

Business Intelligence Guidebook

From Data Integration to Analytics

Rick Sherman

Chapter-03

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

How Projects Really Truly Work

Create your own cartoon at www.projectcartoon.com



How the customer explained it



How the project leader understood it



How the analyst designed it



How the programmer wrote it



What the alpha testers received



What the beta testers received



How the business consultant described it



How the marketing department advertised it



What was shipped



When it was delivered



What the digg effect can do to your site



How the project was documented



How it was supported



The disaster recover plan



How the customer was billed



The open source version



What the digg effect did to the site



The competitor's product

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY



PURPOSE

- **INFORMATION IN THIS CHAPTER:**

- **Purpose**
- Goals
- Deliverables
- Roles
- Workflow
- Interviewing business people
- Documentation techniques

THE PURPOSE OF DEFINING REQUIREMENTS

Defining requirements creates the foundation of a successful business intelligence (BI) solution by documenting what you are planning to build.

The development team then uses these requirements to design, develop, and deploy BI systems.

Traditionally, a business analyst (or someone in that role) handles this phase, which takes place early in the project and includes a lot of document writing.



THE PURPOSE OF DEFINING REQUIREMENTS

- Most **BI failures** are not related to **technology shortcomings** but rather to a failure of **meeting expectations** or of **requirement surprises** toward the end of the BI project.



THE PURPOSE OF DEFINING REQUIREMENTS

- The **most common mistakes** in **defining requirements** are that they:
 - Are not detailed enough to clarify what is needed and set expectations
 - Restrict their focus to just business requirements
 - Are not refined and changed as the project changes
 - Do not involve business power users or BI designers and developers
 - Re-create the existing system with its warts and inefficiencies

THE PURPOSE OF DEFINING REQUIREMENTS

- The **documented requirements** are used to **guide the project, manage scope, and provide the input to the BI development team** just as blueprints are used for building your house.



DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

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GOALS

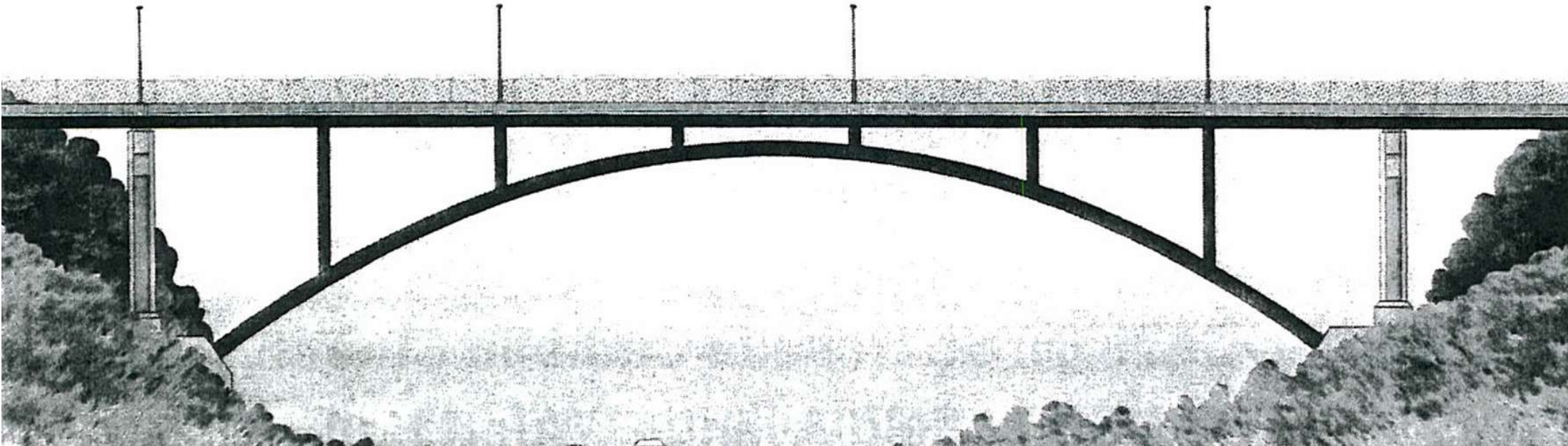
- The **primary goal** is to define the **set of requirements** that will be used to **design, build, and implement** BI solutions within an **agreed-upon project timeline and budget**.
- From a **business perspective**, it gets agreement on the business needs and their priorities, while from a **technology perspective**, it establishes what needs to be built in the three pillars of BI: data model, data integration, and analytical processes.

GOALS

- The **secondary goal** is for the BI team to **establish** the working **relationships** with its **sponsors**, **stakeholders**, and others that **support** the BI project. This phase is often the first opportunity for everyone in the project to work together:
 - Business people who will ultimately be the information consumers
 - Business and technology people who are subject matter experts (SMEs) in the analytical requirements, data source systems and data shadow systems
 - IT staff members who support the applications and infrastructure for the BI solution

