



WQI-FWK-001

The WiFi Quality Institute: The WiFi Quality Framework Conceptual Architecture, Taxonomy and Domains of WiFi Quality

WQI Framework | 001

The WiFi Quality Institute: The WiFi Quality Framework

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Scope

Relationship with the Doctrine

This Framework builds upon the WiFi Quality Doctrine (WQI-DOC-001), which establishes the philosophical, conceptual and institutional foundations of WiFi Quality as an emerging discipline. Whereas the Doctrine addresses why a new understanding of WiFi Quality is required, this Framework addresses what that understanding consists of: it defines the conceptual architecture — the taxonomy, terminology and relationships — through which WiFi Quality is described and organised. The two documents are complementary, and this Framework presupposes the foundations set out in the Doctrine.

The Doctrine also introduces the epistemological pathway through which knowledge of WiFi Quality is established: the progression from observation to measurement, evidence and assessment. That pathway lies outside the scope of this document. This Framework is concerned exclusively with the conceptual structure of WiFi Quality itself; the methodological processes through which evidence is collected and transformed into assessment are addressed by the WiFi Quality Methodology (WQI-TG-001, forthcoming).

A brief note on terminology: while "Wi-Fi" remains the formal designation used by the Wi-Fi Alliance, this Framework adopts the unhyphenated form "WiFi" throughout, consistent with the convention established by the Doctrine (WQI-DOC-001) and with common industry and consumer usage. The distinction is orthographic rather than substantive; both terms refer to wireless networking based on the IEEE 802.11 family of standards.

Position within the WQI Publication Series

The WiFi Quality Framework occupies the second position within the core conceptual publications of the WiFi Quality Institute, following the Doctrine and preceding the WiFi Quality Methodology (WQI-TG-001, forthcoming). The relationship among these publications is intentionally hierarchical: the Doctrine establishes the rationale for the discipline; this Framework defines its conceptual organisation, identifying the principal domains, dimensions and attributes of WiFi Quality and the relationships between them; the Methodology, once published, will define how WiFi Quality is assessed in practice, building upon the taxonomy and terminology established here.

Further WQI publications — whether addressing assessment methodology, technical guidance or other practical applications — are expected to remain conceptually consistent with the structure established by this Framework, without this Framework depending upon or anticipating their content.

What this Framework Defines

This Framework defines the conceptual structure of WiFi Quality. Specifically, it establishes the principal concepts that constitute WiFi Quality; the taxonomy through which those concepts are organised; the hierarchical relationship between Domains, Dimensions and Attributes; the conceptual relationships among the different components of WiFi Quality; the role of Operational Context in shaping the relative importance of quality characteristics; and the canonical terminology adopted throughout

the WQI publication series for describing WiFi Quality.

The purpose of this document is to provide a stable conceptual reference capable of supporting consistent communication, research, education and the future development of evidence-based methodologies.

What this Framework Intentionally Does Not Define

This Framework is not an assessment methodology. It does not prescribe how WiFi Quality should be measured, sampled, evaluated or scored, nor does it define testing procedures, evidence collection methods, assessment workflows, measurement thresholds or algorithms for determining assessment outcomes.

Nor does this Framework establish certification schemes, conformity requirements, compliance criteria or programme governance; such matters belong to separate publications within the WQI ecosystem.

By limiting its scope to conceptual organisation, this Framework remains independent of any specific assessment methodology, technology, product or certification programme, allowing its principles to remain applicable as methodologies and operational practices evolve.

Canonical Terminology: WiFi Experience

The Doctrine, as a foundational and narrative publication, was not written to fix technical terminology with precision — its purpose was to establish why WiFi Quality deserves recognition as a discipline, not to formalise the vocabulary through which that discipline is described. Accordingly, the experience of users interacting with a WiFi environment is expressed there in two related but distinct terms: "User Experience" throughout its narrative text and conceptual figures, and "WiFi Experience" in its Glossary. This is consistent with the Doctrine's own view of itself, expressed in its closing chapters, as a foundation intended for refinement rather than a final or immutable statement.

This Framework, by contrast, is a conceptual and technical publication, and requires the precision that its register demands. A single canonical term is therefore adopted from this publication onwards: WiFi Experience.

Within this Framework, WiFi Experience denotes specifically the experience of users interacting with a WiFi environment in pursuit of their intended activities. The term is deliberately narrower than the broader notion of User Experience (UX) used in human-computer interaction, service design and usability disciplines, with which it should not be conflated.

This terminological choice improves conceptual precision, avoids unintended collision with an established and much broader field, and ensures consistency across future WQI publications.

Part I — Foundations

Chapter 1 — From Performance to Quality

For many years, discussions about wireless networks have treated performance and quality as though they were interchangeable. Higher throughput has often been read as higher quality; lower latency, as a better experience; stronger signal strength, as evidence of a superior wireless environment. These assumptions are understandable, but they capture only part of a considerably broader reality.

Performance, Experience and Quality occupy distinct conceptual levels. Although closely related, they answer different questions and should not be treated as synonyms. WiFi Performance concerns how a wireless network behaves: it is expressed through measurable technical characteristics such as throughput, latency, packet loss, roaming behaviour, coverage or availability. WiFi Experience concerns how that behaviour is perceived by users while performing their intended activities — two networks with comparable technical performance may produce markedly different experiences, depending on operational context, user expectations and the nature of the activities undertaken. WiFi Quality concerns neither of these alone, but the broader capability of a wireless environment to fulfil its intended purpose consistently, within a defined operational context.

These three concepts form a progression rather than a set of competing definitions. Performance supplies the technical substrate from which WiFi Experience emerges; WiFi Experience, in turn, constitutes one important manifestation of overall WiFi Quality. Quality is not, however, reducible to either of them: it is neither the sum of individual performance metrics nor a synonym for subjective user satisfaction, but a multidimensional property arising from the interaction of technical, operational and human factors.

