Understanding & Applying Data Analytics

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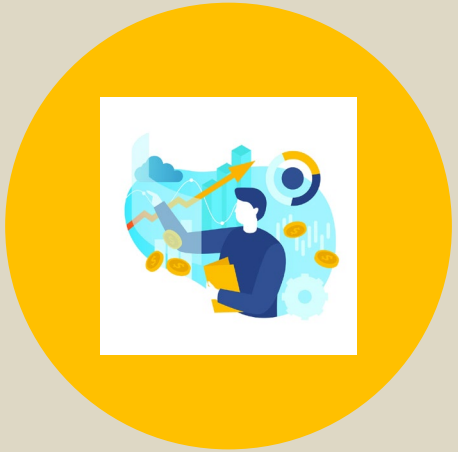
Course Objective: Increase Knowledge of

AUDITOR'S RESPONSIBILITY FOR UNDERSTANDING & APPLYING DATA ANALYTICS



HOW ANALYTICS CAN BE USED IN EACH PHASE OF THE AUDIT PROCESS

DATA ANALYTICS RISK AND CHALLENGES

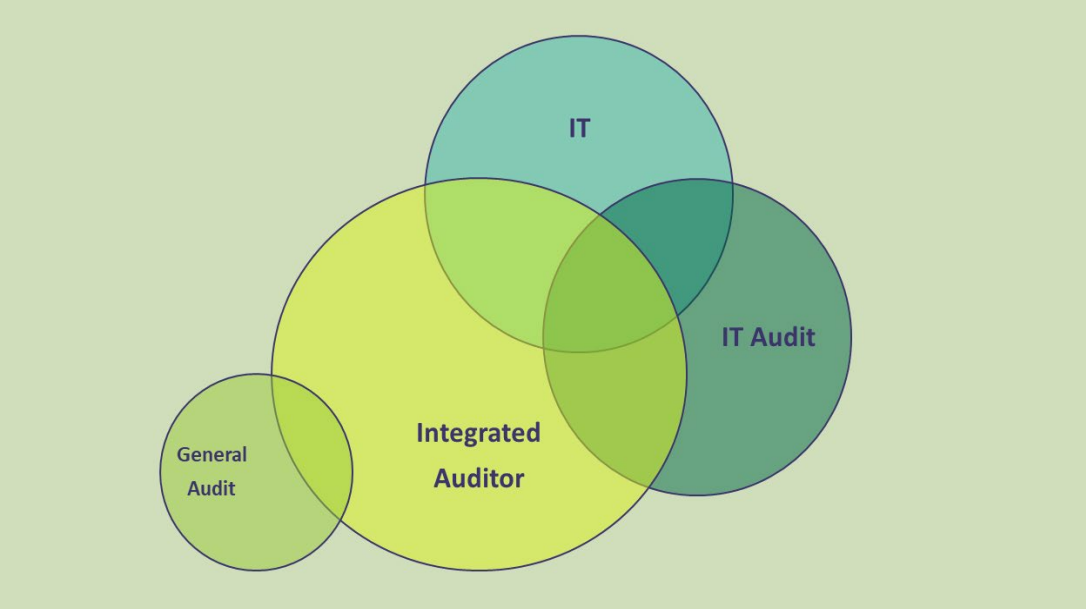
Professional Expectations

IIA Standards for the Professional Practice of Internal Auditing- Standard 1210.A3

"Internal Auditors must have sufficient knowledge of key information technology risks and controls and available technology-based audit techniques to perform their assigned work

However, not all internal auditors are expected to have the expertise of an internal auditor whose primary responsibility is information technology auditing"

