# 企業電子商務網站需求分析研究
# Study of Business Requirement Analysis in Electronic Commerce Website

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## 摘要

對於許多組織，有效的企業分析並沒有整合在專案工作中。其結果是，專案未能提供預期的商業價值。2014 年國際專案管理學會 PMI 報告如下：在 2013 年 64％已完成的專案，成功地滿足了其原有的目標和企業的意圖、16％在專案啟始便被視為失敗的、37％組織報告不準確的需求收集是專案的主要失敗原因、不佳的需求管理實務是專案失敗的第二大原因。我們積極地採用企業需求分析方法建立一個中小企業電子商務網站並達成企業目標和目的，並提高網路商店開發的成功率和它的應用，降低成本及增加營收。

**關鍵字**：企業分析、需求、企業需求分析、網站

## ABSTRACT

For many organizations, effective business analysis is not an integral part of their project work. As a result, projects are not delivering the intended business value. In 2014, PMI reported the followings: 64% of the completed projects successfully met their original goals and business intent, 16% of projects that started were deemed failures. Inaccurate requirements gathering was reported by 37% of organizations as a primary cause of project failure, and poor requirements management practices are the second leading cause of project failure in 2013. We intensively adopted the business requirement analysis method to develop an electronic commerce website for a small and medium enterprise to fulfill the enterprise goals and objectives, and increase successful rate for the development online store and its application to reduce the cost and increase revenue.

**Key words:** Business Analysis, Requirement, Business Requirement Analysis, Website

## 1. Introduction

In this chapter the Research Background, Research Goal and Research Method are described.

### 1.1. Research Background

For many organizations, effective business analysis is not an integral part of their project work. As a result, projects are not delivering the intended business value. In 2014, PMI reported the following: (1) In the past 12 months, 64% of the completed projects successfully met their original goals and business intent. (2) In the past 12 months, 16% of projects that started were deemed failures. (3) Inaccurate requirements gathering was reported by 37% of organizations as a primary cause of project failure. (4) Poor requirements management practices are the second leading cause of project failure,

second only to changing organization priorities.

The small and medium enterprises usually need to promote their products and services on the website through the internet in Taiwan. Because lack of information management team to develop the website for their business long term goals and short term objectives. They know that the information technology can enable their business strategic plan and expand their marketing. Business requirements are goals, objectives, and higher-level needs of the organization that provide the rationale for why a project is being undertaken. Business requirements are defined before a solution is determined and recognize what is critical to the business and why. In business analysts, needs assessments are performed to examine the business environment and address either a current business problem or opportunity. A needs assessment may be formally requested by a

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business stakeholder, mandated by an internal methodology, or recommended by a business analyst prior to initiating a program or project.

Goals and objectives are important to needs assessment, because they provide the context and provide direction for any change that addresses the business need. Ideally, except for unforeseen problems and opportunities, all programs and projects directly support the stated business goals and objectives. Programs and projects are linked to the goal and objectives through the business case. Business cases are assembled as one of the final tasks in the needs assessment and are discussed in further detail later on in this section. Even without a formal business case, goals and objectives should be leveraged to guide the direction of business analysis. When a business case is created, it becomes a valued input to project initiation, providing the project team with a concise and comprehensive view of the business need and the approved solution to that need. More than a simple input, a business case is a living document that is constantly referenced throughout a program or project of work. It may be necessary to review and update a business case based on what is discovered as a program or project progresses over time.

When a business case is inadequate or nonexistent, the product scope may be unclear or poorly defined. This in turn often leads to scope creep, which results in rework, cost overruns, and project delays. A business case can help to address the possible risks of having to cancel a project due to loss of sponsor or stakeholder support, costs exceeding the perceived benefits, and changes to the business. Possibly worse than terminating a project is finishing a project only to have the end-product not be used because the solution did not match the business needs.

## 1.2. Research Goal

Business analysis is the first step for the object-oriented system analysis and design. Customer and business requirements should be captured before starting the project. For teaching the object-oriented system analysis and design in Cheng Shiu University for twelve years, we found out that customer needs are often ignored, or superficial expressed methodology. Solution does not meet the needs of customer's leading to rework, waste of time and cost.

We hope that through the Business Analysis Methodology promoted by International Management Institute to develop the e-commerce website to meet customer needs, and then allows learners of system analysis and design to familiarize themselves with Business Analysis Methodology

method and flexible use of Technology & Tools.

## 1.3. Research Method

Business Analysis Methodology, domain knowledge, and techniques & tools, which was described in a Guide to the Project Management Body of Knowledge (PMBOK Guide) Fifth Edition (PMI, 2013) was applied to Empirical Research. The five domains knowledge including: Needs Assessment, Planning, Elicitation and Analysis, Traceability and Monitoring, and Evaluation were used extensively. Adaptive project life cycle was selected to develop the value-driven electronical commerce website project. Universal Modelling Language Methodology for the object-oriented system analysis and design was also applied to model the business analysis.

