

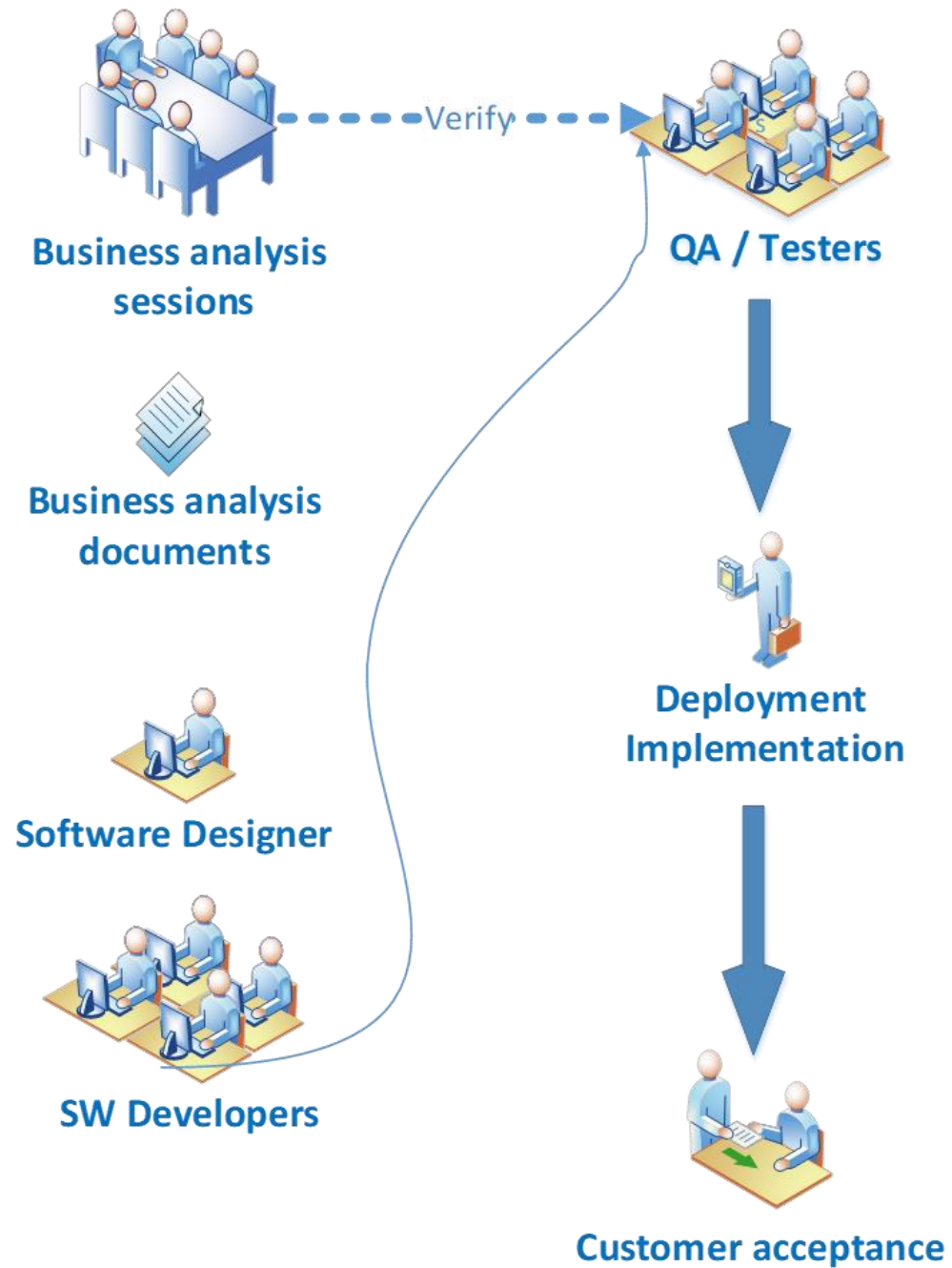
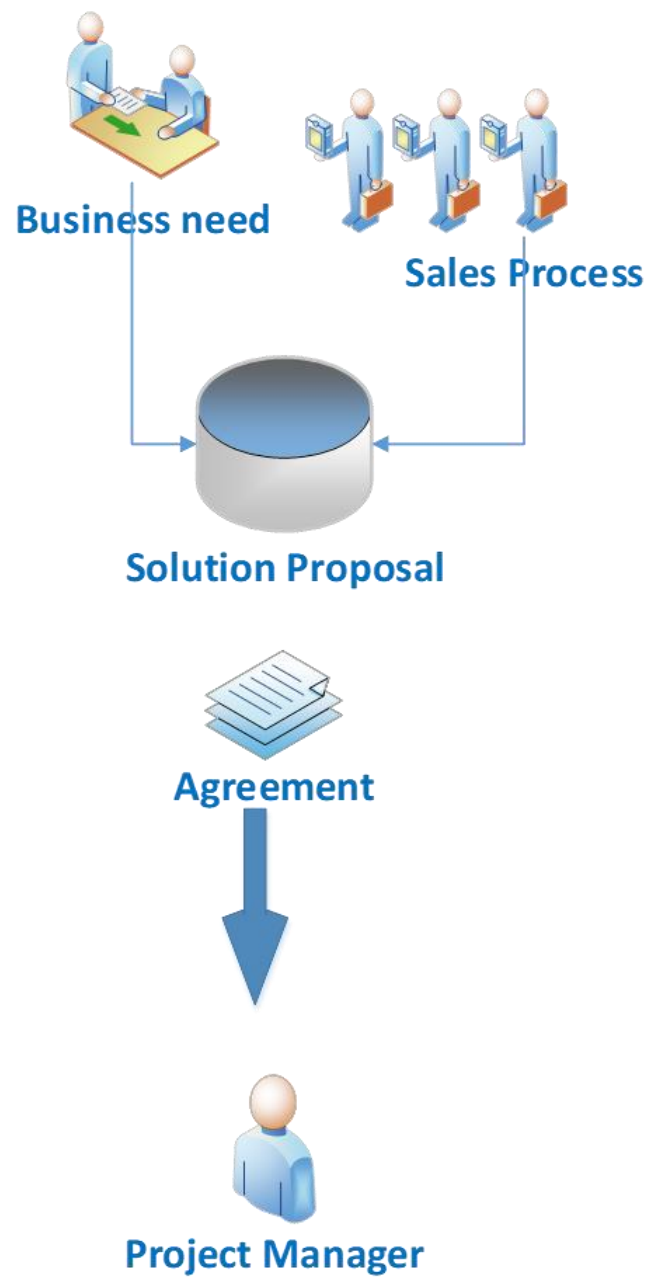
System Analysis and Design