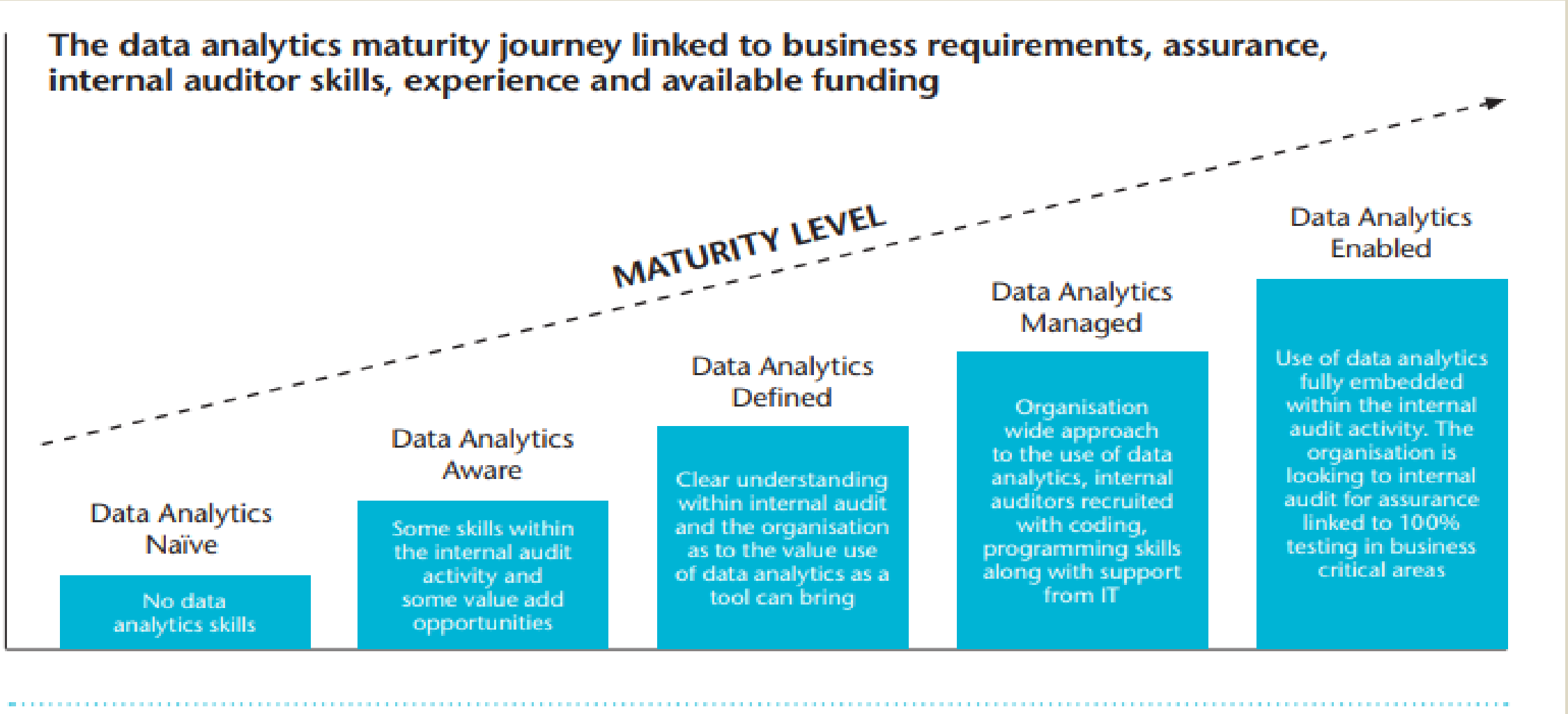
The Data Analytics Mandate



Good Read: IIA Global Knowledge Brief: Data Analytics Mandate 2019

- Data Analytics has become a necessity rather than a desire
- Auditors must close the technology capability gap
- Auditors must use the tools at its disposal to “audit at the speed of risk”
- Technology will fundamentally change how audit services are performed and how IA value is measured
- Legacy industries may not be as nimble as others in implementing drastic change, including data analytics

Assessing your Organizations Maturity Level



Next Generation Methodology Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Level (5-pt. scale)
1	Agile Audit Approach	2.7
2	Dynamic Risk Assessment	2.8
3	High-Impact Reporting	2.8
4	Continuous Monitoring	3.1

Analytics and Technical Competencies

"Need to Improve" Rank	Areas Evaluated by Respondents	Competency Level (5-pt. scale)
1	Auditing process automation/robotic process automation	2.2
2	Big data/business intelligence	2.5
3	Cloud computing	2.4
4	Internet of Things	2.4
5	Data analytics tools — data manipulation	2.6

Data Analytics Are Utilized in all Stages

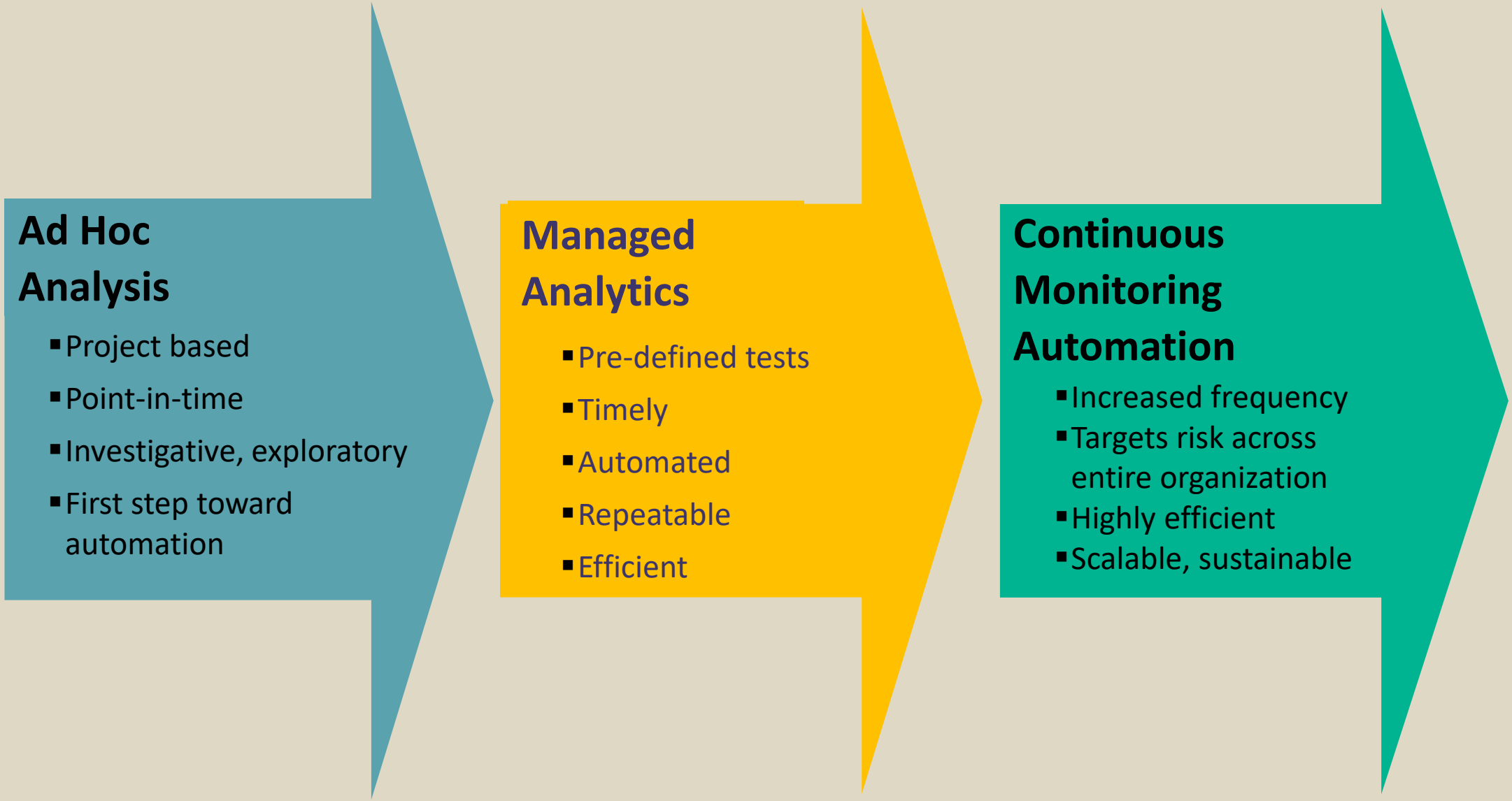
Planning:	Determining resource needs
	Performing risk assessments
	Developing the work plan
Fieldwork:	Performing testing
	Selecting samples & evaluating results
	Assessing root cause
	Quantifying impact of deficiencies
Reporting	Analytics
	Dashboards
	Heat Maps
Monitoring	Scripts
	Anomaly Reporting