Business analysis refers to the set of tasks and activities that help enterprises determine their objectives for meeting certain opportunities or addressing challenges and then help the enterprises define solutions to meet their objectives. Those engaged in business analysis are charged with identifying the activities that enable the enterprises to define the business problem or opportunity, define what the solutions looks like, and define how it should behave in the EC website.

## 2. Literature Reviews

Definition of Business Analysis and Requirements, Domains for Business Analysis, Business Analysis Planning Techniques and Outputs, Business Analysis Models, and Overview for Object-Oriented System Analysis and Design.

## 2.1. Definition of Business Analysis and Requirements

PMI (2015) defines "business analysis is the application of knowledge, skills, tools, and techniques to: Determine problems and identify business needs; Identify and recommend viable solutions for meeting those needs; Elicit, document, and manage stakeholder requirements in order to meet business and project objectives; Facilitate the successful implementation of the product, service, or end result of the program or project."

A Guide to the Project Management Body of Knowledge (PMBOK Guide) Fifth Edition (PMI, 2013) defines that requirement is a condition or capability that is required to be present in a product, service, or result to satisfy a contract or other formally imposed specification. Requirements can be classified into various categories to provide clarity

and context to the issue. There are: Business requirements, Stakeholder requirements, Solution requirements, Functional requirements, Nonfunctional requirements, Transition requirements, Project requirements and Quality requirements eight types in a project (Hooks and Farry, 2000; Carkenord, 2008; Podeswa, 2008; Blais, 2011).

Business requirements describe the high-level needs of the overall organization to address a problem or opportunity; Stakeholder requirements express the needs of a specific stakeholder or group of stakeholders, which may include customers, users, or suppliers; Solution requirements describe the features and functions that the product, service, or result needs to exhibit to satisfy the business and stakeholder requirements. These are often grouped into two categories: Functional and nonfunctional requirements. Functional requirements denote particular behaviors and operations that the solution will perform. Nonfunctional requirements describe certain environmental conditions or required attributes to ensure the product or service operates effectively; Transition requirements describe the temporary capabilities that are essential to migrate from the current state to a future state environment; Project requirements describe the actions, processes, and other conditions that the project needs to satisfy; Quality requirements describe the criteria needed to ensure completion of project deliverables and demonstrate compliance with identified standards and quality metrics. Project and quality requirements are not a part of the requirements process but are a part of the project program work (Robertson and Robertson, 2012; PMI, 2016).

PMI (2016) states that requirements may also be reused when describing common features or services that are used across multiple systems, processes, or programs. Requirements reuse should be planned for during business analysis planning and performed throughout the various phases of the project. Reusing requirements can save an organization time, effort, and cost - provided the requirements are accessible and structured in a manner that supports their reuse.

## 2.2. Domains for Business Analysis

There are five domains in business analysis knowledge: Needs Assessment, Planning Elicitation and Analysis, Traceability and Monitoring, and Solution Evaluation as shown in Table 1:

Table 1 Domains for Business Analysis

| Domains | Tasks |
|---|---|
| **Needs Assessment** | The Needs Assessment domain includes activities related to understanding a business problem or opportunity and evaluating various inputs to help develop an effective solution. Tasks include defining or reviewing a business problem or opportunity, collecting and analyzing information, collaborating in the development of project goals and objectives, identifying stakeholders, and determining stakeholder values. |
| **Planning** | The Planning domain focuses on the preparation required to effectively manage the business analysis activities that will occur within the project. This includes establishing tools, policies, and procedures for the requirements management plan, requirements traceability, change management, document control, and acceptance criteria (AC). |
| **Elicitation and Analysis** | The Elicitation and Analysis domain centers on requirements management activities. Tasks include the elicitation. analysis, decomposition, acceptance, approval, specification, and validation of the requirements for a product or project. |
| **Traceability and Monitoring** | The Traceability and Monitoring domain includes the activities related to managing the life cycle of requirements. The tasks within this domain comprise the continuous monitoring and documenting of requirements as well as the communication of the requirements status to stakeholders. |
| **Evaluation** | The Evaluation domain includes activities that relate to the assessment of how well the delivered solution fulfills the requirements and meets the business need. Tasks within this domain include testing the solution, determining if there are gaps, and obtaining sign-off. |

Revised from PMI-BAG 2015.

## 2.3. Business Analysis Planning Techniques and Outputs

Identify problem or opportunity and access current state of the organization are important tasks in planning domain. Techniques and Outputs for Business Analysis Planning are summarized as shown in Table 2.

