

# The Digital Practitioner Foundation Study Guide

*by Andrew Josey*

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# The Digital Practitioner Foundation Study Guide

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The Open Group Guide

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# Preface

## The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through technology standards. Our diverse membership of more than 700 organizations includes customers, systems and solutions suppliers, tools vendors, integrators, academics, and consultants across multiple industries.

The mission of The Open Group is to drive the creation of Boundaryless Information Flow™ achieved by:

- Working with customers to capture, understand, and address current and emerging requirements, establish policies, and share best practices
- Working with suppliers, consortia, and standards bodies to develop consensus and facilitate interoperability, to evolve and integrate specifications and open source technologies
- Offering a comprehensive set of services to enhance the operational efficiency of consortia
- Developing and operating the industry's premier certification service and encouraging procurement of certified products

Further information on The Open Group is available at [www.opengroup.org](http://www.opengroup.org).

The Open Group publishes a wide range of technical documentation, most of which is focused on development of Standards and Guides, but which also includes white papers, technical studies, certification and testing documentation, and business titles. Full details and a catalog are available at [www.opengroup.org/library](http://www.opengroup.org/library).

## This Document

This document is a Study Guide for the DPBoK™ Foundation certification. This first edition is aligned with the Digital Practitioner Body of Knowledge Standard™, Version 1.0, also known as the DPBoK Standard. It gives an overview of every learning objective included in the syllabus, and in-depth coverage on preparing and taking the DPBoK Part 1 Examination. It is specifically designed to help individuals prepare for the examination.

DPBoK Foundation certification can help:

- Those who require a first introduction and basic understanding of the Digital Practitioner Body of Knowledge Standard
- Individuals who wish to create and manage product offerings with an increasing digital component, or lead their organization through Digital Transformation
- IT professionals working within any size organization, from a startup through to a large enterprise, that has adopted digital approaches

The audience for this document is:

- Senior digital business professionals, up to and including C-level, who need an increased awareness of digital practices
- Mid-career IT professionals who need retraining to stay relevant and validate their digital Subject Matter Expert (SME) status in specific domain areas
- Entry-level computing and digital business professionals
- College-level students and computing and digital business majors

The high-level structure of the document is summarized as follows:

- [Chapter 1, \*Introduction\*](#) provides a brief introduction to DPBoK Foundation certification, including the DPBoK Part 1 Examination
- [Chapter 2, \*An Introduction to the DPBoK Standard\*](#) provides a first introduction to key terminology, key concepts such as digital-first, Digital Transformation, and also the structure of the Body of Knowledge
- [Chapter 3, \*Digital Value\*](#) describes the basic concepts employed by the Digital Practitioner, such as why people want digital, computing, or IT services; the general outlines of their structure; how they come into being; and how they change over time
- [Chapter 4, \*Digital Infrastructure\*](#) describes the overall capabilities of digital infrastructure and initial concerns for its effective, efficient, and secure operation
- [Chapter 5, \*Application Delivery\*](#) describes the fundamental objectives and activities of application development
- [Chapter 6, \*Product Management\*](#) describes why product management is formalized as a company or team grows, and the differences between product and project management
- [Chapter 7, \*Work Management\*](#) describes the key concerns and practices of work management as a team increases in size
- [Chapter 8, \*Operations Management\*](#) describes the basic concepts and practices of operations management in a digital/IT context
- [Chapter 9, \*Coordination and Process\*](#) describes how to coordinate as the organization grows into multiple teams and multiple products
- [Chapter 10, \*Investment and Portfolio\*](#) describes aspects of IT investment and portfolio management, including finance, sourcing, portfolio management, Service Catalogs, and project management
- [Chapter 11, \*Organization and Culture\*](#) describes various aspects of organizational structure, human resources, and cultural factors, as an organization goes through the “team of teams” transition
- [Chapter 12, \*Governance, Risk, Security, and Compliance\*](#) describes the core aspects of governance, risk, security, and compliance, as an organization operates at enterprise scale
- [Chapter 13, \*Information Management\*](#) describes the basic aspects of information and data management on a large scale; this involves the establishment of formal governance, control, and

management techniques for information

- [Chapter 14, \*Architecture\*](#) describes key practices and methods for managing complexity using Enterprise Architecture

## How to Use this Document

The chapters in this document are arranged to cover the DPBoK Foundation syllabus and should be read in order. Where a topic requires further information from a later part in the syllabus, a cross-reference is provided.

