

eBook

Building a Data Literacy Program

What, Why, and How

By Dave Wells

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About the Author



Dave Wells is an advisory consultant, educator, and industry analyst dedicated to building meaningful connections throughout the path from data to business value. He works at the intersection of information management and business management, driving business impact through analytics, business intelligence, and active data management. More than forty years of information

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About Eckerson Group

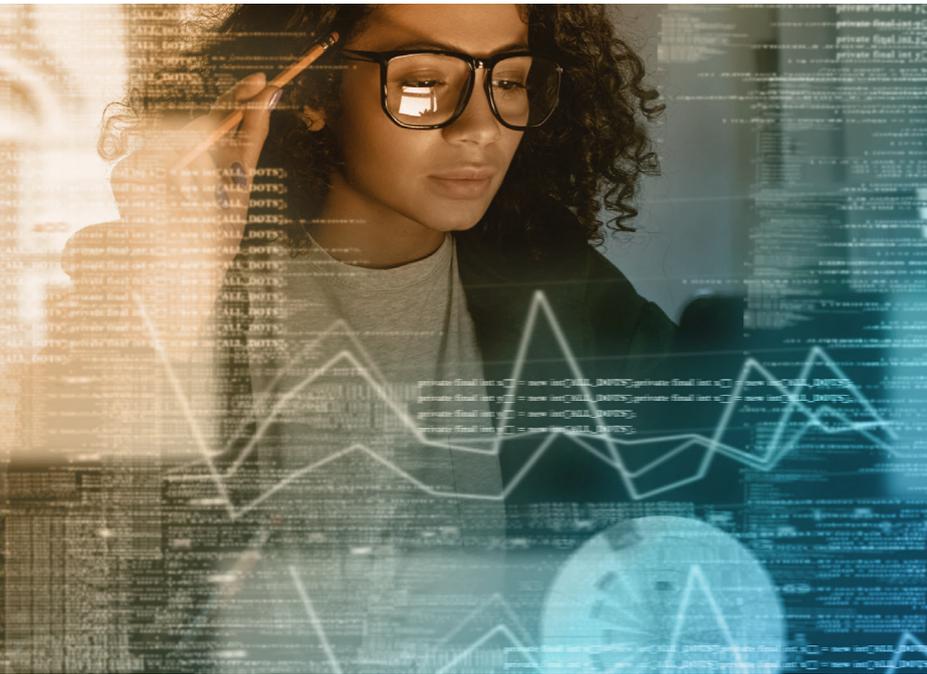
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Introduction

Data literacy is at the core of data-driven culture. Everyone who works with data (Who doesn't in today's business world?) needs to have the ability to understand, find meaning, interpret, and communicate with data. Data literacy is essential, but building a data literate enterprise is challenging.

This e-book describes the concepts, components, and processes of an enterprise data literacy program. Collectively, the chapters describe how to build a data literacy program, assess data literacy both individually and organizationally, and take action to cultivate and continuously improve data capabilities.

> **Chapter 1: The Data Literacy Imperative.**

This chapter defines data literacy, describes the nature and importance of a data literacy program, and describes the challenges and complexities of building the program.

> **Chapter 2: The Data Literacy Body of Knowledge.**

This chapter provides an overview of the broad scope of knowledge in the domain of data literacy. A common

misconception equates data literacy with ability to create and interpret data visualizations. That is but a small part of the entire body of knowledge.

> **Chapter 3: Data Literacy Assessment.**

This chapter describes the processes and techniques that are used to quantitatively assess data literacy for individuals, roles, and groups. As Peter Drucker says, “you can't manage what you can't measure.” Assessment provides the critical measures needed to manage data literacy.

> **Chapter 4: Developing a Data Literate Enterprise.**

This chapter describes the processes and practices needed to develop data literacy in individuals and in organizations—the planning, the resources, and the learning activities that make a real difference in enterprise data literacy.

Our hope at Eckerson Group is that you will put these concepts, processes, and practices to work to create an enterprise with a high level of data literacy and a thriving data culture.



Chapter 1: The Data Literacy Imperative

Everyone is talking about data literacy. But talk is easy. Doing something about it is more difficult. What does it take to truly become a data literate enterprise?

It seems that everyone is talking about data literacy today. CDOs position literacy among their top priorities and many organizations count it among their pressing needs. A Qlik [survey](#) finds that only 24% of business decision-makers are confident in their abilities to work with data and that less than one-third of C-Suite leaders are viewed as data literate. A recent [report](#) by Wayne Eckerson finds that only 20% of organizations have a data literacy program, yet 68% believe that data literacy has significant impact on financial performance. The need for greater literacy clearly exists, and the level of awareness is high. The puzzle is in what comes after awareness. How do you create data literacy? Where to start and how to grow data literacy?

Let's begin by acknowledging that it is a big undertaking. Data literacy is fundamental to success as a data-driven organization, and literacy at the level needed is not something that will happen casually. You'll need a data literacy program—formalized, funded, sponsored, planned, executed, and measured.

Further, you'll need a program that addresses all three dimensions of data literacy—people, knowledge, and culture. And to get started, you'll need to agree on a definition of data literacy. Definition is prerequisite to goal-setting, planning, execution, and measurement.

What Is Data Literacy?

Data literacy is the ability to understand, find meaning, interpret, and communicate using data. Just as language literacy is the set of knowledge and skills to communicate and inform with words, data literacy encompasses a similar set of knowledge and skills to communicate and inform with data.

Data literacy is both an individual and an organizational skill set. A data literate individual has the ability to understand, interpret, and apply data to fulfill communication responsibilities of their specific job role. A data literate organization has the ability to communicate, collaborate, and innovate using data.

People and Data Literacy

With the variety and diversity of data-related job roles, data literacy is clearly not a one-size-fits-all set of knowledge and skills. Yet it is impractical to define, develop, and measure literacy uniquely for each job role.

For purposes of data literacy program planning and management, it works to address data literacy for two distinct groups. I'll refer to the groups as data analysts and data strategists. But let these labels apply somewhat liberally; they are roles, not job titles. In the data analyst group, include anyone whose role includes responsibilities to analyze data. That might be a full-time data scientist, a marketing manager who analyzes campaign responses, or virtually anyone who participates in self-service analytics. In the data strategist group, include executive and leadership roles with responsibility to set direction, secure funding, establish policies, and drive initiatives to create value with data.