Table 2 Techniques and Outputs for Business Analysis Planning

| Item | Tasks | Techniques | Outputs |
|---|---|---|---|
| Identify Problem or Opportunity | Identify Stakeholders | Brainstorming, Surveys, Decomposition Modeling, Interviews, Organizational Modeling, Organization charts | Initial Stakeholder List, Responsibility Assignment Matrix |
| | Investigate the Problem or Opportunity | Interview, Document review, Observation, Process Modeling, Benchmarking, Pareto Analysis, Tread analysis | Problem or Opportunity |
| | Draft the Situation Statement | | Situation Statement |
| Access Current State of the Organization | Assess Organizational Goals and Objectives | SWOT | Goals and Objectives, Relevant Criteria |
| | Perform Root Cause Analysis | SWOT, Five Whys, Cause-and-Effect Diagram, Process Flow | Root Causes of Problem or Contributors to Opportunity |
| | Determine Required Capabilities | Capability Tables, Affinity Diagram, Benchmarking | Required Capabilities |
| | Assess Current Capabilities | Process Flows, Enterprise and Business Architecture, Capability Frameworks | Current Capabilities |

## 2.4. Business Analysis Models

A model is a descriptive and visual way to convey information to a specific audience in order to support analysis, communication, and understanding. Models may also be used to confirm knowledge, identify information gaps that the business analyst may have, and identify duplicate information (Simsion and Witt, 2004; Haas and Hosenlopp, 2007; Cadle, et al., 2014; IIBA, 2015). There are Scope Models, Process Models, Rule Models, Data Models, and Interface Models, and examples models used in this study as shown in Table 3.

Table 3 Business Analysis Models Organized by Category

| Category | Definition | Example Models |
|---|---|---|
| Scope Models | Models that structure and organize the features, functions, and boundaries of the business domain being analyzed | Goal and business objectives model<br>Organizational chart<br>Use case diagram<br>Decomposition model<br>Fishbone diagram<br>SWOT diagram |
| Process Models | Models that describe business processes and ways in which stakeholders interact with those processes | Process flow<br>Use case<br>User story |
| Rule Models | Models of concepts and behaviors that define or constrain aspects of a business in order to enforce established business policies | Business rules catalog<br>Decision tree<br>Decision table |
| Data Models | Models that document the data used in a process or system and its life cycle | Data dictionary<br>State table<br>State diagram |
| Interface Models | Models that assist in understanding specific systems and their relationships within a solution | System interface table<br>User interface flow<br>Wireframes<br>Display-action-response |

Revised from: PMI-BAG, 2015.

Business analysts should use any combination of models best suited to meet stakeholder needs in a given context. Each modelling technique has strengths and weaknesses and provides unique insights into the business domain.

## 2.5. Overview for Object-Oriented System Analysis and Design

The concept of object-oriented technology is based on the object model to describe the real systems, and data abstraction, encapsulation, inheritance and different type of concept of the same name, into the development of systems for objects (Wu, 2016).

Gottesdiener (2005) and Wiegers (2013) studied from the system implementation side, the modeling can be divided into five concrete: (1) requirements modeling, (2) object structural modeling, (3) object interaction behavioral modeling, (4) user interface modeling, (5) system components and structured modeling. Then do illustrate respectively detail. In the requirement molding stage contains users and business requirements, through the requirement elicitation and requirement transformation by use case diagram, activity diagram, blueprint, and data glossary. In the object structural modeling stage contains class diagram, object diagram, composite structure diagram. In the object interaction behavioral modeling stage contains sequence diagram, communication diagram, timing diagram, and interaction overview diagram. In the user interface modeling stage contains interface structure diagram, interface diagram, interface glossary, sequence diagram, and state diagram. In the systems components and structured modeling stage contains component diagram, and deployment diagram. Finally, by way of the above molding, resulting in user interface design, programming, wireframe, and database design as shown in Figure 1.
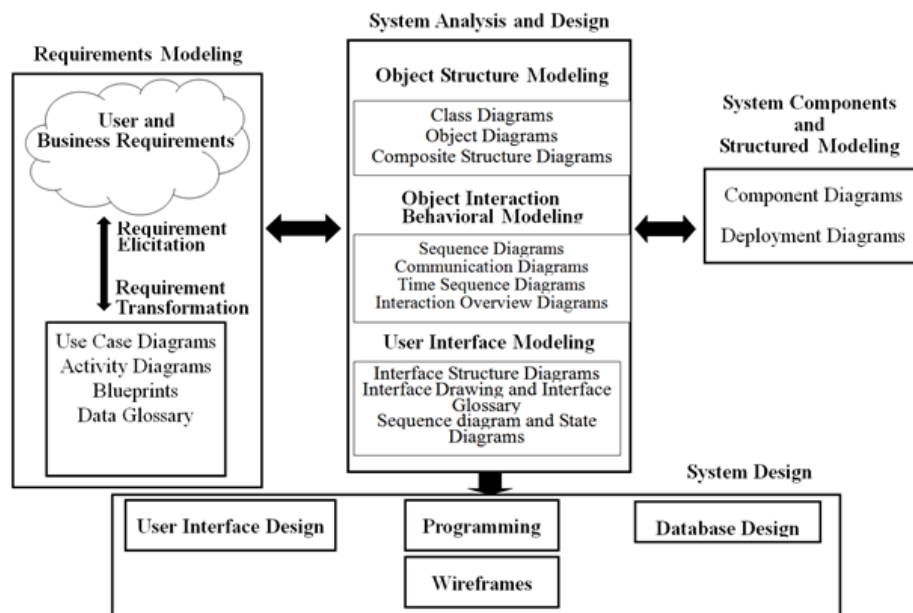


