GLOBAL INDUSTRY ATLAS

450 Industry Applications. One *Execution* Control Principle.

A strategic atlas of pre-execution authorization across industries, subindustries and digital operations.

25	10	450
TAXONOMY GROUPS	STRATEGIC DOMAINS	NUMBERED APPLICATIONS



VERIFY FIRST · AUTHORIZE FIRST · EXECUTE SECOND

STRATEGIC APPLICABILITY PUBLICATION · EDITION 2026 · POTENTIAL APPLICATIONS, NOT IMPLEMENTATION STATUS

ABOUT THIS PUBLICATION

The market is defined by what systems are authorized to execute.

QODIQA's potential market is defined not by one industry, but by the actions digital systems are authorized to execute.

This atlas documents where a single principle (verify authorization before a consequential action is performed) could apply. It maps **450 numbered applications** in **25 taxonomy groups**, organized into ten strategic domains and read through ten cross-industry action types.

The statement above is strategic positioning. It is not a quantified market size, and this publication contains no market-size figures, revenue forecasts, adoption rates or effectiveness metrics.

FOUR DISTINCTIONS KEPT THROUGHOUT

1 **Implemented capabilities**

Capabilities described in the QODIQA architecture: cryptographic verification, request verification, replay protection, deterministic and semantic policies, pre-execution control, AI provider integration and evidence mechanisms.

2 **Potential applications**

The 450 entries are applications that could reuse those capabilities. They are not claims of deployment, customers, partnerships or certification.

3 **Integration required**

Industry use depends on adapters, policy configuration, resource identification and enforcement at the relevant execution point.

4 **Additional assurance**

Safety-critical and regulated domains may require independent validation, certification, redundancy, fail-safe behavior and integration with existing safety systems. Entries in such contexts are marked ADDITIONAL ASSURANCE.

HOW TO NAVIGATE

Use the Contents (p. 3); every line is a link. PDF bookmarks mirror the structure. The Atlas Index at the end lists all 450 applications with page references. Each atlas page carries the group letter and section identifier in its running header and footer.

Company and product names that appear in source entries (for example entries 1 and 19) identify categories of systems. No relationship, endorsement or partnership with any named company is stated or implied.

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M Defense, Security and Strategic Aerospace 28
N Government, Public Administration and Civic Services 29
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PART 01

01

The Thesis

Digital systems should verify authorization before performing an action, rather than relying exclusively on monitoring, logging or remediation after execution.

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1.2 The principle 06
1.3 Execution control architecture 07
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1.1 EXECUTIVE OVERVIEW

A cross-industry execution control layer.

QODIQA is intended to function as an **Execution Control Layer**: a point at which a consequential digital action is verified and authorized *before* it is performed. Its central proposition is that monitoring, logging and remediation after the fact are necessary but insufficient once systems, and increasingly AI agents, can act on their own.

The principle applies wherever a digital system can initiate a consequential action: an AI agent transferring money, an enterprise assistant opening confidential information, a deployment changing production infrastructure, a robot receiving a command, an administrator modifying permissions, a workflow sending a confidential document.

THE OPPORTUNITY

AI is the natural entry point. The same control principle may extend to broader software execution control and, through appropriate integrations, to operations that affect the physical world. This atlas maps that breadth: **450 applications, 25 taxonomy groups, 10 strategic domains, 10 action types.**

THE ADVANTAGE

The potential strategic advantage is reuse: one common verification and authorization core, combined with industry-specific policies, integrations and assurance requirements.

THE TECHNICAL OBJECTIVE

Ensure that protected actions cannot pass through the relevant execution point without the required verification.

THE QUALIFICATION

Enforcement depends on integration and on coverage of the relevant execution paths. The 450 entries are potential applications, not implementation, deployment or certification status. In safety-critical systems, QODIQA does not replace existing safety controls, certified systems, human authorization requirements or regulatory obligations.

READ FIRST
1.2 The principle · 1.3 Architecture · 4.1 Applicability levels

EXPLORE
2.1 Ten domains · 2.3 Action matrix · 2.4 Taxonomy map

LOOK UP
5.2 Atlas index: every application, 001 to 450, with its page.

1.2 THE PRINCIPLE

VERIFY FIRST. AUTHORIZE FIRST. EXECUTE SECOND.

Most control today is retrospective: actions are monitored, logged and, when something goes wrong, remediated. Pre-Execution Authorization moves the decisive check to the moment before the action, where an unauthorized action can still be stopped rather than merely recorded.

WHERE A DIGITAL SYSTEM CAN INITIATE A CONSEQUENTIAL ACTION

01
An AI agent transferring money.

02
An enterprise assistant accessing confidential information.

03
A software deployment changing production infrastructure.

04
A robotic system receiving an operational command.

05
A cloud administrator modifying permissions.

06
A financial system processing a transaction.

07
A connected device initiating an operation.

08
An automated workflow sending a confidential document.

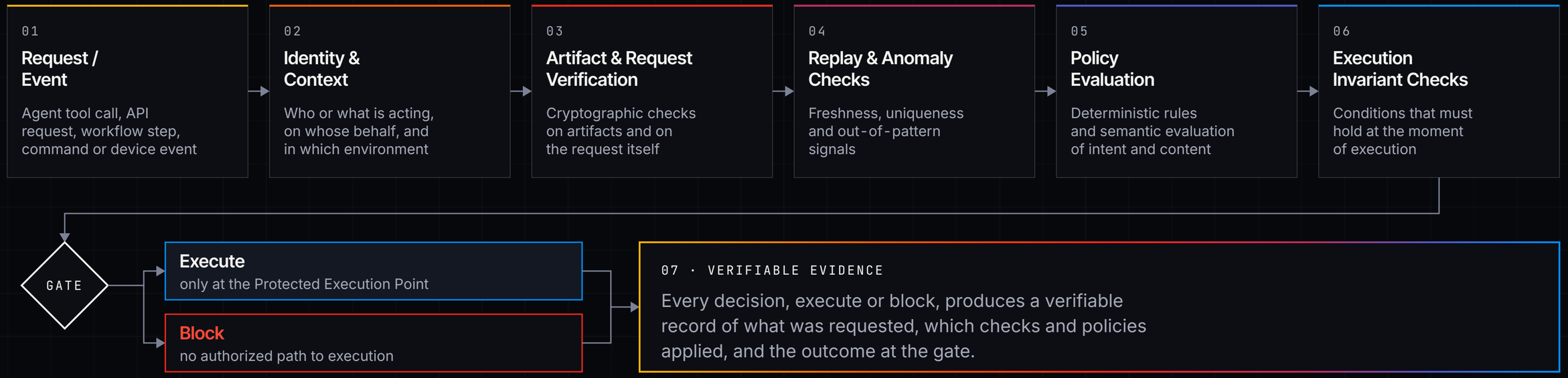
The principle is not limited to AI. It applies wherever a digital system can initiate a consequential action.

1.3 DIAGRAM 1 · EXECUTION CONTROL ARCHITECTURE

From request to decision: a conceptual pre-execution path.

Conceptual representation of the described architecture. It does not imply that every stage is universally deployed in every integration; the stages present, their order and the execution paths covered are determined by each integration.