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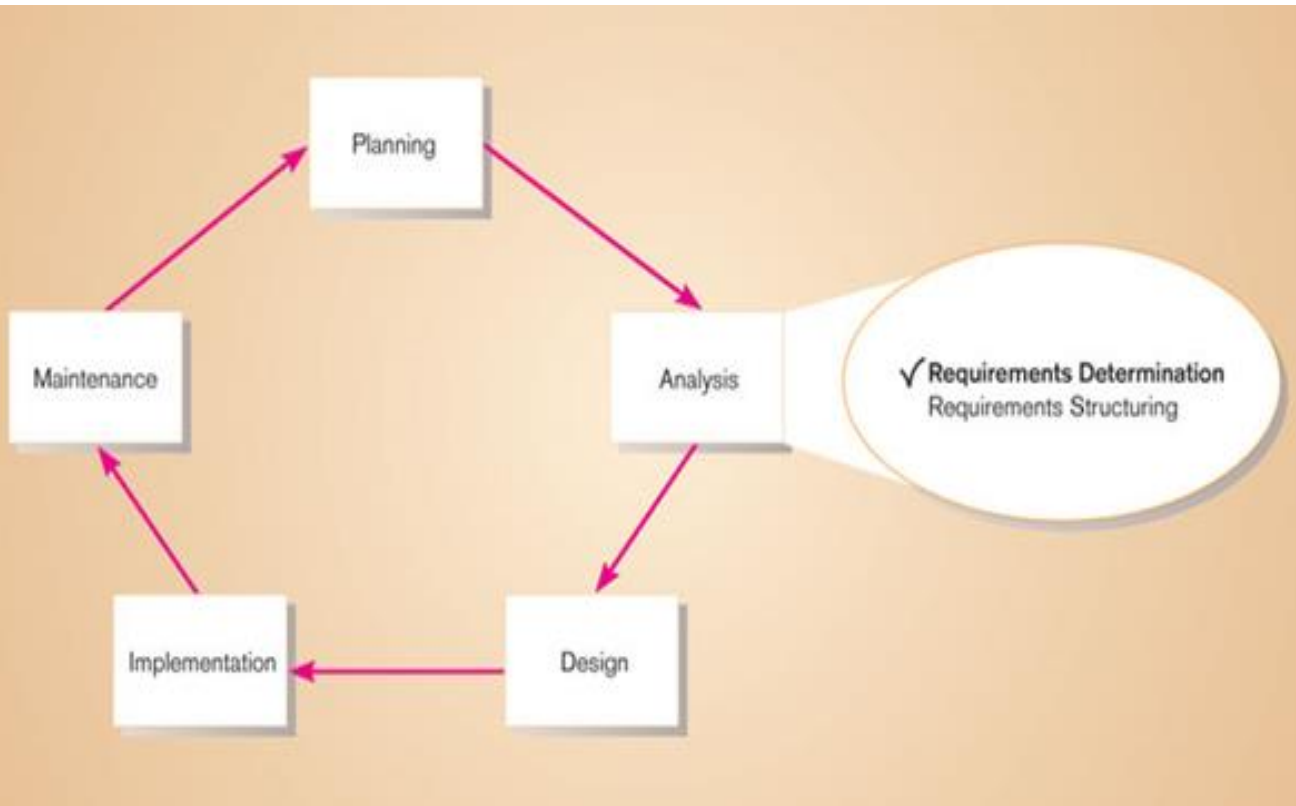
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Analysis Phase



- **Who** will use the system.
- **What** the system will do.
- **Where** and **when** it will be used.

Two Sub phases:

1- Requirements Determination:

Careful study of organization **current procedures** and the **information systems used** to perform organizational tasks.

2- Requirements Structuring

Relationships between requirements and eliminating redundancy

What is a Requirement?

- A Requirement is a **usable representation** of a **need**.
- Requirements focus on **understanding what kind of value** could be **delivered** if a requirement is **fulfilled**.
- A requirement defines:
 - A **Feature** that a future solution has to enable (Cloud Access)
 - A **Function** that a future solution has to Execute (Calculate Savings)
 - A **Fact** that a future solution has to enforce (regulations)
 - A **Quality** that a future solution has to exhibit (Access file in 1 second)

Requirement Classification Schema

- 1- Business requirements**
- 2- Stakeholder requirements**
- 3- Solution requirements**
- 4- Transition requirements**

Requirement Classification Schema

1- Business requirements: statements of *goals*, *objectives*, and *outcomes* that *describe* why a *change* has been initiated.

They can apply to the **whole of an enterprise**, a business area, or a specific initiative.

2- Stakeholder requirements: describe the *needs* and *wants* of stakeholders that must be met in order to *achieve the business requirements*.

They may serve as a **bridge** between **business** and **solution** requirements.

Requirement Classification Schema

3- **Solution requirements:** describe the *capabilities(functions)* and *qualities* of a solution that *meets the stakeholder requirements*.

They provide the appropriate *level of detail* to allow for the *development* and *implementation* of the solution.

Solution requirements can be divided into two sub-categories:

a- **Functional requirements:** What the system should **DO**? describe the *capabilities/features* that a solution must have in terms of the *behavior* and *information* that the solution will manage, and

b- **Non-functional requirements:** How the system should **BE**? describe *conditions/performance constraints* under which a solution must *remain effective* or *qualities* that a solution must have.

Requirement Classification Schema

4- Transition requirements: describe the *capabilities* that the solution must have and the *conditions* the solution must meet to *facilitate transition* from the *current* state to the *future* state, but which are not needed once the change is complete.

Attributes and **actions** necessary to implement the new solution in existing organization.

They are differentiated from other requirements types because they are of a *temporary nature*.