Data Analysts. Nearly everyone in business today works in the roles of business analyst and data analyst as part of their day-to-day activities. Data literacy is an essential set of skills to be successful with data and

business analysis. Data literacy often makes the difference between understanding and misunderstanding, and between communication and miscommunication. Developing data literacy through trial and error is a high-risk approach, and the cost of errors can be exceptionally high. A literate data analyst has knowledge and skills related to:

- > Data and database fundamentals
- > Data governance and metadata responsibilities
- > Data integration, data warehousing, and data lake concepts
- > Basics of BI and analytics
- > Data searching and data evaluation
- > Data preparation processes and techniques
- > Data analysis and data visualization

Data Strategists. Business executives and leaders fill critical roles in the quest to be data driven. Becoming a data-driven organization depends less on technology than on people,

processes, and culture. They create the data vision, define and communicate data strategy, and shape data culture. In these roles data literacy is important not only to communicate with data, but also to communicate about data. A literate data strategist has data knowledge and skills related to:

- > Value creation
- > Risk management
- > Governance practices and processes
- > Culture and data sharing
- > Roles and responsibilities
- > Processes and technologies
- > Use cases ranging from reporting to data science
- > Data analysis and data visualization

The goals of a data literacy program are to ensure that every individual in each of these groups has the knowledge and skills needed to fulfill their responsibilities, and that the

organization collectively has all of the skills needed to communicate, collaborate, and innovate using data.

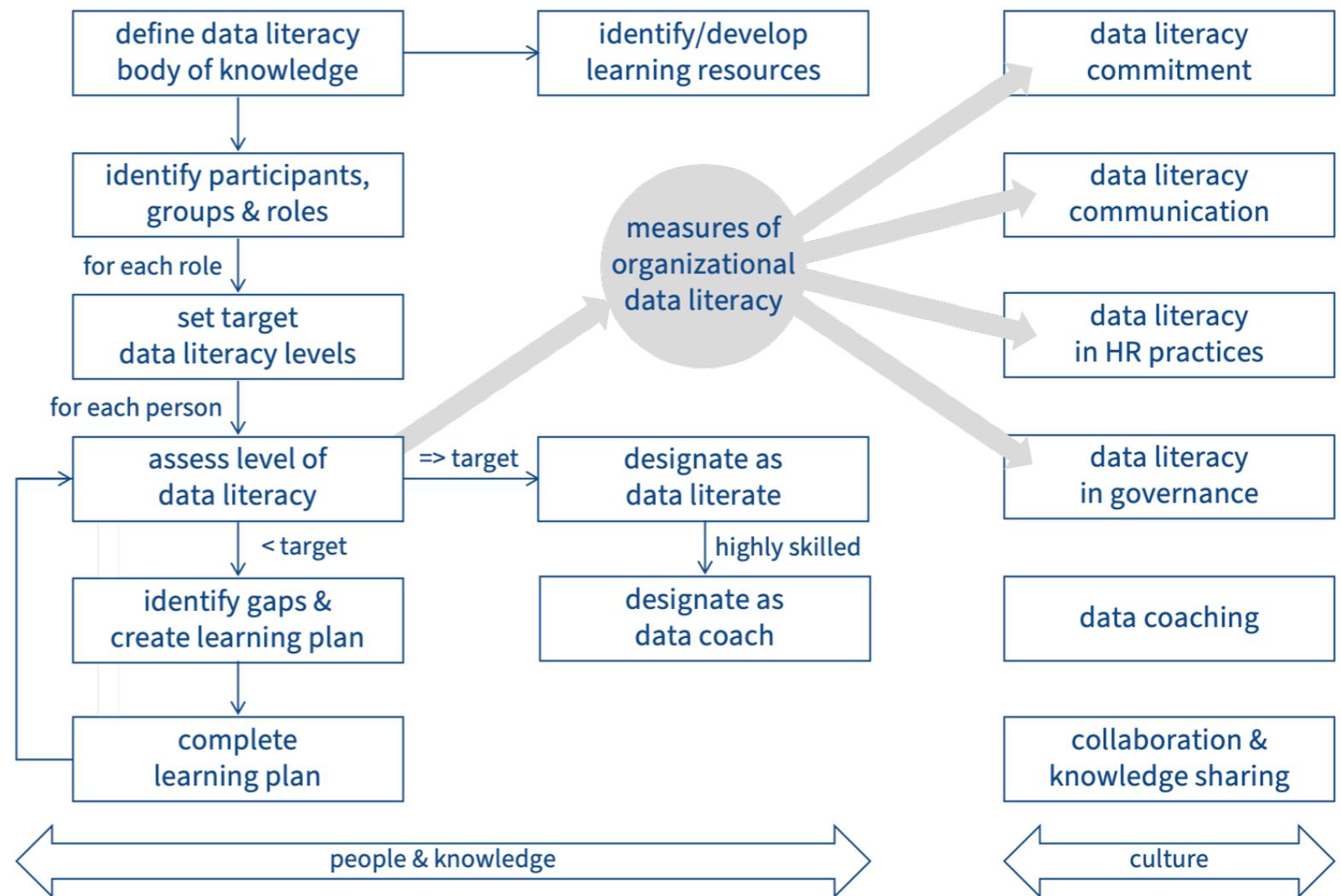
Complexities of a Data Literacy Program

Building a data literacy program is a complex endeavor involving many activities to develop people and build knowledge, and several more activities to create a culture of data literacy. Figure 1 illustrates the activities and their relationships.

The data literacy program is a cross-functional effort that minimally involves data analysts, data strategists, data governors, data coaches, and HR management. People and knowledge activities focus on literacy assessment and filling knowledge gaps. Culture activities are directed at weaving data literacy into everyday work activities—data literacy as part of job descriptions, data literacy in governance practices, etc. Individual literacy assessments are aggregated to derive organizational metrics, which in turn inform culture-oriented activities.

This is but an initial introduction to the scope and activities of a data literacy program. Subsequent chapters in this e-book dive deeper

Figure 1. Data Literacy Program Activities



into the activities and the components. The activities focus on people, culture, knowledge, learning, assessment, and measurement. At first glance, it may seem overwhelming or intimidating, but don't shy away. It is a pragmatic way to address the pressing

need for data literacy, and it should be done incrementally to grow and evolve data literacy over time.