The distinction matters because different disciplines naturally attend to different levels of this progression. Wireless engineering is concerned principally with performance; human-centred disciplines, principally with experience. WiFi Quality integrates both perspectives into a single conceptual framework capable of describing the wireless environment as a whole, rather than any one level of it in isolation.

Accordingly, this Framework treats Performance, WiFi Experience and WiFi Quality as distinct but interrelated concepts. The chapters that follow build on this distinction to define the architecture through which WiFi Quality itself is organised and understood.

Chapter 1 — Key Principles

- WiFi Performance, WiFi Experience and WiFi Quality are distinct conceptual constructs.
- Performance describes how a wireless environment behaves.
- WiFi Experience describes how that behaviour is experienced while users pursue their intended activities.
- WiFi Quality describes the overall capability of a wireless environment to fulfil its intended purpose consistently within its operational context.
- Performance contributes to WiFi Experience, and both contribute to the understanding of WiFi Quality, but neither is individually equivalent to it.

Chapter 2 — The Four-Level Conceptual Model

The conceptual architecture presented in this Framework rests upon four distinct, sequential levels of abstraction. Each level addresses a different object of understanding, and none should be treated as interchangeable with the others; conflating them has historically been a significant source of the ambiguity surrounding WiFi Quality as a concept.

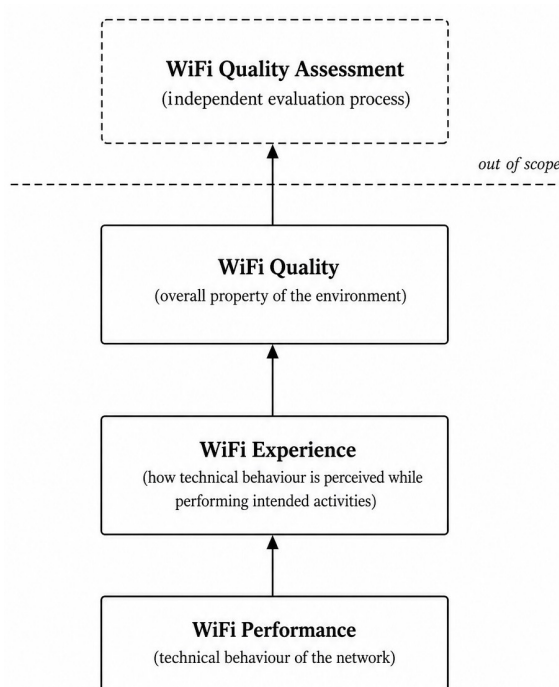
Level 1 — WiFi Performance. Performance denotes the observable technical behaviour of a WiFi environment, expressed through measurable characteristics such as throughput, latency, packet loss, roaming behaviour and availability.

Level 2 — WiFi Experience. WiFi Experience denotes how that technical behaviour is perceived by users while pursuing their intended activities. It reflects the network as encountered from the user's perspective, rather than the network's behaviour considered in isolation.

Level 3 — WiFi Quality. WiFi Quality is the multidimensional property of a WiFi environment arising from the combined contribution of technical, operational and human characteristics. It constitutes the central object of this Framework, around which the taxonomy developed in the following chapters is organised.

Level 4 — WiFi Quality Assessment. WiFi Quality Assessment is the systematic process through which evidence is interpreted to determine the level of WiFi Quality achieved by a given wireless environment. Unlike the three preceding levels, it does not describe an intrinsic property of the environment, but the independent evaluation of that property through an evidence-based methodology. For this reason, WiFi Quality Assessment falls outside the scope of this Framework and is addressed separately by the WiFi Quality Methodology (WQI-TG-001, forthcoming).

Figure 1 — The Four-Level Conceptual Model



The vertical arrangement represents increasing conceptual abstraction rather than strict composition or

causal dependence. WiFi Experience contributes to WiFi Quality from the perspective of the Human Domain, but Technical and Operational characteristics also contribute directly to WiFi Quality. The complete network of relationships is developed in Part IV (Interdependencies).

The first three levels describe the conceptual structure of WiFi Quality itself; the fourth describes the process through which that structure is subsequently evaluated. Although closely related, the two belong to different conceptual layers, and the exclusion of the fourth level from this Framework preserves a clear separation between the definition of WiFi Quality and the methodologies used to assess it.

The four-level model provides a useful conceptual scaffold for situating WiFi Quality between technical behaviour and independent assessment; the fuller network of relationships among Domains, Dimensions and Attributes, including the position of WiFi Experience within it, is developed in Part IV.

Chapter 2 — Key Principles

- The Four-Level Conceptual Model distinguishes four separate conceptual levels: Performance, Experience, Quality and Assessment.
- WiFi Performance, WiFi Experience and WiFi Quality describe progressively broader characteristics of a WiFi environment; WiFi Quality Assessment describes the process by which that environment is evaluated, not a property of the environment itself.
- WiFi Quality is the primary object defined by this Framework.
- The progression across the four levels reflects increasing abstraction, not strict composition: WiFi Experience contributes to WiFi Quality as part of the Human Domain, without being the sole channel through which Technical or Operational characteristics contribute to it.
- The conceptual definition of WiFi Quality is independent of the methodology used to assess it.

Part II — The Architecture of WiFi Quality

Chapter 3 — The WiFi Quality Taxonomy

Every mature discipline organises its knowledge through a structured taxonomy. Medicine distinguishes body systems from diseases and clinical manifestations; Quality Management separates principles, processes and controls; Information Security distinguishes domains, controls and implementation measures. In each case, the taxonomy supplies the common conceptual structure through which knowledge can be organised, communicated and progressively refined — and without it, different organisations tend to apply the same terms to different concepts, or different terms to the same concept, making objective comparison and methodological consistency unnecessarily difficult.

