‘thrown over the wall’ thereby creating unnecessary delays and possible rework. Eliciting requirements is highly dependent on the knowledge of the stakeholders, their willingness to participate in

the definition of requirements and the ability of the analyst to assist the stakeholders in reaching consensus.

Throughout the requirements elicitation and analysis phases, the analyst must build relationships and trust with the stakeholders. The more interaction there is between the analyst and stakeholder groups, the greater the chance of uncovering requirements that were not explicitly identified in the early stage of the requirements process.

When working with stakeholders it is advisable for the analyst to adopt an 'outside-in' approach that will ensure attention is given to the correct level of stakeholders first. Typically, this will be the Business Sponsor and end Users. The technique used for elicitation as well as the business analysts approach will determine what kind of documentation is possible and desirable. The more experienced the business analyst is, the more on target he or she will be in delivering the appropriate documentation at the right level of detail.

Effective communication of requirements helps to bring the stakeholders to a common understanding of requirements. Because stakeholders usually represent groups of people from different backgrounds, business domains and authority levels, communication can be challenging and critical to the success of the project. It is usually down to the maturity and skill of the analyst to determine which sets of requirements are relevant to particular stakeholder groups and to present those requirements in the appropriate format (and using the appropriate review approach) for the audience to validate and to approve the requirements. It is unwise to expect stakeholders who are unrelated to a requirement set to validate and approve the requirement. Treating all stakeholders equally may be an easy path for an analyst to follow but in reality it may lead to more personality and complexity problems. Remember, the Business Sponsor is the final decision-maker and approver of requirements and must be included in validation review sessions.

Baseline Requirements

When requirements are approved they need to be base-lined. Changes to requirements after base-lining will require a formal change control process. There will also be subsequent approval and tracking processes needed to ensure that the new information supports the agreed business goals and that objectives can be tracked to fulfillment. New requirements must support the solution scope in order to be approved. As requirements are developed and reviewed, it is common for conflicts to arise as a result of the differing perspectives of stakeholders from different areas viewing requirements. The Business Analyst must be skilled in facilitation and conflict management to be able to resolve conflicts and issues that arise between stakeholders before approval is given to the requirement. In all cases, the Business Analyst must attempt to resolve conflicts to reduce any possible chance of resistance to the solution.

Conclusion

Good business analysis equals good requirements. Good business analysis helps to make sure the right solution is built at the right time, for the right reasons. By focusing on an organization's business objectives, tracing them to a viable solution with the necessary set of features and then tracing further to detailed requirements, Business Analysts ensure that the organization's efforts are focused on the right features and requirements for the right reasons. They then ensure the solution is built and implemented correctly. In the present economic climate organizations no longer have the luxury to build "throw-away" solutions or even to consider "fixing it in release two, three or four". The business analyst must plan to get requirements right the first time with the right amount of detail, and that's exactly what good business analysis is about. It is also about collaboration. People need to cooperate and coordinate to make smart decisions and avoid the huge wastage of time caused by dysfunctional relationships. The larger the size of the team, the greater the chance of failure. A good organization should focus on building highly skilled project teams. Business Analysts should be smart leaders who have earned the respect of stakeholders and can maneuver effectively between the different levels of stakeholders.

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