

Digital Practitioner Body of Knowledge™ Standard

A Standard of The Open Group

Reference Cards Summary

Introduction

This document is a summary of the Digital Practitioner Body of Knowledge™ Standard, also known as the DPBoK™ Standard, from The Open Group®. It is intended to help readers quickly gain an understanding of the contents of the DPBoK Standard.

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Acknowledgements

The Open Group gratefully acknowledges The Open Group Digital Practitioners Work Group for developing the standard on which this document is based, and from which extensive material is drawn.

The Open Group gratefully acknowledges Fujitsu for the original design work for these reference cards, and in particular the contributions of the following:

- Yu Aoki, Fujitsu
- Chris Frost, Fujitsu
- Hideki Hara, Fujitsu

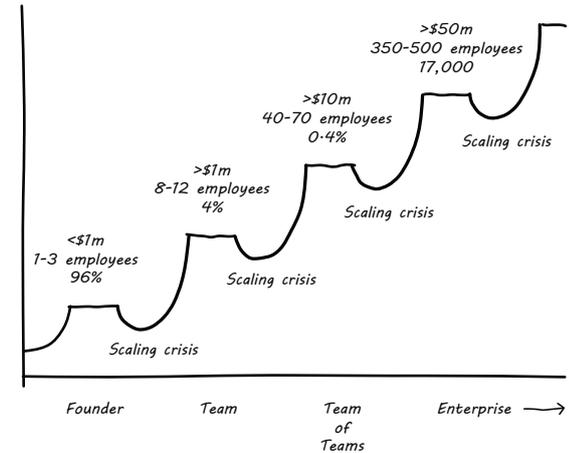
Digital Practitioner Body of Knowledge™ Standard

A Standard of The Open Group



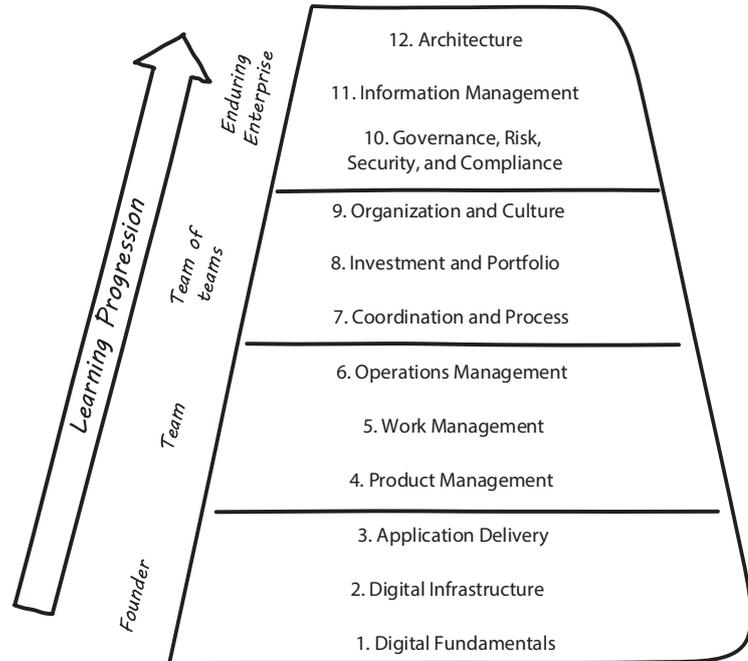
Overview of the DPBoK Standard

- The Digital Practitioner Body of Knowledge (“the DPBoK Standard”), a standard of The Open Group, is a large reference book of industry best practices for people involved in digital business
- Subjects covered by the Body of Knowledge include:
 - Agile project delivery
 - Design thinking
 - Lean
 - DevOps
 - Site Reliability Engineering (SRE)
- The first version of the DPBoK Standard was published in July 2019, and work continues in The Open Group to refine and expand it; this summary relates to the latest version published in January 2020
- The DPBoK Standard describes the competencies necessary for digital business, which are explained in the context of a growing company, beginning with the need for basic competency in digital infrastructure, applications, and other similar fundamentals for a digital startup
- As a company grows, additional competencies become necessary, such as product management and operations management, to include, at the largest scale, competencies such as architecture, governance, and compliance
- The DPBoK Standard is structured around 4 step levels, called “Contexts”, of growth in a company; starting with the individual/founder, then growing to a team of perhaps 8 – 12 people, through a “team-of-teams”, and ultimately to a large, enduring enterprise with hundreds of employees