Figure 1 Object-Oriented Modeling and Model Tool (Revised from Wu, 2015)

## 3. Need Assessment and Business Analysis Planning for Electronic Commerce Website

Business Requirement analysis and Systems analysis and design are an iteration process, using object-oriented analysis and design can give fully play reusability of requirements and objects, and they can save a lot of requirement elicitation or system development time. Therefore, this study using VP-UML software modelling tools to analyze stakeholder's requirements, system analysis, system analysis, system design, system test, system implementing, monitor and track long term performance.

Purposes of business analysis and system

development must meet business goals, business strategy and related needs of the users. Therefore, we must consider four factors: the enterprise background, the system objectives and constraints, as well as user and business requirement descriptions.

## 3.1. Identification of the Problem or Opportunity

Tai florist is a traditional medium enterprise, and it has 20 physical stores distributed in Taiwan. The problem or opportunity of business statements of Tai florist are: lacking of marketing budget, high purchasing cost, slow delivery speed and not friendly online store leading to consumer reluctance to patronize the company's website, consumer behavior gradually change into online shopping, and the company website is not working properly, no promotion actives for online store, low brand awareness, and low quality of the professional personnel resulting in revenue decline. The goal of the project is to rebuild the online flower store and then increase revenue 10% in 2016 compared that with 2015. The objectives are to promote the numbers of website by 50%, deliver product to customer in 24 hours, and offering multiple trading patterns.

The eight steps can be used to improve the

problem are: the panel was established to improve the problems, description of the problems, temporary measures to implement and confirm, reason analysis and confirm, permanent improvement measures drawn, permanent measures to improve the implementation and effectiveness, prevent problems recurrence, and finished.

## 3.2. Stakeholders Analysis and Management

Effective stakeholder management is key to the success of this business analysis project. It should begin before the project starts, at the inception stage, and be continued throughout the project – and even afterwards, in order to ensure that the changes are implemented effectively. Stakeholders can be assessed in terms of their interest in the project and their power or influence over it, and strategies for managing them actively must be defined in accordance with this assessment.

A RACI chart was used to define stakeholder involvement-lists the main products or deliverables down the side and the various stakeholders along the top. Where a stakeholders intersect with products, we indicate their involvement with them as A: Accountable, R: Responsible, C: Consult and I: Inform as shown in Table 4:

Table 4 RACI Matrix for Assessing Business Needs of Online Florist Project

|  | Sponsor | PM | BA | Team | SME |
|---|---|---|---|---|---|
| Identification problem or opportunity | A | C | R | C | C |
| Assess the current state of the organization | A | I | R | C | C |
| Proposed action | I | A | R | C | C |
| Prepare business case | I | A | R | C | I |

PM: project manager, BA: Business Analysis, SME: Subject Matter Expert.

Relevant stakeholders: Division CEO, Shareholders, Marketing, consumers, physical discount store, and webpages designer. The Stakeholder influence analysis matrix as shown in Table 5:

## 3.3. Assess Organization Current State

Organizational goals and objectives can be revealed in internal corporate strategy documents and business plans. Corporate strategies translate goals identified in business plans into actionable plans and objectives. Business Goal: the revenue of the website to grow 15% compared with 2015.

Business Objective: to promote the numbers of website by 50%, deliver product to customer in 24 hours.

SWOT (strengths, weaknesses, opportunities, threats) analysis is often used to pull together the results of an analysis of the external and internal environments. SWOT for Tai Florist is shown in Table 6:

Table 5 Stakeholder Influence Analysis Matrix

| Stakeholder | Project role | Working Experience | Group Represented | Influence | Plan |
|---|---|---|---|---|---|
| Business dept. CEO | Sponsor | 20 years | 5 | High positional / Positive | Major decision |
| PM | PM | 10 years | 12 | Middle positional / Positive | Self-management |
| BA | BA | 7 years | 120 | Middle positional / Positive | Self-management |
| Physical shop | Domain SME | 15 years | 50 | Low positional / Negative | Review carefully-Assigned seating |
| Website engineer | Implementation SME | 5 years | 20 | Low positional / Negative | Reinforce rules |
| Marketing dept. | Implementation SME | 7 years | 15 | Low positional / Positive | Self-management |