Within each chapter are “Key Learning Points” and “Summary” sections that help you to easily identify what you need to know for each topic.

## Conventions Used in this Document

The following conventions are used throughout this document in order to help identify important information and avoid confusion over the intended meaning:

- *(Syllabus reference Unit X, Learning Outcome LO-xxx: Statement)*

Used at the start of a text block to identify the DPBoK Foundation syllabus learning outcome.

- Ellipsis (...)

Indicates a continuation; such as an incomplete list of example items, or a continuation from preceding text.

- **Bold**

Used to highlight specific terms.

- *Italics*

Used for emphasis. May also refer to other external documents.

In addition to typographical conventions, the following conventions are used to highlight segments of text:



### Note

A Note box is used to highlight useful or interesting information.

**Tip**

A Tip box is used to provide key information that can save you time or that may not be entirely obvious.

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# About the Author

*This document builds on materials from the Digital Practitioner Body of Knowledge Standard published by The Open Group. The author listed here has prepared this document. See the Acknowledgements section for more information.*

## **Andrew Josey, The Open Group**

Andrew Josey is VP Standards and Certification, overseeing all certification and testing programs of The Open Group. He also manages the standards process for The Open Group. Since joining the company in 1996, Andrew has been closely involved with the standards development, certification, and testing activities of The Open Group. He has led many standards development projects including specification and certification development for the ArchiMate®, TOGAF®, POSIX®, and UNIX® programs. Most recently he has led the development of the TOGAF Business Architecture Level 1 certification credential and DPBoK Foundation certification. He has led the automation of The Open Group standards development using a GitLab-based automated build toolchain. He is the lead author of this document.

He is a member of the IEEE, USENIX, and the Association of Enterprise Architects (AEA). He holds an MSc in Computer Science from University College London.

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- David Lounsbury

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- Chris Frost
- Paul Homan
- Robert Weisman

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# Referenced Documents

The following documents are referenced in this Guide.

(Please note that the links below are good at the time of writing but cannot be guaranteed for the future.)

- [1] M. L. Abbott, M. T. Fisher, and T. Keeven, *The Art of Scalability, Scalable Web Architecture, Processes, and Organizations for the Modern Enterprise*, June 2015, published by Addison-Wesley
- [2] G. Adzic, *Impact Mapping: Making a Big Impact with Software Products and Projects*, October 2012, published by Provoking Thoughts
- [3] D. J. Anderson, *Kanban: Successful Evolutionary Change for your Technology Business*, April 2010, published by Blue Hole Press
- [4] K. Beck, *Extreme Programming Explained: Embrace Change*, 2000, published by Addison-Wesley
- [5] K. Beck et al., *Manifesto for Agile Software Development*, 2001; refer to [www.agilemanifesto.org/](http://www.agilemanifesto.org/)
- [6] K. Beck et al., *Principles behind the Agile Manifesto*, 2001; refer to [www.agilemanifesto.org/principles.html](http://www.agilemanifesto.org/principles.html)
- [7] C. Betz, *The CMDB is Not a Data Warehouse*, 2011, Integrated IT Management, published by Enterprise Management Associates
- [8] J. Bezos, *2016 Letter to Amazon Shareholders*, April 2017; refer to [www.blog.aboutamazon.com/company-news/2016-letter-to-shareholders](http://www.blog.aboutamazon.com/company-news/2016-letter-to-shareholders)
- [9] S. Blank, *The Four Steps to the Epiphany: Successful Strategies for Products That Win*, July, 2013, published by K & S Ranch
- [10] F. P. Brooks, *The Mythical Man-Month: Essays on Software Engineering*, April 1975, published by Addison-Wesley
- [11] M. Buckingham and A. Goodall, *Reinventing Performance Management*, Harvard Business Review, Vol. 93, No. 4, 2015
- [12] J. Carlzon, *Moments of Truth*, 1987, published by Ballinger Pub Co
- [13] M. E. Conway, *How Do Committees Invent?*, April 1968, published in Datamation Magazine; refer to [www.melconway.com/research/committees.html](http://www.melconway.com/research/committees.html)
- [14] J. DeLuccia, J. Gallimore, G. Kim, and B. Miller, *The DevOps Audit Defense Toolkit*, March 2015, published by IT Revolution
- [15] A. Edmondson, *Psychological Safety and Learning Behavior in Work Teams*, Administrative Science Quarterly, Vol. 44, No. 2, June 1999, published by the Johnson Graduate School of Management, Cornell University

