

White Paper

10 Key Lessons for Business Process Modeling

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Everything we do in our lives involves processes, from getting up in the morning and dressing, to making breakfast, to driving to work. If I need to begin work at 09h00 but consistently arrive by 09h30, then I need to understand and analyze the processes I follow (including metrics such as time wasted, time to travel, etc.) before I can make improvements that will ensure I arrive at work at the expected time of 09h00.

Process Definitions

There are many modeling techniques to use to understand business processes. Every technique in this White Paper has been described in other books and publications written by Individuals and groups of people who are experts in the field of business analysis and software development (for example, International Institute of Business Analysis®; Object Management Group; Peter Chen (1976); ANSI; Martin and McClure (1985); Jacobson (1992), Karl Wieggers, etc.). The majority of techniques have been around for many, many years (data flow diagrams, entity relationship diagrams, workflow diagrams, etc.) and amazingly still work exceptionally well. Presenting complex requirements simply and clearly is an essential skill for business analysis practitioners and using a variety of diagramming techniques for the same problem helps to expose information that may never be exposed until it is too late. Another essential skill required by analysts is the ability to communicate expertly to Business and IT professionals. Mastering the different modeling techniques helps analysts to ask the right questions and to communicate

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the business' need accurately during review and feedback. The following 10 key lessons are based on techniques I have used during my 30 years personal experience as a BA professional and all are documented to a greater or lesser extent by the above and other authors.

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|------------------------------------|--|
| Process | A process is a “(1) Series of actions, steps, or procedures leading to a result. (2) High-level sequence or flow of tasks performed during production of a product or delivery of a service.” (Ward, p.326). Processes can mean a high-level activity in an organisation or a low-level activity and are named from the perspective of the business using verb-noun standards. |
| Process Modeling | A technique that typically uses diagrams (flowcharts) to document understanding of the current or desired processes of a business area. |
| Process Model | A process model identifies the essential business activities that exist within an organization. A model includes diagram, textual description, metrics and other supporting information. |
| Process Modeling Management | A method for creating better processes so as to improve organizational performance. |

Lesson #1 Use Decomposition Diagramming Techniques

A decomposition diagram shows the essential business functions of an organization without showing any sequence or relationships between them. Decomposition is a proven approach to break (decompose) a complex organization or system down into manageable and discrete pieces that are easier for many people to understand and it is used to present many different views of a business or system. For example, to understand the organization an organizational chart is used; in strategic planning a decomposition diagram is used to decompose high-level corporate goals into lower level division and/or department goals; the breakdown of project tasks use the diagramming technique on a project work breakdown structure; a decomposition diagram may be used as a framework to define the functionality required to be developed for a new system or department.

There are a few key rules for building a decomposition diagram that enforce consistency and the accuracy of the diagram is based entirely on the business analysis practitioner's ability to structure organization information correctly. It can be created at a high level or detailed level. When built correctly, the decomposition diagram is a lasting model of the business that can be refined and reused especially when it accurately reflects the true business processes.

Simple principles used to create a decomposition diagram are:

- Only one type of relationship between components exists – parent to child.
- Every parent has more than one child.
- The relationship is shown by a straight line between components, no sequence (no arrows).
- A child is always at a lower level than its parent where the principles of inheritance apply (a child always inherits from its parent; a parent does not inherit from its child).