PRE-EXECUTION AUTHORIZATION PATH



ORDER AND PRESENCE OF STAGES ARE INTEGRATION-SPECIFIC. EVIDENCE MAY BE CAPTURED AT EVERY STAGE.

Verify. Identity, context, artifacts and the request itself are checked using Cryptographic Verification, together with replay and anomaly checks.

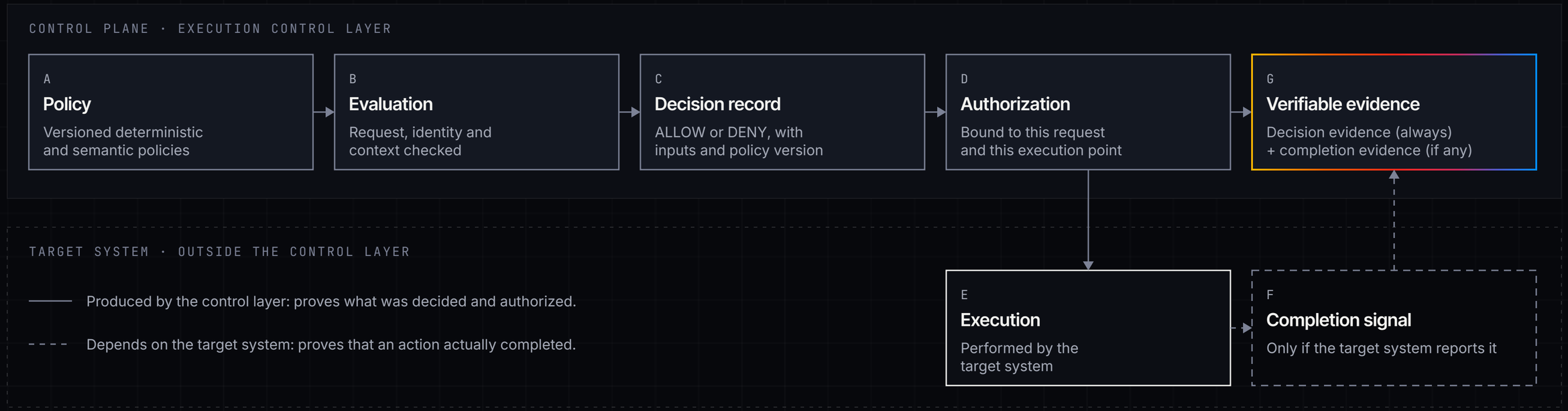
Authorize. Deterministic Policy Enforcement and Semantic Policy Evaluation decide whether this action, by this actor, in this context, is permitted; execution invariants are confirmed.

Execute, or block. Only an authorized action proceeds to the Protected Execution Point. Either outcome produces Verifiable Evidence.

1.4 DIAGRAM 9 · CONTROL AND EVIDENCE LIFECYCLE

A decision record is not proof of completion.

Conceptual lifecycle. The control layer can evidence what it decided and authorized (A–D, G). Whether an external action actually completed (E–F) is known only if the target system reports or attests to it.



Decision evidence records the request, the identity and context, the policy version applied and the ALLOW or DENY outcome at the gate.

Authorization is bound to a specific request and execution point, so that an approval cannot simply be reused for a different action.

Completion evidence is a separate signal from the target system. Where it is unavailable, evidence shows authorization, not that the action took place.

1.5 TERMINOLOGY

Eight terms, used consistently across the atlas.

Execution Control Layer

The layer at which consequential actions are verified and authorized before they are performed, independent of the system that requests them.

Pre-Execution Authorization

The decision, made before an action runs, that this actor may perform this action on this resource in this context.

Deterministic Policy Enforcement

Explicit, rule-based policies that produce the same decision for the same inputs: limits, roles, time windows, dual control.

Semantic Policy Evaluation

Evaluation of the meaning and intent of a request or its content, used alongside deterministic rules where rules alone are insufficient.

Cryptographic Verification

Use of cryptographic mechanisms to check the integrity and origin of artifacts and requests before they are trusted.

Verifiable Evidence

Records of requests, checks, policies and decisions that can be independently checked, distinct from proof that an external action completed.

Industry-Specific Integration

Adapters, resource identification and policy configuration that connect the common core to a particular industry system.

Protected Execution Point

The place in a system where an action actually takes effect, and where enforcement must sit for the control to be meaningful.

PART 02

02

The Landscape

Ten strategic domains, ten cross-industry action types and twenty-five taxonomy groups: three lenses on the same execution control principle.