- [16] P. Harpring, *Introduction to Controlled Vocabularies: Terminology for Art, Architecture and other Cultural Works*, April 2010, published by Getty Publications
- [17] L. Hassi and M. Laasko, *Design Thinking in the Management Discourse: Defining the Elements of the Concept*, June 2011, published by the 18th International Product Development Management Conference
- [18] D. Hornford, S. Sabesan, V. Sriram, and K. Street, *The Seven Levers of Digital Transformation* (W17d), September 2017, published by The Open Group; refer to [www.opengroup.org/library/w17d](http://www.opengroup.org/library/w17d)
- [19] M. Housman and D. Minor, *Toxic Workers*, 2015, published by Harvard Business School
- [20] ISACA, *COBIT® 5*, 2012; refer to [m.isaca.org/cobit/Documents/COBIT-5-Introduction.pdf](http://m.isaca.org/cobit/Documents/COBIT-5-Introduction.pdf)
- [21] W. A. Kahn, *Psychological Conditions of Personal Engagement and Disengagement at Work*, Academy of Management Journal, Vol. 33, No.4, December 1990, published by Academy of Management
- [22] G. Kim, J. Humble, P. Debois, and J. Willis, *The DevOps Handbook: How to Create World-Class Agility, Reliability, and Security in Technology Organizations*, December 2016, published by Trade Select
- [23] T. A. Limoncelli, S. R. Chalup, and C. J. Hogan, *The Practice of Cloud System Administration: Designing and Operating Large Distributed Systems*, September 2014, published by Addison-Wesley
- [24] T. Malone and K. Crowston, *The Interdisciplinary Study of Coordination*, ACM Computing Surveys, Vol. 26, No. 1, March 1994
- [25] S. S. McChrystal, T. Collins, D. Silverman, and C. Fussell, *Team of Teams: New Rules of Engagement for a Complex World*, November 2015, published by Penguin
- [26] P. Mell and T. Grance, *The NIST Definition of Cloud Computing*, Special Publication 800-145, September 2011, published by the National Institute of Standards and Technology; refer to [nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf](http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf)
- [27] K. Morris, *Infrastructure as Code: Managing Servers in the Cloud*, June 2016, published by O'Reilly Media
- [28] A. Osterwalder and Y. Pigneur, *Business Model Generation*, July 2010, published by Wiley
- [29] D. Parkhill, *Challenge of the Computer Utility*, September 1966, published by Addison-Wesley
- [30] M. Poppendieck and T. Poppendieck, *Implementing Lean Software Development: From Concept to Cash*, September 2006, published by Addison-Wesley
- [31] D.G. Reinertsen, *Managing the Design Factory: a Product Developer's Toolkit*, March 1998, published by Free Press
- [32] E. Ries, *The Lean Startup: How Constant Innovation Creates Radically Successful Businesses*, October 2011, published by Portfolio Penguin
- [33] E. Rogers, *Diffusion of Innovations*, November 2003, published by Free Press