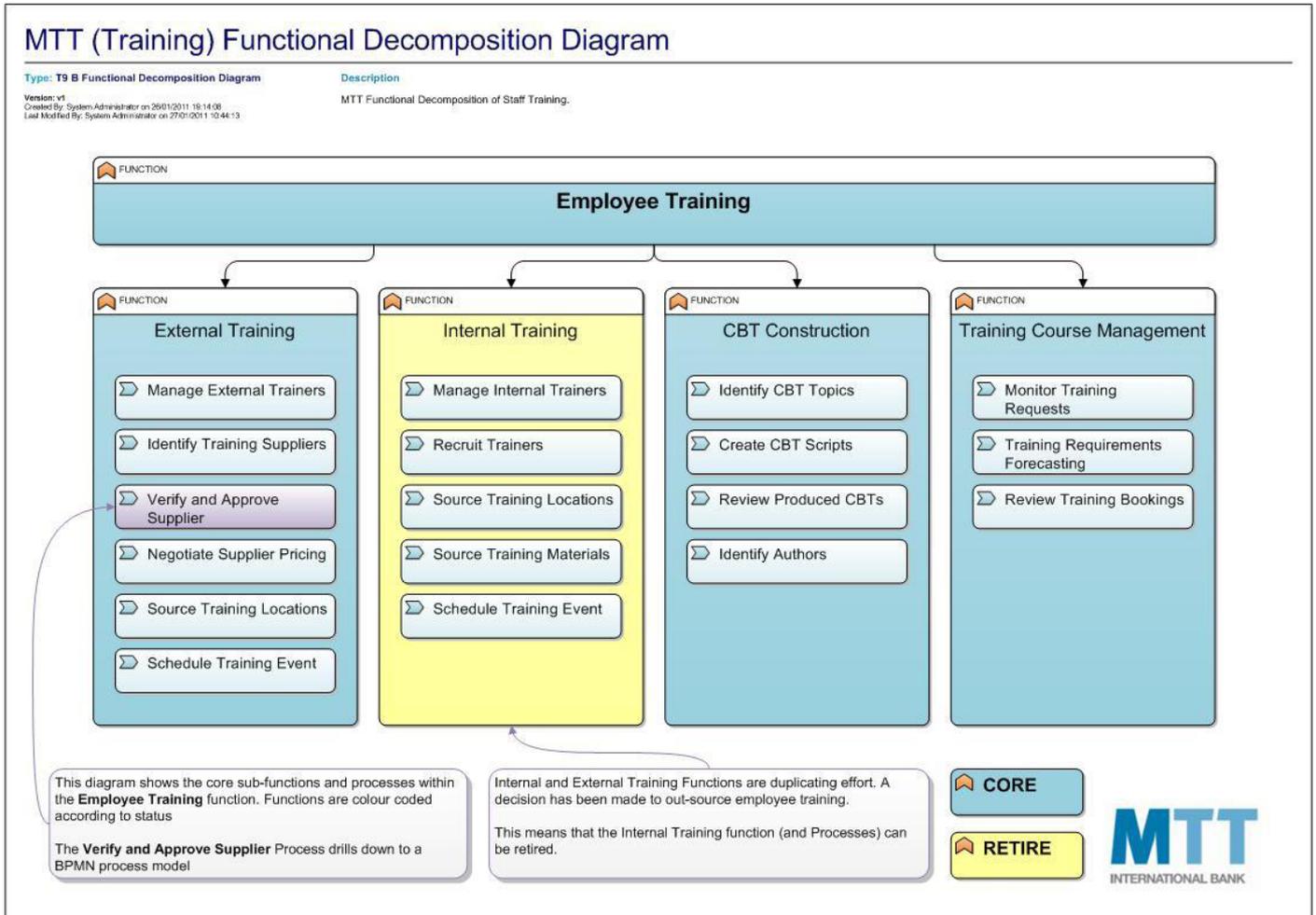


Figure 1: Functional Decomposition Diagram for Employee Training within a Company

Lesson #2 Use Workflow Modeling Techniques

Workflow diagrams are one of the oldest and most established techniques to use; they are popular and easy to use. They are useful to show how work flows across organization boundaries (between Divisions and Departments) and across different roles. They are used to understand the current (As-Is) environment and the future (To-Be) views. A gap analysis is performed by analysing the current and future views and for achieving consensus from stakeholders for business process improvements.

Workflow diagrams are also known as Flow Diagrams; Activity Diagrams; Process Diagrams; Data Flow Diagrams (DFDs). These diagrams show how work is accomplished including the sequence in which tasks are undertaken and by whom (business people, external agents or systems). The simplicity of the workflow diagram can be a danger if the diagram is not a true representation of business reality. This means the Business Analysis practitioner must be skilled in techniques needed to work with stakeholders to gather and structure business information before the diagram is created.