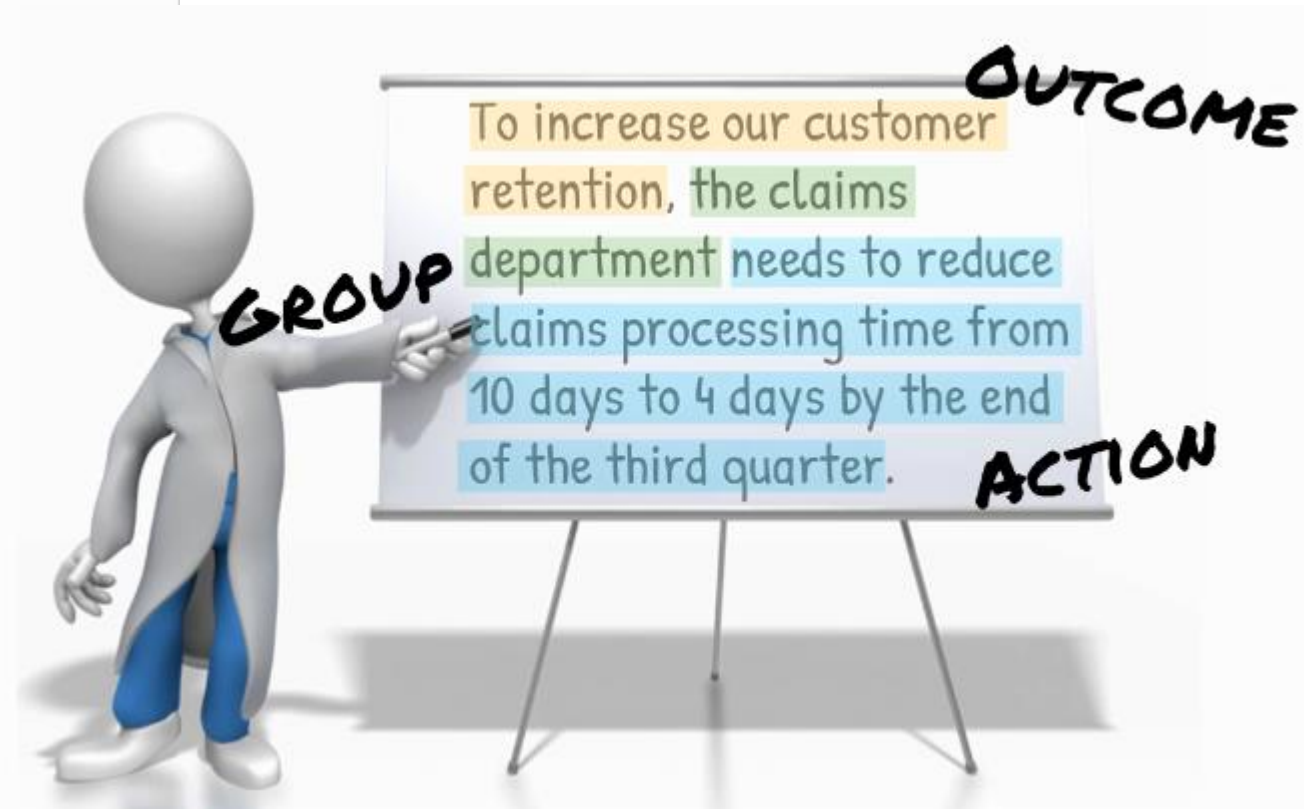
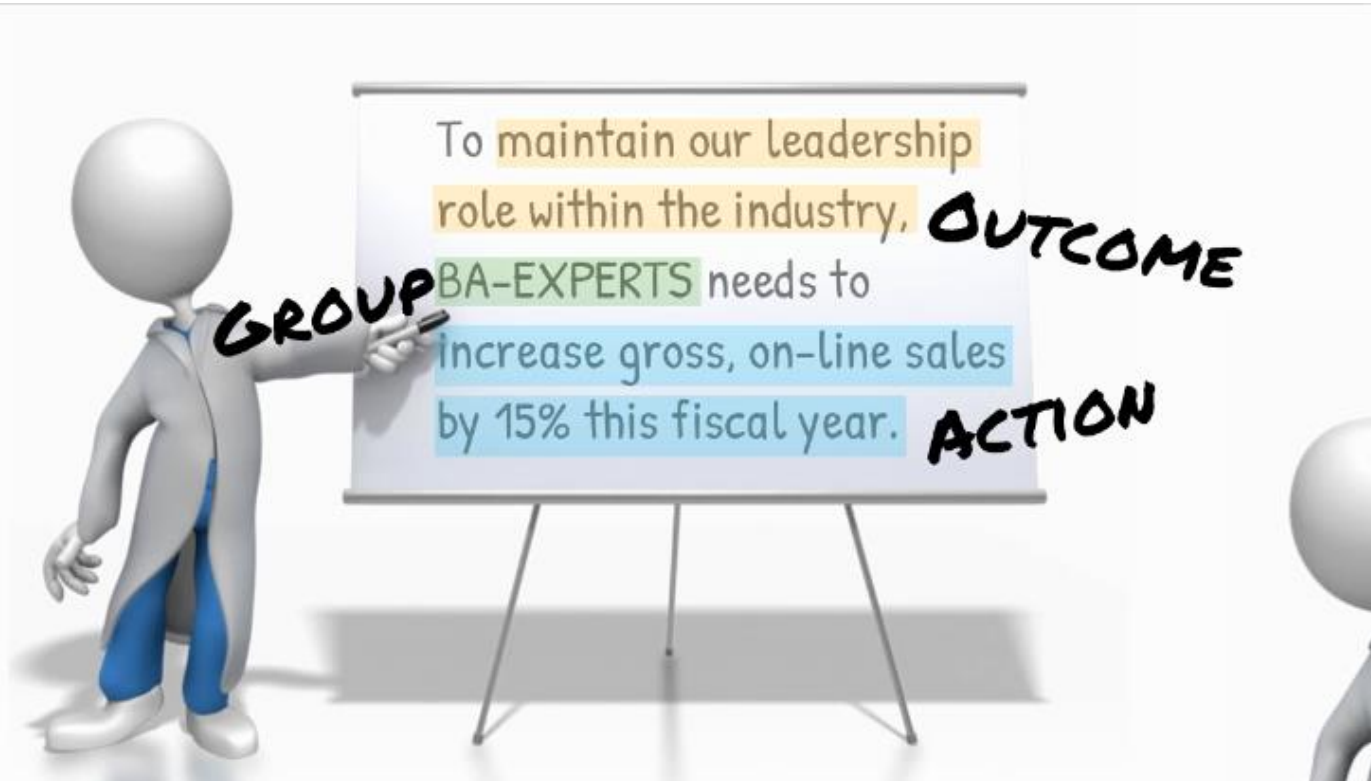
Transition requirements address topics such as *data conversion*, *training*, and *business continuity*.

Business Requirements

- Defines the high-level **goals** and **objectives**.
- Address the question “**Why the project is needed**”
- **Executive levels** usually define the business requirements
- Their purpose is to **prioritize** and **resource** projects.