- [34] W. E. Schneider, *The Reengineering Alternative: a Plan for Making Your Current Culture Work*, September 1999, published by McGraw-Hill
- [35] K. Schwaber, *The Enterprise and Scrum*, June 2007, published by Microsoft Press
- [36] K. Schwaber and M. I. Beedle, *Agile Software Development with Scrum*, October 2001, published by Pearson
- [37] C. Sims and H. L. Johnson, *Scrum: a Breathtakingly Brief and Agile Introduction*, April 2012, published by Dymaxicon
- [38] P. G. Smith and D.G. Reinertsen, *Developing Products in Half the Time: New Rules, New Tools*, October 1997, published by Wiley
- [39] D. E. Strode and S. L. Huff, *A Taxonomy of Dependencies in Agile Software Development*, 2012, 23rd Australasian Conference on Information Systems
- [40] D. E. Strode, S. L. Huff, B. Hope, and S. Link, *Coordination in Co-located Agile Software Development Projects*, The Journal of Systems and Software, Vol. 85, June 2012.
- [41] The Open Group, *ArchiMate® 3.1 Specification*, a standard of The Open Group (C197), November 2019, published by The Open Group; refer to [www.opengroup.org/library/c197](http://www.opengroup.org/library/c197)
- [42] The Open Group, *The Digital Practitioner Body of Knowledge™ Standard, (The DPBoK™ Standard)*, a standard of The Open Group (C196), July 2019, published by The Open Group; refer to [www.opengroup.org/library/c196](http://www.opengroup.org/library/c196)
- [43] The Open Group *IT4IT™ Reference Architecture, Version 2.1*, a standard of The Open Group (C171), January 2017, published by The Open Group; refer to [www.opengroup.org/library/c171](http://www.opengroup.org/library/c171)
- [44] The Open Group, *TOGAF® Series Guide: Business Models (G18A)* June 2018, published by The Open Group; refer to [www.opengroup.org/library/g18a](http://www.opengroup.org/library/g18a)
- [45] The Open Group, *The TOGAF® Standard, Version 9.2*, a standard of The Open Group (C182), April 2018, published by The Open Group; refer to [www.opengroup.org/library/c182](http://www.opengroup.org/library/c182)
- [46] W. Royce, *Managing the Development of Large Software Systems*, August 1970, published by Proc. IEEE WESCON
- [47] M. Treacy and F. Wiersma, *The Discipline of Market Leaders: Choose Your Customers, Narrow Your Focus, Dominate Your Market*, January 1997, published by Basic Books

# Chapter 1. Introduction

This chapter provides an introduction to this document.

## 1.1. Key Learning Points

This document is a Study Guide for students studying for the DPBoK Foundation certification. This edition is aligned to the DPBoK Standard, Version 1.0. It will familiarize you with all the topics that you need to know in order to pass the DPBoK Part 1 Examination.

It gives an overview of every learning objective included in the syllabus and in-depth coverage on preparing and taking the examination. It is specifically designed to help individuals prepare for the examination.

*(Syllabus Reference: Unit 13, Learning Outcome LO-DPBoK-Certification: You should be able to explain the DPBoK Certification Program)*

This first chapter will provide you with important information on the DPBoK Certification Program, and the structure of the DPBoK Part 1 Examination.

## 1.2. The Open Group Certification for People Program

Certification is available to individuals who wish to demonstrate they have attained the required knowledge and understanding of the DPBoK Standard. At the time of writing there is a single level defined for DPBoK Certification for People Program, denoted Level 1, which leads to certification at DPBoK Foundation. This Study Guide covers DPBoK Foundation.

### Why become certified?



Becoming certified demonstrates clearly to employers and peers your commitment to being a Digital Practitioner. In particular, it demonstrates that you possess a body of core knowledge about the DPBoK Standard as an open, industry standard framework. The Open Group publishes the definitive directory of DPBoK certified individuals, and issues certificates and Open Badges.

## 1.3. The DPBoK Foundation Certification

The purpose of certification for DPBoK Foundation is to provide validation that the individual has gained knowledge of the foundational set of concepts for the Digital Practitioner.