There are various symbols and shapes that are used to create workflow diagrams. The standard approach was recommended by The American National Standards Institute (ANSI) in the 1970s and more recently a new approach to creating workflow diagrams is called Business Process Modeling Notation (BPMN). This notation was defined by the Business Process Management Initiative wishing to standardise business process modeling techniques and who later merged with the Object Management Group (OMG) who maintain UML standards.

Simple principles to create workflow diagrams are:

- Must have one start event.
- Must have at least one end and at least one output.
- Can be divided into sections to show departments, divisions and roles within an organization. These sections are referred to as pools and swim-lanes.
- Can be used to create As-Is and To-Be views and can be created at various levels of detail.
- Workflow diagrams must have a start, tasks, decisions, sequence, end and output. They can show information flows, systems and people involved in the process.
- Workflow diagrams are used to identify alternative and exception paths when business rules are applied.
- Workflow diagrams are also used in Six Sigma (SIPOC diagrams) and Lean approaches to business improvement.
- Workflow diagrams use verb-qualifier-noun naming standards, active voice and present tense.
- When metrics are added to workflow diagrams, they become a valuable technique for business process improvement.

Verify and Approve Training Provider

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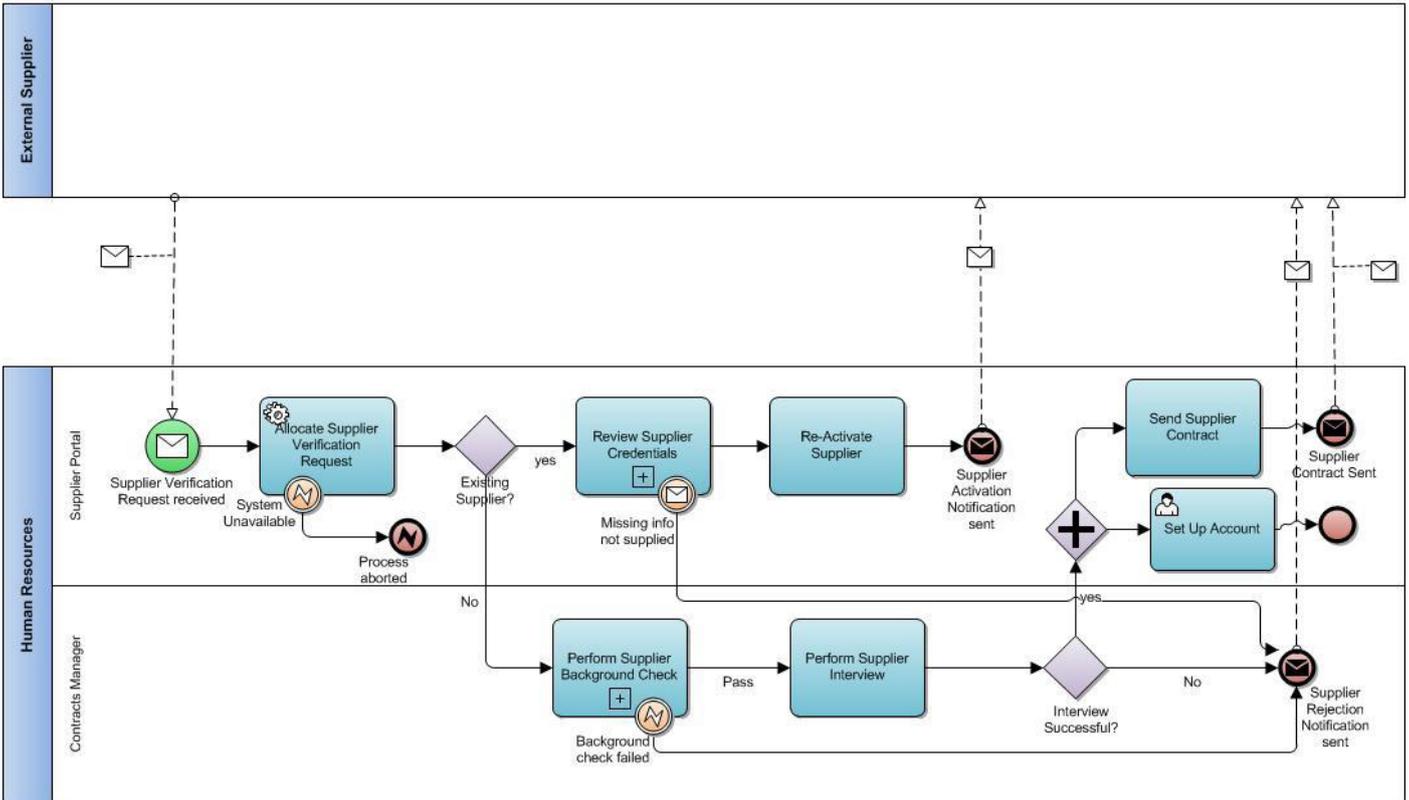