WiFi Quality requires the same degree of conceptual organisation. This Framework provides it through a hierarchical taxonomy composed of three levels — Domain, Dimension and Attribute — each representing a different degree of abstraction and fulfilling a different conceptual role.

Domains occupy the highest level of conceptual organisation within the Framework. A Domain groups together the Dimensions that share a common perspective on WiFi Quality; Domains are deliberately broad and stable, and provide the principal categories through which the multidimensional nature of WiFi Quality is organised. This Framework defines three Domains — Technical, Operational and Human — which together provide a comprehensive conceptual representation of WiFi Quality.

Dimensions describe the principal characteristics of WiFi Quality within each Domain. Each Dimension represents a distinct aspect of quality contributing to the overall capability of a WiFi environment to fulfil its intended purpose, and Dimensions are conceptually independent of one another, although they may interact in practice — a relationship developed further in Part IV. Coverage, Reliability, Availability and WiFi Experience are examples of Dimensions; the complete set belonging to each Domain is defined in Part III of this Framework.

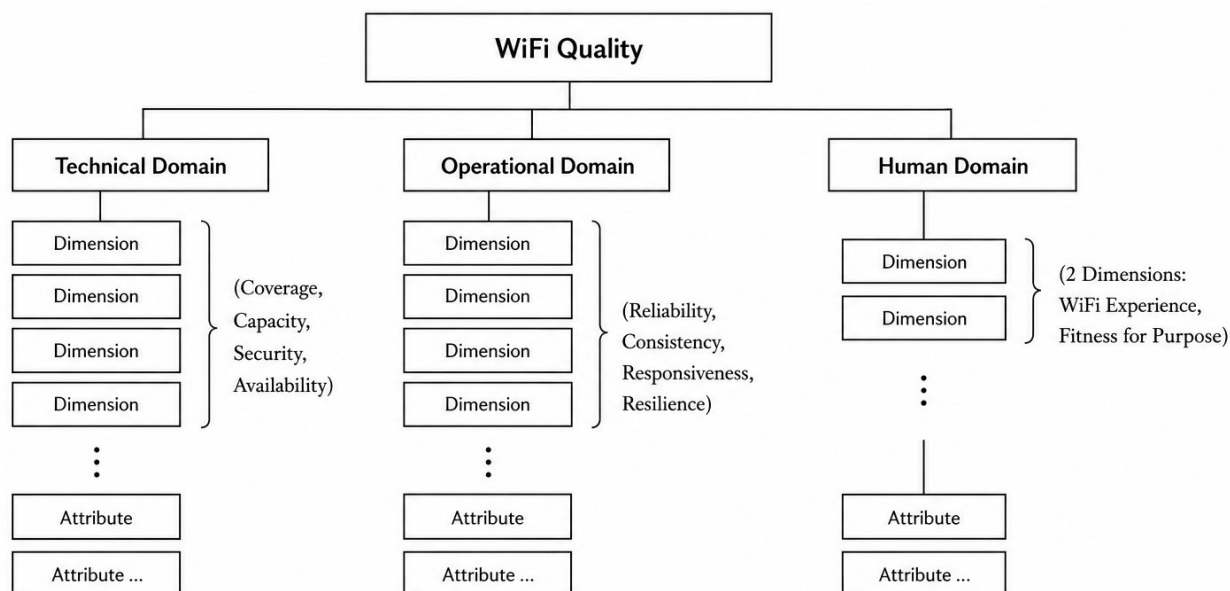
Attributes represent the most granular conceptual level within the taxonomy: an Attribute describes an individual characteristic contributing to a particular Dimension. Attributes do not represent measurements, metrics or assessment criteria — they are conceptual building blocks, not instruments of evaluation. Their identification, interpretation and evaluation form part of the methodological activities addressed separately by the WiFi Quality Methodology (WQI-TG-001, forthcoming).

Reconciling this taxonomy with the Doctrine. The Doctrine does not apply the terms Domain, Dimension and Attribute consistently. Figure 1 of the Doctrine labels individual elements such as Coverage and Security as "Quality Dimensions", while Figure 2 applies the same term, "Dimensions", to the three broader categories — Technical, Operational, Human — that group those elements. The Doctrine's Glossary, in turn, defines "Quality Dimension" as a category grouping "Quality Attributes", a definition that corresponds to neither figure precisely. As with its treatment of user-facing experience, the Doctrine's narrative register did not require the same terminological precision that this Framework, as a conceptual and technical publication, now demands. This Framework introduces an explicit third level, Domain, absent from the Doctrine: the broader categories shown in Figure 2 correspond to Domains as defined here, while the elements shown in Figure 1

correspond to Dimensions, each in turn decomposable into Attributes. This clarification should be read as a refinement of the Doctrine's terminology rather than a departure from its underlying model.

Hierarchical structure. The taxonomy is strictly hierarchical: Attributes contribute to the definition of Dimensions, Dimensions collectively describe a Domain, and the three Domains together constitute the conceptual architecture of WiFi Quality. This relationship may be represented as follows.

Figure 2 — The WiFi Quality Taxonomy



This taxonomy organises WiFi Quality into three Domains, each expressed through the Dimensions defined in Part III of this Framework and further decomposed into Attributes. The Dimensions shown in parentheses are the complete set defined for each Domain, not illustrative examples. Attributes represent the most granular level of the taxonomy; their specific identification lies outside the scope of this Framework and is addressed by the Methodology.

Each level of the taxonomy may also be understood by the type of question it answers, which clarifies why WiFi Quality requires three distinct layers of abstraction rather than a single, undifferentiated list of characteristics.