Structure of the DPBoK Standard

- There are 12 competencies, 3 within each of the 4 contexts, and these competencies are the most important capabilities necessary for digital business at each level on the organization scale
- The DPBoK Standard describes tools and techniques for each of the 12 competencies, which, as shown in the diagram on the right, are further divided into competency categories
- In this summary document, each competency and its competency categories are described on one page



The 12 Competencies

1. Digital Fundamentals

Competency

The Digital Fundamentals competency covers basic structures and qualities of modern digital systems engineering. This enables an understanding of the core means and motivations for creating digital systems.

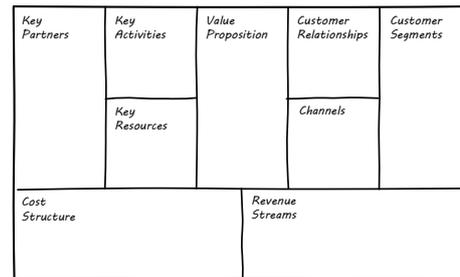
Competency Categories

- Digital Context covers techniques to identify the consumers, customers, and sponsors of a digital service
- Digital Value Methods covers tools and techniques to define the fundamental business value creation mechanisms
- The Digital Stack covers basic definitions of the layers of technology; for example, middleware, applications, network
- The Digital Lifecycle covers basic definitions of lifecycle stages in the development and operation of digital systems

Examples

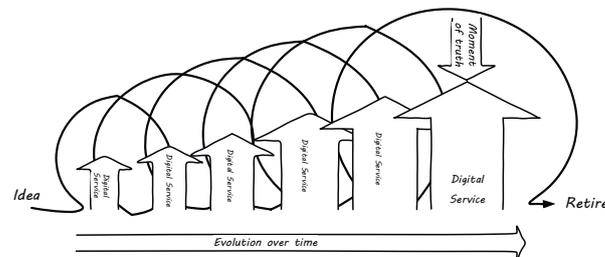
Example 1: Digital Value Methods – Business Model Canvas

The Business Model Canvas defines a format for a one-page overview of a business model.



Example 2: The Digital Lifecycle – The Digital Service Lifecycle

This lifecycle shows how a digital service grows over time through iterations of improvement cycles, until it is retired at the end of its life.



2. Digital Infrastructure

Competency

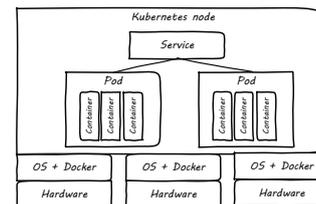
The Digital Infrastructure competency covers the basic components of hardware and software infrastructure within modern digital systems. This enables an understanding of the core infrastructure building blocks of digital systems.

Competency Categories

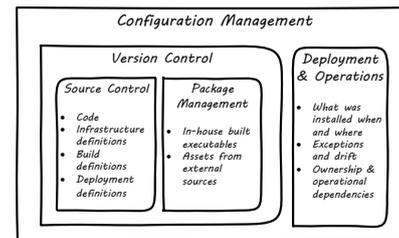
- Computing and Information Principles covers the basic components of compute, storage, and network
- Virtualization covers common components of virtual systems, such as hypervisors and containers
- Cloud Services covers basic concepts of cloud computing, such as multi-tenancy, IaaS, PaaS, and SaaS
- Configuration Management and Infrastructure as Code covers basic techniques of source control, versions, packages, operations configuration management, and Infrastructure as Code
- Securing Infrastructure covers techniques of infrastructure security

Examples

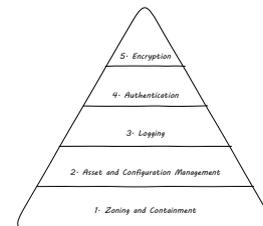
Example 1: Virtualization – Kubernetes
Kubernetes is a popular, open source container manager.