2.1 The ten strategic domains 11

2.2 Ten cross-industry action types 12

2.3 Action-to-industry matrix 13

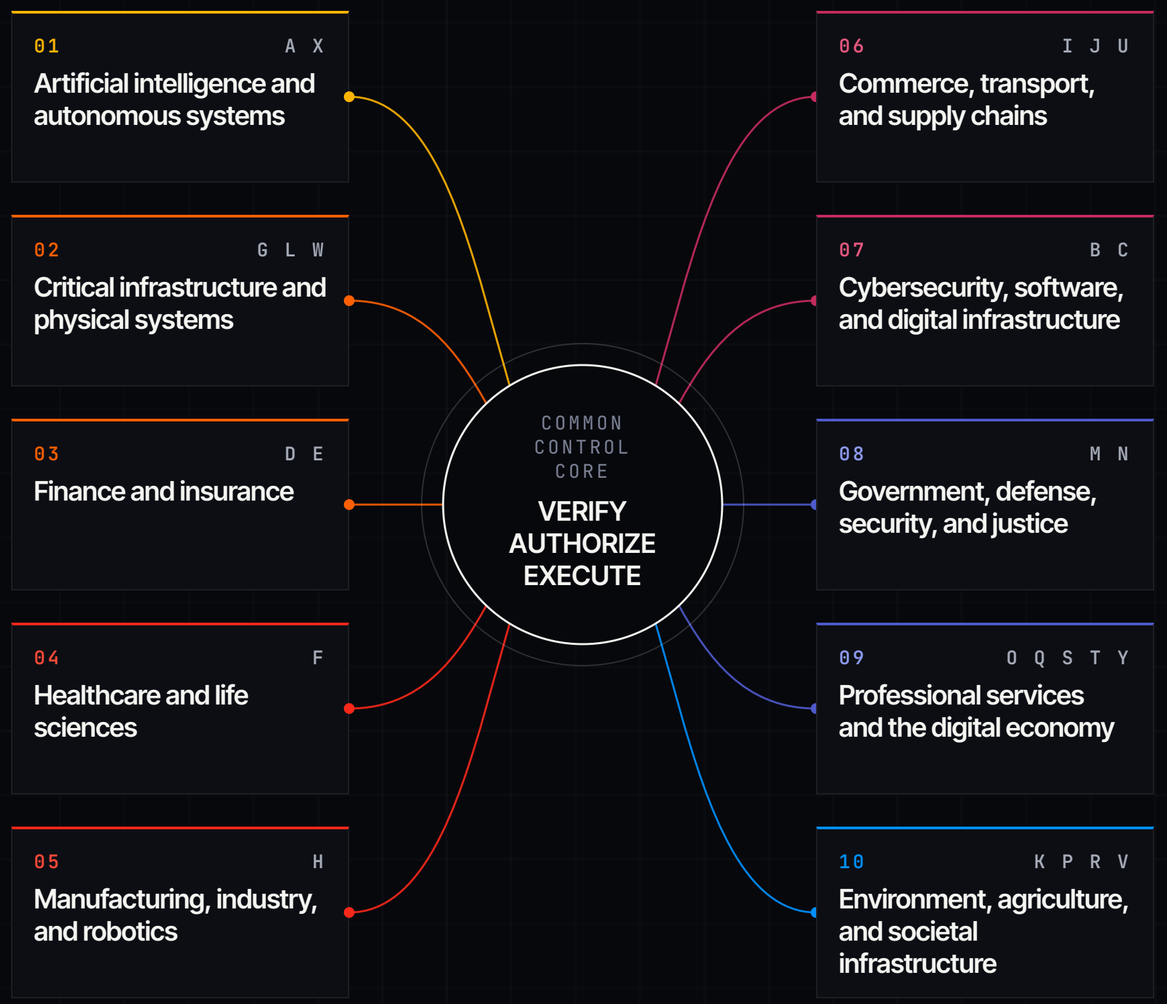
2.4 Industry taxonomy map 14

2.1 DIAGRAM 3 · THE TEN STRATEGIC DOMAINS

Ten domains. One control principle.

The ten domains are the high-level navigation structure of the atlas. Each of the 25 taxonomy groups (letters on each card) is assigned to one domain; the assignment is editorial, for navigation.

01	Artificial intelligence and autonomous systems	A X
02	Critical infrastructure and physical systems	G L W
03	Finance and insurance	D E
04	Healthcare and life sciences	F
05	Manufacturing, industry, and robotics	H
06	Commerce, transport, and supply chains	I J U
07	Cybersecurity, software, and digital infrastructure	B C
08	Government, defense, security, and justice	M N
09	Professional services and the digital economy	O Q S T Y
10	Environment, agriculture, and societal infrastructure	K P R V



2.2 TEN CROSS-INDUSTRY ACTION TYPES

The same ten kinds of action recur in every industry. They are what an execution control layer protects.

01
Financial actions
Transferring money, placing orders, approving payments.

PRIMARY IN
D E G J N Q S T U V Y

02
Administrative actions
Approving applications, modifying records, issuing documents.

PRIMARY IN
B C D E F I L M N O P R S T U V Y

03
IT actions
Executing commands, changing server configurations.

PRIMARY IN
A B C G H L M P W X

04
Information actions
Accessing, exporting, transmitting, or deleting data.

PRIMARY IN
A B C D E F L M N O P Q T U V X Y

05
Communication actions
Sending emails, publishing messages, notifying customers.

PRIMARY IN
A E J L M N O Q S T Y

06
Commercial actions
Issuing orders, changing prices, signing contracts.

PRIMARY IN
D G I J K O Q R S U

07
Physical actions initiated digitally
Opening doors, starting equipment, commanding robots.

PRIMARY IN
G H I K M R W

08
Scientific actions
Running experiments, accessing laboratory instruments.

PRIMARY IN
F K P V X

09
Autonomous actions
Agents deciding and executing sequences of operations.

PRIMARY IN
A B C D G H I K L M U W Y

10
Irreversible actions
Permanently deleting data, transferring assets, applying permanent modifications.

PRIMARY IN
A B C D F G M N T Y

Primary in lists taxonomy groups where the action type is a primary pattern in the conceptual matrix (2.3). Letters refer to the groups in Part 03.

2.3 DIAGRAM 6 · ACTION-TO-INDUSTRY MATRIX

Ten action types across twenty-five taxonomy groups.

ACTION TYPE / GROUP	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
01 Financial	○	○		●	●	○	●	○	○	●	○	○		●	○	○	●	○	●	●	●	●	○		●
02 Administrative	○	●	●	●	●	●	○	○	●	○	○	●	●	●	●	●	○	●	●	●	●	●	○	○	●
03 IT	●	●	●	○	○	○	●	●	○	○	○	●	●	○	○	●	○	○	○	○	○	○	●	●	○
04 Information	●	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●	●	○	○	●	●	●	○	●	●
05 Communication	●	○	○	○	●	○	○		○	●		●	●	●	●	○	●	○	●	●	○	○	○		●
06 Commercial	○	○		●	○	○	●	○	●	●	●	○		○	●		●	●	●	○	●	○			○
07 Physical	○		○			○	●	●	●	○	●	○	●	○		○		●	○			○	●	○	○
08 Scientific	○					●	○	○			●		○			●						●	○	●	
09 Autonomous	●	●	●	●	○	○	●	●	●	○	●	●	●	○	○	○	○	○	○	○	●	○	●	○	●
10 Irreversible	●	●	●	●	○	●	●	○	○	○	○	○	●	●	○	○	○	○		●	○	○	○	○	●

● PRIMARY PATTERN ○ RELEVANT PATTERN BLANK: NOT EMPHASIZED.

Conceptual matrix: an editorial reading of where each action type appears in the source taxonomy. It is not a measured coverage, adoption or effectiveness score.

2.4 DIAGRAM 4 · INDUSTRY TAXONOMY MAP

Twenty-five groups, A to Y. Every tile links to its group.

A Artificial Intelligence, Autonomous Agents and AI Infrastructure
p. 16 · 001-018 · 18 APPS · D01

B Software, IT and Digital Infrastructure
p. 17 · 019-034 · 16 APPS · D07

C Cybersecurity and Digital Infrastructure Protection
p. 18 · 035-050 · 16 APPS · D07

D Finance, Banking and Capital Markets
p. 19 · 051-074 · 24 APPS · D03

E Insurance and Risk Transfer
p. 20 · 075-084 · 10 APPS · D03

F Healthcare, Medicine and Life Sciences
p. 21 · 085-106 · 22 APPS · D04

G Energy and Natural Resources
p. 22 · 107-124 · 18 APPS · D02

H Manufacturing, Industry and Materials
p. 23 · 125-150 · 26 APPS · D05

I Transport, Logistics and Mobility
p. 24 · 151-175 · 25 APPS · D06

J Commerce, Retail and Distribution
p. 25 · 176-190 · 15 APPS · D06

K Agriculture, Food and Bioeconomy
p. 26 · 191-213 · 23 APPS · D10

L Telecommunications, Internet and Communications
p. 27 · 214-229 · 16 APPS · D02

M Defense, Security and Strategic Aerospace
p. 28 · 230-245 · 16 APPS · D08

N Government, Public Administration and Civic Services
p. 29 · 246-265 · 20 APPS · D08

O Law, Consulting and Professional Services
p. 30 · 266-282 · 17 APPS · D09

P Education, Research and Knowledge Development
p. 31 · 283-300 · 18 APPS · D10

Q Media, Entertainment and Creative Industries
p. 32 · 301-320 · 20 APPS · D09

R Real Estate, Construction and Urban Infrastructure
p. 33 · 321-340 · 20 APPS · D10

S Tourism, Hospitality and Personal Services
p. 34 · 341-355 · 15 APPS · D09

T Human Resources, Work and Corporate Organization
p. 35 · 356-368 · 13 APPS · D09

U Procurement, International Trade and Corporate Operations
p. 36 · 369-383 · 15 APPS · D06

V Environment, Climate and Circular Economy
p. 37 · 384-397 · 14 APPS · D10

W Water, Sanitation and Essential Services
p. 38 · 398-408 · 11 APPS · D02

X Science, Engineering and Emerging Technologies
p. 39 · 409-423 · 15 APPS · D01

Y Specialized Domains and Emerging Markets
p. 40 · 424-450 · 27 APPS · D09

Reading a tile: group letter · group name · application number range · number of applications · strategic domain (D01–D10) · page. Total: 450 numbered applications.