Figure 2: Workflow Diagram for 'Verify and Approve Training Provider' Process

Lesson #3 Use Entity Relationship Diagrams (ERDs)

This is one of the most powerful diagrams a Business Analysis practitioner can use to understand organization or system complexity and yet surprisingly few practitioners are comfortable using it. This diagram visually represents information required by the business to manage business operations and to make sound business decisions and yet I am regularly surprised when told by BA practitioners and business

people that 'IT deals with data, we do not'. IT is the 'custodian' of business data at a physical level (database management). Modeling business information at a Conceptual and Logical level creates a visualisation of business information requirements. A workflow diagram transforms business information (data) and if there is no clear understanding of the business information (data) the accuracy and sequencing of the tasks in the workflow diagram can be called into question. Good Business Analysis practitioners begin to build the ERD in parallel to creating workflow diagrams.

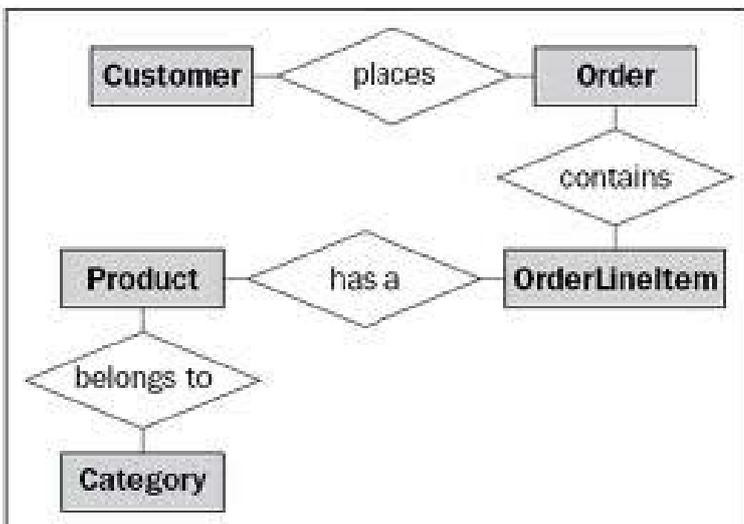


Figure 3: Basic example of an Entity Relationship Diagram

Common Business Information Challenges

- Proliferation of redundant data and databases
- Duplicate data is stored in different systems
- Data integration and synchronisation is a nightmare
- No clear data definitions or naming standards

Data Modeling promotes 'one fact in one place'. This requires business people to articulate and understand every aspect of their business. It also clarifies understanding across business domains and eliminates duplication. For example, in a financial industry, the operational business units may refer to a client as an Individual, Organization or Small business entity who has a legal contract in place with the financial house in the form of a financial instrument. Marketing Division however talks about a Prospect being a potential client and Legal Division refers to Debtors as clients who owe money. The business activities performed in Operations, Marketing and Legal are different and the manner in which they manage their clients may be different however from an analysis perspective when looking at a client lifecycle status, Prospect and Debtor are a status instance of the lifecycle whilst the information that is to be kept to manage the 'client' is common in all cases with some specialisations. For example, Title; Surname; First Name; Contact Number; Contact Address, Date of Birth, etc. Data modeling facilitates data reuse and sharing and stabilises data over time. This leads to physical data sharing and less storage of redundant data. It also helps the organization to accept that information is organization-wide and not the property of one business area over another. Data modeling and sharing makes the organization more cohesive and increases quality of service to outside customers and suppliers.

