

An Overview of the AWS Cloud Adoption Framework

Version 2

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Abstract

Adopting Amazon Web Services (AWS) presents many benefits, such as increased business agility and flexibility, as well as reduced costs. However, in order to fully realize these benefits your staff may need to acquire new skills and create or update core processes. Doing so can maximize the business value and minimize the business risks of cloud adoption.

The AWS Cloud Adoption Framework (AWS CAF) helps organizations understand how cloud adoption transforms the way they work, and it provides structure to identify and address gaps in skills and processes. Applying the AWS CAF in your organization results in an actionable plan with defined work streams that can guide your organization's path to cloud adoption. This framework leverages our experiences and best practices in assisting organizations around the world with their cloud adoption journey.

Introduction

Cloud computing introduces a significant shift in how technology is obtained, used, and managed. It also shifts how organizations budget and pay for technology services. Cloud computing benefits organizations by giving them the ability to trade capital expense for variable expense, gain advantage from massive economies of scale, make agile capacity decisions, increase business speed and agility, stop spending money running and maintaining data centers, and go global in minutes.

With Amazon Web Services (AWS) your organization can immediately provision the compute, storage, network, and database resources needed for any project. These resources launch and are ready for use by your project team within minutes. The environment can be reconfigured easily, updated quickly, scaled up or down automatically to meet usage patterns and optimize spending, or shut down temporarily or permanently. The billing for AWS services becomes an operational expense rather than a capital expense.

Cloud adoption requires that fundamental changes are discussed and considered across the entire organization, and that stakeholders across all organizational units—both outside and within IT—support these changes. The AWS Cloud Adoption Framework (AWS CAF) provides guidance that supports each unit in your organization so that each area understands how to update skills, adapt existing processes, and introduce new processes to take maximum advantage of the services provided by cloud computing. Thousands of organizations around the world have successfully migrated their businesses to the cloud, relying on the AWS CAF to guide their efforts. AWS and our partners provide tools and services that can help you every step of the way to ensure complete understanding and transition.

At the highest level, the AWS CAF organizes guidance into six focus areas. We describe these focus areas as Perspectives. Figure 1 shows the six Perspectives of the AWS CAF.

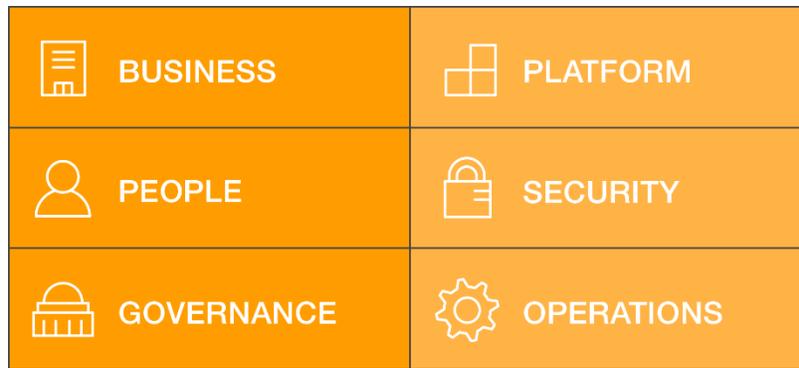


Figure 1: The AWS Cloud Adoption Framework (CAF)

Each AWS CAF Perspective is made up of a set of CAF Capabilities, which is a composite of responsibilities typically owned or managed by one or more functionally related stakeholders. Each Capability describes “what” a stakeholder owns or manages in the cloud adoption journey. The Capabilities are a standard used within the CAF. Each Capability consists of a set of CAF Skills and Processes that provide structure to identify gaps in your existing skills and processes. For example, the People Perspective provides guidance for stakeholders who own or manage human resources (HR), staffing functions, and people management responsibilities. The guidance in this Perspective focuses on people development, training, and communications to assess how stakeholder-owned or -managed capabilities will transform with cloud adoption.

In general, the Business, People, and Governance Perspectives focus on business capabilities, and the Platform, Security, and Operations Perspectives focus on technical capabilities. A brief description of each AWS CAF Perspective is provided here, with more detailed descriptions later in this whitepaper.

- Business Perspective** – Common roles: Business Managers, Finance Managers, Budget Owners, and Strategy Stakeholders.

