Previews of TDWI course books offer an opportunity to see the quality of our material and help you to select the courses that best fit your needs. The previews cannot be printed.

TDWI strives to provide course books that are content-rich and that serve as useful reference documents after a class has ended.

This preview shows selected pages that are representative of the entire course book; pages are not consecutive. The page numbers shown at the bottom of each page indicate their actual position in the course book. All table-of-contents pages are included to illustrate all of the topics covered by the course.

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TDWI Requirements for Data-Driven Enterprises

Discovery, Analysis, and Management

COURSE OBJECTIVES

You will learn:

✓ *How to deal with unique aspects of data-driven requirements*

✓ *Ways to categorize requirements to maximize their completeness*

✓ *Proactive approaches to requirements discovery*

✓ *How to solicit requirements for data-driven initiatives*

✓ *How to identify requirements for data-driven initiatives*

✓ *Why requirements management is essential and how it is performed*

✓ *How to analyze requirements*

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**Transforming Data
With Intelligence™**

Module 1

Requirements Challenges

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Traditional and Analytics Initiatives
Traditional Requirements

Sample Payroll System Business Requirements

- Collect employee time reports
- Calculate gross pay
- Withhold state and federal taxes
- Process benefits deductions and employer contributions
- Calculate net pay
- Pay employees by check or direct deposit
- Etc.

Sample Payroll System Information Requirements

- Add employee time report
- Calculate monthly gross from salaries
- Add W-4 form
- Process current period deductions
- Process current period contributions
- Maintain CYTD balance amounts
- Calculate current period net pay
- Print payroll checks
- Etc.

Traditional and Analytics Initiatives

Traditional Requirements

PURPOSE

The typical purpose of traditional requirements is to provide information on system capabilities and characteristics that need to be built to support a business function or process.

EXAMPLES

Examples of traditional business-level requirements for a payroll system include:

- Collect employee time reports
- Calculate gross pay
- Withhold state and federal taxes
- Process benefits deductions and employer contributions
- Calculate net pay
- Pay employees by check or direct deposit

These translate into functional requirements such as:

- Add employee time report
- Calculate monthly gross from salaries
- Add W-4 form
- Process current period deductions
- Process current period contributions
- Maintain current year-to-date balance amounts

BUSINESS REPRESENTATIVE ROLE

The business representative assigned to these initiatives is someone who is familiar with the business function or process and understands how it works. That person has a good understanding of the business transactions, scheduled reports, and prescribed business rules and is well equipped to answer questions posed by the business analyst seeking to gather the requirements.

REQUIREMENTS ANALYST ROLE

The business analyst's role is to gather the needed system features in the form of requirements. These requirements address what needs to be provided as well as how things are performed from a business perspective.

Traditional and Analytics Initiatives
Analytics Requirements

Sample Payroll Analytic Business Requirements

- Monitor overall payroll costs
- Identify people making more than 10% over the classification midpoint
- Understand the relationship between employee tenure and performance
- Analyze employee turnover
- Etc.

Sample Payroll System Functional Requirements

- Payroll costs by employee and pay period
- Classification midpoint salary amounts
- Employee hire date
- Employee job performance
- Employee termination date
- Etc.

Traditional and Analytics Initiatives
Analytics Requirements

PURPOSE

The typical purpose of analytics requirements is to provide insight into the information that is needed to support analysis and decision making.

EXAMPLES

Examples of analytics business requirements for a payroll system include:
- Monitor overall payroll costs
- Identify people earning more than 10% of the classification midpoint
- Understand the relationship between employee tenure and job performance
- Analyze employee turnover

These requirements don't directly reveal the information that is needed and how it will be used. Hence, in lieu of traditional functional requirements, what's needed is a set of information requirements.

Examples of information requirements include:
- Payroll costs by employee and pay period
- Classification midpoint of salary amounts
- Employee hire date
- Employee job performance
- Employee termination date

BUSINESS REPRESENTATIVE ROLE

The business representative assigned to these initiatives may or may not be the person who ultimately uses the information. Hence, while the business representative may be aware of what is needed on the surface, he or she may not know the ultimate use. In fact, the ultimate user may not be able to anticipate all the ways the analytics information could be used.

REQUIREMENTS ANALYST ROLE

The business analyst's role here becomes more difficult. The analyst needs to gather some requirements, but more importantly, he or she needs to discover the real requirements. To accomplish that feat, the analyst needs to help the business representative look beyond the surface requirements and must elicit needs that the business representative may not have initially considered.

For example, providing termination dates may be sufficient for calculating employee turnover statistics, but by discovering why these are needed and how they will be used, additional information requirements could be identified.

Traditional and Analytics Initiatives

Requirements Gathering vs. Discovery

GATHER	DISCOVER
Accumulate	Dig Up
Aggregate	Discern
Amass	Explore
Assemble	Reveal
Collect	Unearth

KEY CHALLENGES

- **Starting point**
- **Deliverable**
- **Data-driven**
- **Completeness**
- **Ambiguity**

Traditional and Analytics Initiatives
Requirements Gathering vs. Discovery

GATHER VS. DISCOVER

Synonyms for gathering requirements include *accumulate*, *aggregate*, *amass*, *assemble*, and *collect*. Something all of these have in common is that the requirements already exist and the task is to document them.

Synonyms for discovering requirements include *dig up*, *discern*, *explore*, *reveal*, and *unearth*. Something all of these have in common is that the requirements may not already exist, shifting the task to one that involves figuring out what they are.

CHALLENGES

Analytics initiatives require requirements discovery, not just requirements gathering. For information discovery, it's not enough to understand *what* is needed—it's necessary to understand *why* it is needed.

STARTING POINT

One of the first challenges for discovery is knowing where to start. Since there isn't a prescribed set of business rules for the analytics environment, it's difficult to determine the starting point. Simply asking, "what do you need" does not usually provide useful results.

DELIVERABLE

Traditionally, the project scope is governed by the function or process being addressed. The ultimate deliverable can be anticipated in these cases. With analytics initiatives, the ultimate deliverable often won't be known until later in the project or even after the project ends. Further complicating matters is that there is a difference between the project deliverable and the ultimate deliverable. The project deliverable is information—but the ultimate deliverable is business improvement.

DATA-DRIVEN

Analytics initiatives are data driven. Since data crosses organizational and functional lines, this means that participants beyond the primary business area may need to be involved.

COMPLETENESS

For a traditional effort, a complete set of requirements is feasible. For an analytics initiative, requirements often evolve both as the project is underway and following implementation.

AMBIGUITY

Analytics requirements are stated using verbs that are subject to interpretation such as *monitor*, *understand*, *plan*, *predict*, and *manage*.