Entity Relationship Diagrams are an outstanding technique to help the analyst understand the business from different perspectives and is useful when investigating commercial off-the-shelf (COTS) solutions. Understanding the business data needs is crucial for any package selection.

Simple principles to create ERD diagrams are:

- 'Things' about which the organization wishes to keep information are called 'Entities' and are named using a 'Noun' or 'Noun phrase'.
- Entities are associated to each other through 'relationships'.
- Entities have attributes and business rules.
- Relationships are bound by mathematical constraints called 'Cardinalities' that are governed by organization policies. For example, a Client can have Zero or Many Investments. This means a client record may be created without an Investment being linked to it. This addresses the 'Prospect' status meaning that Marketing Division can pursue marketing and promotional activities to this group of potential clients (where client status = 'Prospect') as a means to actively grow the customer base.
- Every Entity has a unique key and each attribute depends on the key, the whole key and nothing but the key meaning business analysis practitioners must be able to normalise data to 3rd form to ensure accuracy of information and requirements.

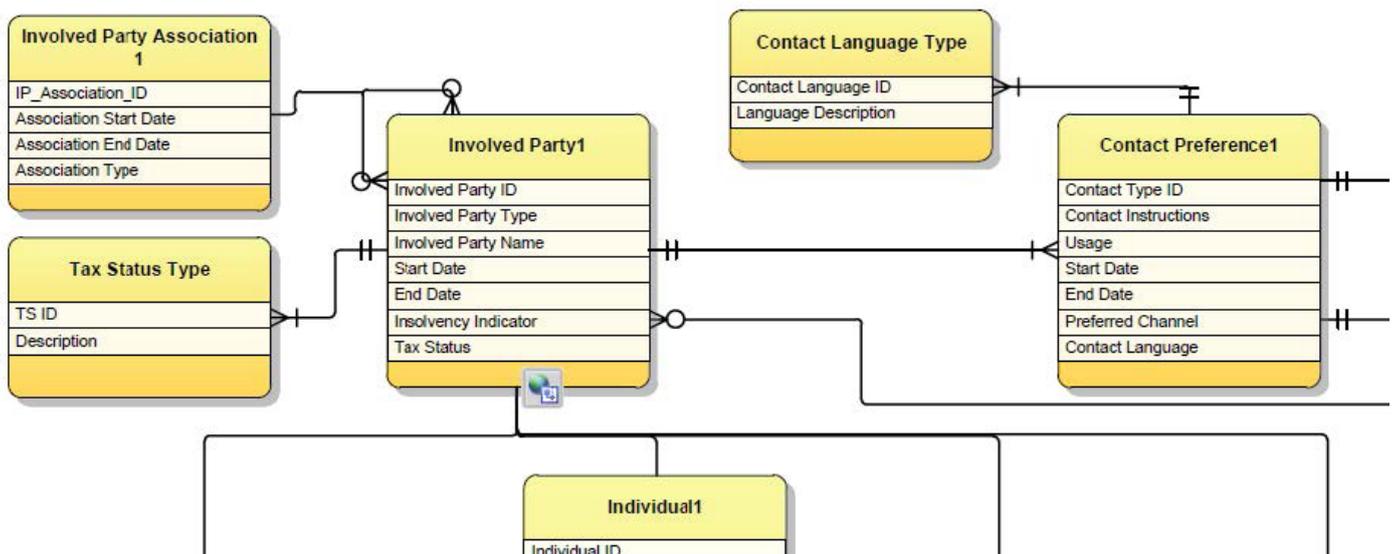


Figure 4: Subsection of a more complex Entity Relationship Diagram

Lesson #4 Use Case Diagrams

The Use Case Diagram technique was developed in the 1980s to show functional requirements of a system from an Actor's perspective. (Actors = Users who interact with the system). It is a useful technique for scoping and prioritising solution requirements of a project. Although the Use Case diagram was developed as a software design technique, it was adopted by Business Analysis as a technique to show non-technical information such as project or business scope. When used in this context, they are typically referred to as Business Use Cases.