Business Requirements Examples



Stakeholder Requirements

- Expresses the ***needs*** and ***wants*** of one or more ***stakeholders*** and ***how*** they will ***interact*** with this ***solution***.
- ***Bridge*** business requirements and Solution requirements.
- ***What is needed*** not ***How to achieve***



Stakeholder Requirements Examples



Solution Requirements

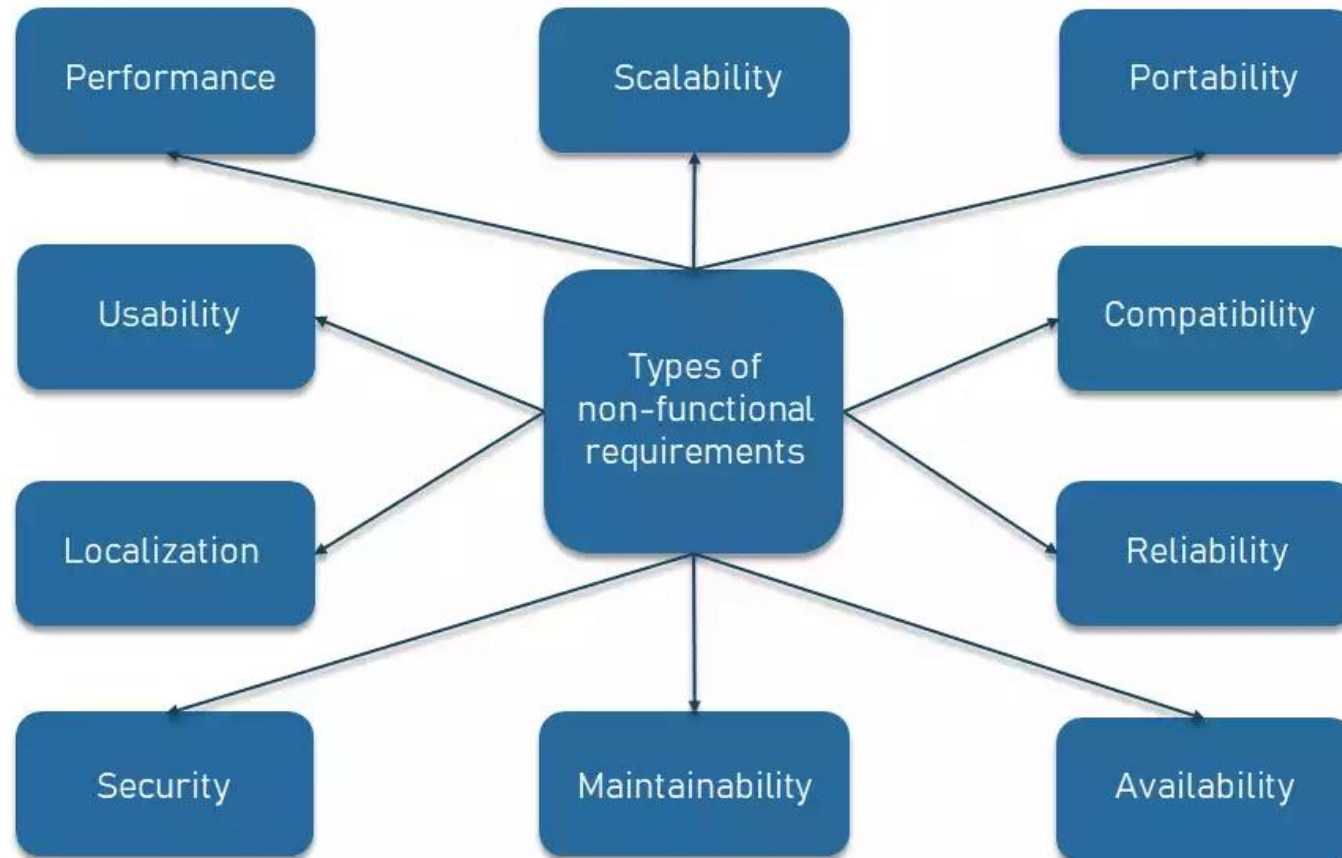
- Describe specific ***characteristics*** of the ***solution*** that need business and stakeholder requirements.
- **Functional requirements** should be ***easy*** for the ***developer*** to use. Expressed by:
 - List of functions
 - List of data elements
 - Process diagrams
 - Solution use cases
 - Prototypes
 - Activity diagrams

Calculate total charges including delivery costs and taxes

Do not ship goods to customers with overdue accounts

Solution Requirements

KEY TYPES OF NON-FUNCTIONAL REQUIREMENTS



Transition Requirements

- Describe *capabilities* need to *integrate* the *proposed solution* to the *existing solution* into the existing environment.
- Describes *capabilities* the solution must have to *facilitate* getting from **as-is** → **to-be**.
- ***Not needed*** when solution is in production.
- Defined by ***complete sentences***.
- Impossible to finalize the transition requirements before the design of selected solution is complete.