1-7

Language of BI Requirements
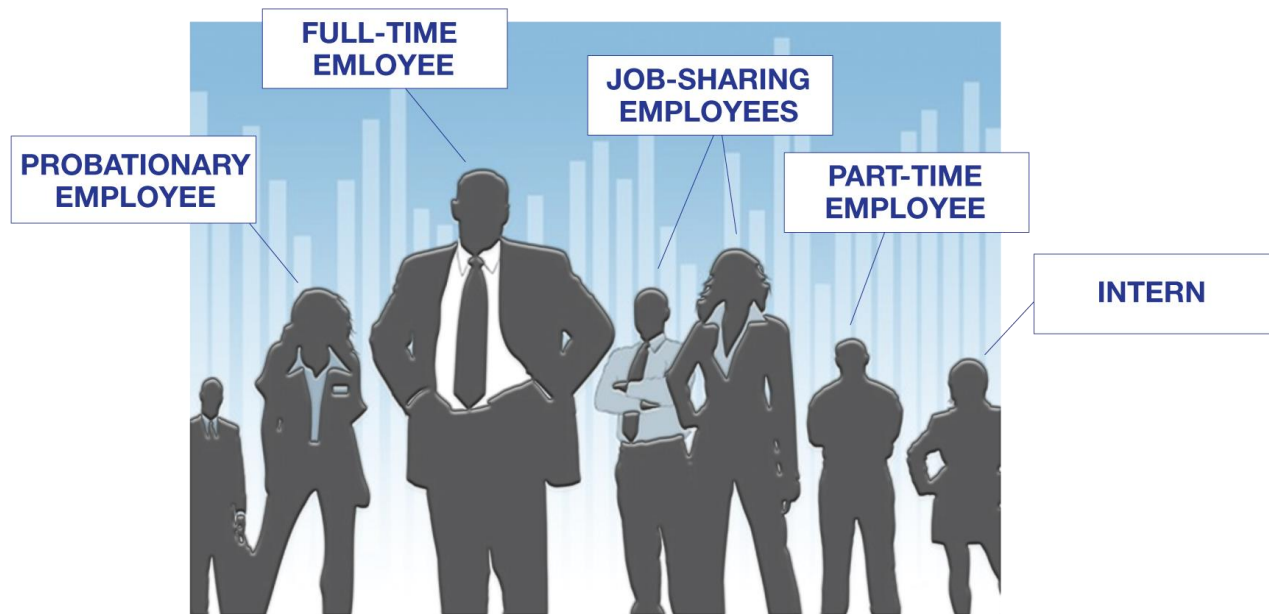
Terminology

Language of BI Requirements
Terminology

TERMINOLOGY

Clear communication is one of the important elements of requirements discovery. Yet the variety of terms and the probability that those terms have different meanings for different people quickly leads to ambiguity and miscommunication.

SAMPLE REQUIREMENT

The Human Resources Director requests a report that displays the number of employees at the end of each month for the past two years.

The request appears to be fairly simple, but there are several ambiguities, including:
- Who is considered an employee?
- If an employee started in the middle of the month, is that person included fully or proportionally?
- Which month—fiscal, calendar, or payroll?

The greatest problems arise not when people aren't sure of the definitions, but when they *are* sure. In the former case, they would ask. In the latter case, they would assume that everyone has the same definition they do, which may not be the case.

For example, in counting employees:
- How are part-time employees to be considered?
- How are job-sharing employees to be considered?
- How are interns to be considered?
- How are probationary employees considered?

The person requesting the information probably has an opinion on who is counted and it is extremely important that the person obtaining the requirements understand that person's definition.

COMMON AMBIGUOUS TERMS

Other terms that are often ambiguous and require clarification include:
- Customer
- Prospect
- Start Date
- End Date
- Sales Amount

Language of BI Requirements
Definitions

Best Practices for Data Elements

- Clear, unambiguous business definitions
- Finite and defined domain of allowed values
- Defined meaning for every code value
- Consistent use throughout business processes
- Consistent use across computer systems
- Known, controlled, and purposeful redundancy
- Declared system of record
- Documented origin, users, and usage
- Defined privacy and security requirements
- Consistent data naming standards

Language of BI Requirements
Definitions

DATA NAMES

The first step in defining data is to assign each data item (entity and attribute) a formal data name. Informal, inconsistent, and meaningless names lead to uncertainty and degrade the quality of data. Names should be assigned using a standard that addresses structure, uniqueness, and clarity of meaning. In *Data Resource Quality,* Michael Brackett identifies several bad habits and good practices in data naming:[1]

Bad Habits	Good Practices
Meaningless data names	Established data-naming taxonomy
Non-unique data names	Defined data-naming vocabulary
Structure-less data names	Naming based on business terms
Incorrect data names (nonsensical)	Applied naming standards
Informal (random) abbreviations	Defined and unique abbreviations
Unnamed data items	Standard abbreviation pattern

DATA DEFINITIONS

Every named data item also needs to have a comprehensive definition. Good data definition practices ensure consistency, eliminate confusion, enhance communication, enable data consolidation, and improve overall data quality. Brackett also identifies bad habits and good practices for data definitions.[2]

Bad Habits	Good Practices
Nonexistent definitions	Business-based meaning
Unavailable definitions	Thorough with no size limit
Short definitions	Current & time-independent
Meaningless definitions	Fundamental (base) definitions
Outdated definitions	Inheritance of definitions
Unrelated (nonsensical) definitions	

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[1] Brackett, Michael [2000]. *Data Resource Quality: Turning Bad Habits into Good Practices,* Addison-Wesley, pp. 27-49.
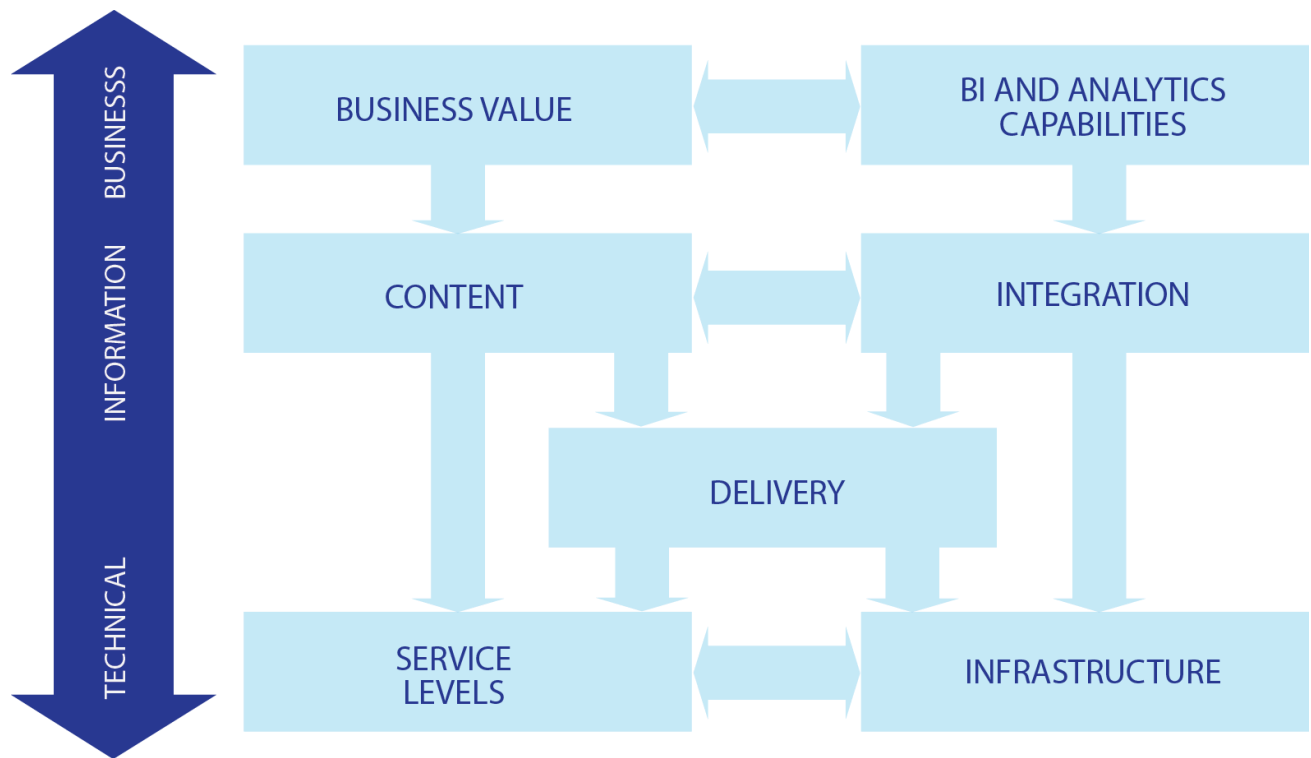[2] *ibid,* pp. 51-71

Module 2

Requirements Classifications

Requirements Categories
Business–Information–Technical

BUSINESSS
INFORMATION
TECHNICAL

| BUSINESS VALUE | BI AND ANALYTICS CAPABILITIES |
| CONTENT | INTEGRATION |

DELIVERY

| SERVICE LEVELS | INFRASTRUCTURE |

Requirements Categories
Business–Information–Technical

BUSINESS REQUIREMENTS

Business requirements address what the business needs to accomplish. The two major classifications are (1) the things the business would be able to do and their associated value, and (2) the BI and analytics capabilities, which are not project-specific.

INFORMATION REQUIREMENTS

Information requirements address the content to be provided to meet the business requirements. The three major classifications are content, integration, and delivery.

TECHNICAL REQUIREMENTS

Technical requirements describe specific qualities that the system must have. The two major classifications are service levels and infrastructure.