Simple principles to create Use Case diagrams are:

- Use Cases are shown as ovals or ellipses
- Actors are people, organizations or other systems. They are shown as stick people or for systems as a rectangle with a “stereotype”.
- A boundary delineates the solution.
- Association lines show the interfaces between the Actors and the Use Cases. Association to people actors indicate interfaces such as screens and reports whilst associations to systems or organization actors represent automated or electronic interfaces.
- Use Cases are named using Verb-qualifier-noun standards because they define processes.
- Use Case Modeling is part of UML (Unified Modeling Language).

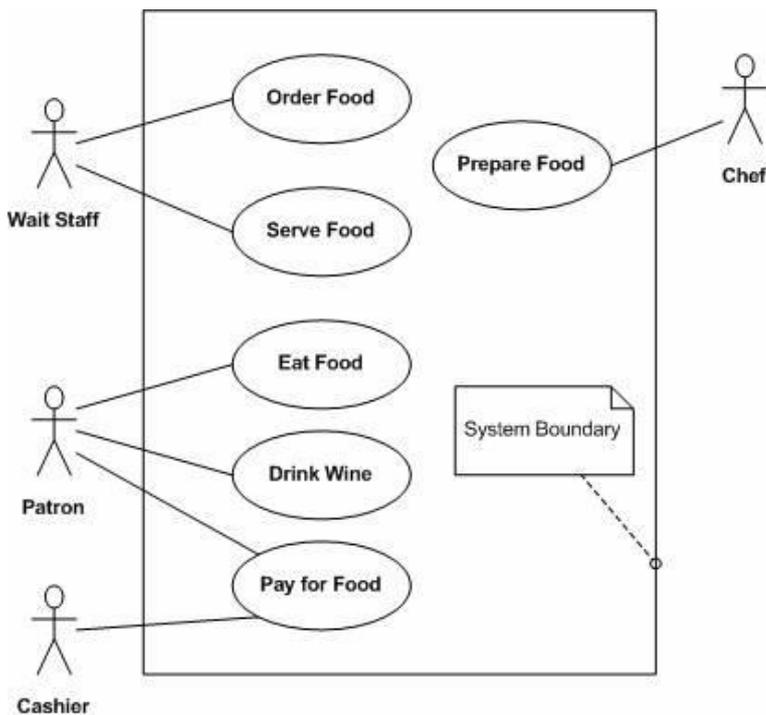


Figure 3: Basic example of an Entity Relationship Diagram

Use Case Descriptions/Narratives

A Use Case Diagram is used to identify Actors and Use Cases needed for a solution but does not describe the information needed to understand what is happening inside the Use Case. Therefore a Use Case Diagram must be supported by a Use Case Description or Use Case Narrative that contains all of the components and sequential steps that describe how the system and actors interact to achieve a business goal. This narrative has two primary sets of users. It presents a clear picture to business stakeholders of how they will use the new software before it is actually built. Upon consensus and approval of the narrative by business stakeholders, it is base-lined and becomes the contract between

business and IT and provides developers with detailed requirements of how to build the system. The Use Case Narrative includes pre-conditions; post-conditions; primary processing paths, alternative paths that show exception processing and error conditions; the action the actor will take and the way the system should respond; screen prototypes; detailed data requirements along with business rules that apply; output deliverables such as reports, communication to customers and error messages. Use Case Modeling techniques can be created in manageable sizes and is a very useful technique. However successful usage requires analysts to be well trained and experienced. Care must be taken when many BAs are using Use Case Modeling on a single project. Use Cases are only complete when they contain all of the necessary elements to support the processing of the use case. However certain data elements may be used by more than one use case and if a characteristic changes, every use case that uses the data element