Table 1 — Conceptual Function of Each Taxonomic Level

Level	Question it answers
Domain	Which perspective of WiFi Quality is under consideration?
Dimension	Which characteristic, within that perspective, is being described?
Attribute	Which specific property gives rise to that characteristic?

This progression — from perspective, to characteristic, to constituent property — reflects a purely conceptual decomposition. It should not be conflated with the question of how each level is observed or measured in practice, which belongs to the evidence-based methodology addressed separately by the WiFi Quality Methodology (WQI-TG-001,

forthcoming).

The taxonomy defines the conceptual composition of WiFi Quality; it does not prescribe the relative importance of any Domain, Dimension or Attribute, whose significance depends instead upon the Operational Context, addressed later in this Framework.

Chapter 3 — Key Principles

- WiFi Quality is organised through a hierarchical conceptual taxonomy composed of three levels: Domain, Dimension and Attribute.
- Domains provide the highest level of conceptual organisation; Dimensions describe the distinct characteristics of WiFi Quality within each Domain; Attributes describe the individual characteristics that collectively define each Dimension.
- This three-level taxonomy resolves an inconsistent use of the term "Dimension" across the Doctrine's figures and Glossary, by introducing Domain as an explicit, previously absent level.
- The taxonomy defines concepts rather than measurements, metrics or assessment procedures.

Chapter 4 — Principles of Taxonomic Design

A conceptual taxonomy is valuable only insofar as it provides a coherent and stable structure through which knowledge can be organised consistently. The taxonomy presented in this Framework has therefore been developed according to a small number of design principles intended to maximise conceptual clarity, consistency and long-term applicability. These principles govern the organisation of Domains, Dimensions and Attributes throughout the Framework and should be understood as characteristics of the taxonomy itself, rather than as characteristics of WiFi Quality.

4.1 Unique Classification

Each conceptual element shall belong to one, and only one, parent element within the taxonomy: a Dimension shall belong to a single Domain, and an Attribute shall contribute to a single Dimension. This principle avoids conceptual duplication and ensures that every concept occupies a unique and clearly defined position within the Framework. It does not imply that concepts are independent in practice — different Domains and Dimensions may well influence one another, as Part IV discusses — only that such interaction does not alter their classification within the taxonomy.

4.2 Collective Exhaustiveness

Taken together, the Domains, Dimensions and Attributes defined by this Framework are intended to provide a complete conceptual description of WiFi Quality: nothing necessary to understand WiFi Quality, as this Framework defines it, should fall outside the taxonomy. This does not require that every possible implementation, technology or future development already be represented within it; it requires only that the conceptual architecture remain capable of accommodating whatever characteristics prove necessary to describe WiFi Quality comprehensively as understanding of the discipline advances.

4.3 Mutual Exclusivity

Elements that share the same parent shall be mutually exclusive: the Dimensions belonging to a given Domain shall each represent a distinct characteristic, and the Attributes belonging to a given Dimension shall each represent a distinct property. This requirement applies within each level of the taxonomy and within each parent element — it does not require exclusivity between elements at different levels, nor between elements belonging to different parents. Where two elements at the same level appear to describe substantially the same characteristic, the taxonomy should be refined to eliminate the resulting redundancy or ambiguity, since unresolved overlap of this kind undermines consistent interpretation across different users of the Framework.

4.4 Stability

The highest levels of the taxonomy should remain stable over time. Domains are intended to represent enduring conceptual perspectives rather than transient technological arrangements, and should therefore change rarely, if at all. Dimensions should evolve only when a genuine advance in the understanding of WiFi Quality justifies conceptual revision. Attributes, being the most granular level, may reasonably be refined more frequently as knowledge develops, provided such refinement preserves the coherence of the architecture above them. This graduated stability allows the Framework to remain applicable despite continual change in wireless technologies, deployment models and operational practice.

4.5 Extensibility

The taxonomy shall support future refinement without requiring fundamental restructuring. New Dimensions or Attributes may be introduced where justified by new evidence, technological evolution or improved conceptual understanding, provided such extensions preserve the existing hierarchical organisation and remain consistent with the design principles established by this Framework. Extensibility allows the Framework to evolve alongside the discipline it describes, without sacrificing conceptual continuity.

4.6 Technology Independence

The taxonomy describes conceptual characteristics of WiFi Quality, not specific technologies, standards, protocols or vendor implementations. This principle concerns the taxonomy's independence from specific generations, standards or vendor implementations within the WiFi (IEEE 802.11) domain to which this Framework applies — not independence from WiFi itself, which remains, consistent with the Doctrine's Scope, the exclusive subject of this publication. No Domain, Dimension or Attribute defined by this Framework should be tied to a particular generation of wireless technology, IEEE standard or proprietary feature. As wireless technologies evolve, the taxonomy is intended to remain conceptually valid, with technological change being absorbed through the interpretation of Attributes rather than through revision of the underlying architecture. This principle follows directly from the Doctrine's insistence that the discipline of WiFi Quality remain independent of any single technology, vendor or product cycle; applied to the taxonomy, it ensures that the Framework is built to outlast the specific technologies through which WiFi Quality happens to be delivered at any given time.

Taxonomic Integrity

These principles are not rigid constraints against future evolution, but the conditions under which the taxonomy can evolve while remaining coherent. Future revisions should seek to improve the Framework while preserving its conceptual integrity, so that new knowledge extends the existing architecture rather than fragmenting it.

Chapter 4 — Key Principles

- A taxonomy must organise knowledge consistently, not merely classify concepts.
- Every conceptual element shall occupy a unique position within the hierarchy (Unique Classification).
- The taxonomy shall collectively describe WiFi Quality without gaps (Collective Exhaustiveness).
- Elements sharing the same parent shall be mutually exclusive, though this requirement does not extend across levels or across different parents (Mutual Exclusivity).
- The highest levels of the taxonomy shall remain stable despite technological evolution (Stability), while remaining capable of future refinement (Extensibility).
- The taxonomy shall describe conceptual characteristics of WiFi Quality independently of any specific technology, standard or vendor implementation (Technology Independence).