The Scope of BI Requirements
Business in BI
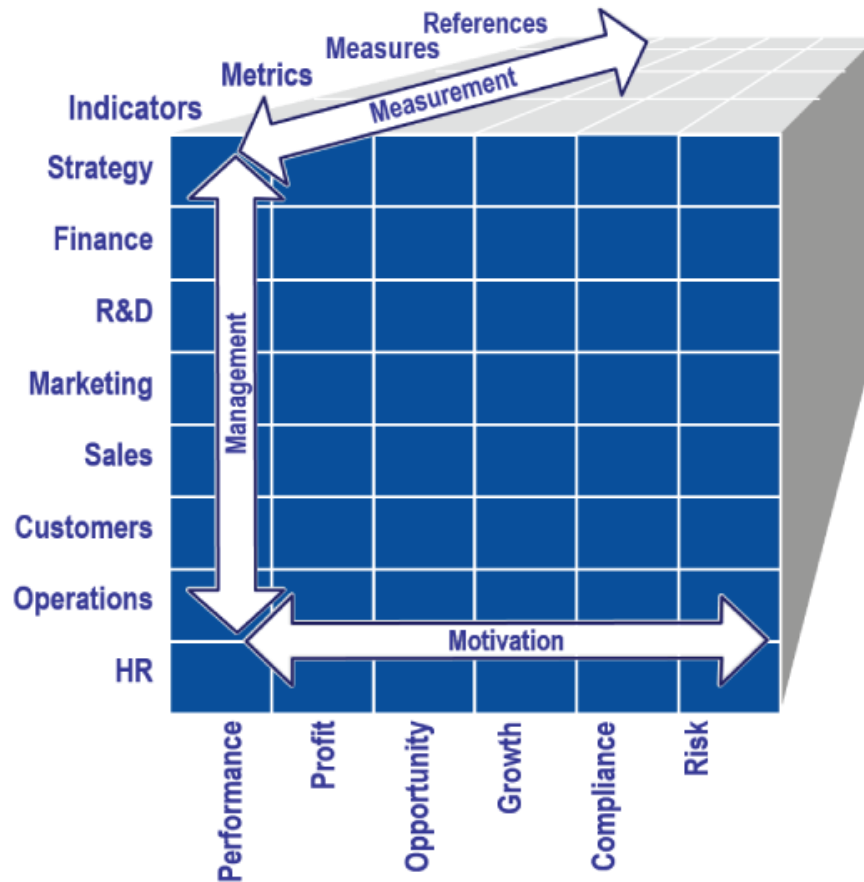
From *Business Analytics for Insight and Foresight.* © David L. Wells, Reprinted with Permission

The Scope of BI Requirements
Business in BI

BUSINESS PERSPECTIVE

The illustration shows a business perspective of BI requirements as a framework of three dimensions. The *business management* dimension encompasses areas of management such as strategy, finance, marketing, sales, and other typical domains of business requirements. These are the things we manage. The *motivation* dimension includes management concerns such as performance, profit, opportunity, growth, compliance, and risk. These are the reasons we manage. Both of these dimensions—management and motivation—should be tailored to the specifics of the industry and the organization in which you are working. The third dimension—*measurement*—is consistent across all industries and organizations. It includes indicators, metrics, measures, and references. These are ways we quantify management outcomes.

At any intersection of the three dimensions, you may find business, information, and technical requirements. Those requirements may align with any of the seven classifications described previously.
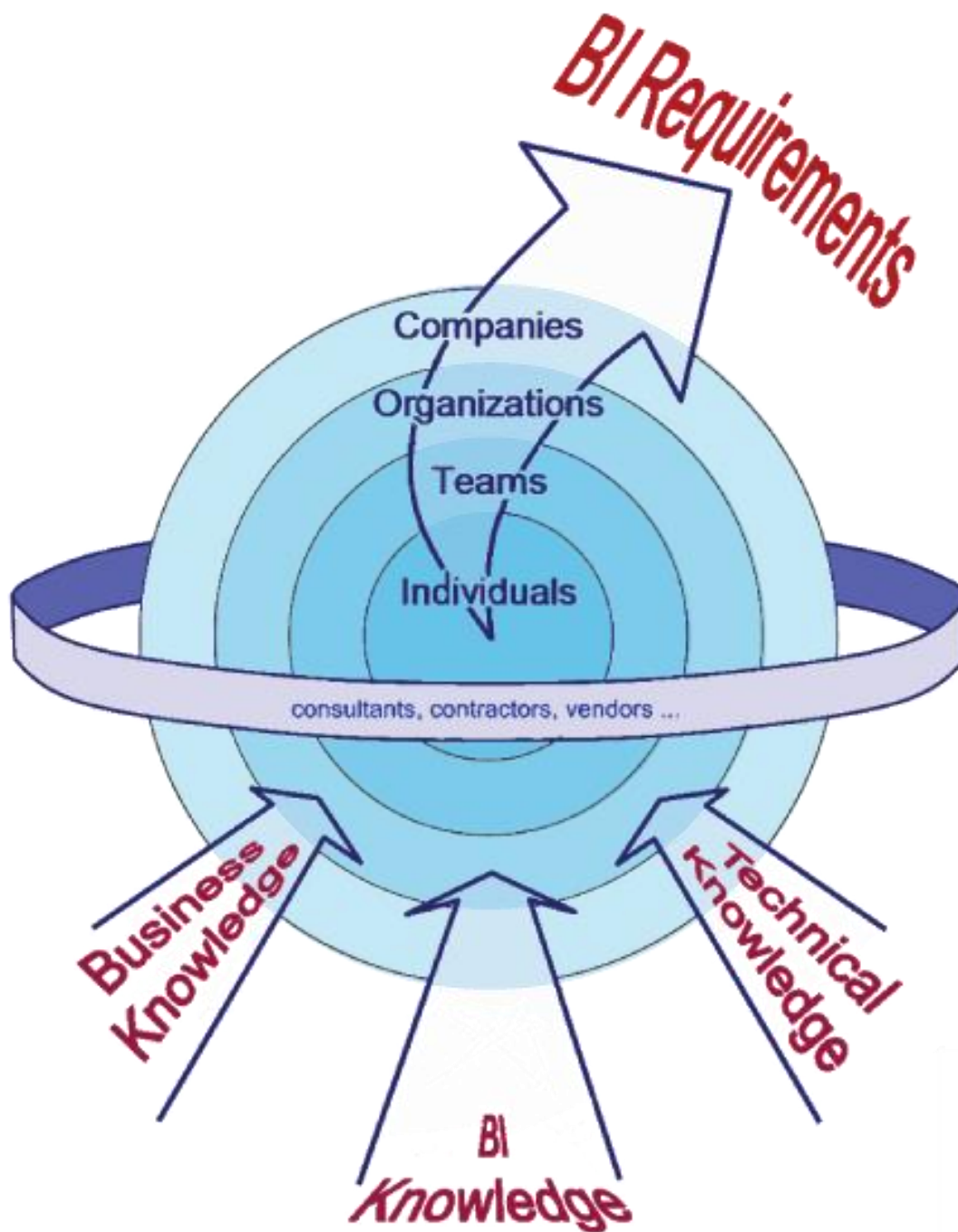
Module 3

Requirements Discovery Techniques

Requirements as a Human Process
People and Requirements Discovery

Requirements as a Human Process
## People and Requirements Discovery

INDIVIDUALS AND GROUPS

Requirements definition is something that is done by people. Thus, getting the right requirements depends on getting the right people with the right knowledge and skills. It also depends on managing the processes such that those people can be productive—matching requirements techniques to the nature and needs of participants and using people in the right roles.

The challenges of requirements discovery are many—complexity, uncertainty, need for innovation, need for speed, existing system influence, number of stakeholders, stakeholder participation, conflict, politics, and geographic and logistic challenges, and more. Meeting the challenges begins by recognizing the people-dependencies and paying attention to human factors.