Table 6 SWOT Analysis for Tai Florist

| Strength | Weakness |
|---|---|
| Knowledgeable researchers and staffs<br>Strong brand image compared with the competition<br>High market share compared with the competitors | Stiffness official system compared with the competition<br>Staff management and welfare system need improve<br>Unlike the first of industry, the lack of dedicated logistics system |
| **Opportunity** | **Threat** |
| Mobile shopping becomes mainstream<br>Revolution thinking of the online shopping channel<br>Quality first, Secure food system | The rise of similar online stores.<br>Competitive incensed<br>Decrease in gross profit |

After identifying needed capabilities and assessing current capabilities related to a given situation, any gaps or missing capabilities that exist between the current and needed states are the capabilities that need to be added. These capabilities are commonly referred to as the "to be" features and functions and are easily identified by performing this gap analysis. Gap analysis is the technique of comparing the current state to the future state to identify the differences or gaps. The needed capabilities that are required to solve the business problem become the rationale for creating a program or project. Table 7 shows a capability table with the deliverables added that will fill the gaps.

Table 7 Example of Capability Table with Gaps Listed

| Problem/Current Limitations | Root Causes | New capability/Feature | Project Deliverables to Fill Gaps |
|---|---|---|---|
| **Product distribution process too long** | Lack of own logistics system | Strengthen and integrate ERP with back-end interface | Reuse successful experience from other branches. |
| **Lack of professional personnel.** | Lack of personnel with EC experience | Enhancing recruiting channel to attract external talents person | Establishing HR database, Introduce external business management consultant. |

## 3.4. Proposals for Recommendations

Proposals for Recommendations includes: (1) assessment and review of personnel promotion system, accelerate the movement of persons (2) actively involved in Taiwanese partners and supplier

association (3) Strengthening of building brand image.

Assumption: Suppose e-commerce outsourcing vendor can completely support business needs to have the skills to create a website complete. Constrain: complete before 2017/12/31. Risk: low cost-effective analysis. Financial indicators: Net present value should be great than 0, Internal Rate of Return.

# 4. Requirements Elicitation and Analysis for Electronic Commerce Website Project

Requirements elicitation and analysis is the iterative work to plan, prepare, and conduct the elicitation of information from stakeholders, to analyze and document the results of that work, and to eventually define a set of requirements in sufficient detail to enable the definition and selection of the preferred solution (PMI, 2015).

## 4.1. Plan for Elicitation

An elicitation plan is a device used by business analysts to help formulate ideas about how to structure the elicitation activities. The plan is a formal document and take a short time to create in this study. The elements in an elicitation plan include: what information to elicit, where to find that information, how to obtain the information, and sequencing the elicitation activities as shown in Table 8:

Table 8 Completed Elicitation Plan

| What | Who | How | Sequence |
|---|---|---|---|
| How many functions are there on the websites? | Sponsor, BA, Product Manager, IT, Sale, Logistics, Customer, Consultant | Document Analysis, Facilitated Workshop | 1 |
| What is a total number of models of products and accessories on the websites? | BA, Product Manager, Sale, Customer | Facilitated Workshop | 4 |
| When is these features placed on the webpage? | PM, IT, Customer | Interview | 2 |
| What are contents and images of the products and accessories on the websites? | Sale, Logistics, Customer, Consultant, BA, Product Manager, | Facilitated Workshop | 5 |

## 4.2. Model and Refine Requirements

In this section Scope model, Process model, Data model, Rule model are used to refine requirements.

### 4.2.1. Scope Model

Use case diagram is a scope model to structure and organize the features, functions, and boundaries of the business domain being analyzed. Constructing use case diagram is an iteration process including: finding actors, identifying use cases, description of use case, and identifying the relationship between the use cases, and drawing the initial use cases. A use case diagram shows all of the in-scope five use cases for the e-flower Ordering System. In this diagram, use cases are represented by oval with the name of the use cases within it. Actors (customer, member, administrator and manager) are shown as stick figures. Straight lines in the diagram associate the use cases that the actor interacts with. The association merely establishes a connection that shows this actor is in some way associated with the use case as shown in Figure 2:
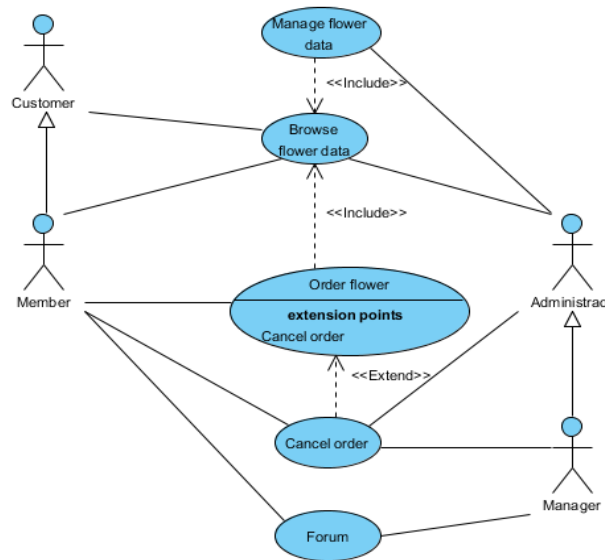
Figure 2 User Case Diagram for the e-flower Ordering System