Chapter 2: The Data Literacy Body of Knowledge

The data literacy scope of knowledge is extensive. A well-defined Data Literacy Body of Knowledge is needed to support assessment, planning, and growth.

Chapter 1 of this e-book describes the nature and importance of a data literacy program and presented a process for building the program. Assessment and planning are core activities in that process—assessment of literacy levels both individually and organizationally, and planning to fill knowledge gaps identified through assessment. A comprehensive Data Literacy Body of Knowledge (DLBOK) is the foundation for assessment, gap analysis, and development of learning plans. This chapter provides an overview of the DLBOK published by [eLearningCurve](#) in support of their data literacy certification program.

A common misconception equates data literacy with the ability to understand and create charts and graphs, limiting the concept to literacy as it applies to data visualization. Full data literacy encompasses all of the skills to understand, find meaning, interpret, and communicate with data. A fully data-literate individual has a working knowledge of where data comes from, how it is processed, how it is organized, how it is managed, and how it is used. I need to

emphasize here that there is a temptation to view body-of-knowledge topics as specialized knowledge where each area is oriented to a specific subset of data stakeholders. Don't be caught in that trap.

Let's take a look at the five major topic areas of data literacy and why each is an important part of the disciplines of data literacy.

Data and Databases

Data Fundamentals. Understanding the basics of data is the foundation for all things connected with data literacy. Distinguishing between data and information, and recognizing the many different kinds of data are important first steps. Knowing where your data comes from and how it is organized, then understanding data contents are keys to proficiency when working with data.

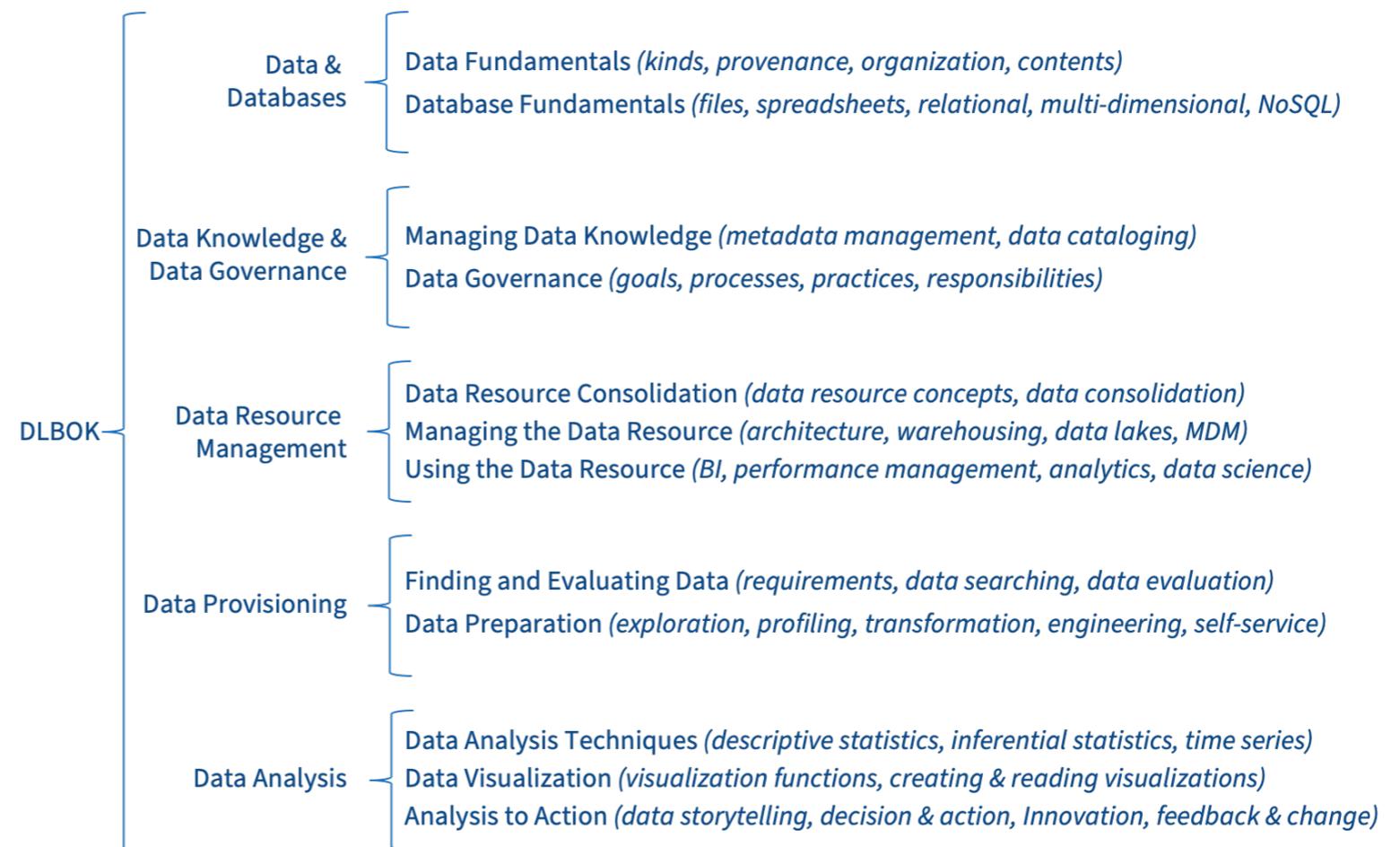
Database Fundamentals. A database is a collection of data that is organized to be stored, accessed, and processed electronically. A common database misconception is the

tendency to equate a database management system with a database—to refer to Microsoft SQL Server, for example, as a database. SQL Server is the database management system or DBMS; a set of software used to create and manage databases. Another common misconception is the belief that a database must contain relational or structured data. A database is any organized collection of digital data whether structured, unstructured, semi-structured, or multi-structured. Many different types of databases exist. The most common types in use today include flat files, spreadsheets, relational databases, multi-dimensional databases, and NoSQL databases. Data literate individuals need to be capable of working with databases of many different kinds.

Data Knowledge and Data Governance

Managing Data Knowledge. Data knowledge is the collective understanding of data by everyone who works with or has a stake in the data. Data knowledge includes understanding of content, meaning, location, structure, quality, privacy and security requirements, and much more. No single individual has all of the knowledge about any data collection, so sharing of data knowledge is essential to achieve maximum data understanding and

Figure 2. The Data Literacy Body of Knowledge (DLBOK)



appropriate use of data. Some data knowledge is managed as metadata in tools such as dictionaries and glossaries, but much of it is “tribal knowledge” held only in the minds and memories of people. Capturing tribal knowledge and collecting it as shareable metadata is one of the many important roles of data cataloging. Shared knowledge is a key factor for growth of organizational data literacy.