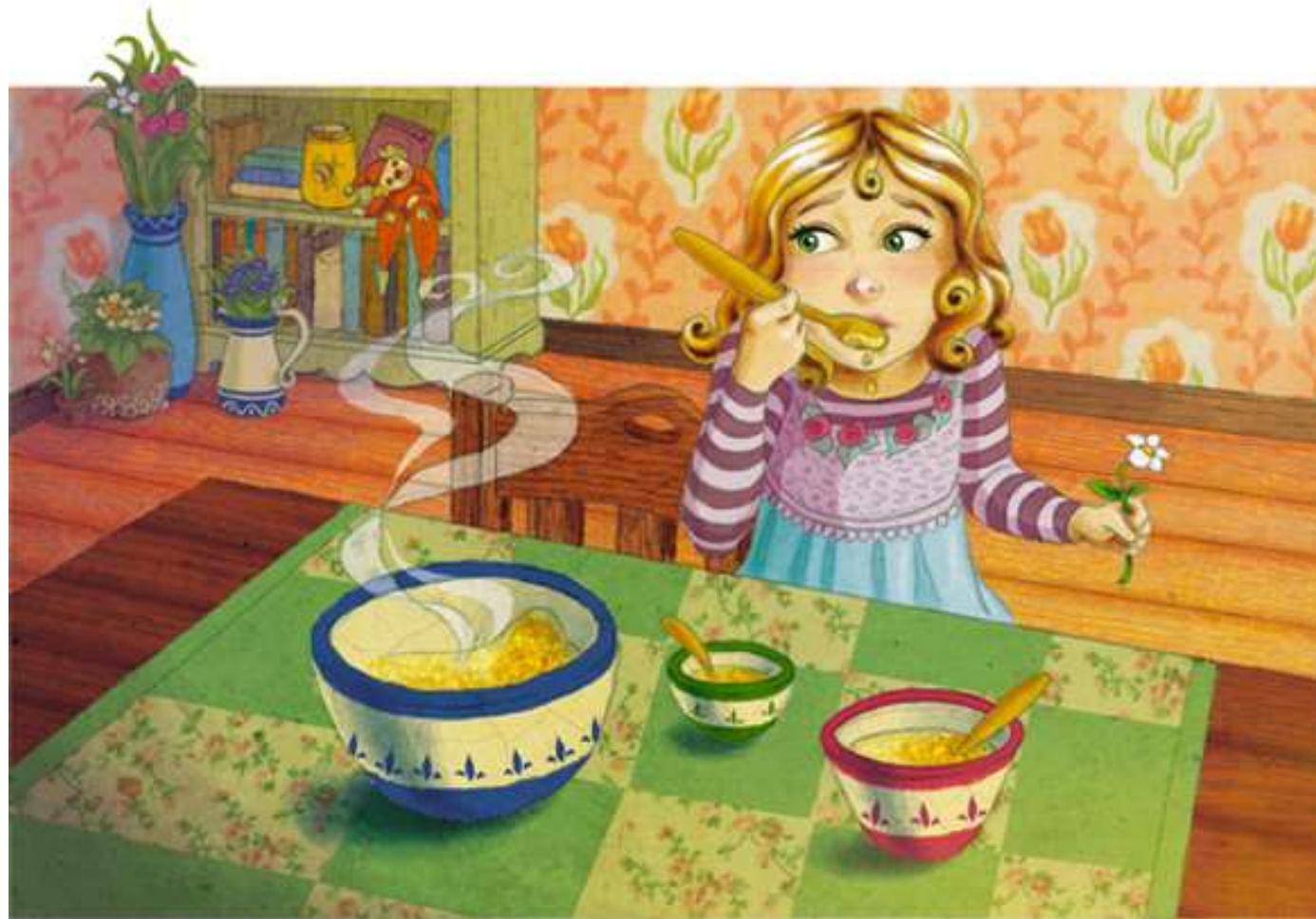
GOALS

- This phase is the bridge between **defining** the project **scope** and **designing** the **data model**, **data integration**, and **BI processes**.
-



GOALS

- Defining requirements often encounters the “Goldilocks syndrome” of being too hot or too cold, but never “just right.”



GOALS

- When **too hot**, the requirements process **suffers from analysis paralysis, takes too long, and appears too bureaucratic.**
- Although a waterfall-style software development life cycle has many benefits, this project approach can be accompanied by an inordinate amount of documents that need to be filled out completely as to whether they are applicable to the BI project and its scope.
- This approach puts the emphasis on completing a checklist of documents rather than getting the right content to build a BI solution on time and within budget.

GOALS

- When **too cold**, the **requirements are too high level**, creating **ambiguity** both with the business and the people building the BI solution.
- The primary danger is that the business expectations do not match what gets built.
- In addition, BI developers will need to interpret high-level requirements, which takes additional time and can introduce errors.
- Most BI project failures are not caused by technology but rather a failure to meet business expectations. This is often caused by high-level requirements that lack the necessary detail to reduce ambiguity.

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

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DELIVERABLES

- The **primary deliverable** is a **set of requirements** that business sponsors, stakeholders, and IT management have agreed upon.
- A **supporting deliverable** will be a **revised project plan** including **budget and resource commitments** based on these requirements.

DELIVERABLES

- The **requirements** need to be in **sufficient detail** to move on to following steps of designing the **data model, data integration processes, and BI applications**.

DELIVERABLES

- A complete set of requirements would include the following subjects:
 - **Business requirements**
 - High-level business requirements
 - Business processes supported
 - Business rules and metrics
 - **BI functional requirements**
 - Use cases
 - Process workflow and user interaction
 - Analytical styles and functionality
 - **Data requirements**
 - Data sources
 - Data conformance, consistency, and currency
 - Data integration
 - Data quality
 - **Regulatory and compliance requirements**
 - Country
 - Industry
 - Privacy and security
 - **Technical requirements**
 - Infrastructure standards
 - Technology directions