Part III — The Domains

Introduction

WiFi Quality is inherently multidimensional: no single characteristic — technical, operational or experiential — is sufficient on its own to describe the quality of a wireless environment. This Framework organises WiFi Quality into three complementary Domains — Technical, Operational and Human — each representing a distinct perspective from which WiFi Quality may be understood. Together, they provide a comprehensive conceptual representation of the characteristics that determine the quality of a WiFi environment.

The Domains are conceptually distinct but not independent in practice: characteristics belonging to one Domain frequently influence those belonging to another, and such interactions are examined in Part IV. Their conceptual separation nonetheless remains essential to a consistent taxonomy, and each of the following chapters identifies not only the Dimensions belonging to a given Domain, but the underlying criterion that unites them and distinguishes them from the other two.

Chapter 5 — The Technical Domain

The Technical Domain comprises the characteristics of WiFi Quality that describe the technical capability of the wireless environment — its capacity, in principle, to provide wireless connectivity under its intended operating conditions. These characteristics concern the properties of the environment itself, rather than the manner in which it is subsequently operated or experienced; the Technical Domain therefore represents the engineering perspective of WiFi Quality, describing what the environment is capable of providing rather than how effectively that capability is sustained or perceived in practice.

What unites the Dimensions of the Technical Domain is that each describes a capability designed and deployed into the environment — a property that, in principle, could be assessed by examining the network's design and configuration at a given point in time, independently of how consistently that capability holds up over time (a question the Operational Domain addresses) or how it is ultimately experienced by those who depend on it (a question addressed by the Human Domain).

This Framework defines the following Dimensions within the Technical Domain: Coverage, Capacity, Security and Availability. Coverage concerns whether wireless connectivity extends across the intended service area; Capacity, whether sufficient wireless resources exist to support expected demand; Security, the environment's ability to protect communications and restrict access to authorised users; and Availability, the environment's underlying capacity to provide access whenever required. None of these Dimensions should be read as a performance metric or an engineering specification — each is a conceptual characteristic that contributes to WiFi Quality regardless of the specific technologies, protocols or vendor implementations through which it happens to be realised.

Chapter 5 — Key Principles

- The Technical Domain describes the technical capability of the WiFi environment — the engineering perspective of WiFi Quality.
- Its Dimensions share a common character: each describes a capability inherent to the environment's design, in principle assessable independently of its sustained

delivery over time or its experienced outcome.

- Technical Dimensions describe conceptual characteristics, not measurements, metrics or implementation methods.
- The Technical Domain contributes to, but does not alone determine, WiFi Quality.

Chapter 6 — The Operational Domain

The Operational Domain comprises the characteristics that describe how consistently the technical capabilities of a WiFi environment are delivered during real operation. Where the Technical Domain describes what the infrastructure is capable of providing, the Operational Domain describes how effectively that capability is sustained over time and across changing operating conditions — a distinction that matters because the two need not coincide: a technically capable network does not automatically deliver high operational quality, since environmental conditions, user density, interference and fluctuating demand may all affect how consistently its underlying capabilities are maintained during everyday use.

What unites the Dimensions of the Operational Domain, in contrast to those of the Technical Domain, is that each concerns behaviour over time rather than capability at a point in time — the environment's conduct under the conditions it actually encounters, rather than the properties designed into it. This Framework defines the following Dimensions within the Operational Domain: Reliability, Consistency, Responsiveness and Resilience. Reliability concerns the environment's ability to continue fulfilling its intended purpose without unnecessary interruption; Consistency, the predictability of its behaviour across time, locations and operating conditions; Responsiveness, its capacity to react appropriately to changing operational demand; and Resilience, its capacity to continue functioning despite adverse conditions, failures or unexpected events. Together, these Dimensions explain why two technically similar networks may nonetheless deliver markedly different levels of overall WiFi Quality once subjected to real-world operating conditions.

Chapter 6 — Key Principles

- The Operational Domain describes how technical capability is delivered in practice, over time and under real operating conditions.
- Its Dimensions share a common character: each concerns behaviour under actual conditions, rather than capability designed into the environment.
- Operational quality is a matter of sustained behaviour, not isolated technical performance.
- Operational characteristics emerge from, but remain conceptually distinct from, technical capability.

Chapter 7 — The Human Domain

The Human Domain comprises the characteristics of WiFi Quality that concern the relationship between people and the WiFi environment. Unlike the Technical and Operational Domains, which describe properties of the wireless environment itself, the Human Domain considers the extent to which that environment fulfils the needs of those who depend on it — recognising that WiFi Quality cannot be understood through

technical or operational characteristics alone, since WiFi ultimately exists to support human activities, organisational objectives and real-world outcomes.

What unites the Dimensions of the Human Domain, distinguishing them from those of the other two, is that each evaluates the environment against an external purpose rather than an internal property: the question is not what the network can do, nor how consistently it does it, but whether what it does answers to the needs of the people and objectives it serves. This Framework defines two Dimensions within the Human Domain: WiFi Experience and Fitness for Purpose. WiFi Experience concerns the experience of users while interacting with the WiFi environment in pursuit of their intended activities; Fitness for Purpose concerns the degree to which the environment supports the operational objectives for which it exists. Because both are defined relative to an external purpose rather than an intrinsic property, they also explain why identical technical characteristics may represent markedly different levels of WiFi Quality in different operational contexts: a hospital, an airport, a university and a hotel may each require excellent WiFi, without the characteristics that constitute excellence being identical between them. The Human Domain provides the conceptual apparatus through which such differing expectations can be understood, without altering the underlying definition of WiFi Quality itself.