TRANSITION REQUIREMENTS



CURRENT SOLUTION

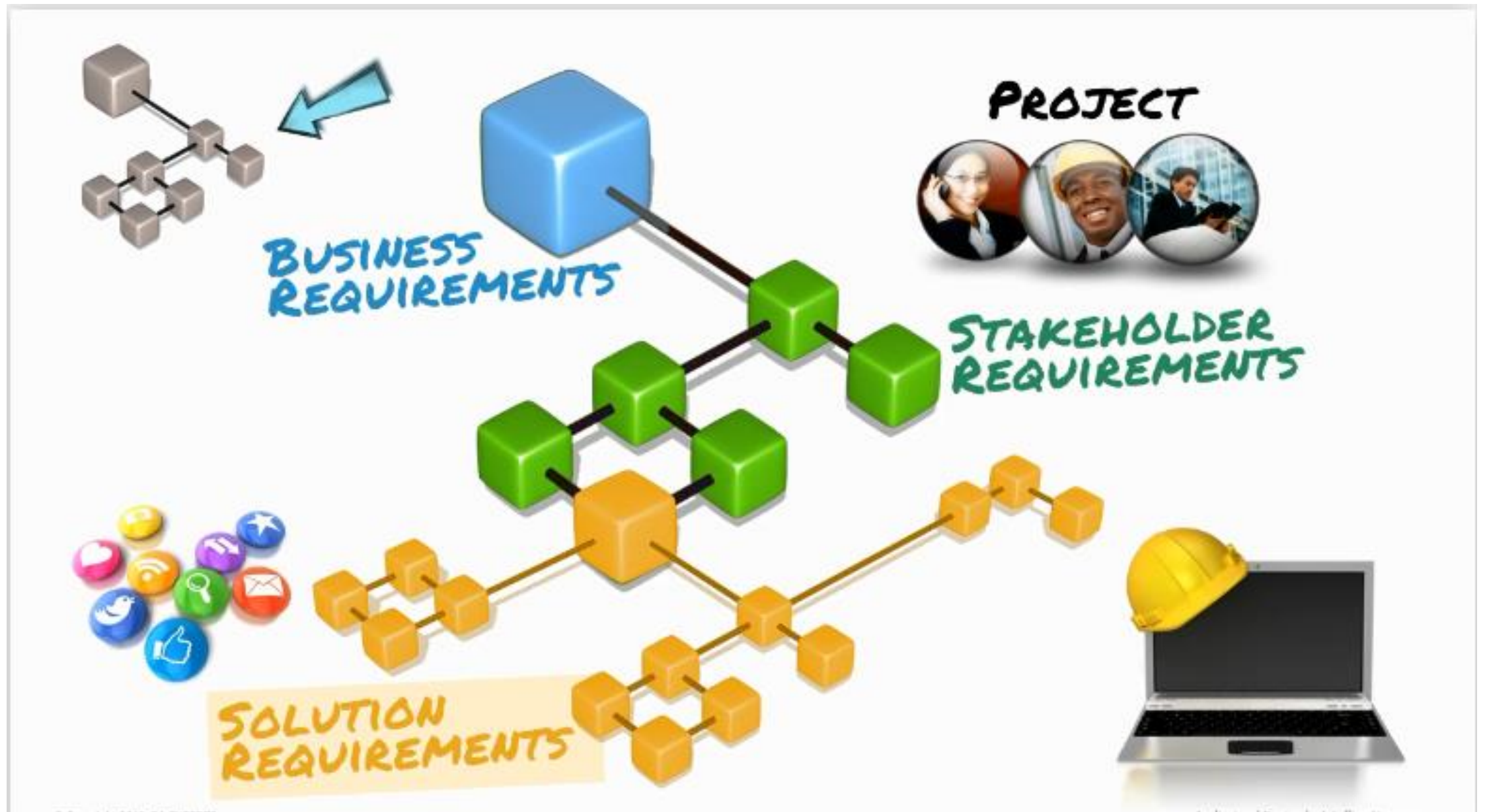


FUTURE SOLUTION

Transition Requirements Examples

Sales personnel must attend a 2-day new customer acquisition program prior to using the new sales support system

All existing customer data will be maintained in both the old and new database format until the end of the first quarter



Examples

Stakeholder Requirement:

As a user, the app must run on all versions of the iPhone.

Solution Requirement:

Functional requirement: The app must have a drop-down menu in black text on a light blue background that allows the user to select the product he wants to purchase

Non-functional requirement: The app must offer 100% reliability with high traffic.

Requirements vs. Design

Requirement	Design
View six months sales data across multiple organizational units in a single view.	A sketch of a dashboard.
Reduce amount of time required to pick and pack a customer order.	Process model.
Record and access a medical patient's history.	Screen mock-up showing specific data fields.
Provide information in English and French.	Prototype with text displayed in English and French.

Requirement Determination Tasks

- 1- Prepare for Elicitation
- 2- Conduct Elicitation
- 3- Confirm Elicitation results
- 4- Communicate Information
- 5- Manage Stakeholder Collaboration

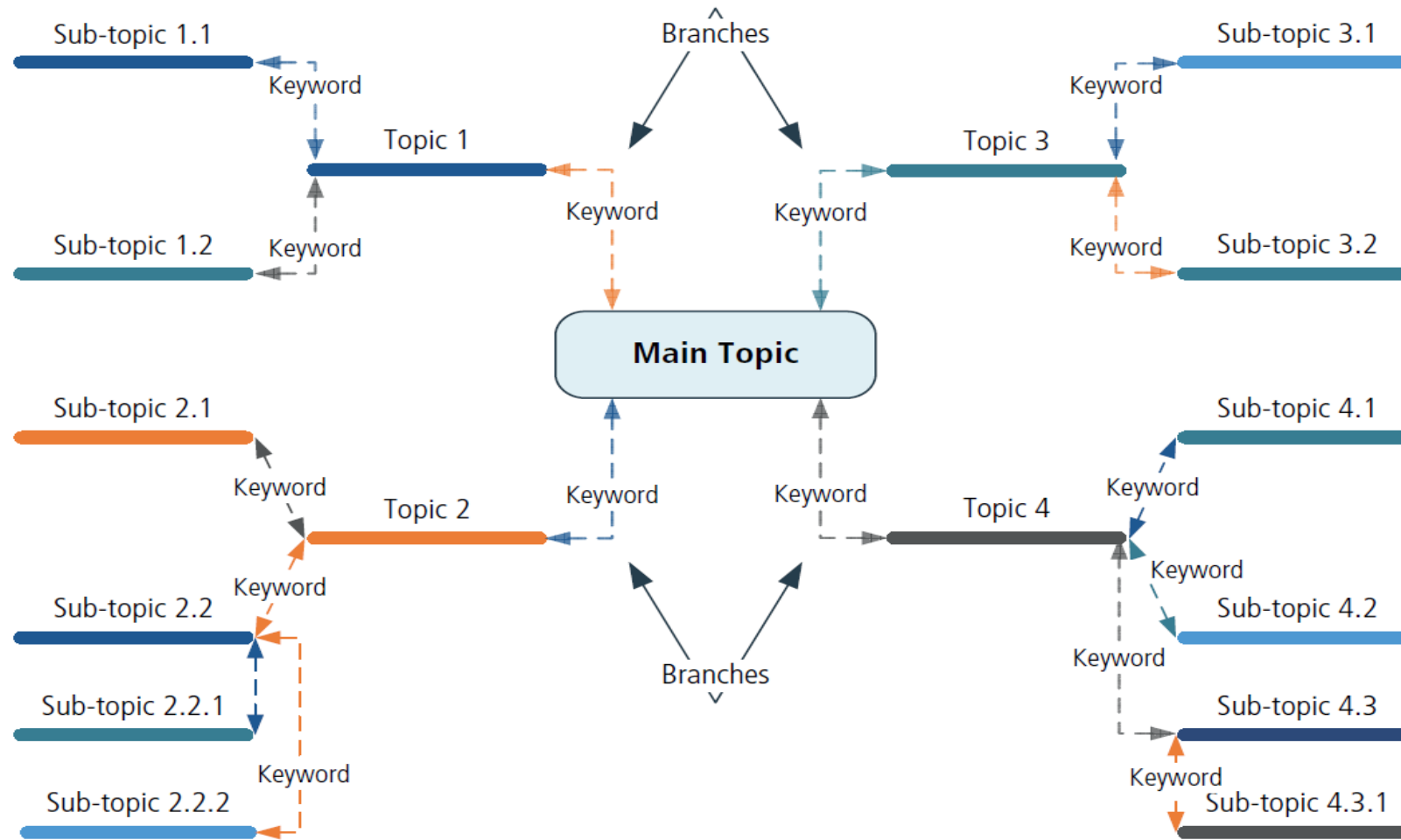
1- Prepare for the Elicitation

Defining the ***desired outcomes*** of the activity, and considering the ***stakeholders*** involved and the goals of the initiative