Requirements as a Human Process
Identifying Stakeholders
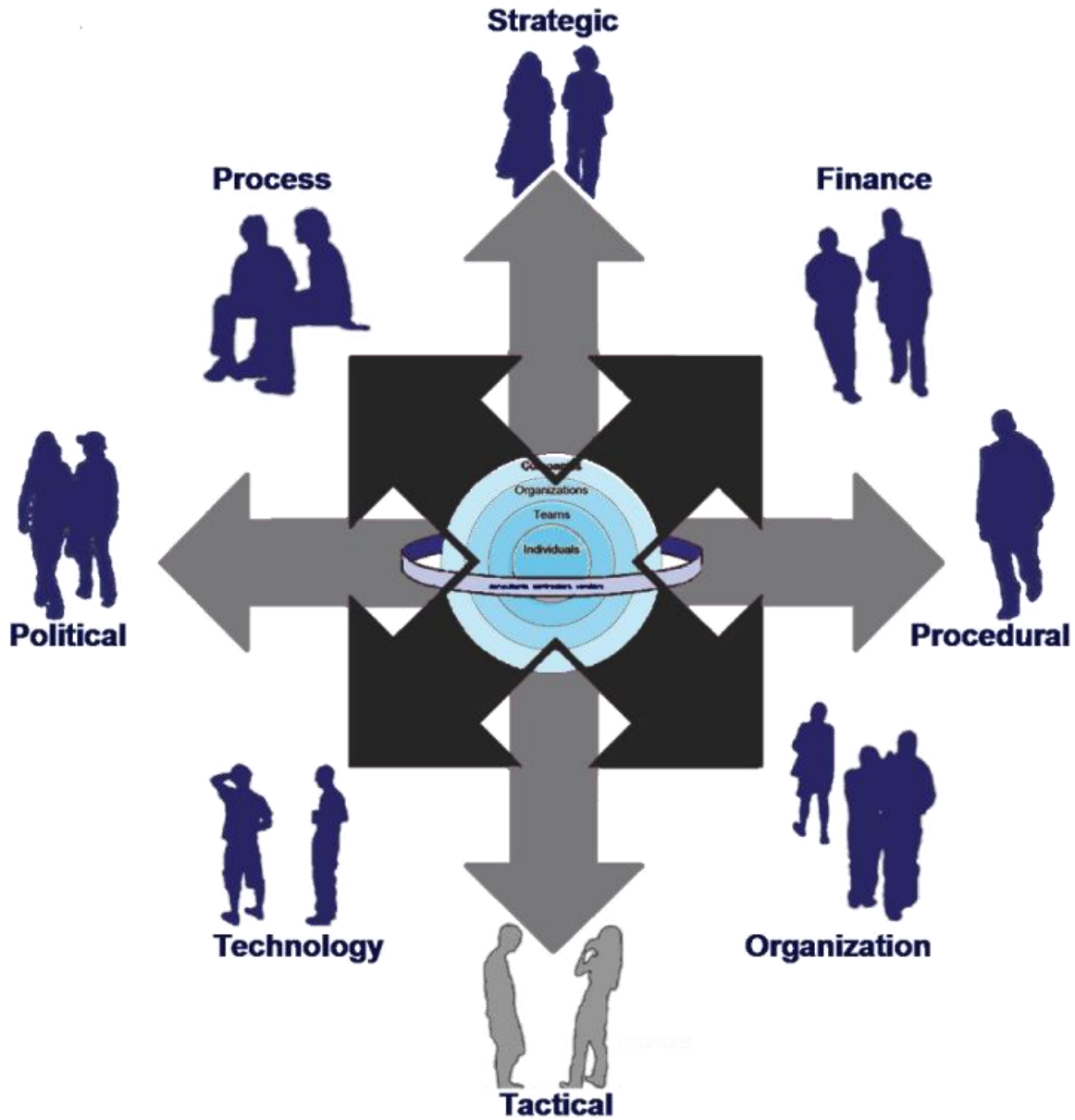
Requirements as a Human Process
Identifying Stakeholders

THE PEOPLE

Getting the right people involves more than roles and skills. Equally important are the right interests and these come from the stakeholders. A *stakeholder* is anyone whose job may be affected by the program or project that is the subject of requirements analysis. Stakeholder interests occur in several forms including:

- *Strategic*: affecting the stakeholder's ability to develop or execute business strategy. Business executives and senior managers are most likely to have strategic interest.

- *Financial*: consuming or contributing to stakeholder financial resources. Anyone funding the effort has a financial stake, as well as anyone who may realize financial gains.

- *Procedural*: affecting how business is conducted across several processes, functions, or organizations. Anyone with cross-functional responsibilities may have a procedural interest. Common examples include internal auditors, risk managers, and compliance officers.

- *Organizational*: affecting the stakeholder's organization with respect to structure, size, or scope of responsibilities. Line-of-business and functional managers are likely to see their organizations changed by BI programs and projects.

- *Tactical*: affecting the stakeholder's ability to define and execute business tactics. Tactical stakeholders typically range from line managers to knowledge workers.

- *Technological*: affecting strategy, planning, management, and support of technology. IT executives, IT managers, and technical architects are likely to be technological stakeholders.

- *Political*: affecting the stakeholder's power and influence, real or perceived. Almost anyone can become a political stakeholder if he or she sees the BI effort as either an opportunity or a threat. It is wise to involve those whose political positions will influence success or failure of the effort.

- *Process*: affecting planning, management, or execution of business processes in which the stakeholder participates. Process stakeholders range from managers responsible for effectiveness and efficiency of processes to knowledge workers who perform the activities of those processes.

Requirements as a Human Process

Busy People vs. Involved Participant

HOW FAR CAN PEOPLE BE STRETCHED?

Requirements as a Human Process
Busy People vs. Involved Participants

PEOPLE VS. PARTICIPANTS

One of the persistent challenges of requirements discovery is stakeholder participation. To the requirements analyst, discovering requirements is "the job." To many stakeholders it is "one more thing to do on top of my full-time job."

It is important to understand the commitments and responsibilities of key stakeholders and to plan processes and use techniques that derive greatest value from their limited time. Planning for efficient use of stakeholder time helps to avoid several risks including:

- The disengaged stakeholder who is a participant in name but not in practice
- The essential but unavailable subject matter expert
- The sporadic and occasional participant who repeatedly needs to be brought up-to-speed
- The unqualified or under-qualified subject matter expert sent by their organization as a surrogate for a more qualified but busier person
- The erosive participant who is willing to sacrifice quality for speed
- The delays and schedule overruns that occur when requirements discovery sessions are canceled, postponed, and frequently rescheduled

Requirements as a Human Process
Some of the Challenges
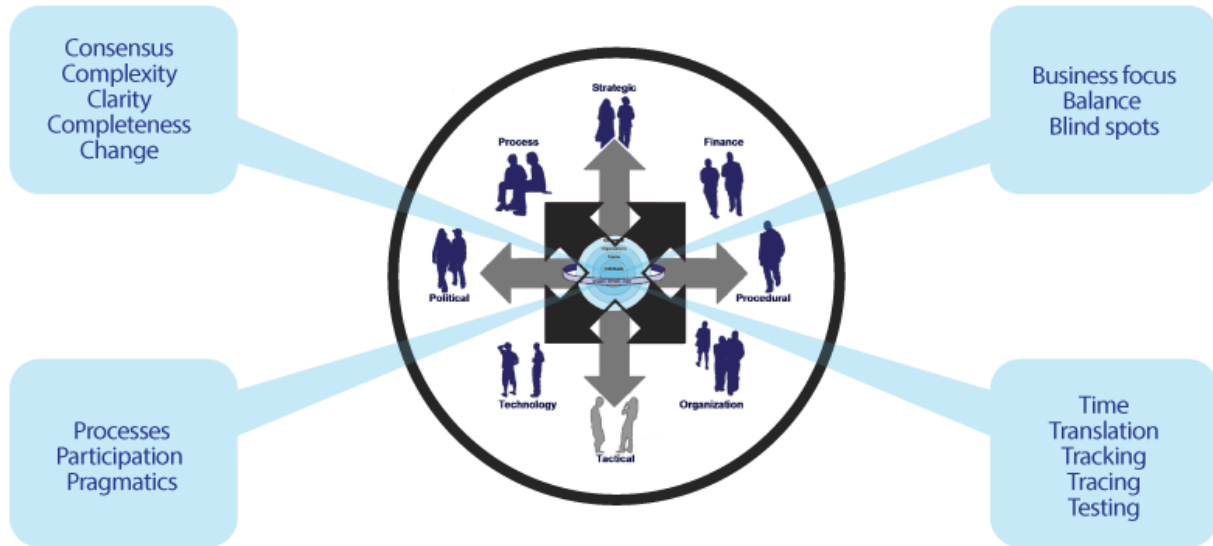
Requirements as a Human Process