Example 2: Configuration Management and Infrastructure as Code – Configuration Management Components
The basic components of IT configuration management.



Example 3: Securing Infrastructure – Security Controls
A hierarchy of common types of infrastructure security controls.



3. Application Delivery

Competency

The Application Delivery competency covers basic concepts of application development and architecture. This enables an understanding of the basic techniques and building blocks of applications in digital systems.

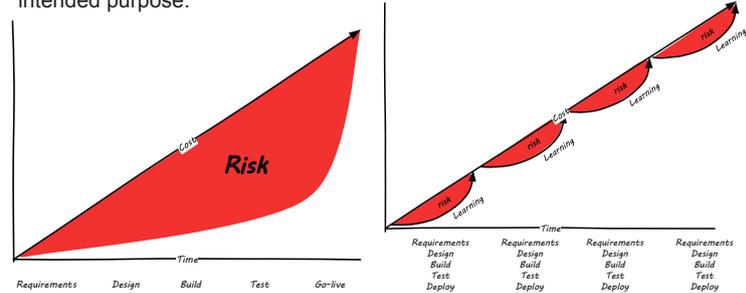
Competency Categories

- Application Basics covers the basic phases of application development, such as analysis, design, and delivery
- Agile Software Development covers the Agile Manifesto and the techniques of Agile project management for software development
- DevOps Technical Practices covers the techniques of continuous development and continuous delivery
- Cloud-Native, APIs, and Microservices covers the techniques and tools to develop “cloud-native” applications, including APIs, Microservices, and “12-factor” application development
- Securing Applications and Digital Products covers some basic techniques for designing and testing secure applications

Examples

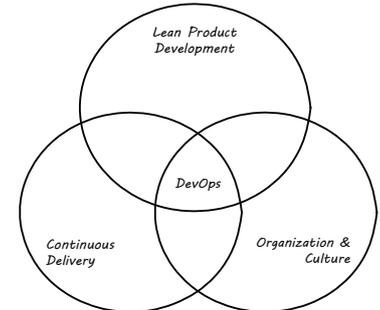
Example 1: Agile Software Development – Risk Gaps

The two diagrams show how the total risk gap is reduced with iterative development. The risk is that the delivered software does not fulfil the intended purpose.



Example 2: DevOps Technical Practices – DevOps Definition

The diagram shows DevOps defined as a combination of a Continuous Delivery (CD) pipeline, a Lean Product Development approach, and an organization and culture that nurtures high performing teams.



4. Product Management

Competency

The Product Management competency covers how product teams are formed and what techniques and attitudes are needed. This enables an understanding of how product management differs from project management.

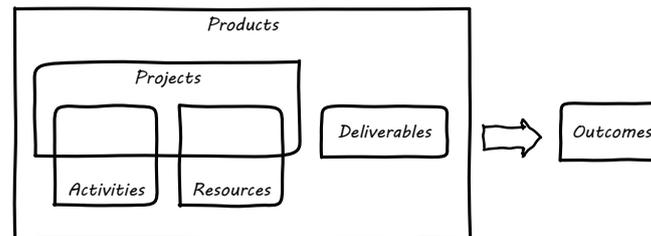
Competency Categories

- Product Management Basics defines product management, and outlines the differences between project and process management
- Product Discovery covers tools and techniques to discover the needs or market demand for a product
- Product Design covers design thinking and other techniques for designing products
- Scrum and other Product Team Practices gives a short overview of Scrum and other iterative, collaborative approaches
- Product Planning gives a short overview of some planning techniques

Examples

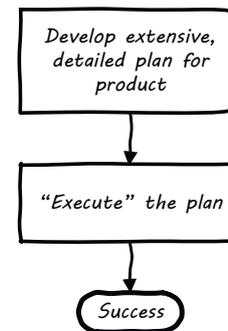
Example 1: Product Management Basics – Product Management May Use Projects

Projects and project management techniques may be used within product management to create outcomes.