- i- Determining which ***work products*** will be ***produced*** using the elicitation results,
- ii- Deciding which ***techniques*** are best suited to produce those results,
- iii- Establishing the ***elicitation logistics***,
- iv- Identifying any ***supporting materials needed***, and
- v- Understanding ***circumstances*** to foster ***collaboration*** during an elicitation activity

Mind Map

Figure 10.29.1: The Taxonomy of a Mind Map



Mind Map

- Mind mapping is used to **articulate** and **capture** thoughts, ideas, and information.
- Mind maps use **images**, **words**, **color**, and connected **relationships** to apply **structure** and **logic** to thoughts, ideas, and information.
- A mind map has a **central main idea** supported by **secondary ideas** (or topics), followed by as **many layers of ideas** (or sub-topics) as necessary to fully capture and articulate the concept.
- **Connections** are made between **ideas** by **branches** that typically have a single keyword associated with them that explain the connection.

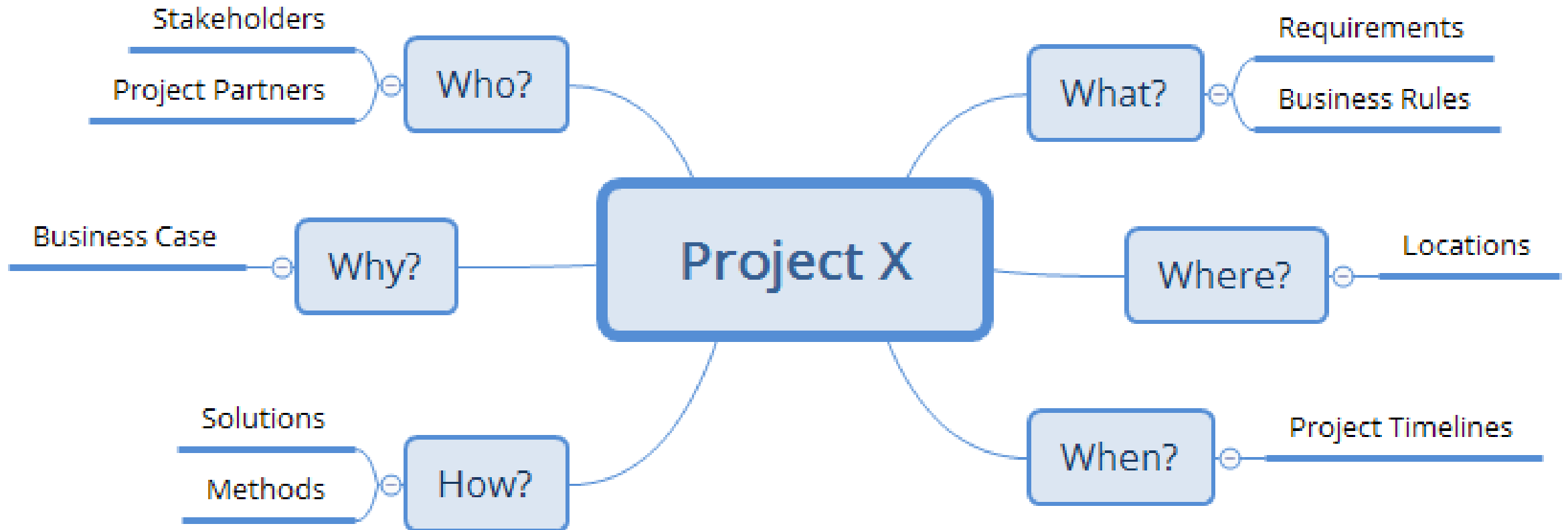
Mind Map

Business analysts use mind maps to:

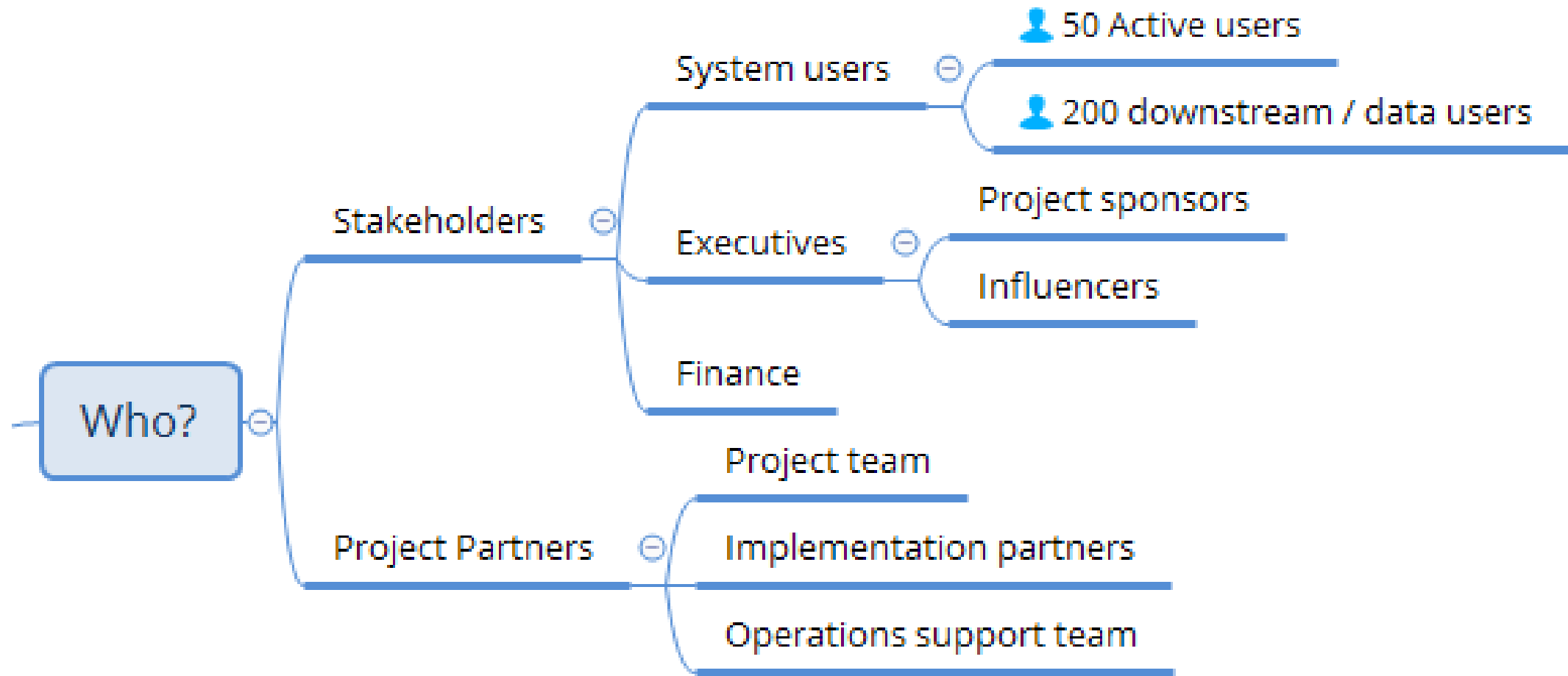
- think through and generate ideas on complex concepts or problems,
- explore relationships between the various facets of a problem in a way that inspires creative and critical thinking.