Helps stakeholders understand how to update the staff skills and organizational processes they will need to optimize business value as they move their operations to the cloud.
- People Perspective** – Common roles: Human Resources, Staffing, and People Managers.

Provides guidance for stakeholders responsible for people development, training, and communications. Helps stakeholders understand how to

update the staff skills and organizational processes they will use to optimize and maintain their workforce, and ensure competencies are in place at the appropriate time.

- **Governance Perspective** – Common roles: CIO, Program Managers, Project Managers, Enterprise Architects, Business Analysts, and Portfolio Managers.

Provides guidance for stakeholders responsible for supporting business processes with technology. Helps stakeholders understand how to update the staff skills and organizational processes that are necessary to ensure business governance in the cloud, and manage and measure cloud investments to evaluate their business outcomes.

- **Platform Perspective** – Common roles: CTO, IT Managers, and Solution Architects.

Helps stakeholders understand how to update the staff skills and organizational processes that are necessary to deliver and optimize cloud solutions and services.

- **Security Perspective** – Common roles: CISO, IT Security Managers, and IT Security Analysts.

Helps stakeholders understand how to update the staff skills and organizational processes that are necessary to ensure that the architecture deployed in the cloud aligns to the organization's security control requirements, resiliency, and compliance requirements.

- **Operations Perspective** – Common roles: IT Operations Managers and IT Support Managers.

Helps stakeholders understand how to update the staff skills and organizational processes that are necessary to ensure system health and reliability during the move of operations to the cloud and then to operate using agile, ongoing, cloud computing best practices.

By identifying the gaps in skills and processes between the current IT environment and the future cloud environment an organization can create an action plan designed to close these gaps. The AWS CAF Perspectives, Capabilities, Skills, and Processes are designed for organizations to use as they develop plans and work streams to move from their current IT environment to

the AWS Cloud, or to deploy a new environment in the AWS Cloud. Stakeholders with organizational buy-in who apply the AWS CAF structure can create an actionable plan that helps the organization quickly and effectively achieve their desired cloud adoption.

Mapping the Journey to the Cloud

Each organization's cloud adoption journey is unique. In order to successfully execute your adoption, you need to understand your organization's current state, the target state, and the transition required to achieve the target state. Knowing this will help you set goals and create work streams that will enable staff to thrive in the cloud.

Engaging stakeholders with their relevant AWS CAF Perspective helps inform your journey to cloud adoption. Through this discovery phase, you will explore capability gaps in terms of AWS CAF Skills and Processes, define necessary work streams, and identify interdependencies between work streams. Knowing work stream dependencies enables you to optimize collaboration on AWS. The AWS CAF provides the structure to discover what organizational skills you need to update and how to modify existing processes and introduce new ones.

Work streams are iterative and change over time. In some technology areas, you may find that it is best for work streams to be integrated with one another. Consider DevOps, for example. DevOps refers to practices, skills, and processes that depend on the collaboration of both development and operational teams. By collaborating across teams, you can automate the process of software delivery and infrastructure changes, which makes your organization more agile and efficient. With the AWS CAF, you're able to identify how technology development and operations teams can become more closely integrated, and by doing so, optimize business results in your cloud environment.

In a transition to the cloud, stakeholders within each AWS CAF Perspective need to engage and actively own organizational and operational change for their area.

As you implement work streams, your organization can leverage the different AWS CAF Perspectives to understand how to communicate interdependencies between different stakeholders. The AWS CAF structure can also help you

ensure that the strategies and plans across your organization are complete and aligned to business goals and outcomes.

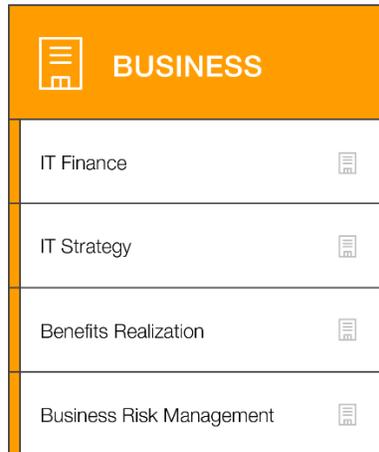
AWS CAF Perspectives: Additional Detail

Each of the six Perspectives that make up the AWS CAF is described in more detail in following sections.