Data Governance. Data governance addresses the policies, processes, and practices to actively manage data assets. The ultimate purpose of data governance is to ensure that data is available when needed, usable and appropriately used, secured and protected as needed, and of high quality. Governance methods vary among organizations with practices differing based

on culture, industry, data management maturity, and data management priorities. Data policy management is fundamental to data governance. Policies may focus on any or all of data protection, data utility, and data value. Typical data governance activities include assessing and improving data quality, collecting and sharing rich and reliable metadata, minimizing data risks, protecting and securing sensitive data, and ensuring regulatory compliance. Everyone who works with data is a stakeholder in data governance with responsibilities to comply with policies and use data appropriately.

Data Resource Management

Data Resource Consolidation. Data resources are the collections of data that are shared and reused across organizations and among people who use data for analysis and reporting. Data resource management is the set of architectures, processes, and practices that are used to consolidate disparate data, resolve inconsistencies, support controlled data sharing, and organize data to support many different users and uses. Data science, for example, typically prefers raw and unrefined data while basic reporting works well with data that is consolidated and

cleansed. Well-managed data resources are able to meet both kinds of data requirements as well as many variations between the two extremes. Knowledge of various data resource management methods helps data consumers to choose the best sources for their data needs and to understand the characteristics of data that they use.

Managing the Data Resource. Managing the data resource involves processes to develop and apply architectures, and to define and execute the processing that is used to manage data throughout its lifecycle. Well-managed data is organized to be easily found, understood, accessed, and processed to meet the needs of many different users and use cases. There is not a one-size-fits-all way to organize data that satisfies all data uses. Data that is optimized for day-to-day business analysis, for example, is not ideally suited for machine learning applications. Data organized for data science doesn't work well for enterprise reporting. The goal of data resource management is to provide optimal data for all uses, from basic reporting to advanced data science, without unnecessary redundancy, and with as much data sharing and data reuse as is practical.

Using the Data Resource. Data is at the core of business management and operations. Data-driven businesses use data in many different ways to:

- > inform decision-making processes,
- > monitor progress toward achieving goals,
- > understand and analyze events and outcomes,
- > know why things happen and how to shape what happens,
- > predict future outcomes, and
- > recommend actions and automate processes.

Business intelligence, performance management, analytics, and data science all depend on managed and shared data resources to deliver information, reduce uncertainty, and enhance organizational learning.

Data Provisioning

Finding and Evaluating Data. Data usage—whether for basic analysis and reporting, advanced data science applications, or

somewhere in the middle—isn't possible until you have the right data. You need to find data that is well-matched with analysis goals. Data seeking is not practical without first stating the goals and understanding the business, information, and data requirements. With known requirements, you can search for data. The datasets that you find should be evaluated for quality and trustworthiness, and sometimes to select the best fit among multiple datasets that are available.

Data Preparation. Data preparation may be performed by data analysts working with self-service tools, or by data engineers building data pipelines for analytics and data science processes. Preparing data for analysis is most commonly an iterative process of data exploration and data transformation. Data exploration is necessary to identify and understand the main characteristics of the data. What things (customers, products, employees, accounts, transactions, etc.) are represented by the data? What facts (names, dates, amounts, etc.) about those things are described and how are they described? Data transformation changes data to create the contents, structures, and formats that are needed for analysis. The three primary reasons

for data transformation are improving data, enriching data, and formatting data.

Data Analysis

Data Analysis Techniques. Data analysis is a process of organizing data for exploration, using statistical methods to explore and find patterns, visualizing patterns to understand and communicate them, interpreting patterns and visualizations to describe meanings and insights, and acting on insights to achieve results. Descriptive analysis develops statistics to illustrate the shape of the data, describing characteristics such as the distribution of values. Inferential analysis develops conclusions, showing relationships and dependencies among variables and trends in data values over time.

Data Visualization. Data visualization illustrates patterns and trends in data as images—charts, graphs, and maps—that make it easy to see things that are not readily visible in large amounts of tabular or textual data. Charts and graphs are the predominant way of visualizing data. Every data analyst needs to understand the common types of charts and graphs and how they are used to communicate. Every manager, decision-maker,

and data dependent worker should understand how to find the meaning in charts and graphs and how to avoid misinterpreting them. Data visualization skills are a fundamental part of data literacy.

Analysis to Action. Data analysis only creates value when we can translate analytics into action. Conventional thinking typically says that the purpose of analytics is to create insights. But insights not acted upon are pointless and the effort to produce them is wasteful. Getting from analytics to action doesn't happen automatically or accidentally. It is a proactive process that involves human factors such as trust and buy-in. It all begins by interpreting the analysis and using it to drive conversation, communication, and collaboration.

Using the DLBOK

This chapter provides a high-level overview of the scope of knowledge for data literacy. The upcoming chapters discuss putting the DLBOK to work to assess data literacy, identify knowledge gaps, develop and execute learning plans, measure and monitor literacy, and grow data literacy both individually and organizationally.



Chapter 3: Data Literacy Assessment

With the broad scope of data knowledge, everyone has both strengths and gaps in data literacy. Assess your data literacy to know and leverage strengths and to identify and fill the gaps.

Cultivating data literacy, both individually and collectively for the organization, is the predominant goal of a data literacy program. And growing literacy doesn't happen without assessment and planning—assessment of literacy levels both individually and organizationally, and planning to fill knowledge gaps identified through assessment. It has often been said that you can't manage what you don't measure. This concept applies to growing a culture of data literacy as much as any other management effort.