DELIVERABLES

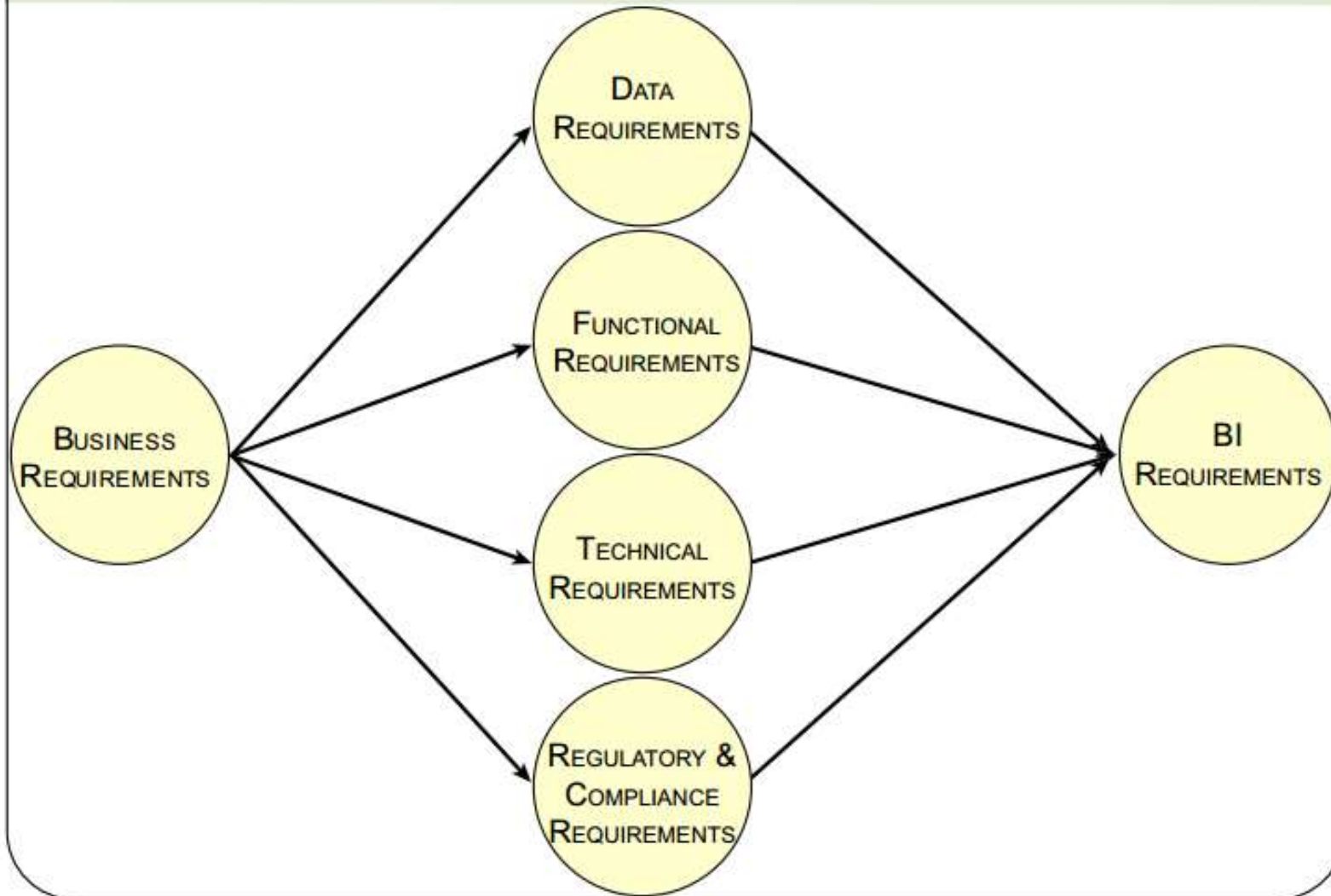
- The **most extensive scope**, requiring all of the above, would be for a **first-time BI, data warehouse (DW), or master data management (MDM)** initiative.



DELIVERABLES

- The best practice for **defining requirements** is a combination of **bottom-up** and **top-down**:
- Gather **new** requirements **bottom-up** to ensure that needed features in the existing systems **become part of the new solution and are not lost**.
- Determine **existing** requirements **top-down** to ensure that **all business stakeholders have their say and you get to validate and fine tune the requirements through feedback loops**.

**DEFINING REQUIREMENTS:
Stepwise Refinement**



DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

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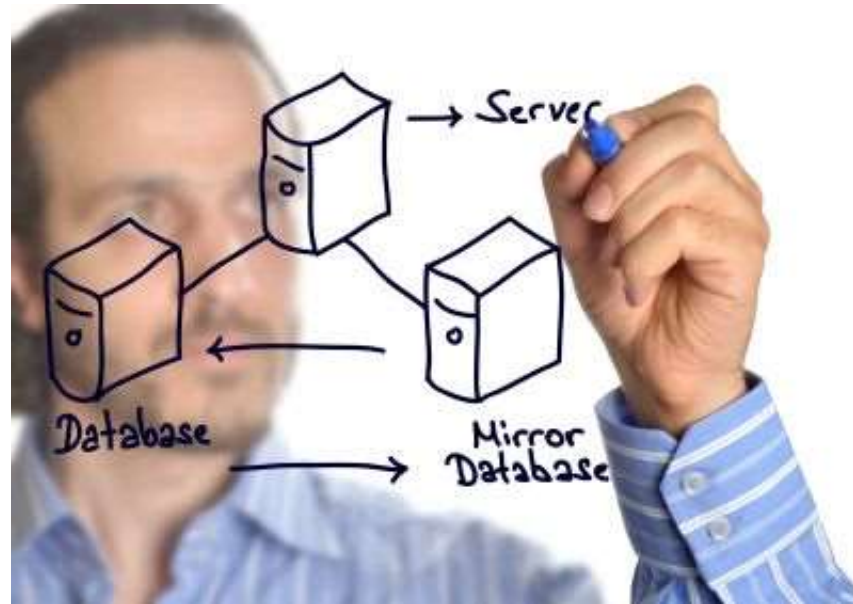
ROLES

- This project phase **requires** a lot of **interaction** between the **BI team** and **people** from **other business and IT groups**.
- This may be a time when the BI team feels **out of their comfort zone** because many of the activities involve people and politics rather than technology.