Example 2: Product Planning – Planning Fallacy

A fallacy of planning is that anything can be delivered by first creating a big, detailed plan, and then executing it, without ever needing to change the plan.



5. Work Management

Competency

The Work Management competency covers tools and techniques to manage the flow of tasks through a small team. This enables an understanding of modern work management techniques, such as Lean and Kanban.

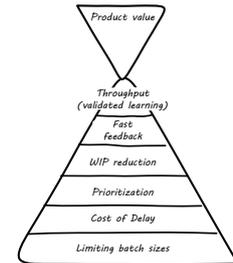
Competency Categories

- Work Management and Lean introduces the basic concepts of Lean working
- Lean Product Development covers more detail of Lean Product and Process Development, and the cost of delay
- Workflow Management covers tracking simple work requests through a fulfilment process, such as a service desk
- Towards Process Management covers business process management and case management
- Systems Thinking and Feedback covers behaviors and interactions of components in complex systems; e.g., OODA (Observe, Orient, Decide, Act)

Examples

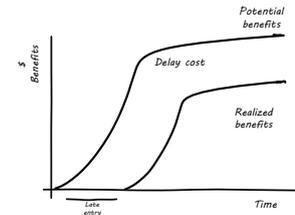
Example 1: Lean Product Development – Hierarchy of Concerns

To achieve product value, there is a hierarchy of principles that must be followed.



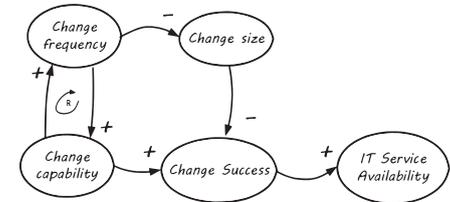
Example 2: Lean Product Development – Aggravated Cost of Delay

A small delay in product development can have a large impact on benefits.



Example 3: Systems Thinking and Feedback - DevOps Consensus

Small, frequent changes lead to higher IT service availability.



6. Operations Management

Competency

The Operations Management competency covers the techniques and tools necessary to maintain digital services to consumers over their operational lifetime, including monitoring, responding to change, and scaling.

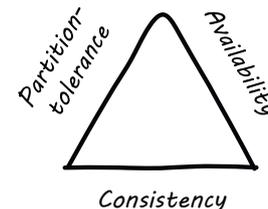
Competency Categories

- Defining Operations Management defines the fundamental components and characteristics of digital systems operations
- Monitoring and Telemetry covers routine monitoring, alerting, logging, and business impact analysis
- Operational Response covers techniques in operations management; for example, incident and change management, SRE, and Chaos Monkey
- Operations-Driven Product Demand covers tools and techniques for scaling systems to meet high workloads

Examples

Example 1: Operations-Driven Product Demand - CAP Principle

CAP is Consistency, Availability, and Partition-tolerance. In distributed systems design, it is possible to achieve any two, but not all three at the same time.

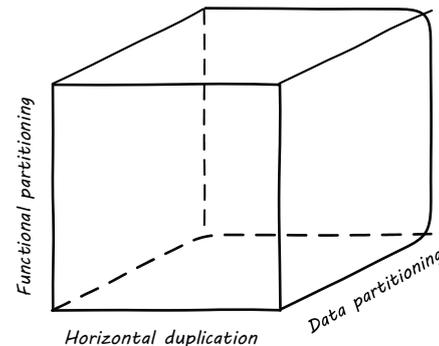


CAP: Choose any two

Example 2: Operations-Driven Product Demand - AFK Scaling Cube

AFK is Abbott, Fisher, and Keeven, the authors of a book that defined this cube. The cube shows the three basic options for scaling a system:

- Replicate the complete system
- Split the system functions
- Split the system data



7. Coordination and Process

Competency

The Coordination and Process competency covers tools and techniques for creating, measuring, monitoring, and improving processes.