will need to be changed otherwise requirements will be inaccurate and inconsistent. This can become a major headache and time wastage for Business Analysts unless QA (Quality Assurance) review protocols are in place. Like most analysis techniques, Use Case Modeling appears much more simple and straightforward than it is however it is a great technique to use with business stakeholders and decision makers because it requires decisions about how people will work with the system. It may require job description and responsibility changes and new procedures.

Lesson #5 Use User Stories

User Stories are a technique used to support use cases. They are created by Users and describe what the system needs to do for the execution of a use case. Analysts collect the User Stories written on Index cards from Users to synthesize user expectations and to support communication of Use Cases to the IT Development Team. It is a great technique to use when users are geographically spread.

Lesson #6 Use Event Diagrams

When analysing a business area, it is important to understand the events that trigger (cause) work to begin inside the business area. An event is typically something that happens outside the business area to which the business must respond and the ways in which the businesses respond to the events are the business processes. There are 3 common events analysts look for and they are: external events (triggered by customers, suppliers, regulatory offices, etc.); temporal events (triggered by time) such as month-end reports, debit orders, etc.; and internal events (triggered by business rules, compliance, legal, etc.) such as when a customer defaults on a payment legal processes are triggered.

Simple principles to create Event diagrams are:

- Events are named with the external entity who initiates them for example, Supplier submits Invoice.
- Start nodes on workflow diagrams are named by the event.
- An Event table can be used as an alternative technique to identify business processes.

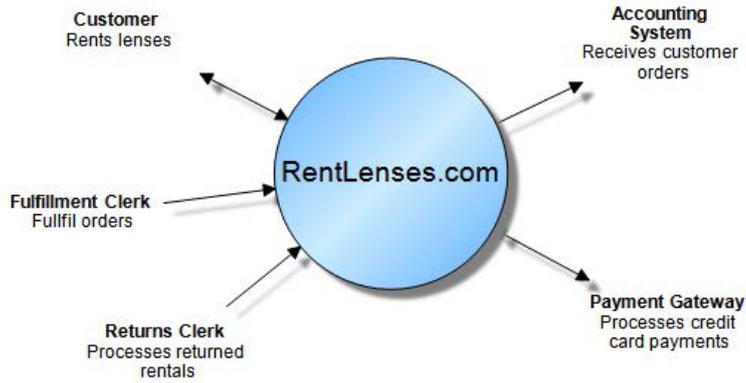


Figure 6: Example Context Diagram

Lesson #7 Use Context Diagrams

A Context Diagram is frequently used by analysts at project initiation and is a great technique to use to get consensus from stakeholders on the business area to be investigated or scope of the solution. This is an old diagramming technique used by analysts when working with stakeholders. It requires them to answer several key questions and clearly articulate what part of the business is to

be studied. It also helps the analyst to ask meaningful questions and by doing so may uncover hidden complexities that may never be revealed until far into the project when the impact on the project could place it in negative risk. The Context diagram is simple to use and because of its simplicity, it is a successful technique to get Stakeholders to contribute to and buy-in to the project early. The true value of the technique lies in the development of the diagram by asking excellent questions about who is affected by the project and what information they provide or receive from the business area. The project scope defined by the Project Sponsor and Project Manager may never have considered the specifics that will be exposed using the Context Diagram technique.

Simple principles to create Context diagrams are:

- A rectangle is used to depict the area of study/focus. The name must reflect a business area name and not the project name.
- External agents are represented by ovals or ellipses and therefore are outside the area of study.
- Arrows represent information input and output. They do not represent processes therefore caution is advised when naming the arrows.
- Processes are performed inside of the area of study and an event table may be used to identify the processes once the Context Diagram is completed. Processes exist to create deliverables such as physical hard goods, information, reports, customer communications, etc.