Transforming Internal Audit through Data Analytics

Area	Opportunity
Planning/Risk Assessment	Leverage existing analytics to measure risk Identify anomalies, patterns, and trends in data Assess data quality
Work Plan/Scope	Determine monetary value, cyclic nature of activity, complexity of operations, dispersion across organizational units
Plan Execution	Allows for 100% testing or statistical sampling Assists with work paper development Provides audit evidence
Issue Identification	Allows quantification of risk Identify common control failures in exceptions
Reporting	Provides data used for visualization
Implementation	Management has tool to monitor or mitigate risks

How Analytics will transform Internal Audit, ISACA Journal Vol 2, 2017

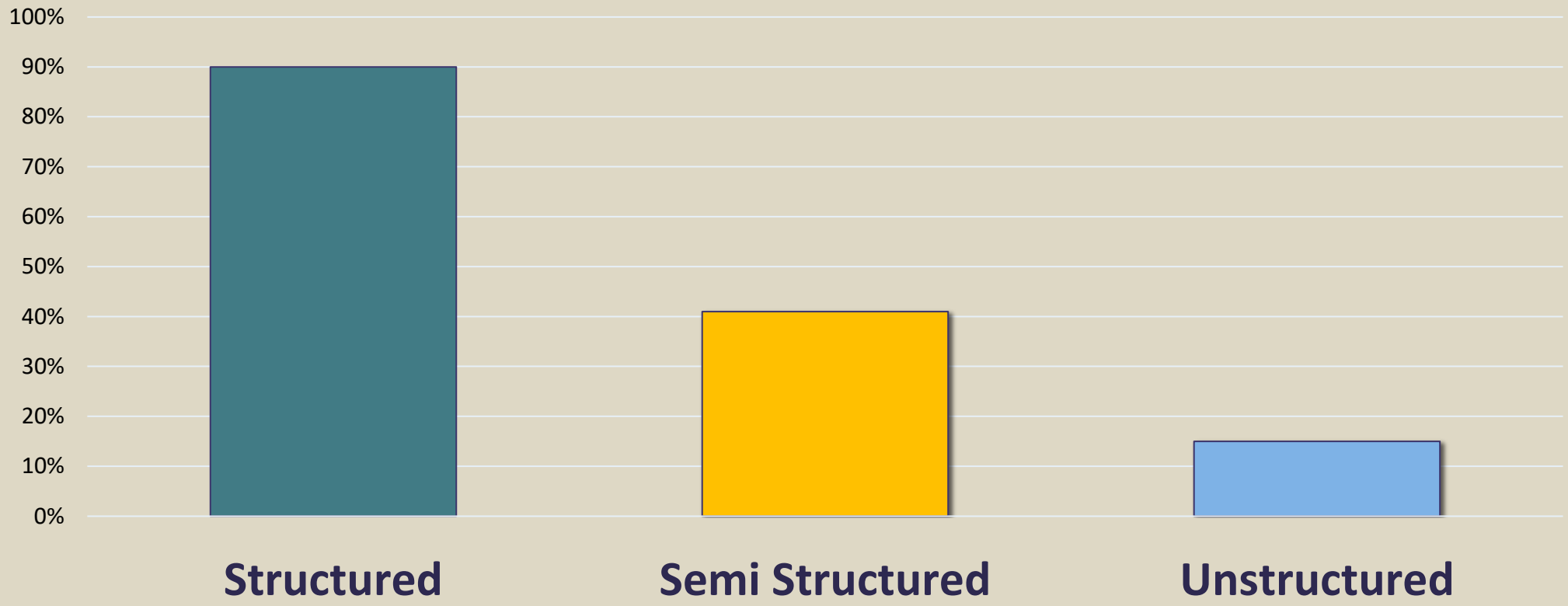
Traditional Methodologies; Focused on Internal Controls



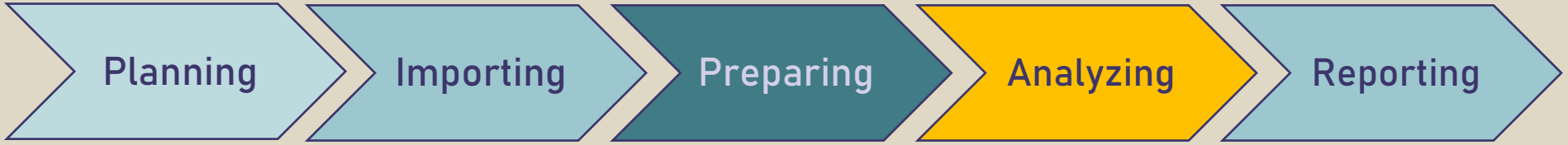
New IA Data Analytics Landscape

Continuous Audit	High Impact Reporting	Agile Audit Approach	Dynamic Risk Assessment
Automation of routine tasks, control testing, and monitoring	Clearer picture of risk, root cause	Increased emphasis on strategic risk Quicker turn around time	Automation of known risk monitoring