The certification can help:

- Those who require an introduction and basic understanding of the DPBoK Standard
- Individuals who wish to create and manage product offerings with an increasing digital component, or lead their organization through Digital Transformation
- IT professionals working within any size organization, from a startup through to a large enterprise, that has adopted digital approaches

The learning objectives at this level focus on knowledge and comprehension.

## 1.4. The DPBoK Level 1 Syllabus

Individuals certified to DPBoK Foundation will have demonstrated their knowledge and understanding of:

- The key concepts of Digital Transformation, digital-first, and the structure of the DPBoK Standard
- The basic concepts (“the Digital Fundamentals”) employed by the Digital Practitioner
- The capabilities of digital infrastructure
- The fundamental objectives and activities of application development
- The need for formalized product management as a company or team grows
- The key concerns and practices of work management as a team increases in size
- The basic concepts and practices of operations management in a digital/IT context
- How to coordinate as an organization grows into multiple teams and multiple organizations
- IT investment and portfolio management, including finance, sourcing, portfolio management, Service Catalogs, and project management
- Organizational structure, human resources, and cultural factors, as an organization goes through the “team of teams” transition
- Governance, risk, security, and compliance, as an organization operates at enterprise scale
- Information and data management on a large scale, including the establishment of formal governance, control, and management techniques for information
- Practices and methods for managing complexity using Enterprise Architecture

### Examination

Certification for DPBoK Foundation is achieved by passing the DPBoK Part 1 Examination. This is a multiple-choice examination with 40 questions.

The topic areas covered by the examination together with the number of questions per area in the examination follow:

1. An Introduction to the DPBoK Standard (3 questions)
2. Digital Value (3 questions)

3. Digital Infrastructure (4 questions)
4. Application Delivery (4 questions)
5. Product Management (3 questions)
6. Work Management (4 questions)
7. Operations Management (3 questions)
8. Coordination and Process (3 questions)
9. Investment and Portfolio (3 questions)
10. Organization and Culture (2 questions)
11. Governance, Risk, Security, and Compliance (3 questions)
12. Information Management (2 questions)
13. Architecture (3 questions)

### 1.4.1. Format of the Examination Questions

The examination questions are multiple-choice questions. These are very similar in format to the Test Yourself questions included in each chapter. Note that the exact format for display is test center-specific and will be made clear on the display monitor when taking the examination.



#### Exam Tip

Please read each question carefully before reading the answer options. Be aware that some questions may seem to have more than one right answer, but you are to look for the one that makes the most sense and is the most correct.

### 1.4.2. What ID do I need to present to take the examination?

You should consult with the examination provider regarding the forms of picture ID you are required to present to verify your identity.

### 1.4.3. Can I refer to materials while I take the examination?

No, it is a closed-book examination.

### 1.4.4. If I fail, how soon can I retake the examination?

You should check the current policy on The Open Group website. At the time of writing, the policy states that individuals who have failed the examination are not allowed to retake the examination within one (1) month of the first sitting.

## 1.5. Preparing for the Examination

You can prepare for the examination by working through this Study Guide section-by-section. After completing each section, you should answer the Test Yourself questions, and read the referenced sections from the DPBoK documentation. Once you have completed all the sections in this Study Guide, you can then attempt the Test Yourself examination paper in [Appendix B](#). It is designed to give a thorough test of your knowledge. If you have completed all the prescribed preparation and can attain a pass mark for the Test Yourself examination paper as described in [Appendix C](#), then it is likely you are ready to sit the examination.

## 1.6. Summary

The Open Group Certification for People: DPBoK Certification Program is a knowledge-based certification program. At the time of writing it has a single level, which leads to certification for DPBoK Foundation.

The topic for this Study Guide is preparation for taking the DPBoK Part 1 Examination that leads to the DPBoK Foundation certification. The examination comprises 40 simple multiple-choice questions to be completed in one hour.