PART 03

03

The Atlas: 450 Applications

All 450 numbered applications of the source taxonomy, in full, in 25 groups. Each entry is a **potential application** of the execution control principle, not a statement of implementation, deployment or certification. Entries marked ADDITIONAL ASSURANCE sit in safety-critical or regulated contexts.

2.4	Taxonomy map	14
A	Group A · 001–018	16
M	Group M · 230–245	28
Y	Group Y · 424–450	40
5.2	Atlas index	48

A

GROUP A · APPLICATIONS 001-018 · 18 ENTRIES

Artificial Intelligence, Autonomous Agents and AI Infrastructure

DOMAIN

D01 · Artificial intelligence and autonomous systems

PRIMARY ACTIONS

IT · Information · Communication · Autonomous · Irreversible

INDICATIVE WAVE

Wave 1 · strategic sequence, not status

001 AI models and LLMs
OpenAI, Anthropic, Google, Meta, and other commercial or open-source models.

002 Autonomous AI agents
Verification of permissions before an agent executes an action.

003 Multi-agent systems
Control of communication, delegation, and transfer of authority between agents.

004 Enterprise AI
Internal assistants, copilots, and agents connected to company systems.

005 Generative AI
Generation of text, code, images, audio, and video, including publication and distribution control.

006 AI for programming
Code modifications, command execution, repository access, and deployment.

007 AI for search and research
Access to sources, confidential documents, and research systems.

008 AI for automated decisions
Verification of authorization before decisions are applied.

009 Multimodal AI
Actions triggered by text, images, voice, video, or sensors.

010 Local AI and edge AI
Models running on computers, devices, and privately managed infrastructure.

011 AI orchestration platforms
Systems connecting models, databases, APIs, and tools.

012 AI-as-a-Service and ML platforms
Services providing AI execution to other companies.

013 MLOps and model operations
Approval of operations involving models and production environments.

014 AI for robotics
ADDITIONAL ASSURANCE

Authorization of commands sent to robots.

015 AI for physical autonomous systems
Autonomous vehicles, drones, and machinery, subject to appropriate architecture and certifications.
ADDITIONAL ASSURANCE

016 AI for security and defense
ADDITIONAL ASSURANCE

Control of permitted uses of AI systems.

017 AI for scientific research
Access to research tools, data, and experiments.

018 AI for workflow automation
Controlled execution of processes across applications.

GROUP A · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S T U V W X Y

- ○ Financial actions
- ○ Administrative actions
- ● **IT actions**
- ● **Information actions**
- ● **Communication actions**
- ○ Commercial actions
- ○ Physical actions initiated digitally
- ○ Scientific actions
- ● **Autonomous actions**
- ● **Irreversible actions**

B

GROUP B · APPLICATIONS 019–034 · 16 ENTRIES

Software, IT and Digital Infrastructure

DOMAIN

D07 · Cybersecurity, software, and digital infrastructure

PRIMARY ACTIONS

Administrative · IT · Information · Autonomous · Irreversible

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

019 Enterprise software and ERP
SAP, Oracle, and other enterprise resource management platforms.

020 CRM and customer management
Access to data, record modifications, and customer communications.

021 Document management systems
Reading, modifying, approving, sharing, and deleting documents.

022 SaaS and cloud platforms
Control of actions initiated through applications and cloud services.

023 DevOps and platform engineering
Builds, deployments, configuration, and infrastructure changes.

024 APIs and microservices
Authorization of calls and operations on resources.

025 Databases and data warehouses
Access, extraction, modification, and deletion of data.

026 Operating systems and IT administration
Privileged commands and administrative actions, provided the relevant execution point is protected.

027 Infrastructure as Code
Approval of changes to Terraform, Kubernetes, and other configurations.

028 Virtualization and containers
Operations on virtual machines, containers, and clusters.

029 Edge computing and IoT platforms
Control of operations executed at the network edge.

030 Identity and access systems
Verification of user and service permissions before operations.

031 Messaging and automation systems
Event-triggered workflows, queues, and webhooks.

032 Backup, recovery, and data deletion
Control of irreversible operations.

033 Digital resource and license management
Authorization of resource usage and modification.

034 Low-code and no-code platforms
Control of automations built without traditional programming.

GROUP B · ACTION PROFILE · CONCEPTUAL, SEE 2.3

○ Financial actions · ● **Administrative actions** · ● **IT actions** · ● **Information actions** · ○ Communication actions · ○ Commercial actions · — Physical actions initiated digitally · — Scientific actions · ● **Autonomous actions** · ● **Irreversible actions**

A **B** C D E F G H I J K L M N O P Q R S T U V W X Y

C

GROUP C · APPLICATIONS 035–050 · 16 ENTRIES

Cybersecurity and Digital Infrastructure Protection

DOMAIN

D07 · Cybersecurity, software, and digital infrastructure

PRIMARY ACTIONS

Administrative · IT · Information · Autonomous · Irreversible

INDICATIVE WAVE

Wave 1 · 2 · strategic sequence, not status

035 **Enterprise cybersecurity**
Control of automated security actions.

036 **Identity and Access Management (IAM)**
Verification of identity, role, context, and permissions.

037 **Privileged Access Management (PAM)**
High-privilege administrative operations.

038 **Security Operations Centers (SOC)**
Automated incident response actions.

039 **SOAR and security automation**
Approval or blocking of isolation and other response operations.

040 **Endpoint Detection and Response (EDR/XDR)**
Endpoint operations according to authorized policy.

041 **Firewalls and network security**
Modification of rules, segmentation, and access.

042 **Zero Trust Architecture**
Authorization checks for every relevant action.

043 **Data Loss Prevention (DLP)**
Control of transfers and data exports.

044 **API security**
Authorization of actions, not merely validation of connectivity.

045 **Secrets management and cryptographic keys**
Access to and operations involving keys, through appropriate integrations.

046 **Malware and ransomware response**
Control of isolation, restoration, or blocking actions.

047 **Digital forensics and investigations**
Control of access to evidence and operations performed on it.

048 **Digital fraud and abuse detection**
Blocking unauthorized actions before completion.

049 **Software supply-chain security**
Control of artifact, package, and version publication.

050 **AI infrastructure security**
Protection of operations performed by agents and automated systems.