Assessment Basics

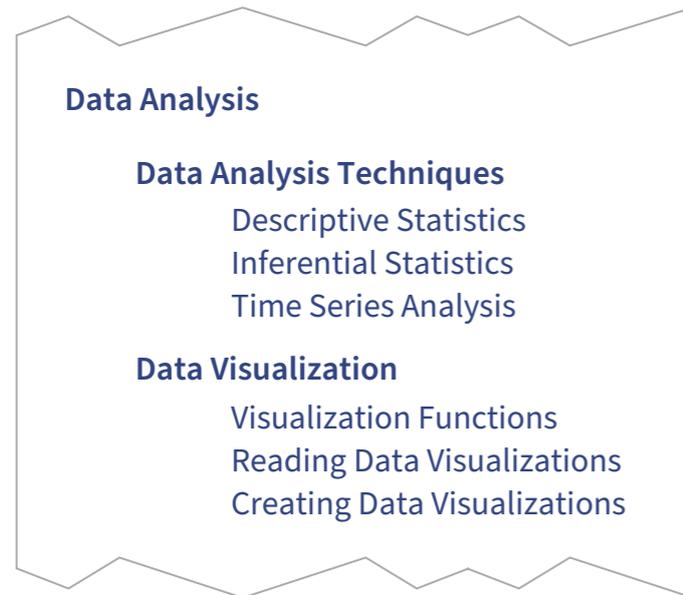
As described in chapter 2, a comprehensive Data Literacy Body of Knowledge (DLBOK) is the foundation for assessment, gap analysis, and development of learning plans. The DLBOK identifies topical areas for data literacy, ideally in a multi-level structure such as the partial example shown in figure 3.

Assessment tests individual knowledge at the lowest level of topic hierarchy, then rolls the

results up to higher levels. An assessment might show, for example, that an individual has:

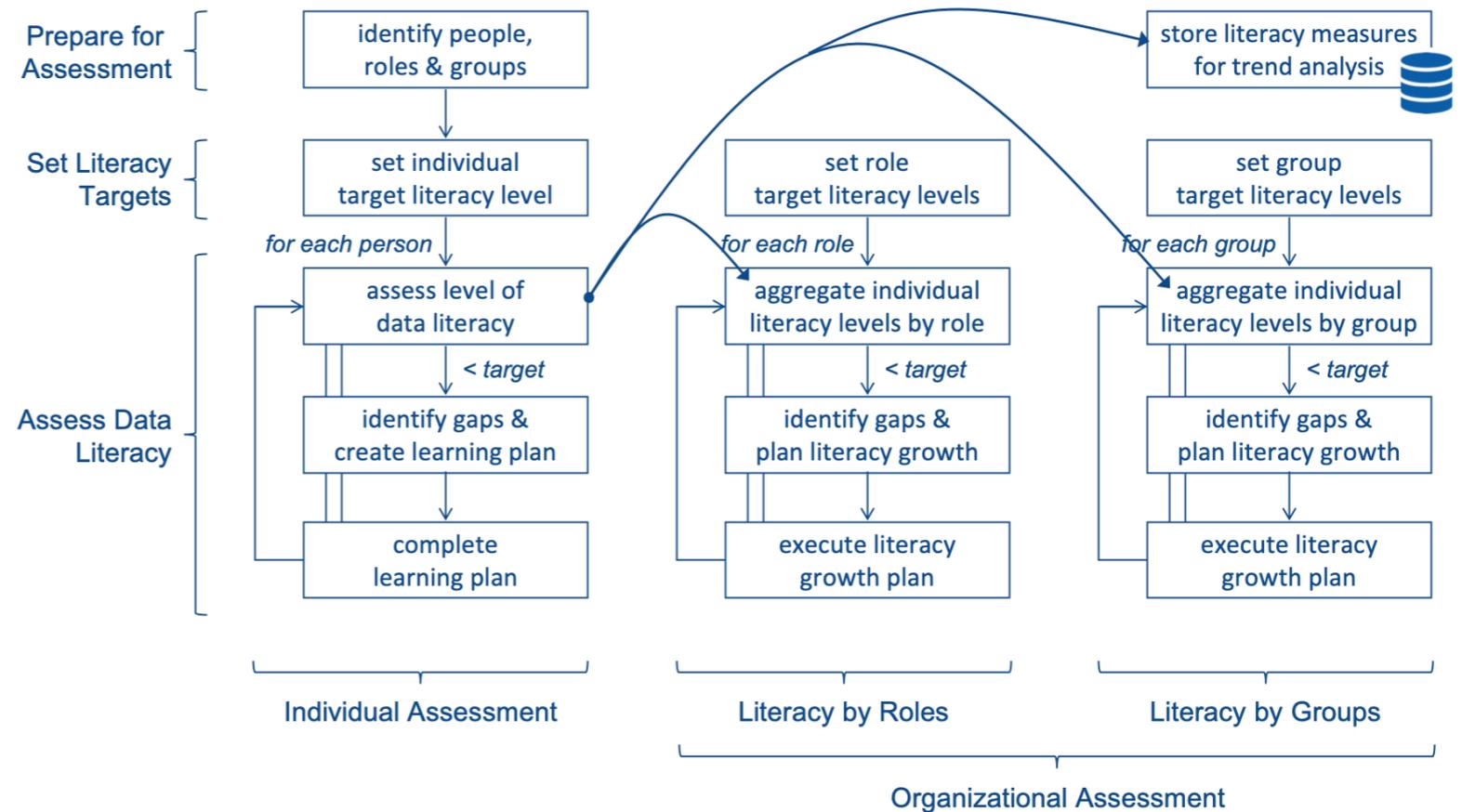
- Above average literacy for Data Analysis
 - Moderate literacy for Data Analysis Techniques
 - High literacy for Descriptive Statistics
 - Low for literacy level Inferential Statistics
 - Moderate literacy for Time Series Analysis
 - High literacy for Data Visualization
 - High literacy for Visualization Functions
 - High literacy for Reading Data Visualizations
 - Above average literacy for Creating Data Visualizations

Figure 3. Partial Example of 3 Levels of DLBOK



The example above intentionally uses subjective and comparative language—moderate, above average, high, low, etc.—to illustrate the concept. In practice, literacy assessment is quantitative with a score calculated for each bottom level topic then rolled up to higher level topics. The eLearningCurve DLBOK is supported with a

Figure 4. Data Literacy Assessment Process



corresponding (and free) assessment tool based on these concepts.

The Assessment Process

Assessing data literacy of individuals is valuable and informative for people who want to advance their data skills and their career growth opportunities. But individual

assessment is only the beginning. It is the foundation upon which organizational assessment is built, and organizational assessment is an essential process when building a culture of data literacy. Literacy assessment with business impact is performed at three levels—by individual, by role, and by group. (See figure 4.)