Preparing for the examination includes the following steps:

- You should work through this Study Guide step-by-step
- At the end of each chapter, you should complete the Test Yourself questions and read the sections of the DPBoK documentation listed under Recommended Reading
- Once you have completed all the chapters in this Study Guide, you should attempt the Test Yourself examination paper provided in [Appendix B](#)
- If you can attain the target score in [Appendix C](#), then you have completed your preparation

## 1.7. Test Yourself Questions

Q1: Which of the following describes the DPBoK Part 1 Examination?

- A. It is an open-book examination
- B. It has 40 simple multiple-choice questions
- C. The exam policy requires you to wait 60 days before a retake
- D. It contains at least four (4) questions related to product management

Q2: Which of the following is the prerequisite for taking this certification?

- A. AEA membership
- B. ITIL Foundation
- C. TOGAF 9 Foundation

D. None required

Q3: Which of the following is a learning unit topic included in the DPBoK Level 1 Syllabus?

- A. Architecture Governance
- B. Digital Infrastructure
- C. Interoperability Requirements
- D. Value Streams

Q4: Which of the following describes the retake policy for the DPBoK Part 1 Examination?

- A. You must wait seven (7) days before a retake
- B. You can retake the exam immediately
- C. You must wait one (1) month before a retake
- D. You must wait three (3) weeks before a retake

## 1.8. Recommended Reading

- DPBoK Foundation Data Sheet
- The Open Group Certification for People: Certification Policy for Examination-Based Programs
- The Open Group Certification for People: DPBoK Conformance Requirements
- The Open Group DPBoK Certification website: [www.opengroup.org/certifications/dpbok](http://www.opengroup.org/certifications/dpbok)



# Chapter 2. An Introduction to the DPBoK Standard

## 2.1. Key Learning Points

This chapter will help you to understand key terminology, key concepts such as digital-first, Digital Transformation, and also the structure of the Body of Knowledge.

### Key Points Explained

This chapter will help you to answer the following questions:

- What are the key terms related to digital?
- What is a digital-first culture?
- What is Digital Transformation?
- What are the seven levers of change?
- How is the Body of Knowledge structured?

## 2.2. Key Terminology

*(Syllabus Reference: Unit 0, Learning Outcome LO-key-terminology: You should be able to define the terms Digital Enterprise, Digital Technology, Digital Transformation, Digitalization, Digitization)*

The following are key terms used in the Body of Knowledge:

### Digital Enterprise

An enterprise characterized by: 1. the creation of digitalized products or services that are either delivered fully digitally (e.g., digital media or online banking), or 2. where physical products and services are obtained by the customer by digital means (e.g., online car-sharing services).

### Digital Technology

IT in the form of a product or service that is digitally consumable to create or enable business value.

### Digital Transformation

The radical, fundamental change towards becoming a digital enterprise.

### Digitalization

The application of digital technology to create additional business value within the primary value chain of enterprises.

### Digitization

The conversion of analog information into digital form.

## 2.3. Digital-First

(Syllabus Reference: Unit 0, Learning Outcome LO-digital-first: You should be able to explain what a digital-first culture is)

A “digital-first” culture is where the business models, plans, architectures, and implementation strategies are based on a digital organization architecture that inspires and rewards a number of desired behaviors, such as servant leadership, strategic value chain thinking, consumer focus, fault tolerance, agility, and more. It requires a workforce with a sense of psychological safety, digitally savvy enough to execute a “digital-first approach”.

As part of this paradigm shift, it is important to have a clear understanding of the existing capabilities; those which can be retired, and new ones that will be needed. In some cases, organizations may need to deal with all these changes while keeping their current legacy platform and supporting applications. This is discussed further in [Section 2.5](#).

### Psychological Safety



Psychological safety is a shared belief that the team is safe for interpersonal risk taking [15]. It can be defined as “being able to show and employ one’s self without fear of negative consequences of self-image, status or career” [21].

In psychologically safe teams, team members feel accepted and respected.