GROUP C · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B **C** D E F G H I J K L M N O P Q R S T U V W X Y

— Financial actions · ● **Administrative actions** · ● **IT actions** · ● **Information actions** · ○ Communication actions · — Commercial actions · ○ Physical actions initiated digitally · — Scientific actions · ● **Autonomous actions** · ● **Irreversible actions**

D

GROUP D · APPLICATIONS 051–074 · 24 ENTRIES

Finance, Banking and Capital Markets

DOMAIN

D03 · Finance and insurance

PRIMARY ACTIONS

Financial · Administrative · Information · Commercial · Autonomous · Irreversible

INDICATIVE WAVE

Wave 1 · 2 · strategic sequence, not status

051 Commercial and universal banks
AI-assisted banking operations.

052 Digital banks and neobanks
Authorization of operations through agents and APIs.

053 Payments and transaction processing
Permission verification before payment initiation or confirmation.

054 Payment processors and gateways
Control of transaction flows.

055 Fintech and embedded finance
Financial operations embedded in other applications.

056 Lending and loans
Data access and execution of approval stages.

057 Credit scoring
Control of data usage and application of decisions.

058 Capital markets and brokerage
Orders, operations, and access to financial instruments.

059 Algorithmic trading and robo-advisory
Verification of limits and permissions before orders are transmitted.

060 Asset and portfolio management
Authorized portfolio operations and modifications.

061 Investment funds and private equity
Analysis workflows, approvals, and data access.

062 Corporate finance and treasury
Transfers, approvals, and cash management.

063 Trade finance
Letters of credit, documents, and commercial operations.

064 Factoring and receivables financing
Validation of automated operations.

065 Cross-border payments and remittances
Authorization checks and limits.

066 Crypto, blockchain, and digital assets
Authorization of transactions, wallet operations, and agent actions.

067 DeFi and decentralized financial protocols
Control at execution points where integration permits intervention.

068 Tokenization and tokenized assets
Authorization of transfers and asset operations.

069 Stablecoins and settlement infrastructure
Control of operations compatible with the integration mechanism.

070 Financial and digital custody
Authorization of access and transfers.

071 Clearing, settlement, and market infrastructure
Control of settlement instructions.

072 Credit unions, cooperatives, and microfinance
Control mechanisms for financial operations.

073 Financial risk management
Application of limits and approvals.

074 Accounting and financial audit
Control of operations and modification of records.

GROUP D · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C **D** E F G H I J K L M N O P Q R S T U V W X Y

- ● **Financial actions**
- ● **Administrative actions**
- ○ IT actions
- ● **Information actions**
- ○ Communication actions
- ● **Commercial actions**
- — Physical actions initiated digitally
- — Scientific actions
- ● **Autonomous actions**
- ● **Irreversible actions**

E

GROUP E · APPLICATIONS 075–084 · 10 ENTRIES

Insurance and Risk Transfer

DOMAIN

D03 · Finance and insurance

PRIMARY ACTIONS

Financial · Administrative · Information · Communication

INDICATIVE WAVE

Wave 1 · 2 · strategic sequence, not status

075 General insurance
Authorization of claims processing and approval.

076 Life and health insurance
Access to sensitive information and AI-assisted decisions.

077 Motor insurance and telematics
Data usage and claims processing.

078 Industrial and property insurance
Risk assessment and approval workflows.

079 Reinsurance
Data exchange and risk operations.

080 Insurance brokerage
Quoting, issuance, and policy administration.

081 Claims management
Authorization of payments and case modifications.

082 Insurtech
AI agents interacting with insurance systems.

083 Cyber risk insurance
Application of controls to digital operations.

084 AI risk insurance
Technical evidence of authorization and execution, potentially supporting risk assessment and incident analysis.

GROUP E · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D **E** F G H I J K L M N O P Q R S T U V W X Y

- ● **Financial actions**
- ● **Administrative actions**
- ○ IT actions
- ● **Information actions**
- ● **Communication actions**
- ○ Commercial actions
- — Physical actions initiated digitally
- — Scientific actions
- ○ Autonomous actions
- ○ Irreversible actions

F

GROUP F · APPLICATIONS 085–106 · 22 ENTRIES

Healthcare, Medicine and Life Sciences

DOMAIN

D04 · Healthcare and life sciences

PRIMARY ACTIONS

Administrative · Information · Scientific · Irreversible

INDICATIVE WAVE

Wave 1 · 3 · strategic sequence, not status

085 **Hospitals and clinics**
Access control and AI workflows.

086 **Primary and outpatient care**
Operations on medical records and clinical workflows.

087 **Medical diagnostics**
Access to data and execution of AI-assisted diagnostic workflows.

088 **Radiology and medical imaging**
Image access and processing.

089 **Medical laboratories**
Analysis and validation workflows.

090 **Emergency medicine and intensive care**
Control of high-risk digital operations. ADDITIONAL ASSURANCE

091 **Pharmacies and pharmaceutical distribution**
Verification of workflows and access.

092 **Medication management** ADDITIONAL ASSURANCE
Authorization of orders and treatment changes in integrated systems.

093 **Medical devices and medical software**
Control of permitted actions, with validation and certification appropriate to the device's intended use. ADDITIONAL ASSURANCE

094 **Telemedicine**
Identity, access, and data sharing.

095 **Mental healthcare**
Control of access to highly sensitive information.

096 **Genetics and genomics**
Authorized use of genetic data.

097 **Biotechnology**
Access to tools and experimental processes.

098 **Clinical research**
Access to data and execution of research operations.

099 **Clinical trials**
Approvals and traceability of operations.

100 **Drug discovery**
Access to models, data, and research tools.

101 **Pharmaceutical manufacturing** ADDITIONAL ASSURANCE
Control of digital operations in regulated processes.

102 **Vaccine and biologics manufacturing**
Control of workflows and process modifications. ADDITIONAL ASSURANCE

103 **Personalized medicine**
Use of data and individualized recommendations.

104 **Home healthcare**
Access to data and authorized commands.

105 **Healthcare administration and reimbursement**
Access control and document processing.

106 **Public health and epidemiology**
Authorized use of data and analytical tools.

GROUP F · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E **F** G H I J K L M N O P Q R S T U V W X Y

- ○ Financial actions
- ● **Administrative actions**
- ○ IT actions
- ● **Information actions**
- ○ Communication actions
- ○ Commercial actions
- ○ Physical actions initiated digitally
- ● **Scientific actions**
- ○ Autonomous actions
- ● **Irreversible actions**

G

GROUP G · APPLICATIONS 107–124 · 18 ENTRIES

Energy and Natural Resources

DOMAIN

D02 · Critical infrastructure and physical systems

PRIMARY ACTIONS

Financial · IT · Commercial · Physical · Autonomous · Irreversible

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

107 **Nuclear energy** ADDITIONAL ASSURANCE
Control of auxiliary digital operations and AI workflows; nuclear safety systems require special treatment and certification.

108 **Electricity generation**
Authorization of AI-assisted operations.

109 **Electricity grids and transmission operators**
Control of commands and access to systems. ADDITIONAL ASSURANCE

110 **Electricity distribution**
Grid operations and maintenance.

111 **Renewable energy**
Solar, wind, hydro, and other generation sources.

112 **Energy storage and batteries**
Charging, discharging, and optimization commands.