ROLES

- In addition to the **business analyst**, these roles include:
- Data architect
- Data modeler
- ETL (Extract, Transform, Load) designer
- BI designer



ROLES

These additional BI roles are not likely to participate in the initial interviews to gather business requirements but get involved as more detailed data and BI functional requirements are defined.

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

- **INFORMATION IN THIS CHAPTER:**

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- Roles
- **Workflow**
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DEFINING REQUIREMENTS WORKFLOW

- To build the BI solution, the **BI team** needs to gather the **business, functional and data requirements** from business and IT in sufficient detail.



DEFINING REQUIREMENTS WORKFLOW

- The process starts with **defining business requirements**, followed by **defining data, functional, regulatory/compliance, and technical requirements**.
- You can do these three tasks in parallel if you have **enough resources**, but be sure to coordinate and share findings.



DEFINING REQUIREMENTS WORKFLOW

- **BUSINESS REQUIREMENTS**

The initial task in this process is to obtain business requirements from the business sponsors, stakeholders, and BI users.

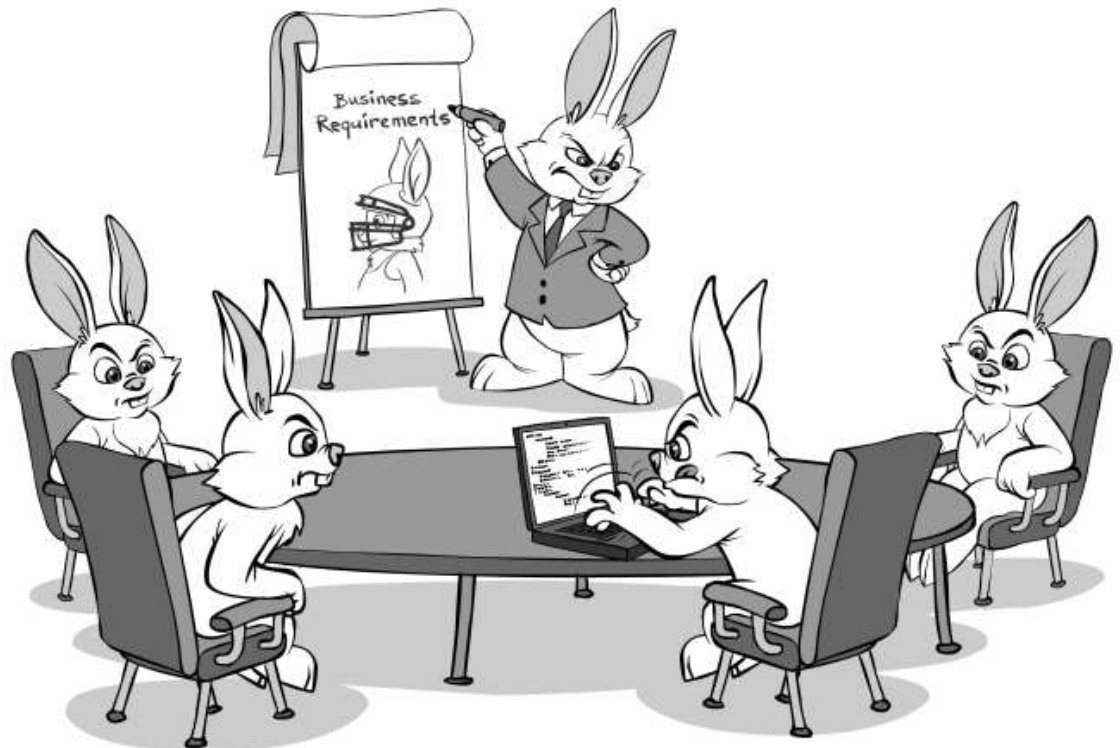


DEFINING REQUIREMENTS WORKFLOW

BUSINESS REQUIREMENTS

Gathering requirements is done primarily through **interviewing**, which is discussed in the following section.

This association identifies **who and what will be affected** by the BI solution.