This should not be read as reducing WiFi Quality to subjective opinion or user satisfaction. Rather, the Human Domain recognises human interaction and organisational purpose as one essential perspective within a broader, multidimensional framework that also includes technical capability and operational behaviour.

Chapter 7 — Key Principles

- The Human Domain describes the relationship between people, organisational purpose and the WiFi environment.
- Its Dimensions share a common character: each evaluates the environment against an external purpose rather than an intrinsic property.
- WiFi Experience and Fitness for Purpose represent complementary characteristics of the Human Domain.
- Human characteristics contribute to, but do not solely determine, WiFi Quality.

Part IV — Relationships and Boundaries

Introduction

The Domains presented in Part III should not be read as isolated components of WiFi Quality. Each describes a distinct conceptual perspective, yet the quality of a WiFi environment emerges from their continual interaction rather than from any single Domain considered in isolation — improvements within one Domain frequently influence the others, and deficiencies often propagate across several Domains before becoming apparent in any one of them. This Part examines how the Domains interact, how Operational Context shapes their relative importance, and where the conceptual boundaries of WiFi Quality begin and end.

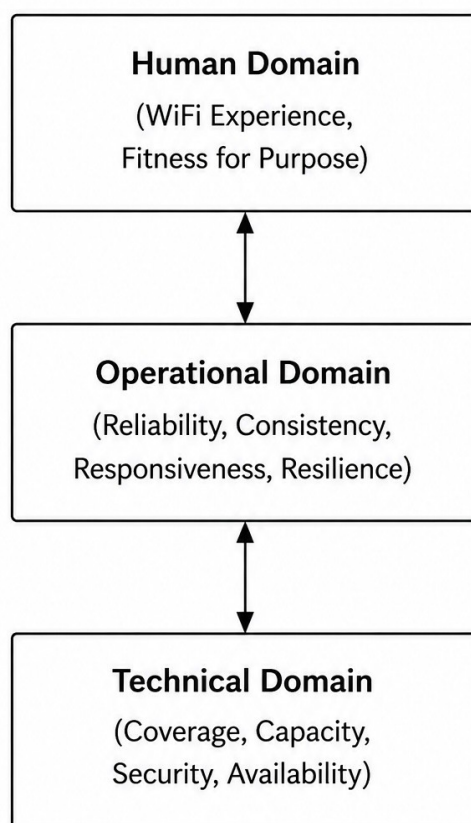
Chapter 8 — Interdependencies

The Domains defined by this Framework are conceptually distinct but functionally interconnected. The Technical Domain describes the capability of the wireless environment; the Operational Domain describes how that capability is sustained during real operation; the Human Domain describes how the resulting environment serves the people and organisations that depend on it. Although the three remain conceptually independent — each answering a different type of question, as Part III established — changes affecting one frequently propagate into the others.

Inadequate technical coverage, for instance, may reduce the availability of wireless connectivity within parts of a building; reduced availability may in turn affect operational reliability, through an increase in connection failures, roaming interruptions or inconsistent service; and these operational effects may ultimately manifest within the Human Domain as a degraded WiFi Experience or a reduced Fitness for Purpose. Read this way, the three Domains trace a natural conceptual pathway from technical capability, through operational behaviour, to human outcome.

This pathway should not, however, be read as a deterministic sequence running in one direction only. Operational characteristics may themselves affect technical behaviour — persistent congestion, for example, may prompt a change to the underlying technical configuration — and human requirements frequently determine, in advance, which technical and operational characteristics a given environment needs in order to achieve its intended level of WiFi Quality. The Domains are therefore best understood as mutually influential rather than hierarchically dependent; their conceptual separation serves understanding, not isolation.

Figure 3 — Conceptual Relationships among the Domains



Arrows indicate that influence typically runs in both directions between adjacent Domains, rather than following a single, mandatory causal chain. WiFi Quality emerges from the combined interaction of all three Domains, not from any one of them considered independently.

Chapter 8 — Key Principles

- The Domains are conceptually distinct but functionally interconnected.
- Technical characteristics frequently influence operational behaviour, which in turn frequently shapes human outcomes; the reverse influence — operational and human factors shaping technical and operational design — is equally significant.
- No single direction of influence should be treated as mandatory or exhaustive.
- WiFi Quality emerges from the interaction of all three Domains, not from any individual Domain in isolation.

Chapter 9 — Operational Context

The relative importance of the Domains, Dimensions and Attributes defined by this Framework is not fixed; it depends instead upon the Operational Context within which a given WiFi environment is expected to fulfil its intended purpose. Operational Context encompasses the circumstances, objectives, constraints and patterns of use that characterise a particular wireless environment — among them the type of organisation, the services it intends to support, its expected users, its operational priorities, its environmental conditions and its patterns of utilisation.

The purpose of Operational Context is not to redefine WiFi Quality, but to provide the lens through which the relative significance of its characteristics can be understood.

Uninterrupted reliability, for instance, may represent the dominant requirement within a healthcare environment, whereas seamless mobility may matter more within a transport hub; an educational environment may place greater weight on scalability during periods of peak demand, while a hospitality environment may prioritise a consistent experience across the entirety of the guest journey. These differing priorities do not imply different definitions of WiFi Quality — they represent different expressions of the same conceptual framework under different operating conditions.

Accordingly, this Framework deliberately assigns no universal weighting to any Domain, Dimension or Attribute: the relative importance of each depends on the Operational Context in which it is considered, and determining that importance for a specific environment is a task for assessment methodology, not for conceptual taxonomy.

Chapter 9 — Key Principles

- Operational Context shapes the relative importance of quality characteristics without redefining WiFi Quality itself.
- The same conceptual framework applies across all operational contexts; only the relative significance of its components varies.
- This Framework assigns no universal weighting to any Domain, Dimension or Attribute.
- Determining relative importance for a specific environment belongs to assessment methodology, not to this Framework.