113 **Oil and gas**
Exploration, production, transportation, and distribution.

114 **Refining and petrochemicals**
AI-assisted industrial operations.

115 **Hydrogen and alternative fuels**
Control of digital operations.

116 **Geothermal energy and biomass**
Facility management.

117 **Energy trading**
Trading, contracting, and commercial operations.

118 **Energy aggregators and virtual power plants**
Coordination of distributed resources.

119 **Smart grids and smart metering**
Access and command control.

120 **Energy efficiency**
Automation of systems and recommendations.

121 **Mining and resource extraction**
Control of machinery and digital processes.

122 **Critical minerals and strategic materials**
Access and operational traceability.

123 **Metal extraction and quarries**
Industrial commands and maintenance.

124 **Industrial water management and water resources**
Digital operations and system control.

GROUP G · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F **G** H I J K L M N O P Q R S T U V W X Y

- ● **Financial actions**
- ○ Administrative actions
- ● **IT actions**
- ○ Information actions
- ○ Communication actions
- ● **Commercial actions**
- ● **Physical actions initiated digitally**
- ○ Scientific actions
- ● **Autonomous actions**
- ● **Irreversible actions**

H

GROUP H · APPLICATIONS 125–150 · 26 ENTRIES

Manufacturing, Industry and Materials

DOMAIN

D05 · Manufacturing, industry, and robotics

PRIMARY ACTIONS

IT · Physical · Autonomous

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

125 **Automotive and automotive components**
Production, quality, logistics, and autonomous systems.

126 **Aerospace and aeronautics** ADDITIONAL ASSURANCE
Engineering processes and authorized operations.

127 **Shipbuilding**
Design, production, and digital operations.

128 **Railways and rolling stock**
Maintenance and digital operations.

129 **Metallurgy and steelmaking**
Furnaces, casting, rolling, and process control.

130 **Wood processing and forestry industry**
Production, traceability, and logistics.

131 **Construction materials**
Cement, concrete, glass, ceramics, and composites.

132 **Semiconductors and microelectronics**
Access to processes, recipes, and manufacturing systems.

133 **Electronics and electrical equipment**
Production and configuration control.

134 **Machine tools and industrial equipment**
Authorization of commands and modifications.

135 **Industrial robotics** ADDITIONAL ASSURANCE
Controlled execution of robotic commands.

136 **Industrial automation** ADDITIONAL ASSURANCE
PLCs, SCADA, and control systems, through compatible and validated architectures.

137 **Instrumentation and sensors**
Control of operations triggered by sensor data.

138 **Industrial chemicals**
Processes, recipes, and digital operations.

139 **Specialty chemicals**
Access control and authorized processes.

140 **Industrial biomanufacturing**
Automation of production workflows.

141 **Textiles and apparel**
Design, manufacturing, and logistics.

142 **Footwear and leather goods**
Production and commercial supply-chain automation.

143 **Furniture and interior products**
Production, design, and orders.

144 **Consumer goods**
Production and planning.

145 **Home appliances**
Design, manufacturing, and embedded software.

146 **Precision industrial equipment**
Processes and controlled access.

147 **3D printing and additive manufacturing**
Authorization of files, commands, and production operations.

148 **Industrial recycling**
Control of automated processes.

149 **Industrial repair and maintenance**
Authorization of interventions and modifications.

150 **Industrial quality control and testing**
Validation of operations and records.

GROUP H · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G **H** I J K L M N O P Q R S T U V W X Y

- ○ Financial actions
- ○ Administrative actions
- ● **IT actions**
- ○ Information actions
- — Communication actions
- ○ Commercial actions
- ● **Physical actions initiated digitally**
- ○ Scientific actions
- ● **Autonomous actions**
- ○ Irreversible actions

GROUP I · APPLICATIONS 151–175 · 25 ENTRIES

Transport, Logistics and Mobility

DOMAIN

D06 · Commerce, transport, and supply chains

PRIMARY ACTIONS

Administrative · Commercial · Physical · Autonomous

INDICATIVE WAVE

Wave 2 · 3 · strategic sequence, not status

151 **Road freight transport**
Commands, transport allocation, and route changes.

152 **Road passenger transport**
Access, bookings, and fleet operations.

153 **Rail freight and passenger transport**
Digital operations and maintenance.

154 **Commercial aviation**
Administrative operations, maintenance, and data workflows.

155 **Airports**
Access, logistics, operations, and AI systems.

156 **Maritime and inland waterway transport**
Port and transport operations.

157 **Ports and terminals**
Infrastructure access, cranes, and logistics operations.

158 **Courier and delivery services**
Allocation, routing, and delivery confirmation.

159 **Last-mile and autonomous delivery**
Commands to robots and delivery systems.

160 **Fleet management**
Command authorization, maintenance, and access.

161 **Autonomous vehicles** ADDITIONAL ASSURANCE
Digital action control within approved safety systems.

162 **Connected vehicles and automotive software**
Access, updates, and remote commands.

163 **Urban mobility and ride-hailing**
Ride allocation and automated operations.

164 **Public transport**
Ticketing, access, and operations.

165 **Traffic management** ADDITIONAL ASSURANCE
Traffic-light operations and automated decisions, with specific safeguards.

166 **Air traffic control** ADDITIONAL ASSURANCE
Auxiliary systems and administrative workflows; not a replacement for certified flight-control systems.

167 **Multimodal logistics**
Coordination of road, rail, maritime, and air transport.

168 **Warehousing and fulfillment**
Robots, inventory, and commands.

169 **Distribution centers**
Logistics workflow automation.

170 **Supply chain management**
Suppliers, procurement, and operations.

171 **Freight forwarding**
Documents and transport coordination.

172 **Customs and cross-border trade**
Documents, declarations, and checks.

173 **Inventory management**
Inventory access and modification.

174 **Demand and supply planning**
Actions resulting from AI predictions.

175 **Perishable-goods logistics**
Control of operations and temperature alerts.

GROUP I · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H **I** J K L M N O P Q R S T U V W X Y

○ Financial actions · ● **Administrative actions** · ○ IT actions · ○ Information actions · ○ Communication actions · ● **Commercial actions** · ● **Physical actions initiated digitally** · — Scientific actions · ● **Autonomous actions** · ○ Irreversible actions

J

GROUP J · APPLICATIONS 176-190 · 15 ENTRIES

Commerce, Retail and Distribution

DOMAIN

D06 · Commerce, transport, and supply chains

PRIMARY ACTIONS

Financial · Communication · Commercial

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

176 **Physical retail**
Point-of-sale systems, inventory, and operations.

177 **E-commerce**
Orders, payments, returns, and accounts.

178 **Marketplaces**
Product publication, merchant access, and transactions.

179 **Supermarkets and hypermarkets**
Inventory, pricing, and automated systems.

180 **B2B commerce**
Commercial orders and approvals.

181 **Wholesale distribution**
Pricing, allocations, and operations.

182 **Pharmaceutical distribution**
Traceability and authorized workflows.

183 **Food distribution**
Inventory, orders, and cold chains.

184 **Fashion and luxury retail**
Transactions, access, and operational authentication.