Business Perspective: Value Realization

The Business Perspective is focused on ensuring that IT is aligned with business needs and that IT investments can be traced to demonstrable business results.

Engage stakeholders within the Business Perspective to create a strong business case for cloud adoption, prioritize cloud adoption initiatives, and ensure that there is a strong alignment between your organization’s business strategies and goals and IT strategies and goals. Figure 2 illustrates Capabilities for the AWS CAF Business Perspective.



BUSINESS	
IT Finance	
IT Strategy	
Benefits Realization	
Business Risk Management	

Figure 2: AWS CAF Business Perspective Capabilities

AWS CAF Business Perspective Capability Descriptions

IT Finance –Addresses your organization’s capability to plan, allocate, and manage the budget for IT expenses given changes introduced with the cloud services consumption model.

A common budgeting change involves moving from capital asset expenditures and maintenance to consumption-based pricing. The move requires new skills to capture information and new processes to allocate cloud asset costs that accommodate consumption-based pricing models. You want to ensure that your organization maximizes the value of its cloud investments. Charge-back models are another common change with cloud adoption. Cloud services provide options to create very granular charge-back models. You will be able to track consumption with new details, which creates new opportunities to associate costs with results.

IT Strategy – Focuses on your organization’s capability to leverage IT as a business enabler. For many organizations that have not yet migrated to the cloud, IT has devolved into simply ensuring that collaboration applications and line-of-business applications stay healthy and operational.

Cloud services provide efficiencies that reduce the need to maintain applications, enabling IT to focus on business alignment. This alignment requires new skills and both new and selectively modified processes between IT and other business and operational areas. IT teams may need new skills to gather business requirements and new processes to solve business challenges.

Benefits Realization – Encompasses your organization’s capability to measure the benefits received from their IT investments. For many organizations, this represents Total Cost of Ownership (TCO) or Return on Investment (ROI) calculations coupled with budget management.

Quantifying and evaluating TCO and ROI changes with cloud services. Cloud services offer new ways to directly link consumption with specific business processes. Measuring the value of technology investments becomes more meaningful when these investments can be directly linked to usage and business outcomes.

Business Risk Management – Focuses on your organization’s capability to understand the business impact of preventable, strategic, and external risks to the organization. For many, these risks stem from the impact of financial and technology constraints on agility.

Organizations find that with a move to the cloud, many of these constraints are reduced or eliminated. Taking full advantage of this newfound agility requires

teams to develop new skills to understand the competitive marketplace and potential disrupters, and to explore new processes for evaluating the business risks of such competitors.

People Perspective: Roles and Readiness

The People Perspective covers organizational staff capability and change management functions required for efficient cloud adoption.

Engage stakeholders within the CAF People Perspective to evaluate organizational structures and roles, new skill and process requirements, and identify gaps. Performing an analysis of needs and gaps helps you to prioritize training, staffing, and organizational changes so that you can build an agile organization that is ready for effective cloud adoption. It also helps leadership communicate changes to the organization.

The People Perspective supports development of an organization-wide change management strategy for successful cloud adoption. Figure 3 illustrates the AWS CAF People Perspective Capabilities.

PEOPLE	
Resource Management	
Incentive Management	
Career Management	
Training Management	
Organizational Change Management	

Figure 3: AWS CAF People Perspective Capabilities

AWS CAF People Perspective Capability Descriptions

Resource Management – Addresses your organization’s capability to project personnel needs and to attract and hire the talent necessary to support the organization’s goals.

Cloud adoption requires that the staffing teams in your organization acquire new skills and processes to ensure that they can forecast and staff based on your organization’s needs. These teams need to develop the skills necessary to understand cloud technologies, and they may need to update processes for forecasting future staffing requirements.

Incentive Management – Addresses your organization’s capability to ensure that workers receive competitive compensation and benefits for the value they bring to your organization. With the shift to cloud, some IT roles move from being commoditized to being highly specialized with high market demand.

Incentive management is key to attracting and retaining employees. Consider incentives as part of cloud adoption work streams. Your organization’s culture and ability to provide an environment for attracting and retaining talent plays a key role in successful adoption. Teams will need to develop new skills to manage culture and new processes for talent management.

Career Management – Focuses on your organization’s capability to ensure the personal fulfillment of your employees, their career opportunities, and their financial security.