Competency Categories

- Coordination Principles and Techniques covers the effects of scaling development from one team to a “team of teams”, and techniques of coordinating work
- Coordination, Execution, and the Delivery Models covers basic project and process controls such as RACI (Responsible, Accountable, Consulted, Informed) matrices, and release trains
- Process Management covers techniques to control and measure processes
- Process Control and Continuous Improvement covers techniques for analyzing and improving processes such as Six Sigma, and PDCA (Plan–Do–Check–Act)

Examples

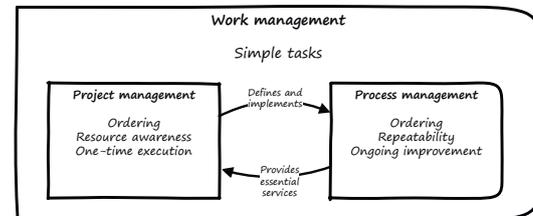
Example 1: Coordination Principles and Techniques – Types of Dependencies

There are three types of dependency: knowledge, task, and resource.

Type	Dependency	Description
Knowledge. A knowledge dependency occurs when a form of information is required in order for progress.	Requirement	Domain knowledge or a requirement is not known and must be located or identified.
	Expertise	Technical or task information is known only by a particular person or group.
	Task allocation	Who is doing what, and when, is not known.
Task. A task dependency occurs when a task must be completed before another task can proceed.	Historical	Knowledge about past decisions is needed.
	Activity	An activity cannot proceed until another activity is complete.
	Business process	An existing business process causes activities to be carried out in a certain order.
Resource. A resource dependency occurs when an object is required for progress.	Entity	A resource (person, place, or thing) is not available.
	Technical	A technical aspect of development affects progress, such as when one software component must interact with another software component.

Example 2: Coordination, Execution, and the Delivery Models – Process and Project Relationship

In general, a project is needed to define and implement a process, but projects also need supporting processes.



8. Investment and Portfolio

Competency

The Investment and Portfolio competency covers tools and techniques to manage finances and contracts, such as allocating funds and evaluating benefits.

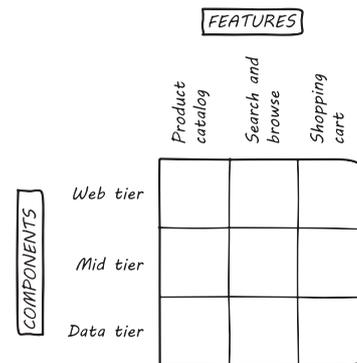
Competency Categories

- Financial Management of Digital and IT covers financial tools and techniques to allocate funds and evaluate benefits
- Digital Sourcing and Contracts covers making decisions about appropriate sources of products and services, licensing models, and contracting for work
- Portfolio Management covers the management of many products in a portfolio, allocating resources across multiple teams, and large-scale planning
- The Digital Product or Service Catalog covers multiple approaches to defining products and services, and offering them via a catalog from which consumers may make requests
- Project Management covers basic techniques to plan projects, and the changing nature of IT projects, changing from bespoke infrastructure and application construction, to more loosely-coupled collections of pre-build services such as IaaS

Examples

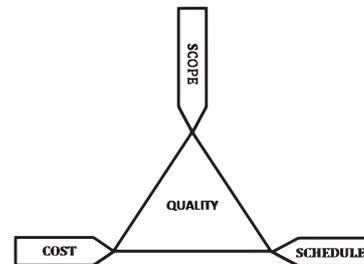
Example 1: Portfolio Management – Features versus Components

Features are “what” the product does, components are “how” the product is built. Components are often shared by many features.



Example 2: Project Management – Project “Iron Triangle”

Projects are trade-offs between scope, cost, and schedule to achieve a certain quality of deliverable.



9. Organization and Culture

Competency

The Organization and Culture competency covers tools and techniques to define organization structures, to hire and manage people, the effects of different cultures, and a review of some popular industry frameworks.