## 2.4. Digital Transformation

(Syllabus Reference: Unit 0, Learning Outcome LO-what-is-digital-transformation: You should be able to describe what Digital Transformation is)

Digital Transformation is fundamentally a strategy and an operating model change, in which technological advancements are leveraged to improve human experiences and operating efficiencies, and to evolve the products and services to which customers will remain loyal. It is the consequence of:

- The ability to handle information in the digital form
- Using digital technologies to manage the process of creating, capturing, and analyzing information to deliver a perceptive human-machine interaction experience

The digital enterprise faces multiple challenges, including:

- New technologies, such as cloud, Internet of Things (IoT), and machine learning
- New techniques, such as Digital Product Management (DPM), reliability engineering, and continuous delivery

For organizations to cope with this fast technology evolution pace and succeed in this Digital

Transformation, changes should be pervasive through the whole organization. Digital Transformation as a strategy should be aligned with the overall organization context and environment, and should be derived from and sometimes even replace the existing organization strategy.

This strategy shift should encompass the new business and IT disruptive trends, using an outside-in perspective, and lead the development of new business and operational models connected with digital technologies and platforms and with the digital economy as a whole.

## 2.5. The Seven Levers of Change

*(Syllabus Reference: Unit 0, Learning Outcome LO-7-levers: You should be able to list the seven levers of change)*

To succeed in today's digital era, organizations will need to consider the seven levers of change, as described in The Open Group White Paper: *The Seven Levers of Digital Transformation* [18].

The seven levers of change are:

- Business process transformation
- Customer engagement and experience
- Product or service digitization
- IT and delivery transformation
- Organizational culture
- Strategy
- Business ecosystem

These levers require a fundamental understanding of value creation for both the organization and the customer. They equip businesses with a structure to reduce the number of failed projects, guide investment decisions, and create a set of products and services designed to seal customer loyalty. For digital success you will need to assess readiness, actively include your people, measure and govern for value – not activities performed, develop your roadmap top-down, and pivot often with bottom-up learnings.

Technology is the glue that connects all players in the ecosystem – suppliers, distributors, service providers, employees, and the customers – and it is a powerful means of building a future-ready organization. However, it is worth bearing in mind that it is not an end in itself. The seven levers are symbiotic pillars that amplify the effects of one another.

## 2.6. The Structure of the Body of Knowledge

*(Syllabus Reference: Unit 0, Learning Outcome LO-four-contexts: You should be able to list the four contexts of the DPBoK structure)*

The Body of Knowledge describes the competencies necessary for digital business, which are explained

in terms of a growing organization, and shown in the scaling model shown in [Figure 1](#). This can be summarized as “from startup to enterprise”, including four levels of organizational evolution.