Data Types used in Analytics



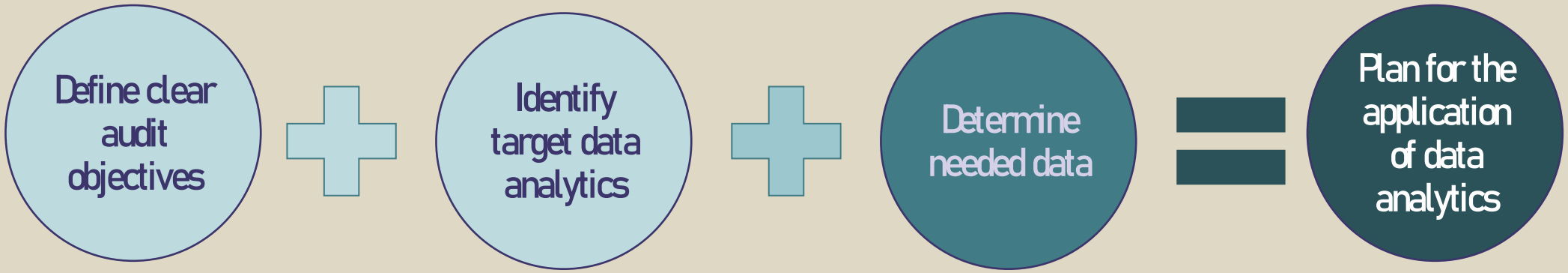
Audit Process



Data Analytics Cycle

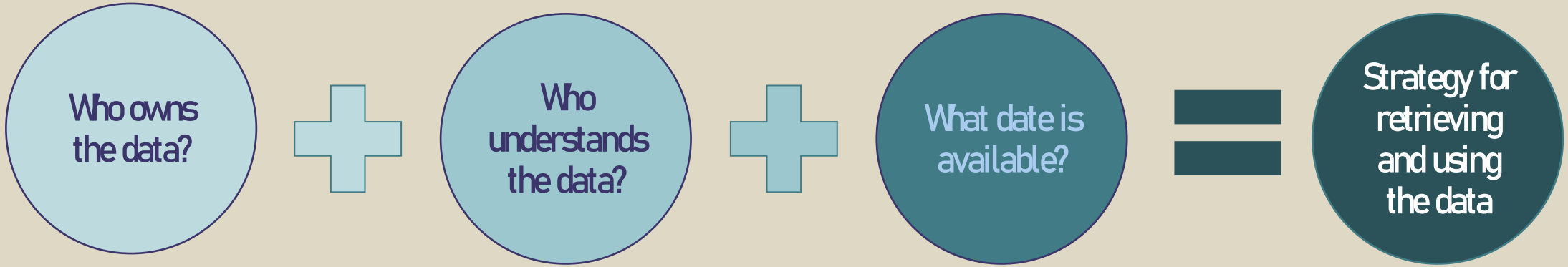
Step #1
Planning

Planning for Data Analytics



Step #2
Importing

Developing & Implementing a Data Strategy



Have insight into the data governance/management structure(s) in place

- Data Governance/Stewardship Committee
- Data Owner
- Data Custodian/Data Steward

Be familiar with the existing data classification scheme

- Sensitive/Confidentiality
- Criticality

Understand Data Sources & Related Risks

Data warehouses

Cloud storage

Business intelligence platforms

Transactional Systems of Record

Point of Sales Systems

External Partners

Public Data Sources

Leverage Resources

Resources

- Meta Data: data dictionaries, table layouts, data flow diagrams
- Current queries used by Data Stewards
- Application documentation
- Reviewing small samples of data if you have access to the file

People Power

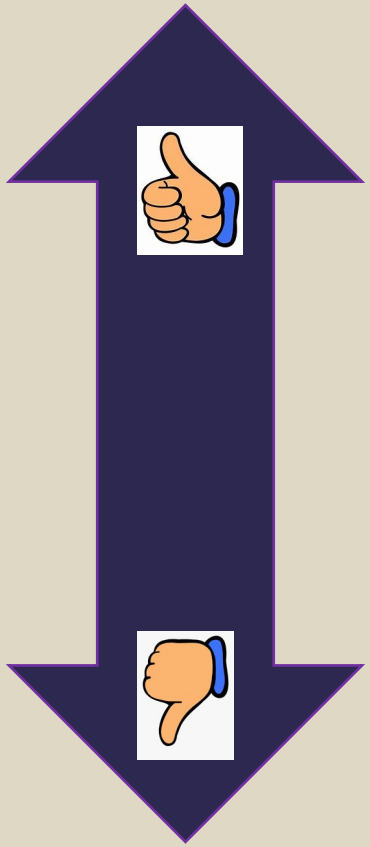
- Existing audit team members with prior knowledge
- Data Stewards within the business process area
- IT application personnel responsible for change management
- Peers at other institutions

Select Appropriate Data Retrieval Methods

- Direct access to data source
- ODBC (Open Database Connectivity)
- Data transfer through indirect data retrieval from existing queries
- Data transfer via a file provided by IT (more independent) or the Data Steward/Owner (must be able to validate)
  - Access
  - Excel
  - Delimited

Source File Formats

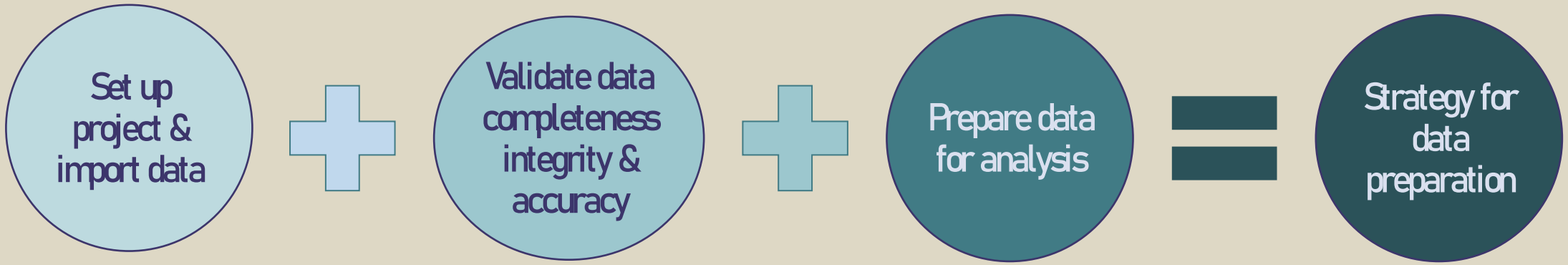
Listed in order reliability



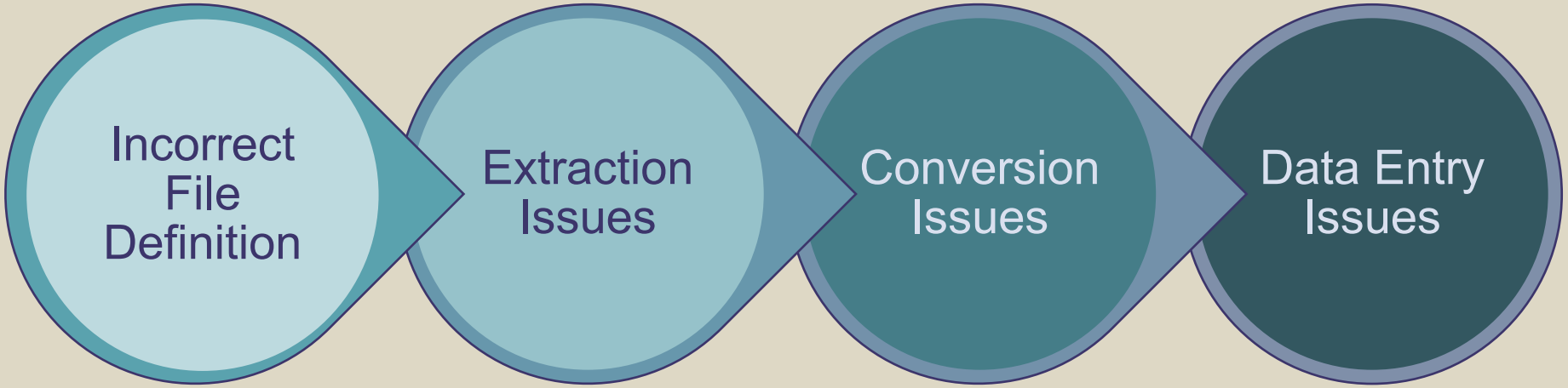
- ✓ ODBC (Direct Connection to Database)
- ✓ Fixed-Width (or Flat File)
- ✓ Delimited
- ✓ Excel
- ✓ Report
- ✓ PDF