Some of the Challenges

MANAGING THE REQUIREMENTS PROCESS

As with any process that involves many people, requirements discovery is challenged by different expectations, perspectives, experiences, knowledge, communication styles, and ways of working. Requirements processes need to be managed and techniques selected with attention to many factors including:

- Project size and scope
- Complexity
- Uncertainty
- Need for innovation
- Need for speed
- Existing system influence
- Number of stakeholders
- Level of stakeholder participation
- Conflict, territorialism, and politics
- Geographic and logistic difficulties

PROCESS GOALS

An effective requirements process strives to achieve:

- Consensus among stakeholders
- Active and balanced stakeholder participation
- Effective use of time and efficient use of resources
- Discovery of blind spots and opportunities to innovate
- Pragmatic and business-focused requirements
- Clarity and completeness of requirements
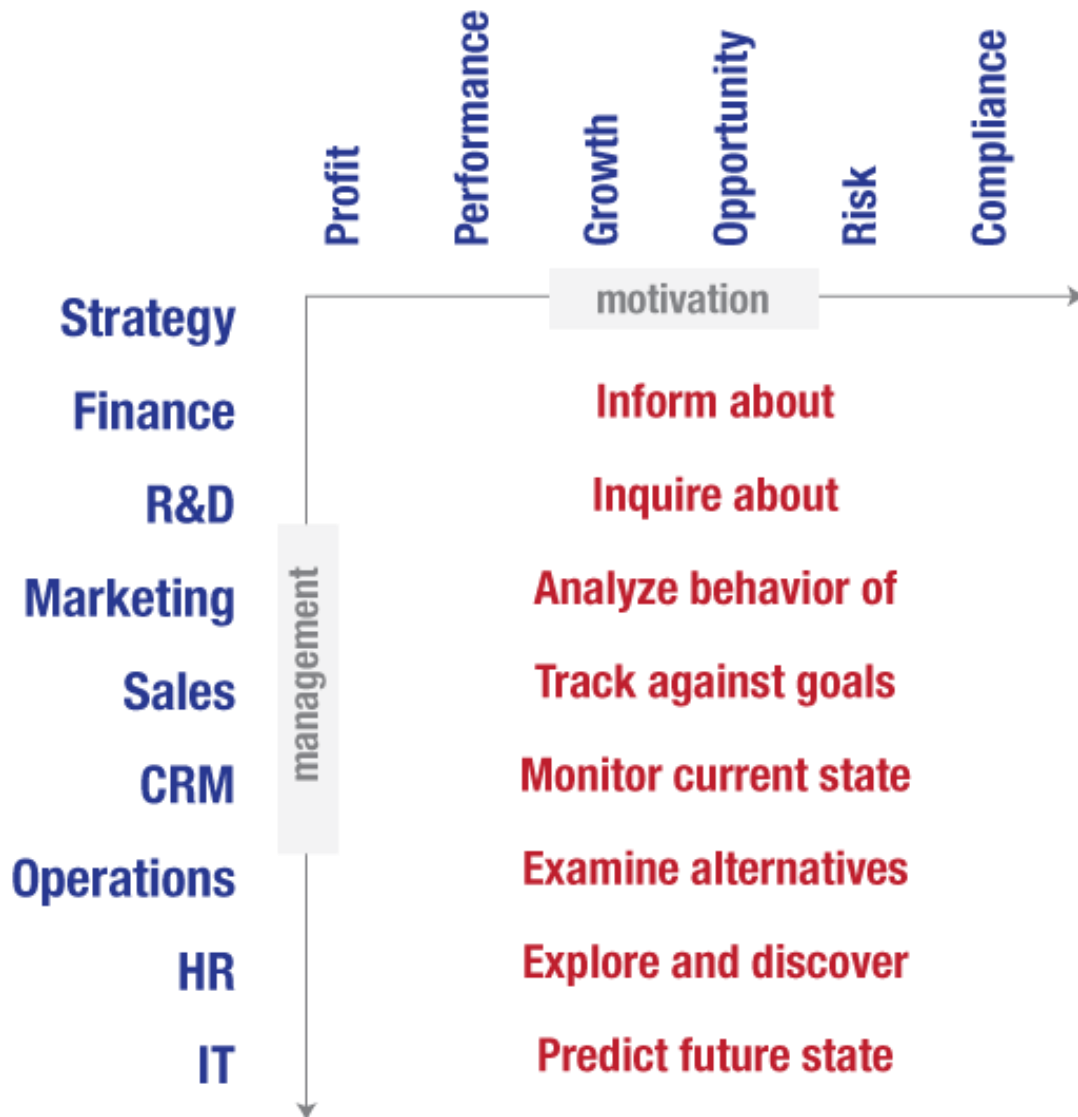- Tested and traceable requirements
- Adaptability

Module 4

Requirements Elicitation and Products

Requirements Discovery Challenges

Setting the Scope

	Profit	Performance	Growth	Opportunity	Risk	Compliance
Strategy			motivation			
Finance			Inform about			
R&D			Inquire about			
Marketing			Analyze behavior of			
Sales			Track against goals			
CRM			Monitor current state			
Operations			Examine alternatives			
HR			Explore and discover			
IT			Predict future state			

management

Requirements Discovery Challenges
Setting the Scope

PURPOSE AND BOUNDARIES

Determining scope is an essential first step for BI requirements discovery. Without well-defined purpose and clear boundaries, requirements become especially elusive. A variation of the "Business in BI" framework described earlier in the course is useful to define the scope.

In this variation we'll work with two dimensions—management and motivation. For any combination of management function and motivation, identify the business capabilities that are needed.

The facing page illustrates a list of business capabilities that readily extends to more granular BI requirements, as you'll see later in this module. For scoping purposes, don't be concerned with how to inform, inquire, analyze, track, and so on. Simply recognize the requirement for business capability to do so.

Requirements Discovery Challenges

Asking the Right Questions
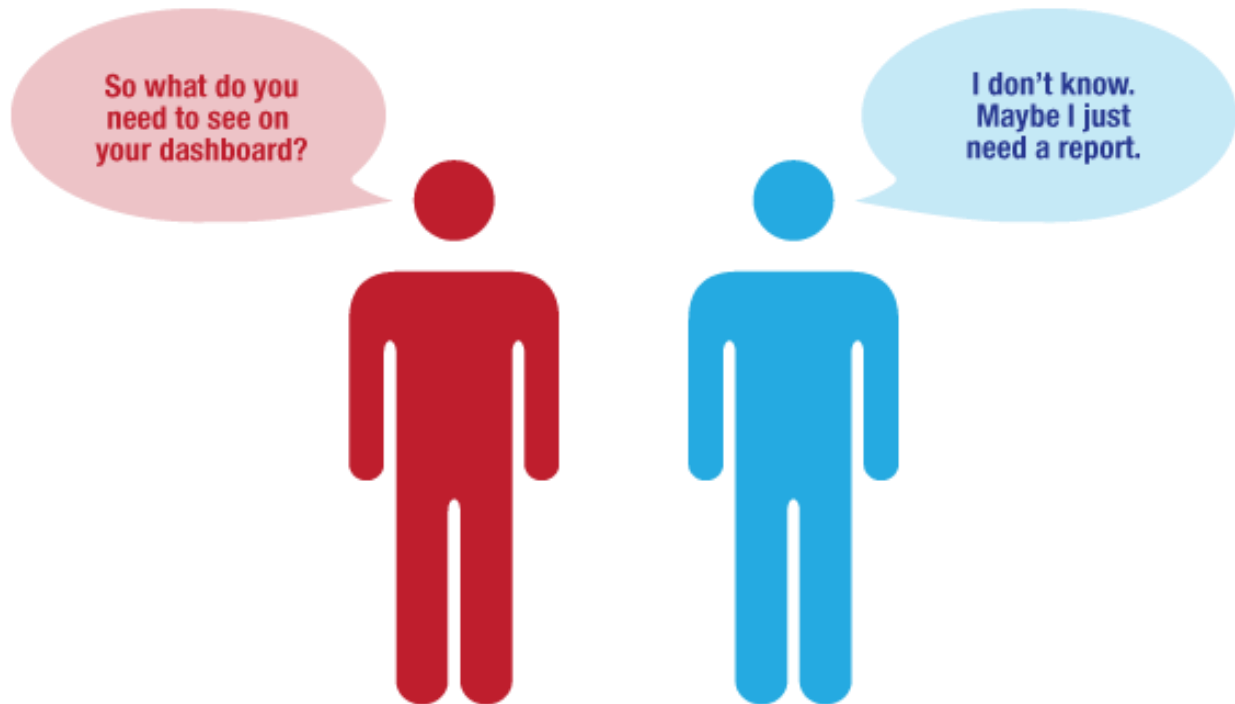
Requirements Discovery Challenges
Asking the Right Questions