DEFINING REQUIREMENTS WORKFLOW

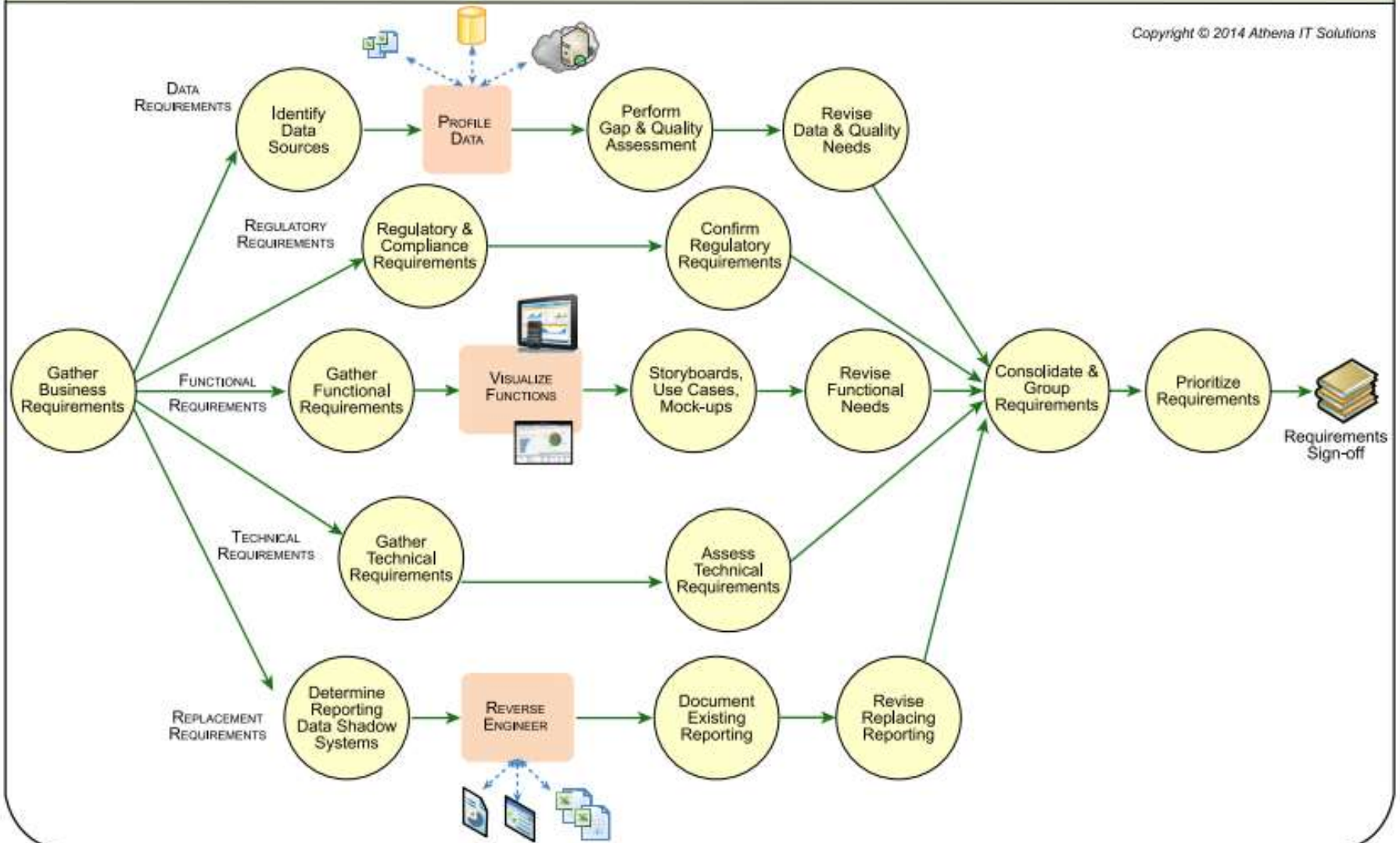
BUSINESS REQUIREMENTS

- While defining **business requirements**, it is crucial to define the **business metrics**—also referred to as **performance metrics**, **measure** or **key performance indicators (KPI)**—that will be required in the BI solution.



DEFINING REQUIREMENTS

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DEFINING REQUIREMENTS WORKFLOW

- **DATA (AND DATA QUALITY) REQUIREMENTS**
- Business requirements need to be **detailed enough** to identify the **data sources** or **systems of record (SOR)**, such as **applications, databases, or files** needed to build the BI solution.
- (The SOR is, by definition, the authoritative data source.)



DEFINING REQUIREMENTS WORKFLOW

DATA (AND DATA QUALITY) REQUIREMENTS

Defining data requirements means drilling into the data sources to identify detailed data content, such as columns within tables or fields within files, and the transformations that are needed for consistency, conformance, or to calculate the business metrics.

DEFINING REQUIREMENTS WORKFLOW

DATA (AND DATA QUALITY) REQUIREMENTS

- The BI team needs to perform **data profiling** or **source systems analysis** to determine the **current state of data quality** and its **consistency** within and across source systems.



DEFINING REQUIREMENTS WORKFLOW

- **FUNCTIONAL REQUIREMENTS**

- There is a tendency for functional requirements to be very generic, such as providing the ability to “drill down into data details,” “access multiple sources,” and “perform role-based security.”
- These types of generic functions should be evaluation criteria for BI products rather than BI functional requirements.

DEFINING REQUIREMENTS WORKFLOW

- Without more details, how does the BI development know what to build?
- This is a symptom of oversimplifying BI as if it is nothing more than accessing data.
- BI is a lot more complicated than that—it supports business processes and decision making by giving a business person the ability to analyze data.
- Functional requirements are a description of that analytical process.

DEFINING REQUIREMENTS WORKFLOW

FUNCTIONAL REQUIREMENTS

- BI functional requirements need to include the following:
 - BI use cases
 - Analytical process workflow and user interaction
 - Analytical styles needed

DEFINING REQUIREMENTS WORKFLOW

FUNCTIONAL REQUIREMENTS

- BI use cases document the **why**, **where**, and **how** of business people using the **BI applications** while performing their jobs.
- High-level examples of this include **sales pipelines**, **supply chain management**, **emergency room wait time**, and **product profitability analysis**.



DEFINING REQUIREMENTS WORKFLOW

FUNCTIONAL REQUIREMENTS

- The next portion of the functional requirements is describing the analytical process workflow and user interactions.
- Once you identify the business processes involved, it becomes clear that analyzing data and metrics is rarely a one-time occurrence.
- Rather, it is a succession of analyses that are often interconnected. Documenting the workflow and dependencies enables you to design a more productive BI environment for the people using it.

DEFINING REQUIREMENTS WORKFLOW



- **REGULATORY/COMPLIANCE REQUIREMENTS**

An enterprise's adherence to **laws, regulations, guidelines**, and **specifications** is going to vary depending on a range of variables including the **countries that are involved**, the **industry**, the **individual business**, and the **type of data**.

DEFINING REQUIREMENTS WORKFLOW

REGULATORY/COMPLIANCE REQUIREMENTS

- When you are gathering requirements, be aware that people you are working with either may not **know all the relevant and required compliance and regulatory rules** or may assume that you already know them.