Step #3
Preparing

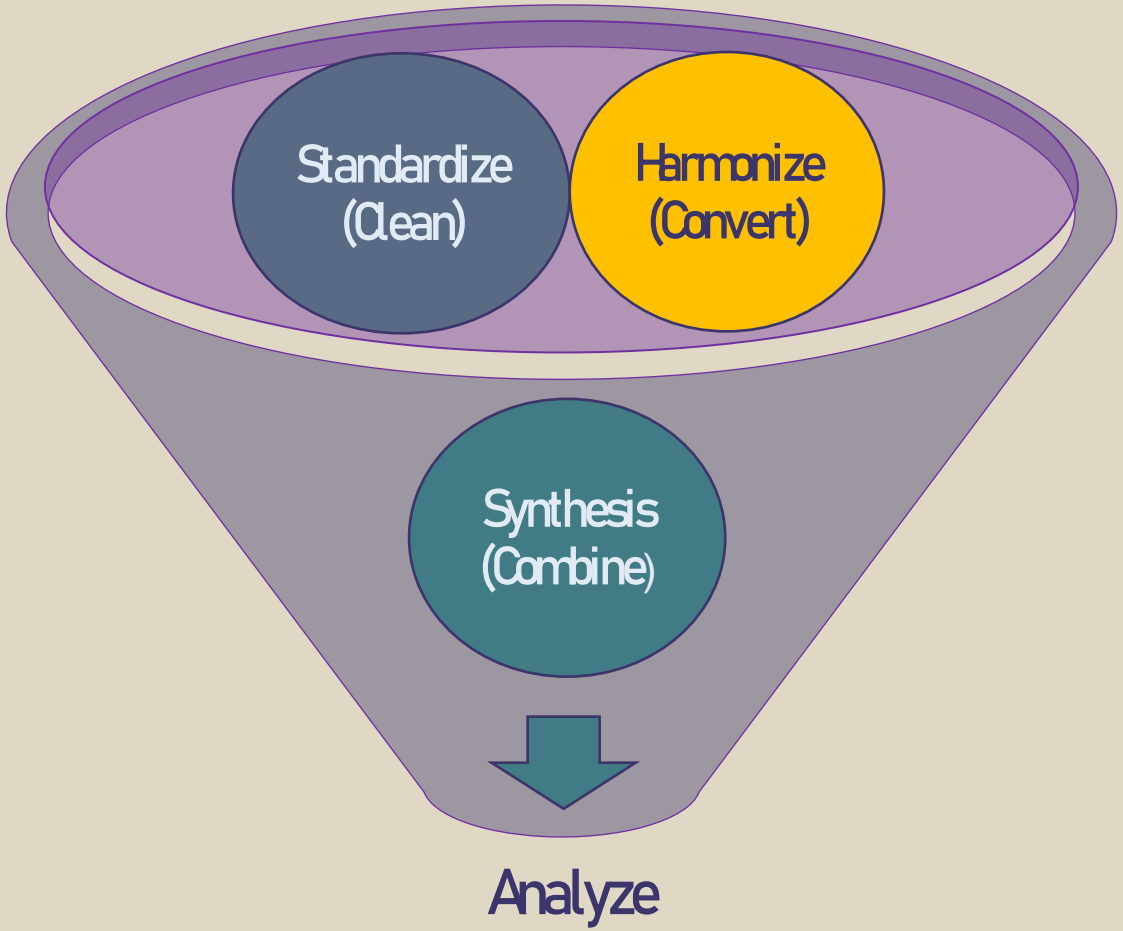
Strategies for Preparing Data for Analysis



Assess Quality and State of the Data



Data Preparation Process

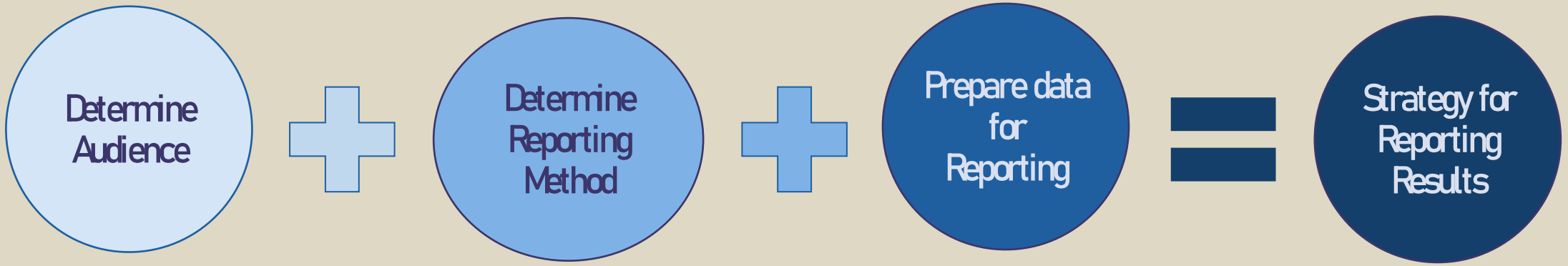


Types of Analysis

Descriptive	What is happening?
Diagnostic	Why is it happening?
Predictive	What is likely to happen?
Prescriptive	What do I need to do to prevent it from happening?