NEW WAYS OF THINKING

Often the hard part of eliciting requirements is in asking questions that shift the thought processes from report-oriented views of information. The interviewer must use new kinds of questions and new ways to ask them to help the interviewee think about information delivery in different ways and to describe requirements that reflect the capabilities of today's BI systems and technologies.

The questions that appear on the following pages provide a launching point. The key in using questions such as these is to listen to the answers and then to formulate specific questions that lead to identifying the requirements.

Key Questions

Surveying the Landscape

- What are the expected goals of your area?
- What are you working to accomplish?
- How do you measure results?
- What are the critical success factors of your job?
- How do you identify opportunities and problems?
- What business dimensions are central to your analysis and decision making? (products, customers, etc.)
- What are your current sources of information?

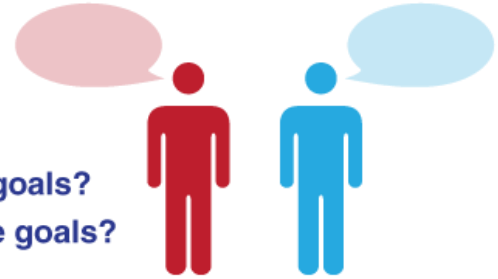# Key Questions
Surveying the Landscape

BIG PICTURE QUESTIONS

The facing page illustrates a list of "big picture" questions that help both interviewer and interviewee get in the right frame of mind to explore and describe real BI requirements. Breaking away from "just another report" thinking means that you need to step back far enough to view information in context of how it is used. These questions set the stage by using concepts such as:

- Goals
- Measurement
- Success factors
- Opportunities
- Problems
- Analysis
- Decision making
- Vision
- Future

Key Questions
Making It Personal

- **What are the most important business goals?**
- **How does your job contribute to meeting those goals?**
- **How do you personally contribute to meeting the goals?**
- **How does information help you to contribute?**
- **Do you produce information that helps others?**
- **How do you know if the goals are being achieved?**
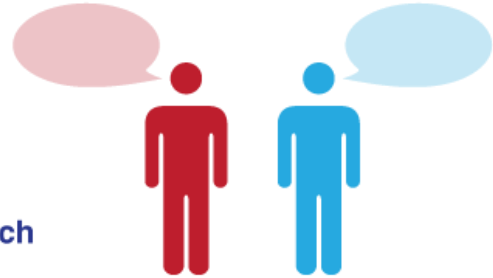
Key Questions
Making It Personal

QUESTIONS FOR INDIVIDUALS

Getting people to see their place in BI can help to surface real requirements. The facing page lists a few questions that can be used to start the conversation about a personal view of business, information, and business intelligence.

Key Questions

The Current State: Data and Analysis

- Would you start Excel and look at the list of recently opened files?
- Please tell me about the content and purpose of each file.
- Where do you get the data for each file?
- How much use is data management and how much is analysis?
- What kinds of analyses do you perform? For what reasons?
- Which files are "one time" use and which do you use frequently?
- Is there more that you would like to do with this information?
- What prevents you from doing more? (skills, lack of data, etc.)
- What other frequent or recurring Excel uses do you have?
- Do you use any database or data analysis tools other than Excel?

Key Questions

The Current State: Data and Analysis

SPREADSHEET QUESTIONS

One of the most effective ways to discover how people work with data and information, and how they perform analysis, is to explore their uses of Excel. Excel is a good indicator of individuals meeting their own information needs.

You'll get different responses if you ask, "how do you use Excel" than if you look at the recent files list and ask questions about those files. It is a good practice to begin with the recent files list and then extend the conversation to other uses. The facing page illustrates some questions that apply this approach.

Key Questions
The Current State: Existing Reports

- What existing reports do you rely on?
- How do you access existing reports?
- What is the frequency for each of the reports?
- What reports go together to make them relevant?
- What other tools do you use to analyze data from these reports?
- Are there specific features that you particularly like or dislike?
- Are the goals of the existing reports still relevant?
- What is important about the organization of each report? (sequence, format, totals, etc.)
- What reports do you cross check for consistency and correctness?
- How do existing reports help you to do your job?

Key Questions

The Current State: Existing Reports

**REPORTING
QUESTIONS**

Eventually you'll need to explore existing reports as a means to elicit BI requirements. Examine existing reports with the goal of understanding what they represent in terms of information and analysis needs—not to simply replicate the reports with different technology. The facing page shows some of the questions that help to discover the underlying requirements inherent in existing reports.

Key Questions

The Future State

- What kinds of information do you depend on others to provide?
- What kinds of information do you provide to others?
- Do you conduct analysis quarter over quarter or year over year?
- Do you see any trends in the kinds of analysis that you perform?
- What kinds of behaviors or results do you analyze?
- What is your role in setting performance goals?
- What is your role in tracking performance against goals?
- What indicators do you watch on a daily or weekly basis?
- In what areas do you have decision-making responsibility?
- Where are your greatest uncertainties?
- What needs do you have to forecast and to simulate?
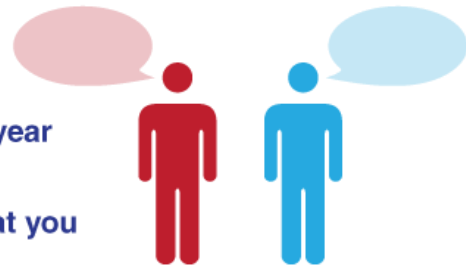
Key Questions

The Future State

CAPABILITY QUESTIONS

Ultimately, the requirements discovery process is meant to identify needs for business capabilities, but it doesn't work to simply ask, "what capabilities do you need?" Nor can you find these requirements by providing a list—inform, inquire, analyze, track, monitor, examine, explore, predict—as if it is a restaurant menu. Find these requirements by asking about the work of an individual or group and then translating the responses into needs for business capabilities. The facing page illustrates the kinds of questions that readily translate to business capabilities.

Module 5

Requirements Analysis and Management

Topic	Page
Requirements as a Systems Process	5-2
Collecting Requirements	5-10
Documenting Requirements	5-14
Information Requirements Analysis	5-16
Technical Requirements Analysis	5-24
Testing Requirements	5-26
Managing Requirements	5-34
Summary and Discussion	5-44