Cloud adoption introduces change to IT career paths, requiring HR managers and people managers to update career management skills and processes so that they can ensure that their team members understand their new roles and career options.

Training Management – Addresses your organization’s capability to ensure employees have the knowledge and skills necessary to perform their roles and comply with organizational policies and requirements.

Staff in your organization will need to frequently update the knowledge and skills required to implement and maintain cloud services. Training modalities may need to be revised so that the organization can embrace the speed of

change and innovation. Trainers will need to develop new skills in training modalities and new processes for dealing with rapid change.

Organizational Change Management – Focuses on your organization’s capability to manage the effects and impacts of business, structural, and cultural change introduced with cloud adoption.

Change management is central to successful cloud adoption. Clear communications, as always, are critical to ease change and reduce uncertainty that may be present for staff when introducing new ways of working. As a natural part of cloud adoption, teams will need to develop skills and processes to manage ongoing change.

Governance Perspective: Prioritization and Control

The Governance Perspective focuses on the skills and processes that are needed to align IT strategy and goals with your organization’s business strategy and goals, to ensure your organization maximizes the business value of its IT investment and minimizes the business risks.

This Perspective includes Program Management and Project Management capabilities that support governance processes for cloud adoption and ongoing operations. Figure 4 illustrates the AWS CAF Governance Perspective Capabilities.

GOVERNANCE	
Portfolio Management	
Program and Project Management	
Business Performance Measurement	
License Management	

Figure 4: AWS CAF Governance Perspective Capabilities

AWS CAF Governance Perspective Capability Descriptions

Portfolio Management – Focuses on your organization’s capability to manage and prioritize IT investments, programs, and projects in alignment with your organization’s business goals.

Portfolio Management is an important mechanism for determining cloud-eligibility for workloads and for prioritizing the move to cloud services. It serves as a focal point for lifecycle management of both applications and services. Teams will need to develop new skills and processes to evaluate cloud services and a workload’s eligibility for the cloud.

Program and Project Management – Addresses your organization’s capability to manage one or several related projects to improve organizational performance and complete the projects on time and on budget.

Traditional waterfall methods of program and project management typically fail to keep up with the pace of iterative changes necessary for cloud adoption and operations. Program and Project Managers need to update their skills and processes to take advantage of the agility and cost management features of cloud services. Teams need to develop new skills in agile project management and new processes for managing agile-style projects.

Business Performance Measurement – Addresses your organization’s capability to measure and optimize processes in support of your organization’s goals.

Cloud services offer the potential for organizations to rapidly experiment with new means of process automation and optimization. Leveraging this potential requires new skills and processes to define cloud-centric Key Performance Indicators (KPIs) and create processes to ensure cloud consumption is mapped to business outcomes.

License Management – Defines your organization’s capability to procure, distribute, and manage the licenses needed for IT systems, services, and software. The cloud consumption model requires that teams develop new skills for procurement and license management and new processes for evaluating license needs.

Platform Perspective: Applications and Infrastructure

IT architects and designers use a variety of architectural dimensions and models to understand and communicate the nature of IT systems and their relationships. Organizations use the capabilities of the Platform Perspective to describe the structure and design of all types of cloud architectures.

With information derived using this Perspective, you can describe the architecture of the target state environment in detail. The Platform Perspective includes principles and patterns for implementing new solutions on the cloud, and migrating on-premises workloads to the cloud. Figure 5 illustrates the AWS CAF Platform Perspective Capabilities.



Figure 5: AWS CAF Platform Perspective Capabilities

AWS CAF Platform Perspective Capability Descriptions

Compute Provisioning – Encompasses your organization’s capability to provide processing and memory in support of enterprise applications. The skills and processes necessary to provision cloud services are very different from the skills and processes needed to provision physical hardware and manage data center facilities. Many processes move from being focused on real-world logistics to being focused on virtual and fully automated processes.

Network Provisioning – Addresses your organization’s capability to provide computing networks to support enterprise applications.

Moving from hardware components to networks delivered as cloud services changes network provisioning significantly, and teams will need to develop new skills and processes to design, implement, and manage this transition.

Storage Provisioning – Focuses on your organization’s capability to provide storage in support of enterprise applications.

Storage provisioning in the cloud is accomplished with cloud-based block and file storage. The skills and processes required to provision these services are significantly different from provisioning the physical storage area network (SAN), network-attached storage (NAS), and disk drives.