Step #5
Reporting

Strategies for Reporting Results



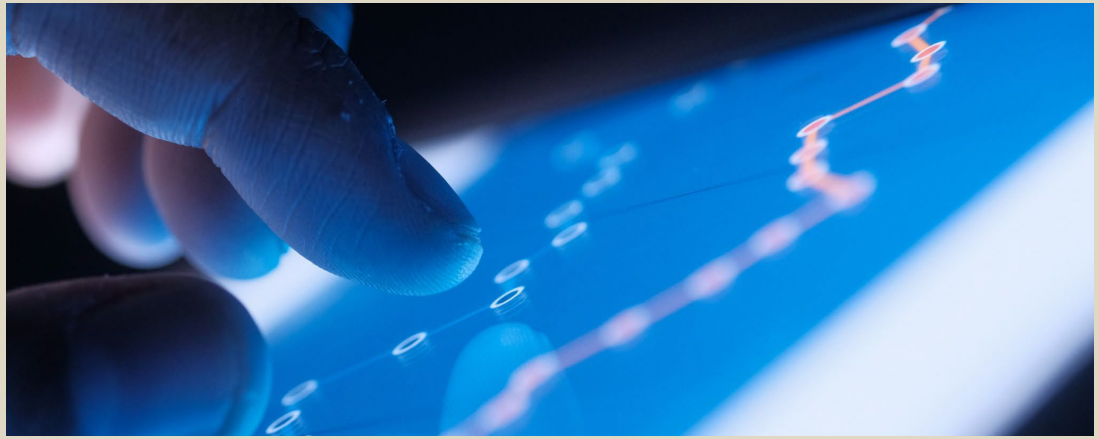
The Challenge

Data Integrity & Availability

Audit Risk & Data Integrity

An effective data analysis technology for audit purposes:

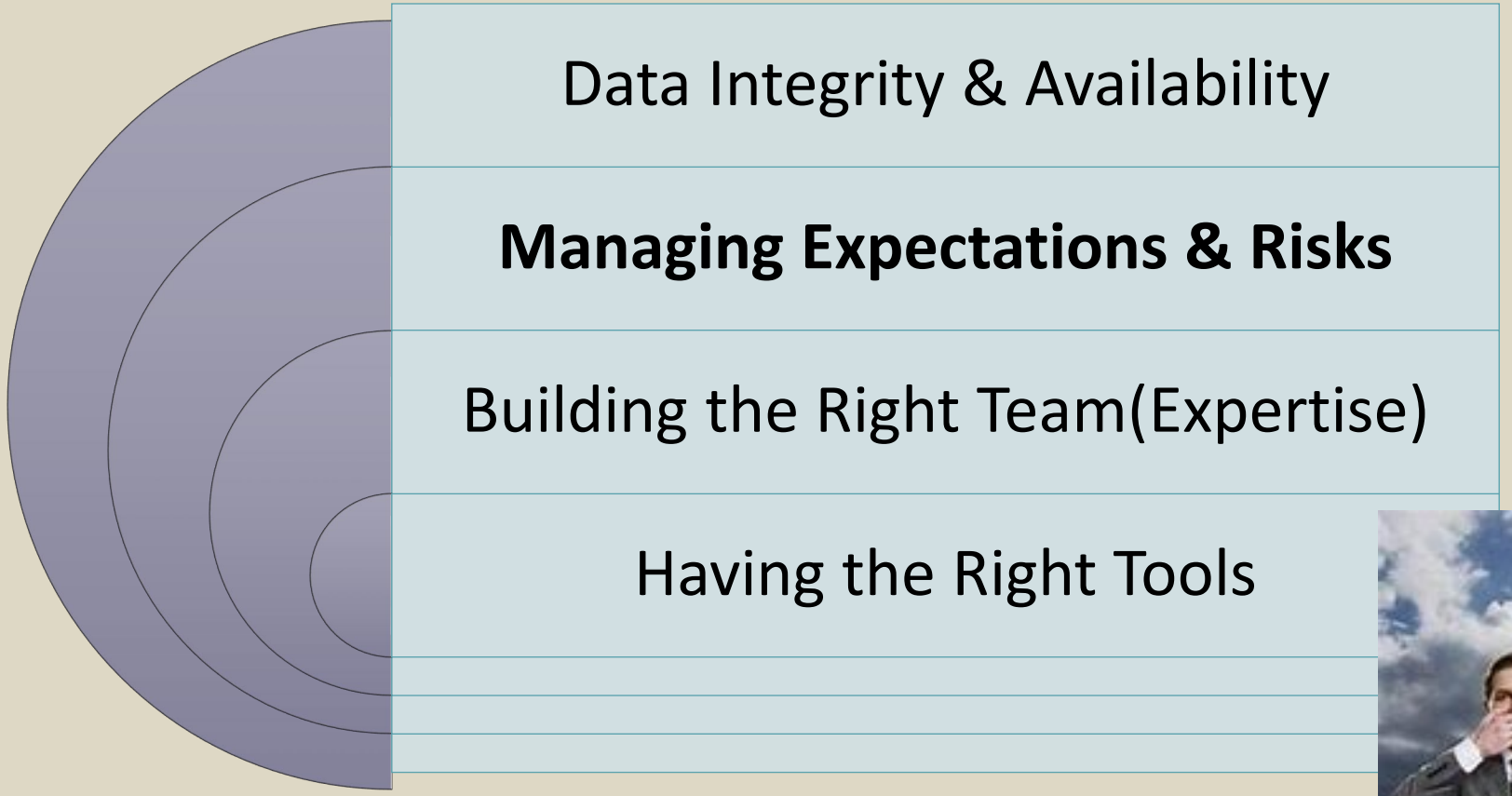
- Must protect the integrity and quality of data.
- Must be able to access and analyze data without altering it or subjecting it to accidental change.
- Must preserve the accuracy and completeness of the data to prevent the skewing of analytical results.
- Must be able to identify data quality errors in the source data.