Preparing for Assessment

Preparation is a necessary first step to determine whose data literacy will be assessed, both individually and collectively by roles and groups. When assessment is driven as a corporate initiative, it makes sense to begin by identifying roles and groups. Typical roles include business executives, business managers, internal auditors, data analysts, business analysts, data engineers, data scientists, etc. Group identification is likely to be based on organization structure, thus hierarchical and perhaps ranging from major business units such as Financial Management to sub-units and teams. Once roles and groups are identified, then it is practical to identify the individuals in those roles and groups.

Sometimes, however, data literacy is more of a grassroots effort than a corporate initiative. In those cases, identify the individuals first, then associate each person with the appropriate roles and groups.

Preparation also includes getting ready to store and manage the assessment data that is needed to measure, monitor, and manage a data literacy program

Setting the Targets

As with any measurement process, measures aren't meaningful without a basis for comparison. Begin by knowing the measurement basis of your assessment method and tool. Does it score literacy on a 10-point scale, a 100-point scale, or some other method? Then consider the DLBOK that frames the assessment. Not all topics in the DLBOK demand the same level of literacy from all individuals, roles, and groups. Data Scientist roles, for example, should certainly have high literacy in statistical analysis with perhaps lower expectations for database management. For each role and group you'll want to set targets by topic.

To make the process manageable, don't set targets at too low a level. Referring back to the earlier example of Data Analysis, it is practical to set targets at the second level—Data Analysis Techniques and Data Visualization. With the measurement basis known, you can set target levels for each individual—perhaps depending partially on their roles—or ask them to set their own targets. You can also establish targets for each role and group to be assessed. Of course, when first getting started, target setting is a

lot of guesswork. Don't hesitate to set some initial targets, conduct that first assessment, and then adjust the targets based on what you learn from assessment.

Individual Assessment

To conduct individual assessment, each person is tested by responding to questions that are based on the DLBOK. (See the column on the left side of figure 4.) Test scores are detailed by DLBOK topics at the same level as is used to set targets. Comparing actual scores to targets identifies both strengths and gaps. Gaps exist where the actual score falls below the target level. Use gap assessment to create a learning plan that will build new knowledge (more about this in chapter 4). Complete the learning plan, then reassess.

Don't overlook strengths that are identified. When assessment shows high literacy level or performance well above the target level, view that strength as an opportunity. In what ways might it offer growth and career opportunities? How can you share that knowledge and skill to grow overall literacy and data capabilities for your team or organization?

Developing data literacy is not an event. It is a journey that is guided by periodic assessment and continuous planning.

Organizational Assessment

Organizational data literacy has two dimensions—literacy by roles and literacy by groups. (See the two columns on the right side of figure 4.) For both dimensions, measures are derived by aggregating individual literacy scores of the people in those roles and groups. Similar to the process for individuals, literacy measures are compared with targets to identify strengths and gaps. Gaps are the areas where measures fall short of targets and a literacy growth plan is needed. That plan may include individual learning plans, group learning, implementing a data coaching program, and other methods. (More on this in the next article in this series.) Strengths should be acknowledged and recognized as group accomplishments, and may indicate opportunities for highly skilled groups to coach or mentor as part of other groups' growth plans.

Ongoing Assessment

Growing data literacy is not an event but a journey. Assessment isn't a one-time activity; it is an ongoing process of measurement as part of continuous growth and improvement. Collect and store assessment measures—ideally as a star-schema dimensioned by roles, groups, and dates—to support analysis and monitoring of trends. Management, measurement, and monitoring work together to inform leadership when creating a data literacy culture. As is typical with continuous improvement processes, you may choose to adjust targets and “raise the bar” as the culture of data literacy matures.

Beyond Assessment

Data literacy assessment identifies gaps but does not actively close the gaps. Use the assessment to plan for learning and growth. That planning needs to identify and implement a variety of learning and growth resources. Chapter 4 discusses how to use results of assessment to cultivate data literacy throughout the enterprise.



Chapter 4. Developing a Data Literate Enterprise

Growing data literacy is a process that begins with assessment and progresses through planning, execution, measurement, and repetition.

The previous chapters have examined the urgent need for data literacy, the Data Literacy Body of Knowledge (DLBOK), and data literacy assessment. Now it is time to put all of the pieces together with a look at the processes and practices needed to develop data literacy in individuals and in organizations. The process begins with assessment and planning, but those activities alone will not achieve your literacy goals. They are only the beginning. The full scope of effort to grow data literacy is illustrated in figure 5.

At the macro level, growing data literacy is a four-step process:

- > **Assessment** is the essential first stage with the goal to know where you are.
- > **Planning** builds on assessment to decide where you want to go and how to get there.

- > **Execution** carries out the actions that are identified in the plan.
- > **Measurement** evaluates progress both in execution of actions and achievement of goals.

Each step is performed both for individuals and for organizations. Individual literacy is important to be sure that every person who works with data is able to create value and minimize risk. Organizational literacy is specifically managed because it is much more than the aggregate of individual literacies.

Expect multiple iterations—perhaps sustained iteration—because developing literacy is not a big bang undertaking. It is not an event, but a journey that is guided by periodic reassessment and continuous planning.

The Human Dimension— Individuals and Organizations

As briefly mentioned above, developing data literacy is important both for individuals and organizations.

When defining the scope of a data literacy program it is important to identify the individuals, roles, and groups that are the focal points.

Individual Data Literacy. Individuals may be self-motivated to develop data literacy, or they may be driven by management initiatives. Every data worker needs to be data literate, though topics and levels of literacy vary among individuals. Data workers include anyone who collects, stores, manages, or analyzes data as part of their responsibilities, as well as anyone who uses data presented as charts, graphs, or reports to make decisions and take actions.

According to a Brookings Institute [report](#), nearly every job has become a digital job that requires data skills. This is certainly technical jobs, but also lawyers, teachers, automotive technicians, nurses, office and clerical staff,

Figure 5. Growing Data Literacy



and more. The report links digital skills with job resiliency—the ability to adjust to changing job requirements. With this in mind, it is important to consider who in your organization needs to have data skills and how to foster interest in data literacy.

Organizational Data Literacy. Organizational literacy is addressed from two perspectives: roles and groups. Roles are based on what a

person does—business executive, business manager, business analyst, accountant, auditor, sales person, data analyst, data engineer, software engineer, data scientist, data architect, data steward, etc. Note both business and technical roles in the list of examples. For the purpose of managing data literacy, roles describe a collection of data workers with similar responsibilities and data interests.