DEFINING REQUIREMENTS WORKFLOW

- **TECHNICAL REQUIREMENTS**

You may need to follow **technical requirements, standards, or guidelines** that you are not even aware of. These requirements could be issued by the **CIO**, an **IT group** with responsibility for infrastructure or architecture, or the business group you are working with.



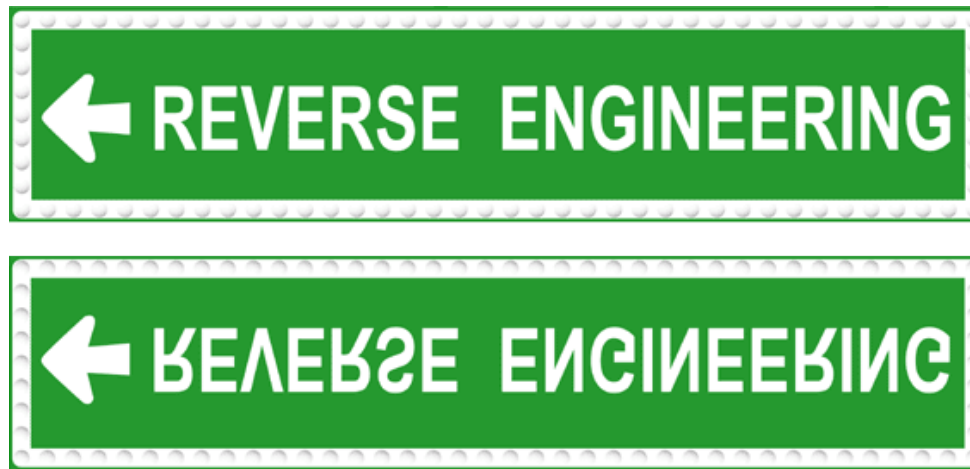
DEFINING REQUIREMENTS WORKFLOW

TECHNICAL REQUIREMENTS

- Technical requirements can include:
 - **New technology directions**, such as whether work is done in the cloud or on the premises
 - Policies on where the **data centers are located**
 - **What vendor hardware and software** can be used
 - If **BI appliances** are required
 - If **Web services** are required
 - Rules on **who can access the databases** (some enterprises only allow one group to access the database, so you will have to work with them)



DEFINING REQUIREMENTS WORKFLOW



- **REVERSE ENGINEERING (WHEN NECESSARY)**

It is rare to create a BI solution with no existing reporting capability in place.

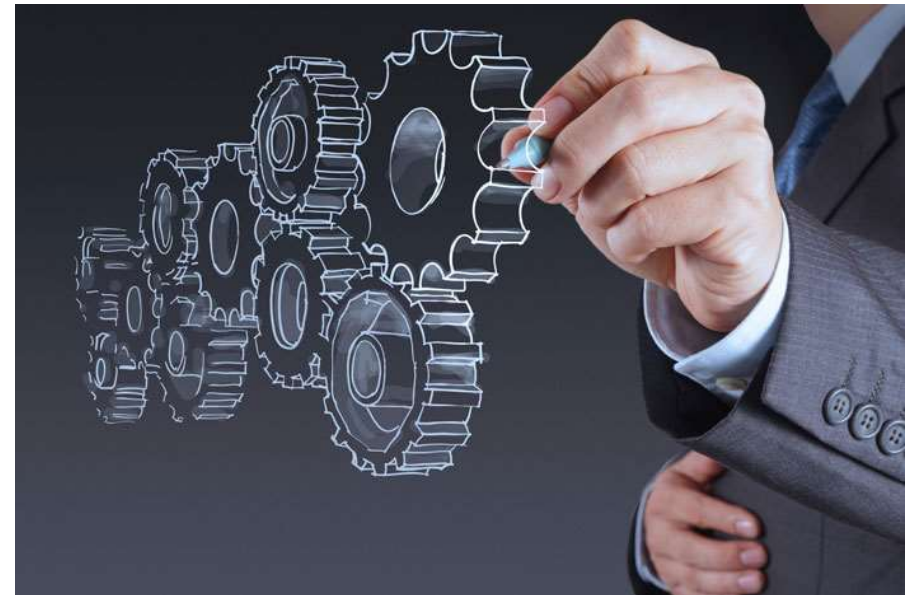
- In most cases, if the **analytical need** is important enough, then the business has been doing something, no matter how imperfect, to get data and analyze it.

DEFINING REQUIREMENTS WORKFLOW

REVERSE ENGINEERING (WHEN NECESSARY)

There are **two reasons** why the BI team will need to **reverse engineer** some or all of the existing **reporting or data shadow systems**:

- First, for **comparison**—although business users may complain about their existing reports or data shadow system, they have been using them for analysis for some period of time, so these systems are now the benchmark for comparison.
- Second, for **better understanding**—even when the old systems are being discarded and the business is providing “new” requirements, it is fairly common for many of the business rules and data used by the business in the old systems to be relevant



DEFINING REQUIREMENTS WORKFLOW

- **PUTTING IT ALL TOGETHER**

You will need to collect business, data, functional, regulatory, technical, and, if applicable, existing reporting requirements from different business groups and people who may have different needs or at least different viewpoints regarding those needs. As the scope of the BI solution expands, so too does the diversity of business groups and requirements you gather.

DEFINING REQUIREMENTS WORKFLOW

- **PRIORITIZING REQUIREMENTS**

Although business and technology participants should validate business, functional, and data requirements as soon as they are gathered and documented, make sure the consolidated requirements documentation is made available for final review and feedback.