Database Provisioning – Addresses your organization’s capability to provide database and database management systems in support of enterprise applications.

The skills and processes supporting this capability change significantly from managing hardware-bound and cost-bound databases to provisioning standard relational database management systems (RDMS) in the cloud and leveraging cloud-native databases.

Systems and Solution Architecture – Encompasses your organization’s capability to define and describe the design of a system and to create architecture standards for the organization.

With cloud services, many of the traditional architectural aspects of systems change. Architects will need to develop new skills to codify architectures in templates and create new processes for workload optimization.

Application Development – Defines your organization’s capability to customize or develop applications to support your organization’s business goals.

New skills and processes for Continuous Integration and Continuous Deployment (CI/CD) are a critical part of designing applications that take advantage of cloud services and the agility promised by cloud computing.

Security Perspective: Risk and Compliance

Security at AWS is job zero. The Security Perspective helps you structure the selection and implementation of security controls that meet your organization’s needs. All AWS customers benefit from a data center and network architecture built to satisfy the requirements of the most security-sensitive organizations. AWS and its partners offer hundreds of services and features to help organizations meet their security objectives for visibility, auditability, control, and agility.

This perspective organizes the capabilities that will help drive the transformation of your organization’s security culture. Figure 6 illustrates the AWS CAF Security Perspective Core Capabilities.

SECURITY	
Identity and Access Management	
Detective Control	
Infrastructure Security	
Data Protection	
Incident Response	

Figure 6: AWS CAF Security Perspective Capabilities

AWS CAF Security Perspective Capability Descriptions

Identity and Access Management – This capability enables you to create multiple access control mechanisms and manage the permissions for each of these within your AWS Account. Privileges must be granted before your user community can provision or orchestrate resources.

Detective Control – AWS provides the capability for native logging as well as services that you can leverage to provide greater visibility near to real time for occurrences in the AWS environment. Correlating the logs from AWS sources with other event sources like operating systems, applications, and databases can provide a robust security posture and enhance visibility.

Consider integrating AWS logging features into centralized logging and monitoring solutions to provide holistic visibility near to real time for occurrences in the AWS environment.

Infrastructure Security – Your AWS environment can be defined and adjusted to evolve with your workload and business requirements. This capability provides the opportunity to shape your AWS security controls in an agile fashion; automating your ability to build, deploy, and operate your security infrastructure.

As new security features become available in AWS, it is important that your organization's IT Security teams update their skills and processes so that they can leverage these new features.

Data Protection – Addresses the capability for maintaining visibility and control over data, and how it is accessed and used in the organization.

Incident Response – Focuses on your organization's capability to respond, manage, reduce harm, and restore operations during and after a security incident. With AWS, you have services and independent software vendor (ISV) solutions available to help you automate incident response and recovery, and to mitigate portions of disaster recovery. As you implement your cloud security, it is possible to shift the primary focus of the security team from response to performing forensics and root cause analysis.

Operations Perspective: Manage and Scale

The Operations Perspective describes the focus areas that are used to enable, run, use, operate, and recover IT workloads to the level that is agreed upon with your business stakeholders. Every organization has an operations group that defines how day-to-day, quarter-to-quarter, and year-to-year business will be conducted. IT operations must align with and support the operations of the business.

Information gained through the Operations Perspective defines current operating procedures and identifies process changes and training needed to implement successful cloud adoption. Figure 7 illustrates the AWS CAF Operations Capabilities.

 OPERATIONS	
Service Monitoring	
Application Performance Monitoring	
Resource Inventory Management	
Release Management / Change Management	
Reporting and Analytics	
Business Continuity / Disaster Recovery	
IT Service Catalog	

Figure 7: AWS CAF Operations Perspective Capabilities

AWS CAF Operations Perspective Capability Descriptions

Service Monitoring – Addresses your organization’s capability to detect and respond to issues with the health of IT services and enterprise applications.

With cloud adoption, processes for both the detection of and response to service issues and application health issues can be highly automated, resulting in greater service uptime. Operations teams will need to develop new skills to leverage cloud features for service monitoring and automate many of their existing service monitoring processes.

Application Performance Monitoring – Addresses your organization’s capability to ensure application performance meets its defined requirements.