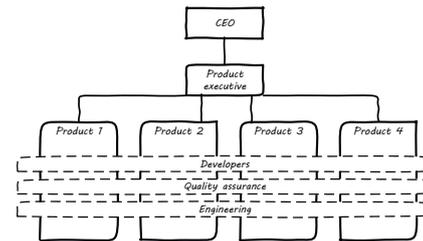
Competency Categories

- The Basic Organizational Conflict compares organizations structured around functions with organization structured around customer products
- Defining the Organization covers the basic requirements to consider in organization design
- Product and Function covers different approaches to organizing large numbers of people, such as by product, by specialism, or by project
- Final Thoughts on Organization Forms covers the need for organizational units to collaborate effectively to create value for the entire enterprise
- IT Human Resources Management covers people management, hiring, assessment, development, reward, and motivation
- Why Culture Matters covers tools to identify and classify culture types, and their effect on an organization, and in particular on people’s motives
- Industry Frameworks covers CMMI®, ITIL®, PMBoK®, COBIT®, and the TOGAF® Standard

Examples

Example 1: The Basic Organizational Conflict – New IT Organization

A new enterprise might organize based on products rather than functions.



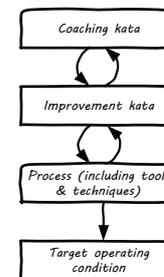
Example 2: Why Culture Matters – Westrum Typology

The “Westrum typology” is a system for classifying cultures into three broad types.

Pathological (Power-oriented)	Bureaucratic (Rule-oriented)	Generative (Performance-oriented)
Low cooperation	Modest cooperation	High cooperation
Messengers (of bad news) shot	Messengers neglected	Messengers trained
Failure is punished	Failure leads to justice	Failure leads to inquiry

Example 3: Why Culture Matters – Toyota Katas

The coaching kata and improvement kata are important for Toyota. The improvement kata teaches how to investigate and resolve problems. The coaching kata is for senior managers to teach new managers about the improvement kata.



10. Governance, Risk, Security, and Compliance

Competency

The Governance, Risk, Security, and Compliance competency covers the definitions of these 4 terms, how they differ from routine management, how they apply to digital business and automation.

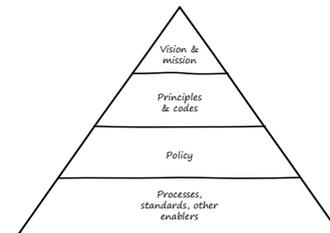
Competency Categories

- Governance covers the basic needs and functions of corporate governance, such as a board of directors
- Implementing Governance covers practice steps to implement governance such as setting policies and standards
- Risk and Compliance Management covers the definition of, and tools and techniques for, managing risk and compliance
- Assurance and Audit covers the definition of, and tools and techniques for, corporate assurance and audit functions
- Security covers definition of IT security concepts, and tools and techniques to develop and operate secure systems
- Digital Governance covers techniques to apply governance to digital systems

Examples

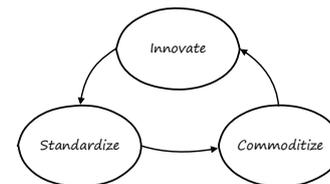
Example 1: Implementing Governance – Vision / Mission / Policy Hierarchy

Vision and mission comes first, eventually leading to policies, then processes and standards.



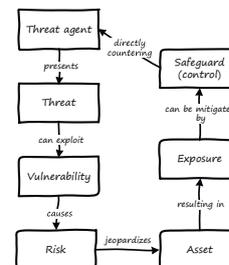
Example 2: Implementing Governance – Innovation Cycle

Over time, innovations become standardized, then commoditized.



Example 3: Security – Security Taxonomy

A taxonomy of fundamental IT security terms, and their relationships.



11. Information Management

Competency

The Information Management competency covers the value of information, and the need to manage it like any other valuable asset; modern techniques for data analytics; and techniques for data agility.