185 **Electronics and IT retail**
Inventory, returns, and services.

186 **Automotive commerce and dealerships**
Orders, financing, and operations.

187 **Second-hand commerce**
Verification and transaction workflows.

188 **Loyalty programs**
Use of points, benefits, and data.

189 **Pricing and revenue management**
Controlled application of price changes.

190 **Commercial advertising and retail media**
Publication and data use in campaigns.

GROUP J · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I **J** K L M N O P Q R S T U V W X Y

- **Financial actions**
- Administrative actions
- IT actions
- Information actions
- **Communication actions**
- **Commercial actions**
- Physical actions initiated digitally
- — Scientific actions
- Autonomous actions
- Irreversible actions

K

GROUP K · APPLICATIONS 191–213 · 23 ENTRIES

Agriculture, Food and Bioeconomy

DOMAIN

D10 · Environment, agriculture, and societal infrastructure

PRIMARY ACTIONS

Commercial · Physical · Scientific · Autonomous

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

191 **Precision agriculture**
Data- and model-driven commands.

192 **Digital agriculture**
Farm management platforms.

193 **Crop farming**
Irrigation, fertilization, and automated operations.

194 **Livestock farming**
Monitoring, feeding, and farm management.

195 **Poultry farming**
Control of automated processes.

196 **Aquaculture and fish farming**
Feeding, monitoring, and control.

197 **Forestry**
Inventory, traceability, and planning.

198 **Irrigation management**
Authorization of commands to systems.

199 **Agricultural drones**
Commands, flights, and authorized operations.

200 **Autonomous agricultural machinery**
Safe control of operations. ADDITIONAL ASSURANCE

201 **Seeds and agricultural genetics**
Access to research data and systems.

202 **Fertilizers and crop-protection products**
Digital operations and compliance with restrictions.

203 **Food production**
Production process automation.

204 **Meat and fish processing**
Workflow and equipment control.

205 **Dairy industry**
Processing, traceability, and control.

206 **Beverages and brewing**
Production, inventory, and operations.

207 **Baking and milling**
Production planning and control.

208 **Cold chains**
Operational commands and alerts.

209 **Food safety**
Control of digital verification and traceability workflows.

210 **Food testing laboratories**
Access, results, and operations.

211 **Agricultural commodity trading**
Contracts, documents, and transactions.

212 **Agro-commodities and agricultural trading**
Orders, logistics, and documentation.

213 **Bioeconomy and biofuels**
Operational and process control.

GROUP K · ACTION PROFILE · CONCEPTUAL, SEE 2.3

Financial actions · Administrative actions · IT actions · Information actions · Communication actions · **Commercial actions** · **Physical actions initiated digitally** · **Scientific actions** · **Autonomous actions** · Irreversible actions

L

GROUP L · APPLICATIONS 214–229 · 16 ENTRIES

Telecommunications, Internet and Communications

DOMAIN

D02 · Critical infrastructure and physical systems

PRIMARY ACTIONS

Administrative · IT · Information · Communication · Autonomous

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

214 **Mobile network operators**
Network configuration and operations.

215 **Fixed-line and internet services**
Provisioning, access, and administration.

216 **Internet service providers (ISPs)**
Network operations and automation.

217 **5G and future 6G infrastructure**
Network commands and optimization.

218 **Network Function Virtualization and SDN**
Automated infrastructure changes.

219 **Data centers and colocation**
Access, administration, and operations.

220 **Cloud providers**
Access and actions involving resources.

221 **CDN and edge networks**
Configuration and content distribution.

222 **DNS systems and domain registrars**
Administrative changes and operations.

223 **Email and enterprise communications**
Sending, sharing, and automation.

224 **Video conferencing and unified communications**
Access and workflow operations.

225 **Satellite networks**
Administrative commands and digital operations.

226 **Internet of Things (IoT)**
Authorization of connected-device actions.

227 **Industrial communications**
Control of operations in industrial networks.

228 **Broadcasting and media infrastructure**
Publication, distribution, and operations.

229 **Emergency communication systems**
Controlled access and auxiliary operations.

GROUP L · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K **L** M N O P Q R S T U V W X Y

○ Financial actions · ● **Administrative actions** · ● **IT actions** · ● **Information actions** · ● **Communication actions** · ○ Commercial actions · ○ Physical actions initiated digitally · — Scientific actions · ● **Autonomous actions** · ○ Irreversible actions

M

GROUP M · APPLICATIONS 230–245 · 16 ENTRIES

Defense, Security and Strategic Aerospace

DOMAIN

D08 · Government, defense, security, and justice

PRIMARY ACTIONS

Administrative · IT · Information · Communication · Physical · Autonomous · Irreversible

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

230 **Defense industry** ADDITIONAL ASSURANCE
Access control and digital operations.

231 **Command and control systems** ADDITIONAL ASSURANCE
Authorization of actions within approved architectures.

232 **Military logistics**
Inventory, transport, and documentation.

233 **Military maintenance**
Access to technical operations and records.

234 **Secure communications systems**
Authorization and administration.

235 **Cyber defense**
Automated detection and response operations.

236 **Military simulation and training**
Scenario and access control.

237 **Uncrewed systems (UAV, UGV, USV)**
Command control subject to applicable safety mechanisms.
ADDITIONAL ASSURANCE

238 **Inspection and reconnaissance drones**
Mission authorization and data access.

239 **Space industry**
Administrative operations and integrated command workflows.

240 **Satellite control centers** ADDITIONAL ASSURANCE
Authorization of commands compatible with the infrastructure.

241 **Launch vehicles and launch services**
Software workflow and auxiliary operational control.
ADDITIONAL ASSURANCE

242 **Earth observation**
Data access and processing.

243 **Geospatial systems and GIS**
Access, processing, and distribution.

244 **Warning and monitoring systems**
Control of automated operations.

245 **Strategic infrastructure protection**
Authorization of digital access and commands.

GROUP M · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L **M** N O P Q R S T U V W X Y

— Financial actions · ● **Administrative actions** · ● **IT actions** · ● **Information actions** · ● **Communication actions** · — Commercial actions · ● **Physical actions initiated digitally** · ○ Scientific actions · ● **Autonomous actions** · ● **Irreversible actions**

N

GROUP N · APPLICATIONS 246–265 · 20 ENTRIES

Government, Public Administration and Civic Services

DOMAIN

D08 · Government, defense, security, and justice

PRIMARY ACTIONS

Financial · Administrative · Information · Communication · Irreversible

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

246 **Central government administration**
Access, documents, and approval workflows.

247 **Local government**
Digital services and administrative operations.

248 **Tax agencies**
Data access, processing, and operations.

249 **Customs and trade authorities**
Documents and decision workflows.

250 **Public procurement**
Authorization of operations and traceability of changes.

251 **Digital identity services**
Identity verification and access.

252 **E-government**
Operations performed by AI agents on behalf of citizens.

253 **Social benefits systems**
Access, processing, and administrative decisions.

254 **Immigration and border management**
Access and case processing.

255 **Regulatory authorities**
Information analysis and administration.

256 **Statistical agencies**
Data access and processing.