Cloud services offer features to monitor and right-size the cloud services that you need to meet performance requirements. Operations teams need to update their skills and processes to ensure they are taking full advantage of these cloud features.

Resource Inventory Management – Addresses the capability to align your organization’s assets in a way that provides the best, most cost-efficient service.

Cloud adoption removes the need to manage hardware assets and the hardware life cycle. Organizations can simplify the management of software licensing by leveraging on-demand techniques that optimize license usage. Operations teams will need to update their skills and processes to ensure they can manage cloud assets.

Release Management/Change Management – Encompasses your organization’s capability to manage, plan, and schedule changes to the IT environment.

Traditional release management is a complex process that is slow to deploy and difficult to roll back. Cloud adoption provides the opportunity to leverage CI/CD techniques to rapidly manage releases and roll-backs.

Reporting and Analytics – Addresses your organization’s capability to ensure compliance with your organization’s reporting policies and to ensure ongoing analysis and reporting of performance against key KPIs such as service-level agreements (SLAs) and operational-level agreements (OLAs).

With cloud adoption, operations teams need to update their skills and processes to ensure that they are taking advantage of new features to provide better detail and granularity in their reporting and analytics.

Business Continuity/Disaster Recovery (BC/DR) – Addresses your organization’s capability to operate in the event of a significant failure of IT services and the capability to recover from those failures within the time parameters defined by your organization.

Many of the traditional BC/DR processes are significantly changed with cloud adoption and require operations teams to update their skills and capabilities to take advantage of the new models.

IT Service Catalog – IT Service Catalog is your organization’s capability to select, maintain, advertise, and deliver an SLA or set of IT services.

With cloud adoption, the IT Service Catalog serves as a control mechanism to ensure that your organization selects the services that provide the best business value while minimizing business risk. It becomes closely coupled with Portfolio Management in the Governance Perspective in order to ensure that technical services are aligned to business goals and needs.

Conclusion

This overview of the AWS Cloud Adoption Framework shows you how organizations can learn how to align their cloud strategies and goals to their business strategies and goals. It helps organizations identify the gaps in their current organizational capabilities and devise work streams to close those gaps.

The AWS CAF is based on our experience gained in assisting many organizations to successfully adopt an AWS Cloud environment.

You can use the AWS CAF guidance for each part of your organization so that stakeholders in each functional area understand how to update their skills and adapt or update existing processes as you journey to the cloud.

Appendix 1: Changes from AWS CAF Version 1

The AWS CAF continues to be widely used by our customers. It is also used widely by AWS teams as they work with organizations to meet their cloud adoption goals. Based on feedback from customers and AWS teams, we made changes to improve clarity and consistency and to better facilitate prescriptive guidance. The following list highlights the changes that were made in the AWS CAF from Version 1 to Version 2:

- **Removed the Maturity Perspective and integrated its content into the other perspectives.**

Customer experience shows that maturity is an aspect of every perspective and not unique to itself. AWS CAF v2 removes the Maturity Perspective in favor of integrating the maturity concept directly into all of the other Perspectives.

- **Renamed the Process Perspective to the Governance Perspective.**

Customer experience shows that there is often confusion over business governance and technical governance. To ensure both aspects are fully addressed, the Process Perspective is renamed “Governance Perspective” to show its alignment to business governance. In AWS CAF v2, technical governance is more prominent in the Operations Perspective.

- **Decompose each Perspective into Capabilities instead of Components.**

Customer experience shows that the variations in components across AWS CAF Perspectives can create challenges in creating a cloud adoption plan. By decomposing into capabilities, AWS CAF v2 is consistent across all Perspectives and simplifies creating a consistent cloud adoption plan.

- **Focus on the Skills and Processes needed to execute each Capability in the Cloud world.**

The biggest impact of cloud adoption to most organizations is *how* they execute their business and technical capabilities. AWS CAF v2 focuses on identifying the changes to the “how” and provides guidance on how to make those changes.

- **Focus the Business, People, and Governance Perspectives on Business Capabilities. Focus the Platform, Security, and Operations Perspectives on Technical Capabilities.**

Customer experience shows the need to ensure that both business and technical stakeholders understand how cloud adoption will impact their owned and managed capabilities. The AWS CAF v2 makes a clear distinction between business and technical stakeholders and structures guidance for both types of stakeholders.