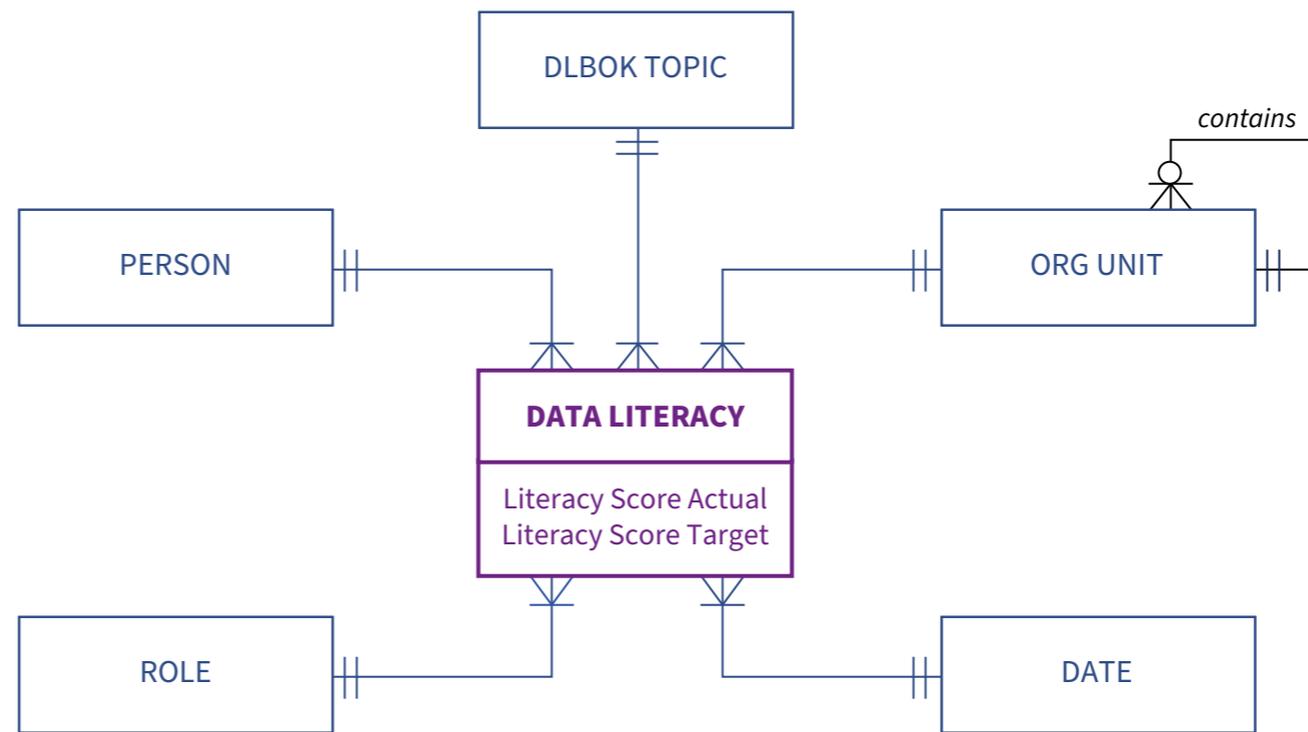
Managing literacy by groups is based on how the organization is structured as business units, departments, functions, teams, etc. Literacy can be assessed, planned, and managed at several levels of organizational hierarchy based on organization chart structure. It may also be managed for cross-functional teams such as a data governance group.

Identifying which individuals, roles, and groups to focus on is important when defining the scope of a data literacy program. For many organizations—especially large enterprises—it makes sense to start with the most essential individuals and organizations, then expand over time as the program matures.

Assessment

Assessment is the essential first step for developing data literacy. Determining the current state based on a DLBOK quantifies where you are, and it provides information needed to identify gaps and plans for growth. Individual assessment tests data knowledge of people to determine quantify data literacy as literacy scores. Scores are compared with target levels to identify gaps.

Figure 6. Data Literacy Assessment Measures as Dimensional Data



Author's Note: I intentionally included a data model to illustrate a point. Some readers—especially data modelers—quickly understand the model without explanation. Others need to read the explanatory text and study the model to understand. (If you want a 90-second introduction to reading data models check out [this video](#).) If I had used a data pipeline diagram instead of a data model, that would be intuitive for data engineers but need explanation for many others. A digital transformation strategy map would make sense to many business managers, but be less clear to people in more technical roles.

This illustrates an important point about data literacy: Each of us has areas of knowledge that are intuitive and based on depth of experience, and we all have areas where we need to expand our knowledge. Broad knowledge across the entire DLBOK with depth of knowledge in the areas of your responsibilities is a realistic and practical data literacy goal.

Organizational assessment aggregates individual scores by groups and roles, comparing them to group and role targets to identify gaps. When assessing at multiple levels of organization hierarchy, it works well to aggregate individual scores at the lowest level of interest and then roll up to higher levels. Collecting assessment data in a multi-dimensional data structure (see the data model in figure 6) makes aggregation and roll-up easy, and supports slice-and-dice analysis of data literacy.

The fact table at the center of this data model contains the values for actual and target data literacy scores. Each row contains scores for one person, in one organization unit, in one role, for one DLBOK topic, and for one assessment date. Dimension tables contain the needed data about topics, persons, organization units, roles, and dates. The structure supports situations in which one person may work in multiple roles and/or organization units. It also supports multi-level organization hierarchy where one organization unit may contain several subordinate units. With Online Analytical Processing (OLAP) technology, all aggregation and roll-up is automated, and the ability to see literacy levels

by any combination of the five dimensions is fully supported.

Individual Planning

The basics of planning are straightforward: know where you are, know where you want to go, and define the path to get there. These basics hold true for data literacy planning. Results of assessment are the starting point—knowing where you are. Next, define the destination as data literacy goals. Then you can map out the journey from where you are to where you're going.

Goal Setting is the process of prioritizing, refining, and sequencing data literacy targets. Targets are initially set for each topic as part of the assessment process (described in Chapter 3 of this eBook) and are used as part of gap analysis. At this point you may want to refine targets depending on the number and size of gaps, and on the relative importance of each topic for your job roles and responsibilities. Identify the most urgent gaps and limit the scope to what is realistic in 6 to 12 months. Decide whether to close each gap, achieving the initial target set at assessment, or to narrow the gap by adjusting the initial target.