DEFINING REQUIREMENTS WORKFLOW

PRIORITIZING REQUIREMENTS

- With the consolidated requirements documentation validated, the next step is to meet to review and prioritize those requirements. The discussions should include the following:
 - Who was interviewed
 - List of business requirements by business process
 - Brief description
 - Commonality of requirement across business groups
 - Feasibility

DEFINING REQUIREMENTS WORKFLOW

PRIORITIZING REQUIREMENTS

Never accept that every requirement is a top priority.

At a minimum, the business needs to classify the requirements in its initial reviews as:

- Must-have
- Should-have
- Nice-to-have
- Forget about it

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

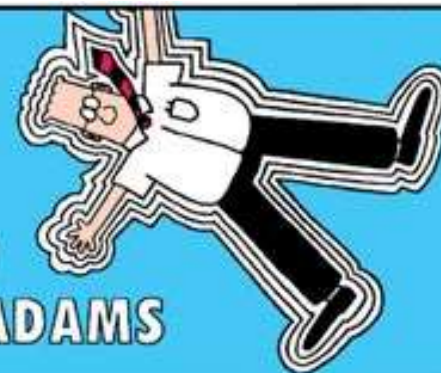
A photograph of four business professionals in a meeting. A man in a dark pinstripe suit and purple striped tie is smiling and looking towards the right. He is holding a pen and a piece of paper. To his left, a woman with long dark hair is looking at him. Behind her, a man in a dark suit is looking forward. On the far right, a man in a grey suit is seen from the side, looking towards the center. They are all seated around a table with glasses and papers.

- **INFORMATION IN THIS CHAPTER:**

- Purpose
- Goals
- Deliverables
- Roles
- Workflow
- **Interviewing business people**
- Documentation techniques



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INTERVIEWING

- The primary technique for gathering business and functional requirements is interviewing.
- This section will discuss how to:
 - Prepare for the interviews
 - Conduct the interviews
 - Follow up after the interviews



INTERVIEWING

PREPARATION FOR INTERVIEWS

There are three preparation areas:

1. **Background information** on the **enterprise** and **interviewees**
2. **Creating a list of subject areas** and, ideally, **specific questions** to be covered in the interview
3. **Inviting participants** and **providing the information from above**



INTERVIEWING

PREPARATION FOR INTERVIEWS

- **First**, the **background information** check for **requirement interviews** is similar to what one would do for a **job interview**.
- The **BI team** needs to be somewhat **knowledgeable** about the following subjects as they apply to the proposed BI solution heading into the interviews:
 - **Enterprise's business and customers**
 - **Business and technology initiatives**
 - **Business terminology and acronyms**
 - **Business processes** that proposed BI solution will be used to support
 - **Interviewees' title, organization, and background**

INTERVIEWING

PREPARATION FOR INTERVIEWS

- Background information on the organization, its business, financial performance, its industry, its competitors, and its customers is available on its Web site and outside financial sites.
- Other information may be on its intranet: business and technology initiatives, business terminology and acronyms, business processes, and organizational information.
- In addition, do not overlook business-oriented social media sites as a great source of background on your interviewees.

INTERVIEWING

PREPARATION FOR INTERVIEWS

- **Second**, the BI team needs to **determine what subject areas** they will focus on during the interviews.
- If possible, it is useful to know **what business processes** and existing reporting or data shadow systems the interviewees use in order to better focus the discussion and make it more productive.

INTERVIEWING

PREPARATION FOR INTERVIEWS

- Some sample questions for **business interviewees** can include:
 - What are your roles and responsibilities?In each area:
 - What information do you need?
 - How is that information gathered and analyzed?
 - What reports or data shadow systems do you use?
 - What information do you lack and how valuable is it to you?
 - What new types of business analysis would be useful to you and how?
 - Do you rely on others to perform this analysis? If so, who does it?
 - If a specific report or information is no longer available, what is your backup plan?

INTERVIEWING

PREPARATION FOR INTERVIEWS

- When interviewing **technology people**, it is extremely important to have an understanding of a **person's background** and **what systems or processes** they are involved in that **relate to the BI project**.



INTERVIEWING

PREPARATION FOR INTERVIEWS

- BI people find these interviews **easier** than interviewing **business people** because they “**speak the same language**,” i.e., technical jargon, and they often know more about the systems in which these people are involved.



INTERVIEWING

PREPARATION FOR INTERVIEWS



Invitation

- Finally, **even if** interviewees have already been asked to attend **requirements-gathering discussions**, send a **formal invitation** to all potential attendees. This invitation should include:
 - **Meeting time, location, and list of potential attendees**
 - **Brief overview of BI project**
 - **Goals and expectations** of meeting and participants
 - **List of subject areas** to be discussed (if known)
 - **Sample of list of questions** (if available)
 - **A list of decisions** that need to be made

INTERVIEWING

PREPARATION FOR INTERVIEWS

- The **interviewees'** time is valuable; **allowing them to prepare for the meeting** is well advised.
- Often the attendees do not really prepare for the interview sessions but, at a minimum, the invitation gives them a chance to at least glance at what the interview sessions are about.
- In addition, the **invitation content** is an excellent framework for the meeting **agenda** regardless of the attendees' preparation.

INTERVIEWING

- **CONDUCTING THE INTERVIEWS**

Whether the interview is a **one-on-one discussion** or a **group meeting**, the agenda published in the meeting invitation should guide the meeting.



INTERVIEWING

- It is important to **take notes** and, if possible, **record** the meeting (with permission). There are many conference, tablet, and smartphone applications for recording, but for greater productivity, I prefer a **smart pen** application that synchronizes the recording with bookmarks in my notes.



INTERVIEWING

CONDUCTING THE INTERVIEWS

When interviewing **business people**, a common **mistake** is to ask an **open-ended question** such as,
“**What do you want in regard to reporting and analytics?**”

This inquiry generally results in a business person either being focused on current limitations in their existing reports or asking for every piece of data their enterprise has and maybe more.