### 4.2.2. Process Model

Use case is a process model that describes a flow of actor-system interactions and boundaries for those interactions, including name, description, actors, organizational benefit, trigger, preconditions, normal flow, post conditions, alternate flows and exception flows. A use case is a series of activities, actions, and reactions that take the actor from initiation to successful completion of the goal. Use cases represent the functional aspects of the system or operation and, as such, are not used to document the nonfunctional aspects of the system. Textual use cases are represented in a standardized document template or in tabular form with standardized columns. The description of browsing flower data use case for the e-flower Ordering System as shown in Table 9. We can apply similar analysis process finishing the remaining four use cases

Table 9 Browse Flower Data Use Case Description

| Name | Browse Flower Data |
|---|---|
| ID | UC_02 |
| Description | Complete online browse the attributes of the flower. |
| Actors | Customer, Member, Administrator |
| Triggers | Customer, Member, or Administrator clicks on the "Query" button on the webpages. |
| Preconditions | Customer, Member, or Administrator can browse flower catalog to select the flower item before he/she orders or manages the flower item. |
| Post conditions | Show query flower ID and unit price. |
| Normal Flow | 1. Customer, Member or Administrator can enter name of the flower to query flower attributes.<br>2. If they click on the "Search" button, the query command is executed to find out the selected flower data.<br>3. The system displays the relevant information for providing customers' order. |
| Alternate Flows | AF1- Customer, Member or Administrator cannot see the flower details.<br>Customer, Member or Administrator can also click "Flower details" button to check the flower attributes before ordering the flower.<br>AF2- Member can fill Q&A form to ask the flower specific attributes and get the response from manager. |
| Exception Flow | If the flower in exist on the catalog, it will display "Cannot find the flower, please re-enter name of the flower. |

A user story is a statement written in everyday language from the viewpoint of a user. It is intended to capture the new functionality or capability of a

solution. The user story for requirement elicitation - Brainstorming is shown in Figure 3:
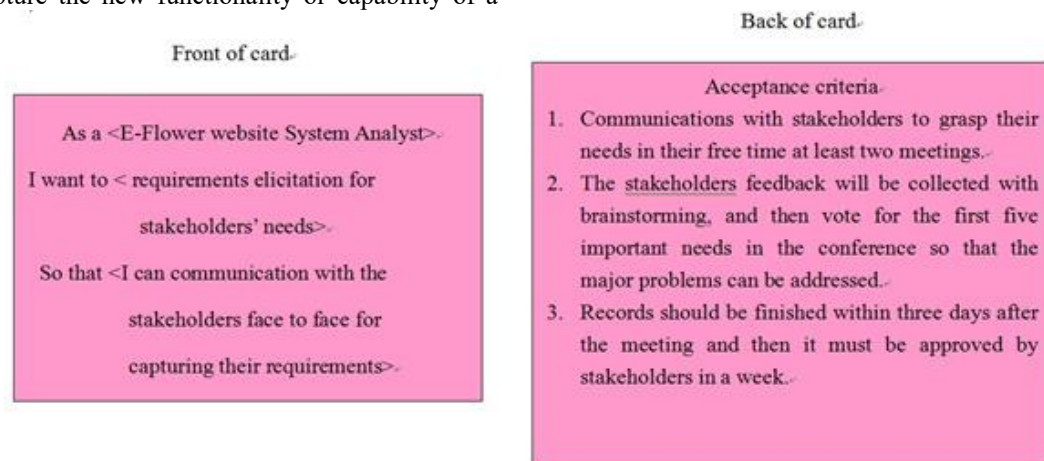
Front of card

As a <E-Flower website System Analyst>.

I want to < requirements elicitation for

stakeholders' needs>.

So that <I can communication with the

stakeholders face to face for

capturing their requirements>.

Back of card

Acceptance criteria

1. Communications with stakeholders to grasp their needs in their free time at least two meetings.
2. The stakeholders feedback will be collected with brainstorming, and then vote for the first five important needs in the conference so that the major problems can be addressed.
3. Records should be finished within three days after the meeting and then it must be approved by stakeholders in a week.

Figure 3 Front and Back of the User Story for E-flower Ordering System.