Requirements as a Systems Process

Systems and Requirements Discovery
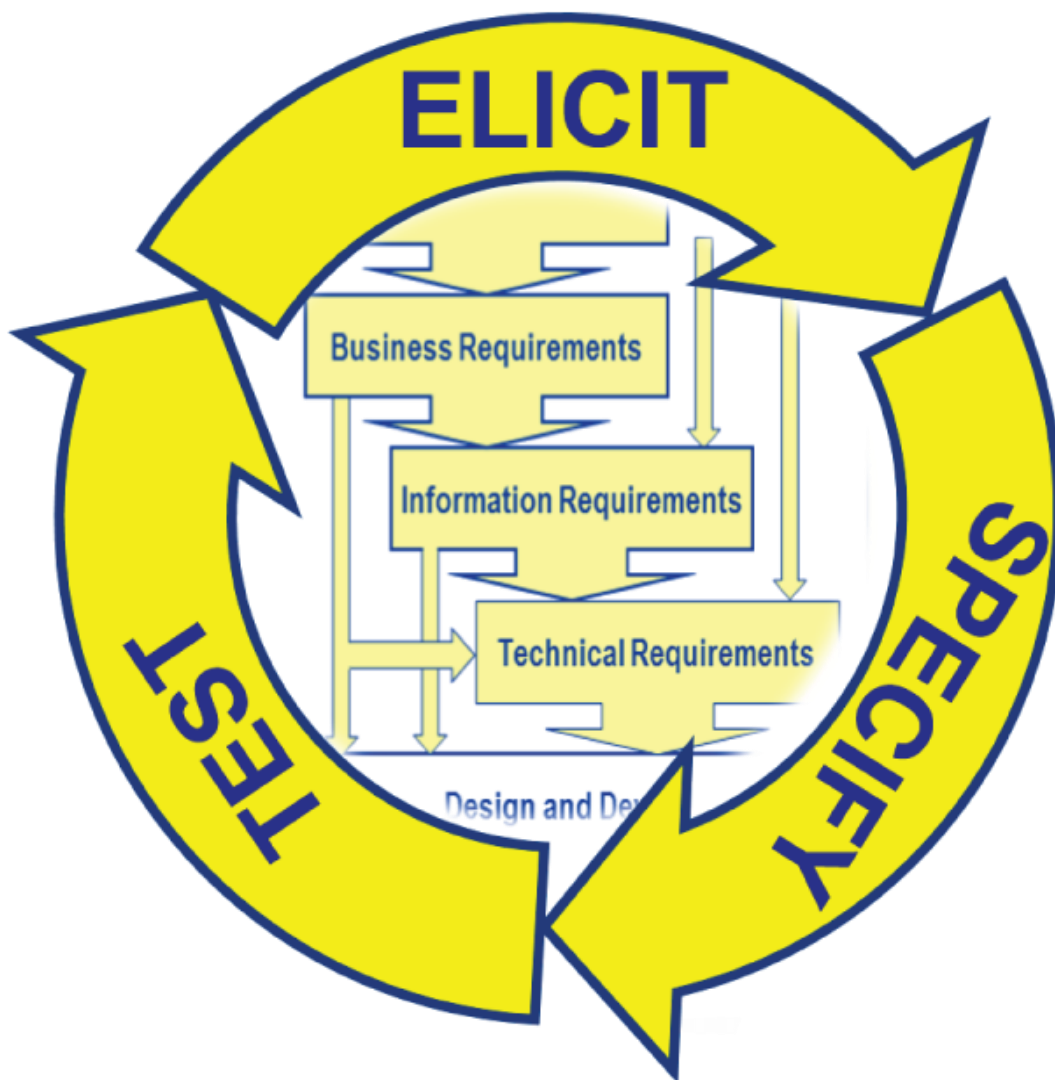
Requirements as a Systems Process
Systems and Requirements Discovery

THREE STAGES

Discovering requirements is more than a task. It is a process commonly described as elicit, specify, and test (EST). Alternative terms for the three-step process include elicit-model-test (EMT) and elicit-define-test (EDT). Regardless of the terminology that you choose, the three steps are important to recognize and to apply.

ELICIT REQUIREMENTS

Requirements elicitation is the activity of obtaining the requirements for a developing system from the stakeholders. Steve McConnell says "the most difficult part of requirements discovery is not documenting what the users 'want'; it is the effort of helping users figure out what they 'need' that can be successfully provided …" (*Software Project Survival Guide,* McConnell, Microsoft Press, 1998). McConnell's statement captures the essence of eliciting requirements—finding what is *needed*.

SPECIFY REQUIREMENTS

Requirements specification (or documentation, or modeling) is the act of recording a description of each requirement. Each requirement describes a necessary attribute of a system—a capability or characteristic that the system must have to provide utility and value to its users. A well-specified requirement includes:

- *What*: A descriptive statement of the requirement that describes a system capability, characteristic, function, feature, or quality
- *Why*: The rationale for the requirement describing the purpose or value to be achieved
- *Who*: The source of the requirement and the stakeholders who will benefit

Whether recorded as text (for "specify" and "document") or as diagrams (for "model"), describing requirements is an important and separate step from eliciting requirements.
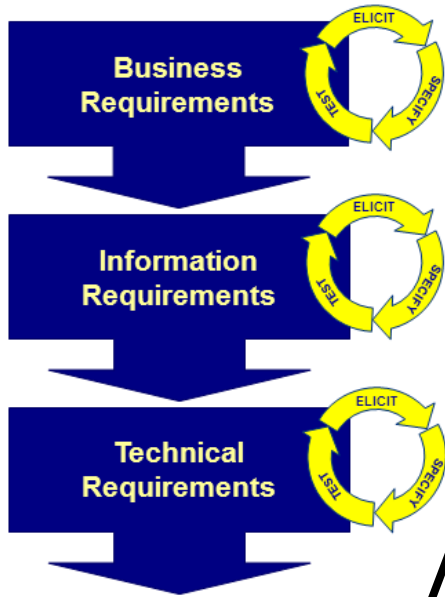
TEST REQUIREMENTS

Requirements testing is the third and final step of the process. Each requirement must be evaluated to ensure that it is clear, unambiguous, complete, consistent, necessary, and feasible.
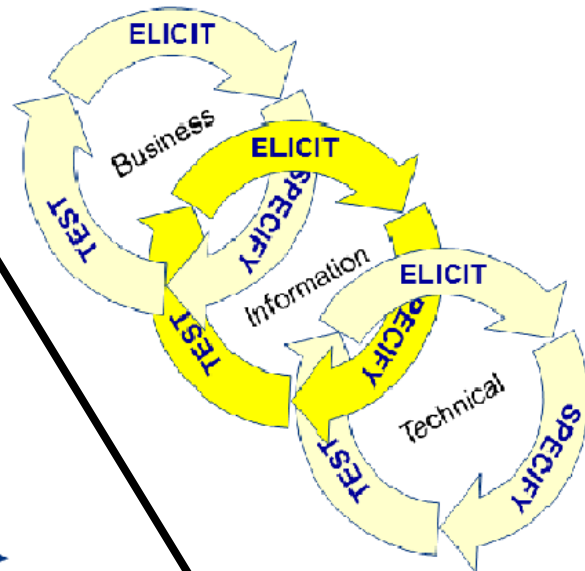
Requirements as a Systems Process
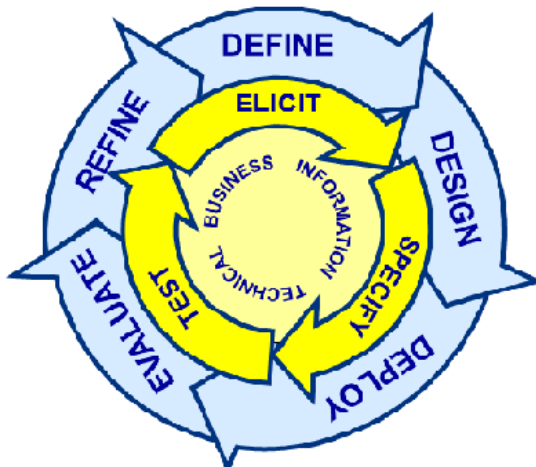
Process and Requirements Discovery

LINEAR

ITERATIVE

AGILE

Requirements as a Systems Process
Process and Requirements Discovery

FIT TO THE METHODOLOGY

Working systematically from business to technical requirements is important. The three-step EST approach is equally important—as are the requirements management practices yet to be discussed—but all of this guidance must be tempered with practicality. Ultimately, your requirements processes must be pragmatic and well matched to the project lifecycle and methodology that is used.

LINEAR PROCESSES

With a linear methodology, linear requirements make sense. Elicit, specify, and test business requirements first. Next, elicit, specify, and test information requirements. Then elicit, specify, and test technical requirements. Be rigorous in testing requirements as deficiencies in business requirements become defects in information requirements, and those defects translate to problems in technical requirements. Be formal and use a good tool for requirements management as dependency and traceability are especially important.