There is no standardized format for a mind map.

Mind Map - Example



Mind Map - Example



2- Conduct Elicitation

- The purpose of conducting elicitation is to **draw out, explore, and identify** information relevant to the change.

Elicitation Techniques:

1- Traditional Methods

- a- Interviewing and Listening
- b- Interviewing Groups
- c- Survey and Questionnaire
- d- Ethnography (Directly observing Users)
- f- Analyzing procedures and other documents

2- Modern Methods

- a- Joint Application Design
- b- Prototyping

3- Confirm Elicitation results

- Elicited information is **confirmed** to *identify* any *problems* and *resolve* them before *resources* are *committed* to using the information.
- This review may *discover errors, omissions, conflicts*, and *ambiguity*.
- *Collaboration* with *stakeholders* might be necessary to *ensure* their inputs are correctly captured and that they agree with the results of non-facilitated elicitation.
- If information is *not correct*, the *analyst* determines what is *correct*, which can *require more elicitation*.

4- Communicate Information

- The ***purpose*** of communicating analysis Information is to ***ensure stakeholders*** have a ***shared understanding*** of ***analysis information***.
- Analysts must communicate appropriate information to stakeholders at the ***right time*** and in ***formats*** (Language, tone, style) that ***meet*** their needs.
- Communication of analysis information is ***bi-directional*** and ***iterative***.

5- Manage Stakeholder Collaboration

- The purpose of managing stakeholder collaboration is to **encourage** stakeholders to **work towards** a **common goal**.
- Stakeholders hold **various degrees** of **influence** and **authority** over the **approval of work products**, and are also an **important source** of **needs**, **constraints**, and **assumptions**.
- As the analysis work progresses, the analyst **identifies stakeholders**, **confirms their roles**, and **communicates** with them to ensure that the **right stakeholders** participate at the **right times** and in the **appropriate roles**.
- Managing stakeholder collaboration is an **ongoing activity**.

5- Manage Stakeholder Collaboration (Cont.)

1- Stakeholder Lists

2- Stakeholder Maps

3- Persona

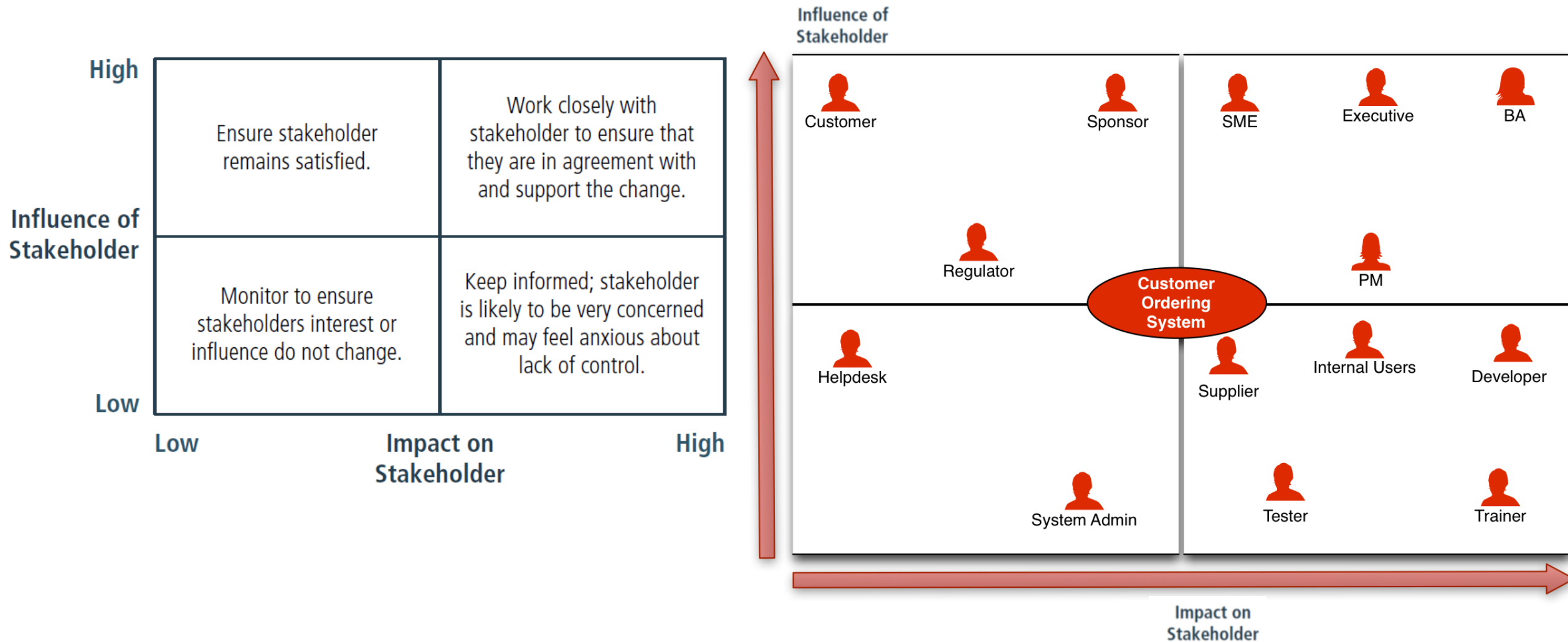
Stakeholder Matrix

Stakeholder Matrix: maps the level of stakeholder influence against the level of impact on stakeholder.