### 4.2.3. Data Model

A state diagram is data model that visually shows how an object moves between different states. This model helps to show the life cycle of an object in a solution. State diagram describes of a use case or thing in its life cycle state of change, emphasizing the order of dynamic views and behavior of the system object, the state diagram of order flower use case illustrated its status, events and activities conversion conditions must be met in order to convert the conversion to the next activity, as shown in Figure 4. This diagram illustrates the transition between states, the sequence in which the transition occurs, and the events that trigger each transition.
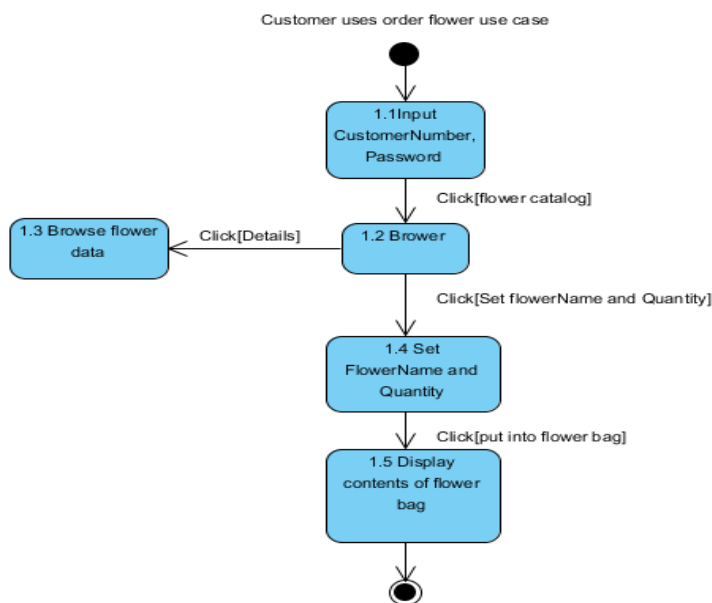
Customer uses order flower use case

1.1 Input CustomerNumber, Password

Click[flower catalog]

1.3 Browse flower data ← Click[Details] — 1.2 Brower

Click[Set flowerName and Quantity]

1.4 Set FlowerName and Quantity

Click[put into flower bag]

1.5 Display contents of flower bag

Figure 4 State Diagram for Ordering Flower Use Case

### 4.2.4. Rule Model

Decision trees and decision tables is a Rule model to depict a series of decisions and the outcomes they lead to. Decision trees work best with binary choices. Decision trees are described in a tree of decision points where each branch represents a different choice. The far right of a decision tree (the leaves) represent the outcomes for a decision or series of decisions. Decision points in a decision tree are commonly represented as text at the branch points or in diamond shapes at the branch points. Decision outcomes are typically represented in boxes as shown in Figure 5:
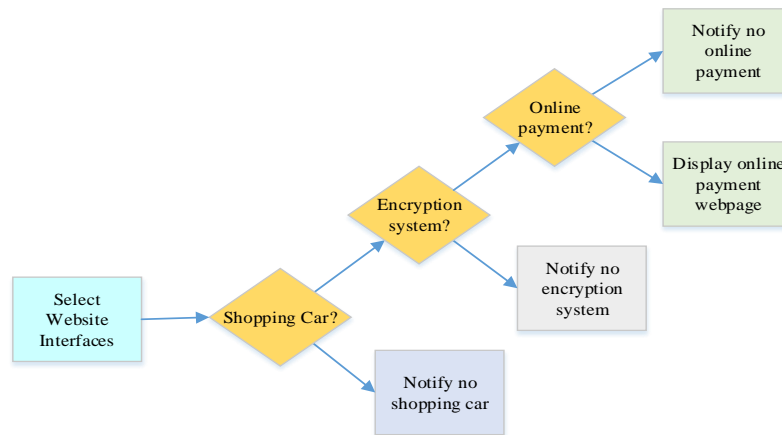
Figure 5. Decision Tree for Select Website Interface of Business rules the Florist Company

## 5. Traceability and Monitoring and Solution Evaluation

During traceability and monitoring, the traceability matrix and associated attributes are created and applied to help monitor and control the product scope. Approved requirements are baselined and tracked. As new requirements surface, these are documented, added to the traceability matrix, assessed for their impacts to the project and product, and presented to stakeholders for approval. Throughout traceability and monitoring, the status of all requirements is communicated using the communication methods defined and approved within the business analysis plan (PMI, 2015). Once the requirement attributes are determined, the traceability matrix created, and requirements approved and baselined, the requirements are monitored throughout the project life cycle. At Enterprises often trace their requirements using a structure called a Requirements Traceability Matrix as shown in Table 10:

Table 10 Requirements Traceability Matrix

| ID | Req Des. | HLR | PO | BG | Prio. | Req. status | Change? | Change Cont. | Date Prop. | Date Comp. | Results | Prod. phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Change logistics company | HLR01 | PO01 | No | 5 | Proposed, Rejected | | | | | | 3 |
| 5 | Simplify ordering process | HLR02 | PO02 | Yes | 1 | Proposed, Approved, Completed | | | | | | 1 |
| 8 | Receive products within 24 hours | HLR03 | PO03 | Yes | 4 | Proposed, Replaced | yes | Limited to urban areas for 24hr delivery | Mar. 01, 2015 | Mar. 26, 2015 | passed | 2 |
| 11 | Interface fit users' needs | HLR04 | PO04 | Yes | 2 | Proposed, Approved | | | | | | 1 |
| 17 | Increase e-payment system | HLR05 | PO05 | Yes | 3 | Proposed, Deferred | yes | 1. Confirm transaction security 2. regulatory compliance | Mar. 02, 2015 | Mar. 26, 2015 | passed | 2 |

The requirements baseline is the boundary that contains all of the approved requirements for the project, project phase, iteration, increment, release, or any other part of a project. The baseline provides a mechanism for comparison, thereby allowing the project team to recognize that a change has occurred. All approved work is inside the boundary or baseline. Everything outside the boundary needs to be approved. Once requirements are approved, these can be changed only through the change control procedures defined for the project. In an adaptive life cycle, requirements baseline changes should focus on: (1) Baselining requirements is performed by maintaining the product backlog. (2) Baselining is an iterative process focused on release and iteration planning. (3) The product owner is the primary point of contact for adaptive projects and is, therefore, ultimately responsible for approving requirements.

Evaluation consists of business analysis activities performed to validate a full solution - or a segment of a solution - that is about to be or has already been implemented. Evaluation determines how well a solution meets the business needs expressed by stakeholders, including delivering value to the customer. Evaluation provides input to go/no-go business and technical decisions when releasing an entire solution or a segment of it. Evaluation of an implemented solution may also be used to identify new or changed requirements.

Development phases for information management system such as online Florist include: acceptance criteria (AC), requirements specification, system design, component design, and they are the input for user acceptance testing, system testing, integration testing, unit testing, respectively. For an iterative or adaptive project life cycle, validation is performed at the end of every iteration, sprint, or release, when the team provides production-ready functionality for the stakeholders to evaluate.

AC provided by business stakeholders or SME for Solution is better to establish early. AC server as a foundation for evaluating candidate solution. It is useful in the development of verification strategies and to identify which areas of a solution needs the most testing. AC for functional requirements, expected values take the form of exact numbers or results. When the actual results of an evaluation do not match the expected results, there may be defects. For functional or nonfunctional requirements or user stories or use cases with defined AC, the expected results can be compared with the actual results. AC for nonfunctional requirements, expected values take

the form of tolerance ranges. The minimum acceptable value represents a commitment by the project team to remain mindful of business needs.

If the actual solution delivers less than the minimum acceptable value, the solution is defective in that regard. When a defect is found during evaluation, it should be addressed by additional requirements analysis, impact analysis, and change requests. For defects found during evaluation, probability and impact matrix can be used to assess their likelihood of occurrence and impact and then to prioritize the defects and determine how to resolve. The defect might exist in: (1) The requirements is written wrong, or is incorrect. (2) The software does not match requirements operational defect. (3) Test case does not expose an existing defect or erroneously identifies an action as a detect. Business Analyst stays involved in the defect repair process by monitoring the repair or the replacement. If a defect cannot be resolved within the time limit, Stakeholders cannot accept this defect. Business Analyst may investigate options for mitigating the effects. These may include additional quality control checks, new manual processes, removal of support for certain exception cases or other measures.

The stakeholders in the RACI matrix who were identified as having a role to approve or sign off on the solution are generally the individuals who make the go/no-go decision. Whenever possible, go/no-go decisions should be made during an in-person meeting to allow all stakeholders to hear the rationale for the decisions from their counterparts. The individual who analyzed the actual vs. expected results should attend the decision meeting.

The formality of signoff depends upon the type of project, the type of product, the project life cycle, and corporate and regulatory constraints. For an adaptive project life cycle, informal signoff generally occurs at the end of each sprint or iteration, with formal signoff occurring prior to release of the solution for this research.

## 6. Conclusions and Recommendations

Business Analysis is a relatively new profession and many of enterprises are struggling with ways to communicate the great value that Business Analyst's bring to an enterprise. Empowers the business analyst to gain a complete understanding of business analysis fundamental concepts and unlock the value of a business analyst to an organization in identifying problems and opportunities and finding solutions.

The business analyst practitioner can learn how to define the business needs and apply the most effective tools and techniques to elicit, analyze and communicate requirements with business stakeholders. A helpful and insightful look at the application of business analysis tools and methods when operating within to the Agile environment.

A business analyst plays many roles, who is business analyst, systems analyst, and business process analyst, to deliver business value. We hope examples on a real life project case study make it easier to learn how to apply each business analysis technique. If any interested researcher wants to know in-depth about the business analysis methodology and techniques, the PMI-BAG is recommended for a good guidance to read and practice.

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