Learning Resources are the means to develop new knowledge and skills. Training resources are the obvious first choice, including in-person and online classes. Look for data literacy certification programs, commercially available classes, software vendor training, university continuing education programs, and more. Training classes are a good beginning but think beyond training to tap other learning opportunities. Are there others in your organization or among your colleagues who would be interested in group learning and discussion activities? Are there people able and willing to act as coaches or mentors? Are there current or upcoming projects that offer an opportunity to learn from experience?

Learning Plan Development brings together goals and resources and plots them on a timeline—for example: (1) complete this class by this date to acquire this knowledge, (2) participate in this project for this time period to gain this experience, (3) work with this mentor for this time period to learn these skills. The learning plan is really your roadmap to goal achievement. It describes what you plan to do, when you plan to do it, and what you expect to accomplish.

Individual Execution

Nike says it well: Just do it! You've made the plan. Now undertake the study, engage with coaches and mentors, participate in discussions, and get involved in projects. Take the actions that are defined in your plan.

Individual Measurement

Don't wait until the end to measure. Evaluate study progress as you go. Are you completing classes on schedule as planned? Are you learning what you need to learn? When the answers to these questions are a definitive "yes" then you're on the right track. When "yes" is not the answer, don't hesitate to adjust the plan. You may want to change resources, change timelines, or, as a last resort, adjust goals.

Organizational Planning

Goal Setting for Capabilities considers the increased ability of groups and roles when data literacy is improved. Organizational planning is similar to individual planning: current state, goal setting, and mapping the path from start to finish. Assessment describes the current state, and some of the goals are similar with individual knowledge and skills translating into organizational capabilities. The aggregates of

individual assessments quantify group and role capabilities, but that is where the similarities end. Aggregates of individual targets don't directly correspond with group and role targets. Those targets are set independently as part of assessment. Scope may be narrowed to a subset of gaps, a subset of groups, a subset of roles, or any combination of the three. Aggressive goals may seek to close gaps or less aggressively to narrow the gaps.

Goal Setting for Cultural Impact goes beyond DLBOK-based assessment to consider the impact of a data-skilled workforce and the business benefits of data literacy. Cultural goals include trust in data, use of data for decision making, integration of data into business processes, engagement with data and with self-service analytics, data and knowledge sharing, data-driven innovation, and advanced use cases such as prediction and automation. A pragmatic approach to cultural change starts by pursuing a small number of these goals. Don't try to tackle everything at once. Choose the goals, then establish for each a benchmark against which progress can be compared. Some goals, such as trust, may need a survey-based benchmark. Benchmarking for others can be achieved by observing who is using

data, how, and for what purposes. Set time-based goals but be realistic about timing. The time frame is different than for individual goals because organizational and cultural change isn't readily achieved in 6 to 12 months.

Literacy Growth Resources are the tools that are useful to elevate organizational data literacy and to drive cultural change. Incentives and motivators are the tools that influence individuals to actively pursue data literacy. These may be as casual as public recognition of data literacy skills and achievements, or as formal as building data literacy into job descriptions and performance reviews. Building data literacy into HR practices, making literacy a governance priority, implementing data coaching practices are effective ways to drive organizational growth. Organization, role, and process changes help to weave data into everyday business activities—perhaps a change such as embedding data stewards into selected business units, or charging department heads with responsibility to provide specific data up the management hierarchy.

Literacy Growth Planning plots changes on a timeline. Define what incentives, motivators, and changes will be implemented and when.

Building literacy into HR practices, literacy as governance priority, and implementing data coaching practices are effective ways to drive organizational growth of data capabilities.

Also know who will implement. Designate responsible organizations and people for each implementation.

Organizational Execution

Again, just do it. Execute the plan. Implement the incentives and motivators. Make the changes in organizations, roles, and processes.

Organizational Measurement

As described for individual measurement, it is important to measure as you go. Don't wait until the end to know if what you're doing is working. This is especially important when driving organizational and cultural change. Assessments and aggregation are a practical basis to measure group and role capabilities. Measurement of cultural progress uses the same basis as for establishing the benchmarks.

Cycles of Improvement

Growing data literacy is a continuous improvement process, both individually and organizationally. Proven practices of continuous improvement—iteration and feedback—are an important part of the data literacy journey. Continuous planning is more important than having a plan. Expect a cycle of plan, do, evaluate, and plan again. That is the inner loop of the diagram in figure 1 and a key to managing through one iteration of literacy growth. But data literacy is a big undertaking with broad reach across organizations and deep reach into business units and processes. Grow data literacy incrementally by taking on one manageable iteration at a time. Assess, execute, reassess, and then broaden the scope for the next iteration. Ultimately, data literacy is not a project. It is a lifestyle.



Conclusion: Data Literacy is a Wise Investment

Every enterprise is data driven—either intentionally or incidentally—because data is everywhere. Public or private, non-profit or commercial, and in every industry the people in your enterprise work with data every day. Data isn't free; it is an investment. To optimize return on that investment, we must also invest in data literacy. From a Balanced Scorecard perspective, Kaplan and Norton show a causal chain that starts with learning and growth. What learning could be more timely, more pervasive, and more central to the data-driven enterprise than learning about data?

Data literacy is not a project. It is a lifestyle.

About Eckerson Group



Wayne Eckerson, a globally-known author, speaker, and consultant, formed [Eckerson Group](#) to help organizations get more value from their

data. His goal was to provide organizations with expert guidance during every stage of their data and analytics journey.

Eckerson Group helps organizations in three ways:

- > Our thought leaders publish practical, compelling content that keeps data analytics leaders abreast of the latest trends, techniques, and tools in the field.
- > Our consultants listen carefully, think deeply, and craft tailored solutions that translate business requirements into compelling strategies and solutions.
- > Our advisors provide one-on-one coaching and mentoring to data leaders and help software vendors develop go-to-market strategies.

Eckerson Group is a global research and consulting firm that focuses solely on data and analytics. Our experts specialize in data governance, self-service analytics, data architecture, data science, data management, and business intelligence.

Our clients say we are hard-working, insightful, and humble. It all stems from our love of data and our desire to help organizations turn insights into action. We are a family of continuous learners, interpreting the world of data and analytics for you.

Get more value from your data. Put an expert on your side. [Learn what Eckerson Group can do for you!](#)