Figure 10.43.1: Stakeholder Matrix

Influence of Stakeholder	High	Ensure stakeholder remains satisfied.	Work closely with stakeholder to ensure that they are in agreement with and support the change.
	Low	Monitor to ensure stakeholders interest or influence do not change.	Keep informed; stakeholder is likely to be very concerned and may feel anxious about lack of control.
		Low	High
		Impact on Stakeholder	

Stakeholder Matrix



Personas

- A persona is defined as a fictional character that exemplifies the way a typical user interacts with a product.
- A persona is a **fictitious** character used as a specific **representative** of a user class
 - Yoshi is a 20-year-old pole vaulter from Tokyo who speaks some English
 - Bob is an IBM sysadmin in New York
 - Fritz is the 50-year-old father of a German



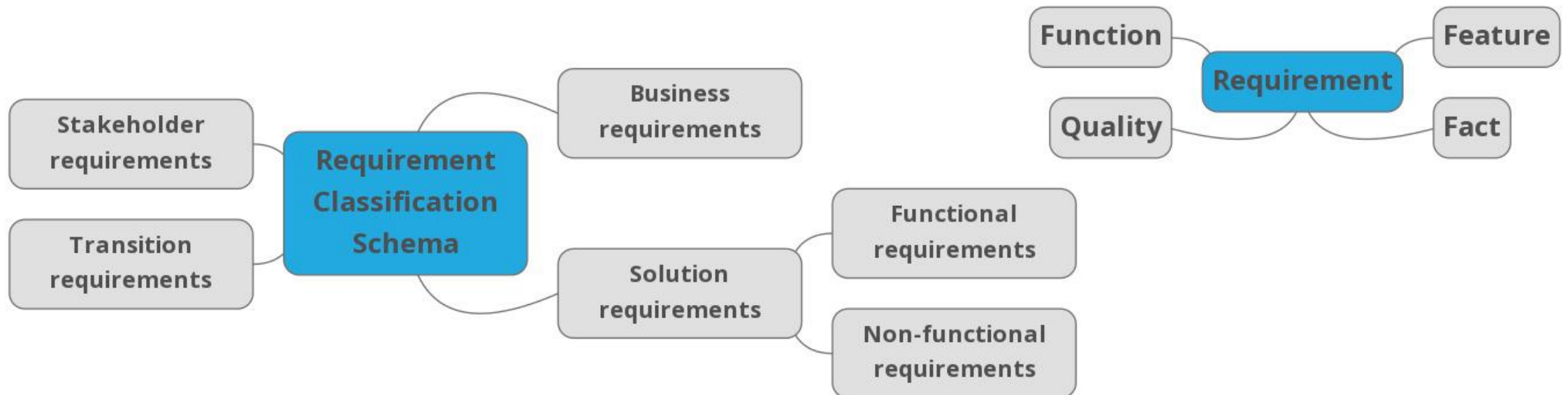
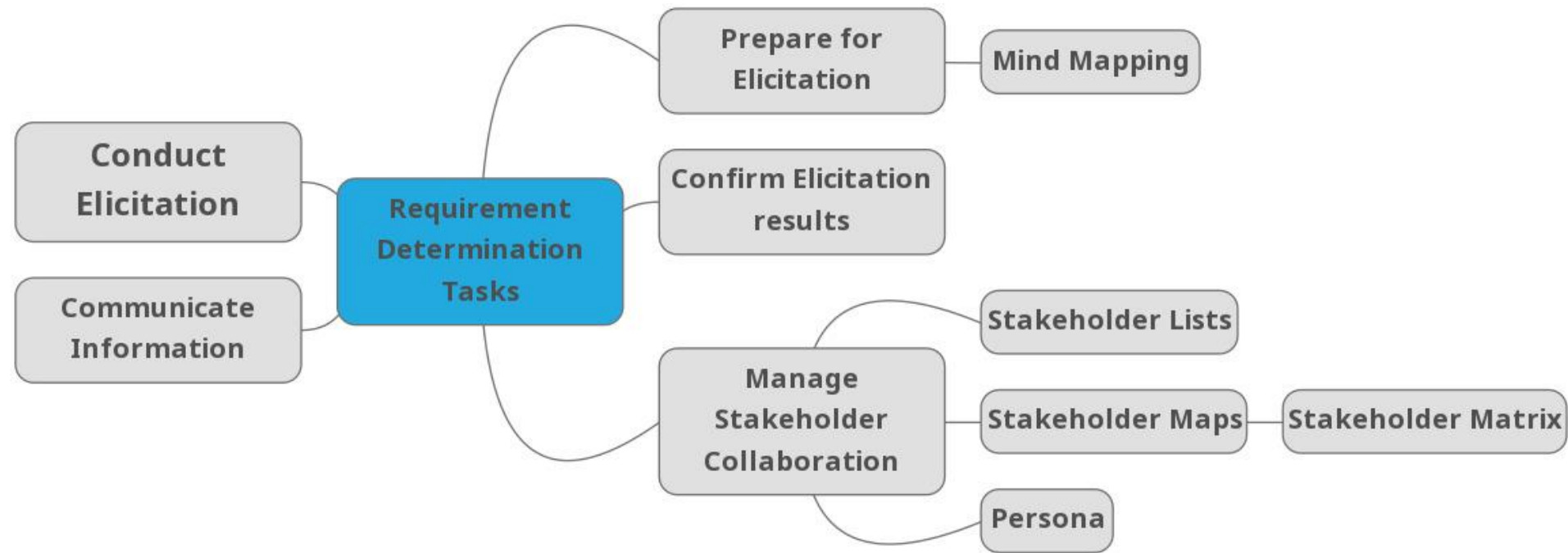
Exercise

Hospital management system keeps information related to the doctors, patients, visits, and prescriptions.

1. Doctor can visit the patients, examine them, add diagnoses, record symptoms, prescribe drugs, and schedule medical procedures, report the patient condition, and finally discharge the patient.
2. System keeps information regarding symptoms, diagnosis details and prescription drug details.
3. Patient can register himself, unregister, confirm the medical procedure, and fills request form for discharge.
4. Patient history can be accessed by the doctor to make better judgements.
5. Patient status includes: hospitalized, intensive care, away and discharged.

Exercise

- Re-write requirement 3 as a stakeholder requirement.
- Re-write requirement 4 as a non-functional requirement.
- Suggest a transition requirement for the hospital MS.
- Which of these requirements is a business requirement?
- Suggest two personas after reading requirement 3.



Sources

- Modern System analysis and Design, **Fourth Edition, Joseph S. Valacich**
Joey F. George
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Lecture
- BABOK, A Guide to the Business Analysis Body Of Knowledge,
International Institute of Business Analysis IIBA.

Thank You