ITERATIVE PROCESSES

Spiral development needs less structure than linear. Business, information, and technical requirements may be discovered simultaneously and iteratively. The act of discovering information requirements serves as part of business requirements testing. Similarly, discovery of technical requirements has a role in testing of business and information requirements. Requirements management may focus largely on identity and recording with less attention to tracing and verification. A simple spreadsheet may be the only tool needed to manage requirements.

AGILE PROCESSES

Agile development needs agile requirements processes. Requirements are discovered as part of the development process—eliciting, specifying, and testing are minor tasks within the larger effort of defining, designing, deploying, and refining a system. Business, information, and technical requirements overlap and are addressed simultaneously. Requirements documents are developer notes, and a list on a whiteboard can serve as a requirements management tool.

Requirements as a Systems Process
The "Why" of Requirements Management

Requirements as a Systems Process
The "Why" of Requirements Management

THE FULL SET OF REQUIREMENTS

Discovering requirements can be fraught with problems unless supported by a requirements management process. The goal of requirements management is to ensure that the set of requirements collectively satisfies all of the needs for a system. Eliciting and individually specifying requirements is different from looking across the entire set of requirements to achieve clarity, completeness, correctness, consistency, and continuity, and readily adapting to the changes that will inevitably occur.

Requirements as a Systems Process
The "What" of Requirements Management

ELICIT

☑ CLARITY
☑ COMPLETENESS
☑ CORRECTNESS
☑ CONSISTENCY
☑ CONTINUITY

IDENTIFY RECORD VERIFY TRACE

ID	Description	Rationale	Test Criterion	Type	Category	Source
01	BI will provide managers with the ability to monitor budgeted to actual revenue.	Revenue achievement is a key criterion of manager performance that requires monitoring capability.	Budget to actual revenue data is available as summary with ability to drill to detail.	Business	Capability	CFO
02	BI will provide marketing with the ability to predict marketing campaign responses.	Effective and efficient marketing depends on ability to forecast response to campaigns.	Tools are available to predict response based on various marketing campaing scenarios.	Business	Capability	Marketing Director
03	BI will provide sales managers with information needed to plan effective sales tactics.	Sales managers need to know what works under what conditions to choose effective methods.	Size of account (revenue), closure rate, and time to close are correlated with sales methods and characteristcs of customers.	Business	Analysis	Director of Sales
13	Performance scorecards for managers show budgeted and actual revenue by fiscal period including variance and trend information.	Revenue achievement is a key criterion of manger performance, thus a key component of a performance scorecard.	Every product and department manager has a performance scorecard that includes budget to actual revenue performance information.	Functional	Monitoring	Sales Mangers
14	OLAP provides sales performance metrics including average revenue per sale, average margin per sale, and average time to close by department, product line, and geographic region.	Monitoring and managing sales performance requires metrics and the ability to perform dimensional analysis of those metrics to identify trends and to explore the causes of those trends.	OLAP capability exists that includes the measures and dimensions described by the requirement.	Functional	Analysis	Sales Mangers
15	Sales performance data is current as of the close of the previous month.	Month-to-month monitoring and management requires relatively current information.	Monthly refresh processes exist for sales performance reports, cubes, and scorecards.	Technical	Latency	Director of Sales

Requirements as a Systems Process
The "What" of Requirements Management

ELEMENTS OF REQUIREMENTS MANAGEMENT

A comprehensive requirements management process addresses each of the following items:

- *Identification*: Every requirement has a unique identifier in the form of a code, number, or short name.

- *Recording*: Every requirement is consistently described using a standard or template, and each is linked to an index of all requirements.

- *Tracing*: Each requirement is traceable to its source. The path from business to information to technical requirements can be followed.

- *Changes*: Every change to a requirement is recorded from the time that the requirement is elicited to the time that it is implemented.

- *Classification*: Each requirement is classified as business, information, or technical.

- *Connection*: Each requirement points to any related documents, models, or other artifacts of the requirements discovery process.

- *Verification*: The state of each requirement is known as it relates to testing criteria such as clarity, ambiguity, necessity, and feasibility.

- *Priority*: It is sometimes necessary to prioritize requirements as a method of managing project time and scope.

Collecting Requirements
Capturing Requirements

Identity **What?** **Why?** **Who?**

ID	Description	Rationale		Source
01	BI will provide managers with the ability to monitor budgeted to actual revenue.	Revenue achievement is a key criterion of manager performance that requires monitoring capability.		CFO
02	BI will provide marketing with the ability to predict marketing campaign responses.	Effective and efficient marketing depends on ability to forecast response to campaigns.		Marketing Director
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03	BI will provide sales managers with information needed to plan effective sales tactics.		know condition ods.	Director of Sales

BI will provide managers with the ability to monitor budgeted to actual revenue.

A declarative statement and a complete sentence.

Collecting Requirements
Capturing Requirements

SPECIFY, MODEL, OR DOCUMENT?

There are many ways to capture and record requirements. It is that variety that causes the diffusion of language about requirements gathering—EST, EMT, or EDT. Note that the differences are entirely about the way in which requirements are recorded: *specify*, *model*, or *document*. Debate about which is the right way is pointless. There is no single best way to record requirements. The correct answer is to use a method and format that works for you and your requirements team.

SOME GUIDELINES

Regardless of the form in which you choose to record requirements, some guidelines will help to achieve well-written requirements statements. Some of the guidelines found among widely accepted best practices for requirements discovery:

- Write in complete sentences, not fragments.

- Use simple sentences. Avoid compound and complex sentences that are strung together with conjunctions.

- Write declarative statements using words such as "is" and "will." For example:

    o *The budget variance report **will** drill down to detail transactions.*

    o *Budget to actual revenue data **is** available as summary with drill-down to detail.*

- Write in business language, avoiding technical jargon.

- Confirm that each statement is concise and free of excess or unnecessary words.

- Confirm that each statement is clear and free of language that is ambiguous or subject to interpretation.

- Reinforce text requirements statements with examples, diagrams, sample data, and so on, whenever practical.

Collecting Requirements
Defining and Refining Requirements

How do you know when the requirement is met?

What level of requirement is expressed?

What kind of requirement is described?

Collecting Requirements
Defining and Refining Requirements

COLLECTING REQUIREMENTS AS DATA

Whatever technology is used to capture requirements—word processor, spreadsheet, database, or commercial tool—it is valuable to define a standard set of data to be collected for each requirement. A defined data structure for requirements allows you to accelerate requirements definition by using a template, to ask the right questions, to fully define each requirement, and to achieve consistency across multiple definitions.

ESSENTIAL REQUIREMENTS DATA

The minimum data that is necessary to define a requirement includes:

- *ID*: A unique identifier for each requirement in the form of a number, code, or short name

- *Description*: A declarative statement that expresses the conditions that exist when the requirement is satisfied

- *Rationale*: A brief statement of reasons for the requirement

- *Source*: The individual, organization, or role from which the requirement is elicited

VALUABLE REQUIREMENTS DATA

Beyond the essential data itemized above, it is valuable to describe additional characteristics of each requirement including:

- *Test criterion*: A statement that describes how you will determine or measure completion of each requirement.

- *Type*: Classification of each requirement as business, information, or technical.

- *Category*: Classification of each requirement based on a schema or taxonomy that makes sense to the organization and the project. Module Four of this course describes one classification schema.

Module 6

Summary and Conclusions

Topic	Page
Best Practices	6-2
Summary of Key Points	6-8

Best Practices
Dos and Don'ts

- **Don't Believe that BI Requirements are the same as IS Requirements**

- **Do Layer Requirements: Business, Information, and Technical**

- **Do Use a Three-Step Approach: Elicit, Specify, Test**

- **Don't Forget Requirements Management**

- **Do Fit Requirements Processes to the Project Methodology**

- **Do Fit Requirements Techniques to Project Characteristics**

- **Don't Work Without Guidelines, Standards, or Templates**

- **Do Remember that Requirements Discovery is a Human Process**

- **Don't Let Requirements Go Untested**

Best Practices

Dos and Don'ts

A GUIDE TO GOOD REQUIREMENTS MANAGEMENT

The facing page itemizes 10 guideposts for successful and effective requirements management. Keeping this list in mind (and perhaps visibly posted) whenever doing requirements work will increase both effectiveness and efficiency of your requirements processes.