Data Challenges ★

- Poor data quality
- Data is not integrated
- Lack of access to data
- Insufficient knowledge of institutional data

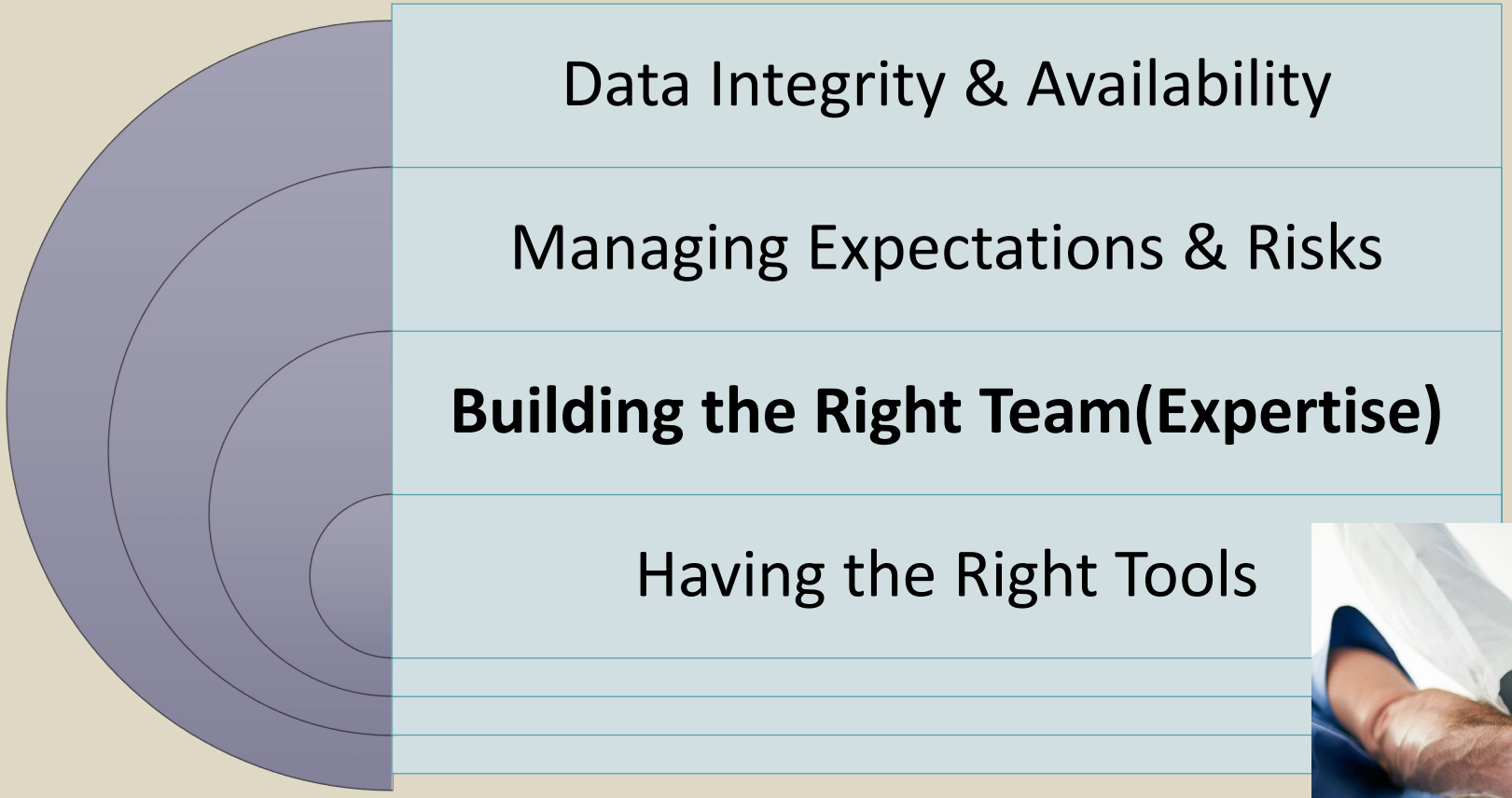
The Challenge



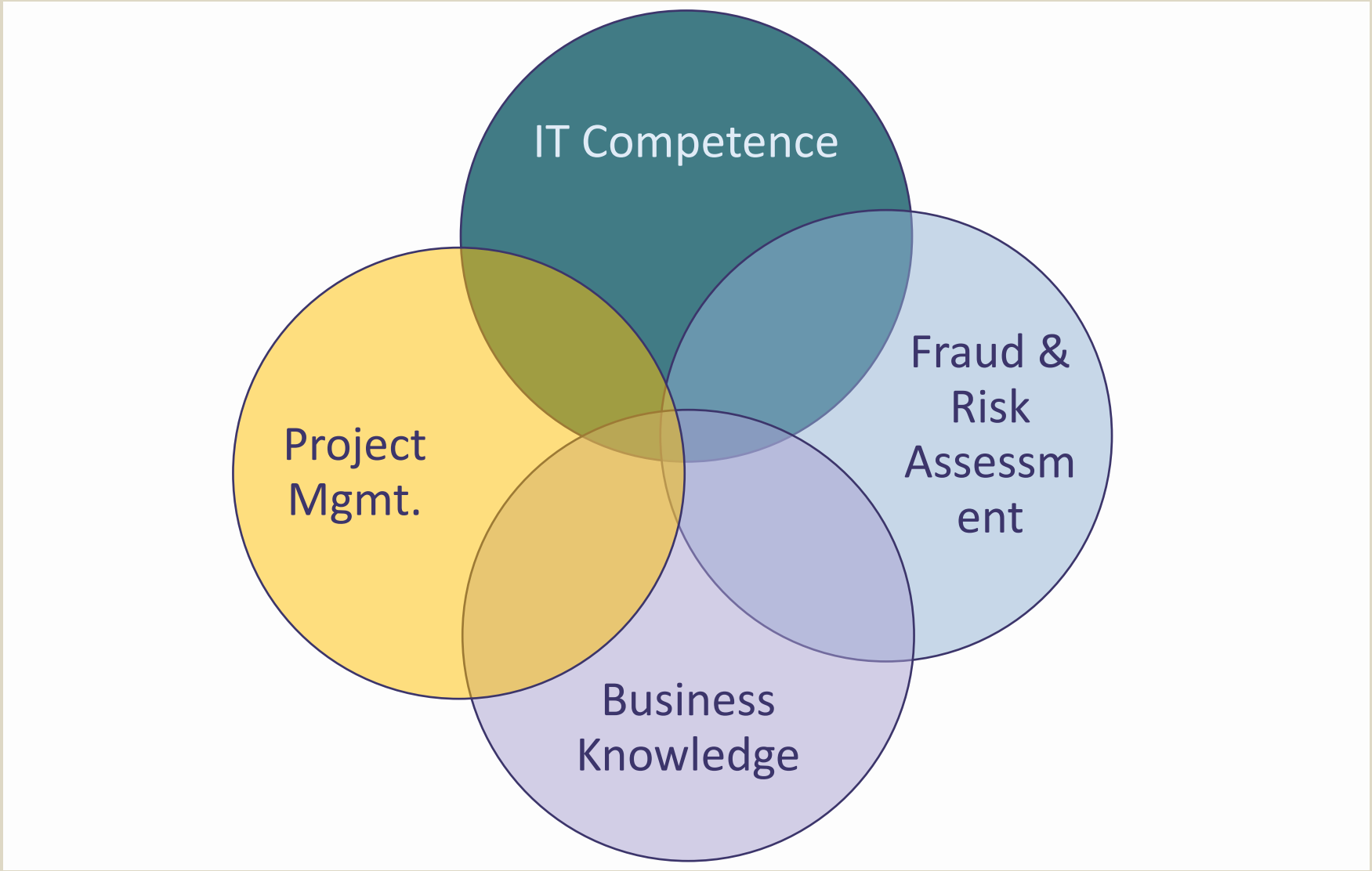
Managing Expectations/Risk

- Unrealistic expectations by management
- Unwillingness of management to act when issues are identified
- Advanced data analytic tools use algorithms may not perform as expected or deliver misleading results
- Programmatic errors
- Machine learning based on predications can amplify existing biases and can learn to discriminate
- Systems that use large amounts of data must comply with data privacy regulations

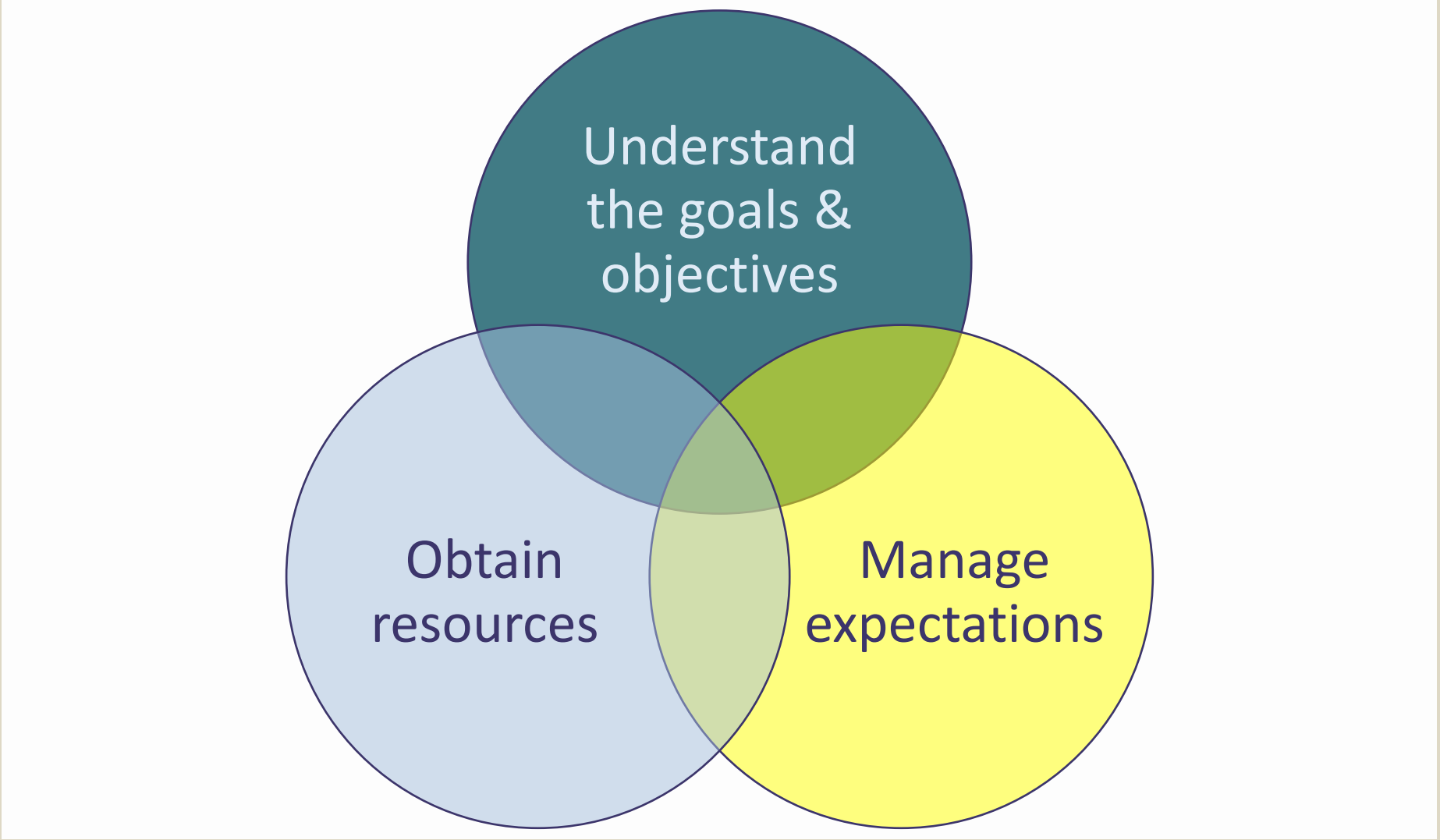
The Challenge



Core Skills of Team



Role of a Data Champion



My Champion (Rocky The Bull)

The Challenge

Data Integrity & Availability

Managing Expectations & Risks

Building the Right Team(Expertise)

Having the Right Tools

Tools

- Data Analysis
- Data Visualization
- Text Mining Tools for Unstructured Data
- Business Intelligence Software

Resources

(GSA.gov) IT Modernization Center for Excellence – Data Analytics

Data Analytic Tool Provider Guidance (ACL, IDEA etc.)

Audit Management Systems Provider Guidance (Teammate, Auto Audit etc.)

Professional Associations

Consulting Firms Surveys & White papers (Deloitte, EY, Protiviti etc.)

Questions?
Comments?

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