Chapter 10 — Boundaries

A clear conceptual framework requires equally clear conceptual boundaries. Several concepts commonly associated with WiFi are closely related to WiFi Quality without being equivalent to it, and maintaining the distinction between them is essential to the discipline's conceptual clarity.

Performance ≠ WiFi Quality. WiFi Performance describes the technical behaviour of the wireless environment; WiFi Quality describes its multidimensional capability to fulfil its intended purpose. Performance contributes to WiFi Quality but does not, by itself, constitute it.

WiFi Experience ≠ WiFi Quality. WiFi Experience describes the experience of users interacting with the environment; WiFi Quality describes the broader property of the environment itself. Although closely related, WiFi Experience constitutes one Dimension within the Human Domain, not the definition of WiFi Quality as a whole.

WiFi Quality ≠ WiFi Quality Assessment. WiFi Quality is an intrinsic conceptual property of the wireless environment; WiFi Quality Assessment is the systematic process through which evidence is interpreted to determine the level of WiFi Quality achieved. The former describes what exists; the latter describes how that property is independently evaluated — a distinction that preserves the independence of the conceptual definitions established in this Framework from the assessment methodologies that will apply them.

Relationship with the Doctrine and the Methodology. The boundaries established above are deliberately limited to the distinctions most fundamental to the discipline. Other

related concepts — Observation, Measurement, Evidence and Assessment — form part of the epistemological pathway introduced by the WiFi Quality Doctrine (WQI-DOC-001) and developed further by the WiFi Quality Methodology (WQI-TG-001, forthcoming). This Framework acknowledges their place within the broader WQI ecosystem but does not develop them here.

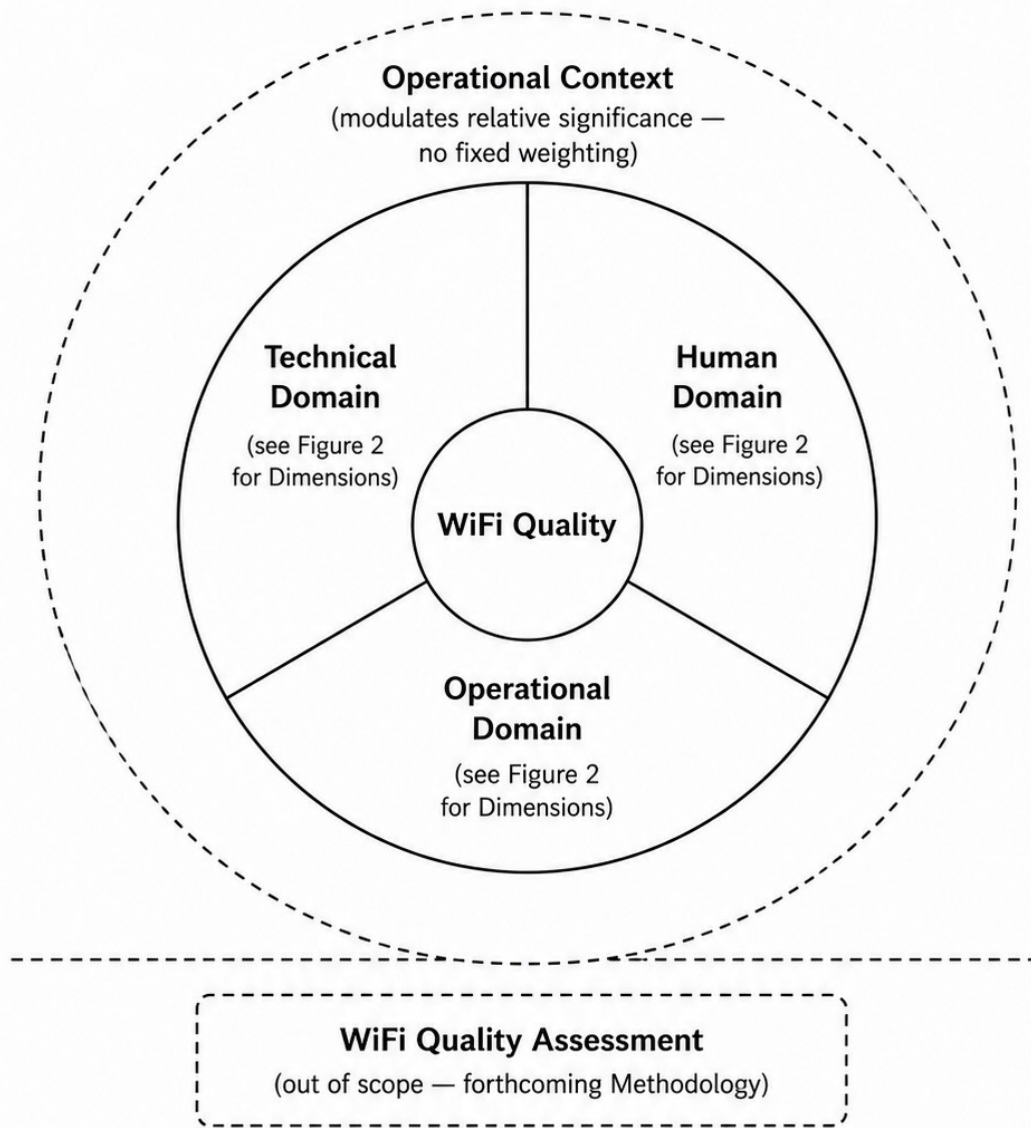
Chapter 10 — Key Principles

- WiFi Performance and WiFi Quality are distinct concepts; Performance contributes to Quality without defining it.
- WiFi Experience contributes to WiFi Quality as one Dimension of the Human Domain, without constituting WiFi Quality as a whole.
- WiFi Quality and WiFi Quality Assessment describe different conceptual objects: an intrinsic property, and the process of evaluating it.
- This Framework limits its boundary-setting to these three fundamental distinctions, deferring Observation, Measurement, Evidence and Assessment to the Doctrine and the forthcoming Methodology.