Competency Categories

- Information and Value covers the need for context to give value to raw information
- Enterprise Information Management covers data authority, data quality, Systems of Record, information risk, and data legislation
- Analytics covers data warehouses and business intelligence
- Agile Information Management covers recent technologies such as data lakes and append-only databases
- Information Management Topics covers SMAC (Social, Mobile, Analytics, and Cloud), Big Data, and the metadata necessary to manage a digital business pipeline

Examples

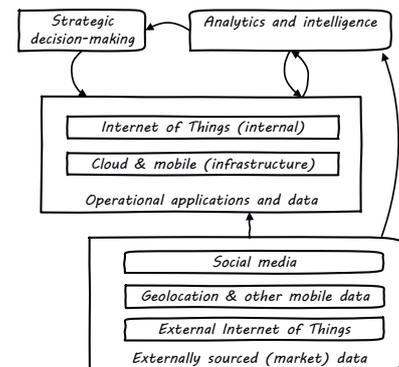
Example 1: Information and Value - COBIT Enabling Information Layers

COBIT defines 6 layers of information value: physical, logical, syntactic, semantic, pragmatics, and social.

Layer	Implication
Physical	The media (paper, electronic) storing the data
Empirical	The layer that observes the signals from the physical, and distinguishes signal from noise
Syntactic	The layer that encodes the data into symbols (e.g., ASCII)
Semantic	The layer providing the rules for constructing meaning from syntactical elements
Pragmatic	The layer providing larger, linguistic structuring
Social	The layer that provides the context and ultimately consequence of the data (e.g., legal, financial)

Example 2: Information Management Topics - Social, Mobile, Analytics, and Cloud

The flow of information between SMAC components.



12. Architecture

Competency Examples

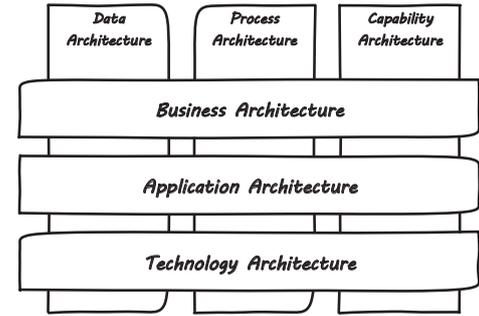
The Architecture competency covers the fundamental needs for architecture tools and techniques, and how architecture fits with modern Agile delivery practices.

Competency Categories

- Why Architecture covers the need for architectural skills and artifacts when developing and operating large systems
- Architecture Practices covers roles, relationships, and techniques for an architecture practice
- Architecture Domains covers different domains and abstractions used in producing architecture models; e.g., Business Architecture and Technology Architecture
- Agile and Architecture covers some topics related to the need for high-level architecture in Agile projects, and practical ways to apply it
- Architecture, Digital Strategy, and Portfolio covers the management of a digital portfolio, and techniques to assess and rationalize an applications portfolio

Example 1: Architecture Domains - Simplified View of the ArchiMate Framework

The ArchiMate® Framework has three disciplines (Business, Application, and Technology Architecture), and three perspectives (Data Architecture, Process Architecture, Capability Architecture).



Example 2: Architecture, Digital Strategy and Portfolio – Standard IT Portfolio “4-box”

This “4-box” model shows a simple approach to portfolio management.

	Low Technical Fitness	High Technical Fitness
High Business Value	Re-engineer or re-platform Consider outsourcing carefully	Invest as needed to exploit value
Low Business Value	Retire if possible or outsource	Improve understanding of customer requirements Retire service if no longer serving a purpose but reclaim/re-use platform, capabilities, and assets



About The Open Group

Leading the development of open, vendor-neutral technology standards and certifications

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, tool vendors, integrators, academics, and consultants across multiple industries.

Keys facts include:

- Over 700 Member organizations, with 43,000+ participants in The Open Group activities from 126 countries
- Our Platinum Members are DXC Technology, Fujitsu, HCL, Huawei, IBM, Micro Focus, Oracle, and Philips
- Services provided include strategy, management, innovation and research, standards, certification, and test development
- Over 98,000 TOGAF® 9 certifications worldwide

Further information on The Open Group can be found at www.opengroup.org.