In either case, the BI team often feels like the business person does not know what they want or does not understand what BI can do for them.

The problem is not with the interviewee, but rather with the interviewer who abdicated responsibility to direct the discussion.

A **better question** would be something specific like, “**What is the most valuable report that you currently run from your data shadow system or on your own spreadsheets?**”

INTERVIEWING

CONDUCTING THE INTERVIEWS

- Ideally, the interviewers are prepared with subject areas to discuss and a list of questions. But the questions are just a starting point; the interviewee needs to delve into the areas that will yield the most information regarding the interviewee's requirements.
- Interviewing is an invaluable skill and includes an element of detective work. The interviewer needs to be flexible and follow the line of inquiry to where it leads.

INTERVIEWING

- **REVIEWING INTERVIEW CONTENT**

Try to review your notes (and recording, if you have it) as soon as possible after the interview. Although it is tempting to schedule interview sessions back-to-back, there are several good reasons to leave yourself time in between them to review what was discussed. First, you need to be very attentive during each interview; a day-long series of meetings will tire even the most dedicated person. Second, there may be overlap between what interviewees discuss—this will all blur together if you have meetings back-to-back. Finally, the interview may raise questions or ideas that you are going to want to write down and digest before you lose those trains of thought.

INTERVIEWING

REVIEWING INTERVIEW CONTENT

- After the interviews, you should send a thank-you note and, if at all possible, attach a quick summary of the interview, listing topics discussed, agreed-upon action items, and outstanding issues.



INTERVIEWING

- **INTERVIEW FOLLOW-UPS**

You will need to have **follow-up discussions** with interviewees to **clarify items, resolve disparities, and to expand upon the topics discussed.**

- These discussions need not be **formal meetings**, but may be handled more effectively with **one-on-one** or **informal group conversations.**
- The reason for this approach is that often the questions are very specific to particular people or topics.

INTERVIEWING

INTERVIEW FOLLOW-UPS

- It is a best practice to document the interview and include the following:
 - Interviewees, titles, responsibilities
 - Business objectives
 - Business initiatives
 - Business processes
 - Data subjects and sources such as application and databases, if possible
 - Stakeholders and business groups that will use BI
 - Issues, concerns, or risks
 - Success factors



INTERVIEWING

INTERVIEW FOLLOW-UPS

- After documenting the interview, send a copy to the interviewees and conduct a follow-up meeting with them to validate the content. Revise the document as necessary, and then, most importantly, get the interviewees to sign off on the document.

INTERVIEWING

INTERVIEW FOLLOW-UPS

- This serves two purposes:

first, it ensures that the interviewees do indeed agree on the content,

and second, it serves as explicit permission to publish the document for other stakeholders to review.

INTERVIEWING

INTERVIEW FOLLOW-UPS

- If there are materials that are not meant to be shared, be sure to clear them up prior to publishing.
- BI projects too often fail to meet expectations and deliver what the business is asking for precisely because this step was not taken seriously, allowing misunderstandings to arise and kill the project.

DEFINING REQUIREMENTS— BUSINESS, DATA AND QUALITY

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- **Documentation techniques**



DOCUMENTING REQUIREMENTS

- You should **document each of the processes** during the **requirements workflow**, gathering feedback from **applicable stakeholders** and refining the document throughout the process.
- It is much easier and productive to **create the documentation** while you go rather than waiting until you have completed all the tasks.
- If you wait, it is guaranteed that you will forget things and risk shortchanging the process by getting behind schedule.



DOCUMENTING REQUIREMENTS

- The key topics in the requirements documentation include:
 - Business requirements
 - Data requirements
 - Current state reporting assessment
 - Feasibility analysis
 - Critical success criteria

DOCUMENTING REQUIREMENTS

- In the “dark ages,” documentation meant an excessively long Microsoft Word document that few people read, and that was likely very verbose or poorly written.
- People spent way too much time on writing prose, editing it, and then finally giving up on it altogether.
- Once reviewed, the document went into a folder never to be seen again. This is bad practice!



DOCUMENTING REQUIREMENTS

- The best practices today are to use **collaborative tools** to **manage the content** and as many visual tools or techniques as possible.
- Although visual techniques **reduce writing**, the primary benefits are **improved communication** and **increased productivity**.



DOCUMENTING REQUIREMENTS

- The **simplest technique** is to have a **documentation tool** with **revision** capabilities to **track changes** and enable the document owner to accept or reject changes from each reviewer.
- You can also find collaborative tools that work in the **cloud** and on **mobile devices**; these may improve access and participation.



DOCUMENTING REQUIREMENTS

- Using a **collaborative tool** is recommended for **documentation**, but do not rely on it for gathering **requirements**, especially business requirements, since nothing replaces interactive **discussions between the stakeholders and you**.



DOCUMENTING REQUIREMENTS

- There are specific techniques or tools that you can use when gathering various requirements:
 - Business requirements
 - Storyboards
 - BI mock-ups
 - Prototyping BI objects
 - Data requirements
 - Data profiling
 - Output from data modeling, ETL, and BI tools
 - Functional requirements
 - Current state of reporting
 - Sample reports or spreadsheets
 - Sample data



DOCUMENTING REQUIREMENTS

- using **storyboarding**, **mock-ups**, or **prototyping** is an extremely effective method to **gather**, **validate**, and **document** functional requirements.
- These visual techniques are a much better way to communicate and establish joint expectations than writing dozens of pages of prose.
- After all the collaboration in defining and documenting the requirements, this phase should be completed with the business sponsor(s) and key stakeholders signing off on the requirements documentation.
- This sets expectations and establishes a baseline to manage the project as it progresses.