Closing Statement

The development of every mature discipline depends on more than terminology or isolated concepts: it requires a coherent conceptual structure through which knowledge can be organised, communicated and progressively refined. This Framework has proposed such a structure for WiFi Quality — a taxonomy of Domains, Dimensions and Attributes; a network of relationships that connects them; a mechanism, in Operational Context, through which their relative significance is understood without being fixed; and a set of boundaries that separate WiFi Quality from the related concepts most often mistaken for it.

Figure 4 — The WiFi Quality Conceptual System



Together, these elements do more than classify characteristics of a wireless environment: they establish, for the first time within the WQI publication series, a complete conceptual system through which WiFi Quality can be consistently understood, communicated and examined.

This Framework should not, however, be read as a fixed or immutable model. Wireless technologies will continue to evolve, new deployment models will emerge, user

expectations will change, and operational environments will grow more diverse still. The principles established here are intended to provide continuity rather than permanence: stable enough to support a common understanding of WiFi Quality, yet flexible enough to accommodate what future research, professional practice and accumulated evidence will inevitably reveal.

This Framework therefore represents neither the conclusion of the discipline nor the complete definition of WiFi Quality. It provides the conceptual architecture through which the discipline may continue to develop consistently, transparently and on the basis of evidence. Future WQI publications — beginning with the WiFi Quality Methodology (WQI-TG-001, forthcoming) — will build upon these foundations by defining assessment methodologies, guidance and other practical applications, while remaining conceptually aligned with the principles established herein.

The long-term value of this Framework will ultimately depend not on the document itself, but on its capacity to support a common language, sustain a consistent understanding, and provide a durable conceptual foundation for the continuing advancement of WiFi Quality as an emerging discipline.

Glossary

Attribute — Individual conceptual characteristic contributing to a specific Dimension of WiFi Quality. Attributes represent the most granular level of the WiFi Quality taxonomy and describe concepts rather than measurements or assessment criteria.

Availability — Technical Dimension describing the capability of a WiFi environment to provide access whenever required.

Capacity — Technical Dimension describing whether sufficient wireless resources exist to support expected demand.

Consistency — Operational Dimension describing the predictability of a WiFi environment's behaviour across time, locations and operating conditions.

Coverage — Technical Dimension describing whether wireless connectivity extends across the intended service area.

Dimension — Distinct characteristic of WiFi Quality belonging to a single Domain. A Dimension groups the conceptually related Attributes that collectively describe one aspect of WiFi Quality.

Domain — Highest level of conceptual organisation within the WiFi Quality Taxonomy. A Domain groups the Dimensions that share a common perspective on WiFi Quality. This Framework defines three Domains: Technical, Operational and Human.

Fitness for Purpose — Human Dimension describing the degree to which a WiFi environment supports the operational objectives and intended activities for which it exists.

Human Domain — Domain describing the relationship between people, organisational purpose and the WiFi environment.

Operational Context — The circumstances, objectives, constraints and patterns of use within which a WiFi environment is expected to fulfil its intended purpose. Operational

Context influences the relative importance of quality characteristics without altering the definition of WiFi Quality itself.

Operational Domain — Domain describing how the technical capability of a WiFi environment is sustained during real operation.

Reliability — Operational Dimension describing the ability of a WiFi environment to continue fulfilling its intended purpose without unnecessary interruption.

Resilience — Operational Dimension describing the ability of a WiFi environment to continue functioning despite failures, interference or other adverse operating conditions.

Responsiveness — Operational Dimension describing the ability of a WiFi environment to react appropriately to changing operational demand.

Security — Technical Dimension describing the ability of a WiFi environment to protect communications and restrict access to authorised users.

Technical Domain — Domain describing the technical capability of a WiFi environment.

WiFi Experience — Human Dimension describing the experience of users while interacting with a WiFi environment in pursuit of their intended activities. This Framework adopts WiFi Experience as the canonical term throughout the WQI publication series, in place of the broader concept of User Experience (UX) used in human-computer interaction and service design (see Scope, Canonical Terminology).

WiFi Performance — Observable technical behaviour of a WiFi environment, expressed through measurable characteristics such as throughput, latency, packet loss, roaming behaviour and availability.

WiFi Quality — Multidimensional property of a WiFi environment describing its capability to consistently fulfil its intended purpose within a defined Operational Context.

WiFi Quality Assessment — Systematic, evidence-based process through which the level of WiFi Quality achieved by a particular WiFi environment is determined. This Framework adopts WiFi Quality Assessment as the canonical term for this concept, in place of the Doctrine's "WiFi Assessment", to align its naming with the terminology used throughout this publication (see Chapter 2, Chapter 10).

About the WiFi Quality Institute

The WiFi Quality Institute (WQI) is an independent organisation dedicated to advancing the understanding of WiFi Quality as a recognised discipline through research, education, conceptual development, evidence-based methodologies and the stewardship of professional knowledge.

The Institute develops and publishes a structured series of technical reports supporting this mission. The WiFi Quality Doctrine (WQI-DOC-001) establishes the philosophical, conceptual and institutional foundations of the discipline. This Framework (WQI-FWK-001) builds upon those foundations by defining the conceptual architecture — the taxonomy, terminology and relationships — through which WiFi Quality is organised and understood. The WiFi Quality Methodology (WQI-TG-001, forthcoming) will complete this core series by defining how WiFi Quality is assessed in practice, on the basis of the concepts established here.

Together, these publications and the research, educational and analytical work that accompanies them support the advancement of WiFi Quality for the benefit of organisations, professionals and society.