Lesson #8 Use Measurements

Performance metrics assist in identifying areas for improvement and help us to understand current performance and goals for improvement and are a basis to measure performance improvement after changes are made. Measurements include how many times a process executes and produces results. This includes volumes, proportion of triggers (i.e. customer triggers, internal triggers, temporal triggers), number of

errors that force variation processing, the number of outputs created. Measurements are usually collected at task level and aggregated to end-to-end process level. Measuring time to execute means total cycle time, wait time, idle time and work duration. We also need to calculate the cost of the process such as the people costs, systems costs as well as efficiency such as amount of rework, customer complaints vs compliments, number of defects and errors, speed of processing and so on. The original process model helps us to understand how work flows and the tasks, people and other elements needed for the work. Measurements provide the true power to analyze the process and to identify what works, what does not work and why not. Only when a holistic view of the process is understood can opportunities for process improvement be recommended.

Lesson #9 The Importance of Stakeholders

Stakeholders are the most important ingredient for project success. Too often business stakeholders have an 'arms-length' involvement in projects during analysis and development but are prepared to spend months if not years (at great cost) enhancing the system to suit their needs. From an analysts perspective, understanding and managing stakeholders is more important than documenting and presenting great requirements that do not meet business needs. To improve any process it is important to identify the processes that have the highest influence on stakeholder expectations and to assess the degree to which the expectations may be met.

Highly skilled analysts work effectively with stakeholders throughout the analysis initiative to gain consensus on understanding of the current view; designing and agreeing on the future view; prioritising requirements; obtaining consensus on detailed requirements; validating requirements and assessing the solution to ensure defects are found and addressed early in the project lifecycle. Stakeholders are an intrinsic part of the project team and have a responsibility to ensure the right solution is implemented to address business needs.

Simple principles when working with Stakeholders are:

- Be a people-person. Build relationships with stakeholders to understand their motives, biases, personalities, strengths and weaknesses. Be sincere.
- Be an active listener. This is an important skill for analysts to have. If we do not have the ability to truly listen and hear what the stakeholders say, then the beautifully documented requirements may be wrong. Stakeholders must feel confident the analyst understands their true business needs and will represent them accurately to the Development Team.
- Be patient. Give stakeholders the opportunity to tell their stories in their own way and in their own time. Show respect no matter what their business title or where they are positioned in the organization hierarchy.
- Maintain eye contact especially when people are talking or if you want to include those people who are not naturally talkative. It is also a useful technique to use when side meetings are taking place during a facilitated session.
- Create a 'safe' environment for stakeholders to speak freely without fear of intimidation or reprisal. Remain neutral when working with stakeholders and do not be seen to take sides.
- Be sensitive to different languages, cultures and situations however remain focused on the work topic and stay away from personal issues.
- Stakeholders include business people, IT representatives, Vendors, External agents such as customers and suppliers and indirect areas within the organization

Lesson #10 Master Modeling Principles and Notation Standards

Few good tools are available to Business Analysis practitioners that are flexible and allow linkage from high level diagrams to low level requirements in a central repository. Setting standard analysis techniques and deliverables is also difficult and most organizations do not understand business analysis sufficiently to appreciate the flexibility and skills a BA practitioner needs to have. This is primarily because projects vary greatly and analysis differs in quantity, perspective and level of detail. Requiring a particular deliverable or modeling notation standard may seem a good way to introduce consistency into the organization but may result in wasted work, incomplete work and poor quality work. To introduce different roles and responsibilities to tackle 'pieces' of analysis work (separation of business analysis responsibility) does not work well either mainly because these 'teams' become silo thinkers and do not have a holistic vision of where the 'pieces' fit together to become a 'whole'.

Instead of organizations employing 200 people to perform 'pieces' of business analysis, rather they should employ 20 excellent BA professionals who have mastered the different modeling notations, have mastered the art of working with stakeholders; have mastered the art of excellent communication across all organization roles and who have the ability and skill to use different frameworks and tools to organise and represent organization components and information accurately whether they are performing architecture work or project work.

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