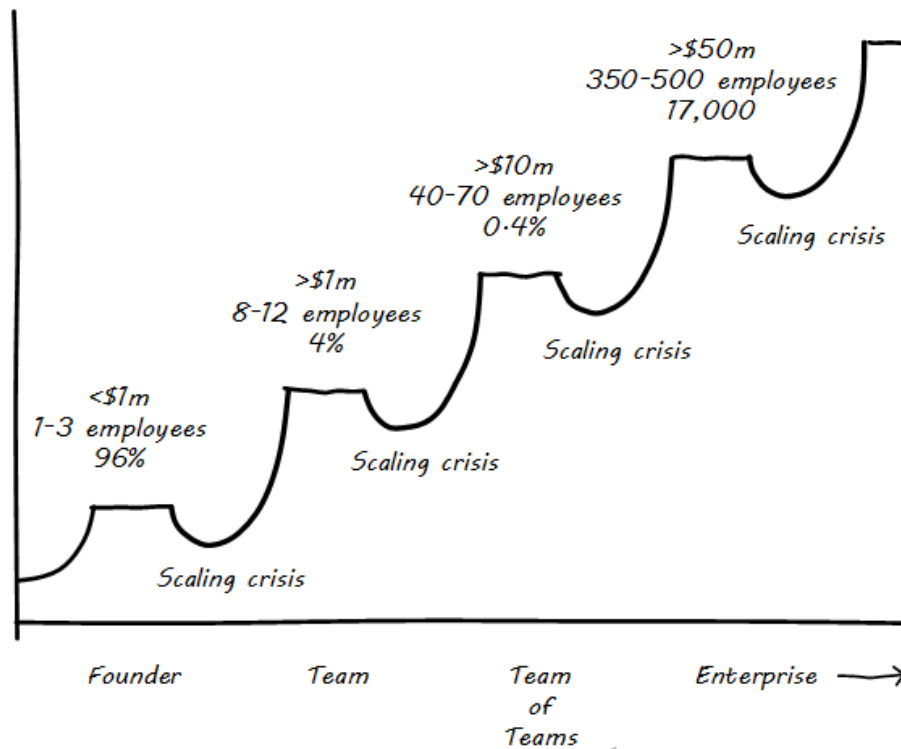


Figure 1. Organizations Cluster at Certain Sizes

Within that range there are four distinct levels, based on the scale of an organization, arranging the content of the Body of Knowledge into four corresponding logical sections, that are referred to as “contexts”. The four contexts on which the structure is based are:

- Individual/Founder
- Team
- Team of Teams
- Enduring Enterprise

Within each context, the Body of Knowledge is divided into “Competency Areas”, which are chapters focused on specific topics; for example, Digital Infrastructure, and Operations Management. There are currently three Competency Areas for each context, giving a total of 12 topics as shown in [Figure 2](#).

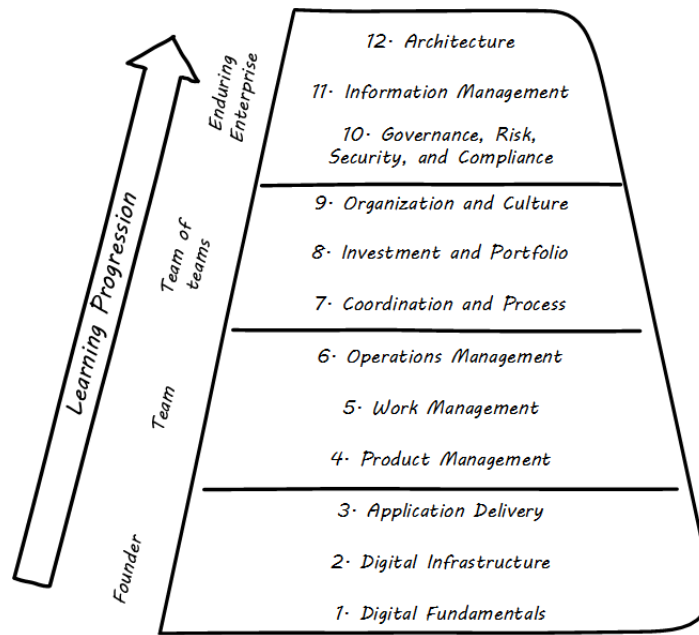


Figure 2. Overview of DPBoK Structure

### 2.6.1. Context I: Individual/Founder

(Syllabus Reference: Unit 0, Learning Outcome LO-context-I-overview: You should be able to describe briefly Context I: Individual/Founder)

Context I represents the bare minimum requirement of delivering digital value; a scenario of one or two founders of a startup, or a Research and Development (R&D) team with high autonomy in a larger organization (e.g., “skunkworks”).

It consists of the following Competency Areas:

- Digital Fundamentals
- Digital Infrastructure
- Application Delivery

What are the minimum essential concerns they must address to develop and sustain a basic digital product? In this context, there is typically little or no concern for process or method. Approaches and practices are opportunistic and tactical, driven by technical choices such as programming language, delivery pipeline, and target execution platform.

Typical capabilities include:

- Conception of digital value
- Dynamic infrastructure and related practices
- Agile development and continuous delivery practices

This context should be relevant for individuals in organizations of all sizes. This is suitable for all digital professionals, as it represents an environment where there can be no distinctions between