257 **Election administration**
Control of administrative operations and access.

258 **Emergency services**
Digital coordination and auxiliary operations.

259 **Police and law enforcement**
Access control and permitted digital actions.

260 **Justice systems and courts**
Case-file access and document operations.

261 **Prisons and correctional systems**
Access and administrative operations.

262 **Diplomatic and consular services**
Access and document processing.

263 **Identity administration and public registries**
Authorized changes to records.

264 **Public healthcare systems**
Digital operations and sensitive data.

265 **Public smart infrastructure**
Control of digital municipal services.

GROUP N · ACTION PROFILE · CONCEPTUAL, SEE 2.3

● **Financial actions** ● **Administrative actions** ○ IT actions ● **Information actions** ● **Communication actions** ○ Commercial actions ○ Physical actions initiated digitally — Scientific actions ○ Autonomous actions ● **Irreversible actions**

O

GROUP O · APPLICATIONS 266–282 · 17 ENTRIES

Law, Consulting and Professional Services

DOMAIN

D09 · Professional services and the digital economy

PRIMARY ACTIONS

Administrative · Information · Communication · Commercial

INDICATIVE WAVE

Wave 1 · 2 · strategic sequence, not status

266 **Law firms**
Access to cases, documents, and legal AI systems.

267 **Corporate legal departments**
Document and operational approval.

268 **Notarial services**
Access to data and document workflows, respecting legal authority.

269 **Judicial enforcement services**
Access and authorized administrative operations.

270 **Arbitration and mediation**
Control of document access and case workflows.

271 **Audit and accounting**
Modifications, approvals, and operational traceability.

272 **Management consulting**
Access and client workflow automation.

273 **Tax consulting**
Data and document processing.

274 **Risk and compliance consulting**
Policy enforcement and evidence collection.

275 **Certification and assessment services**
Access to documents and verification workflows.

276 **Translation services**
Document access and publication of results.

277 **Recruitment and executive search**
Access to profiles and process automation.

278 **Outsourcing and BPO**
Operations performed by agents on behalf of clients.

279 **Customer support services**
Account changes, refunds, and operations.

280 **Property management services**
Access and contractual operations.

281 **Valuation and due diligence services**
Data and document access.

282 **Digital certification and trust services**
Integration of cryptographic evidence and verification.

GROUP O · ACTION PROFILE · CONCEPTUAL, SEE 2.3

○ Financial actions
● **Administrative actions**
○ IT actions
● **Information actions**
● **Communication actions**
● **Commercial actions**
— Physical actions initiated digitally
— Scientific actions
○ Autonomous actions
○ Irreversible actions

P

GROUP P · APPLICATIONS 283–300 · 18 ENTRIES

Education, Research and Knowledge Development

DOMAIN

D10 · Environment, agriculture, and societal infrastructure

PRIMARY ACTIONS

Administrative · IT · Information · Scientific

INDICATIVE WAVE

Wave 1 · 2 · strategic sequence, not status

283 **Universities**
Access to systems, data, and AI tools.

284 **Schools and secondary education**
Student data access and administrative automation.

285 **Online education**
Access, assessments, and account administration.

286 **E-learning platforms**
Automated operations and personalized access.

287 **Digital examinations and assessments**
Control of operations and data.

288 **University research**
Access to data and tools.

289 **Scientific laboratories**
Authorization of digital commands.

290 **AI research**
Access to models, GPUs, and datasets.

291 **High-performance computing (HPC)**
Authorization of jobs and resource allocation.

292 **Quantum computing**
Access to systems and job authorization through appropriate integrations.

293 **Digital libraries**
Access, distribution, and content operations.

294 **Academic publishing**
Document processing and publication.

295 **Collaborative research platforms**
Permissions and data sharing.

296 **Testing and certification laboratories**
Operations and records.

297 **Medical research institutes**
Access to data and research processes.

298 **Climate and geospatial research**
Data access and processing.

299 **Professional education and certifications**
Access and result administration.

300 **Code repositories and collaboration infrastructure**
Control of modifications and publication.

GROUP P · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O **P** Q R S T U V W X Y

○ Financial actions ● **Administrative actions** ● **IT actions** ● **Information actions** ○ Communication actions — Commercial actions ○ Physical actions initiated digitally ● **Scientific actions** ○ Autonomous actions ○ Irreversible actions

Q

GROUP Q · APPLICATIONS 301–320 · 20 ENTRIES

Media, Entertainment and Creative Industries

DOMAIN

D09 · Professional services and the digital economy

PRIMARY ACTIONS

Financial · Information · Communication · Commercial

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

301 **Social networks**
Content publication, account administration, and automated operations.

302 **Video platforms**
Uploading, moderation, and distribution.

303 **Audio and video streaming**
Access, rights, and content operations.

304 **Digital press and journalism**
Publication workflows and source access.

305 **Book publishing**
Digital creation, editing, and distribution.

306 **Music industry**
Publication, licensing, and rights management.

307 **Film and television**
Production, post-production, and distribution.

308 **Animation and visual effects**
Authorization of AI operations and access to materials.

309 **Game development**
Access to infrastructure, code, and AI tools.

310 **Online gaming platforms**
Accounts, transactions, and administrative operations.

311 **Esports**
Administration, competitions, and automated workflows.

312 **Advertising and creative agencies**
Creation, approval, and publication of materials.

313 **Digital marketing**
Campaigns, segmentation, and automation.

314 **Influencer marketing**
Authorization of publication and content usage.

315 **AI image and video generation**
Control of tool usage and distribution.

316 **Virtual and augmented reality**
Access, actions, and permissions in digital environments.

317 **Metaverse and virtual worlds**
Operations involving assets and permissions.

318 **Intellectual property licensing**
Verification of usage permissions.

319 **Digital Rights Management (DRM)**
Enforcement of access and usage rules.

320 **Digital archives and cultural heritage**
Access, modification, and distribution.

GROUP Q · ACTION PROFILE · CONCEPTUAL, SEE 2.3

● **Financial actions** ○ Administrative actions ○ IT actions ● **Information actions** ● **Communication actions** ● **Commercial actions** — Physical actions initiated digitally — Scientific actions ○ Autonomous actions ○ Irreversible actions

R

GROUP R · APPLICATIONS 321–340 · 20 ENTRIES

Real Estate, Construction and Urban Infrastructure

DOMAIN

D10 · Environment, agriculture, and societal infrastructure

PRIMARY ACTIONS

Administrative · Commercial · Physical

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

321 **Real estate development**
Documents, approvals, and project workflows.

322 **Real estate agencies**
Data, contracts, and AI system access.

323 **Property management**
Operations and system access.

324 **Residential construction**
Digital commands and project management.

325 **Commercial and industrial construction**
Operational and documentation control.

326 **Civil infrastructure**
Bridges, roads, tunnels, and public projects.

327 **Structural engineering**
Model access and approval of modifications.

328 **Architecture and BIM**
Permissions over models and documents.

329 **Construction project management**
Approval and execution workflows.

330 **Smart buildings**
Access control and commands to building systems.

331 **HVAC and building automation**
Operations involving heating, ventilation, and cooling.

332 **Physical access control**
Authorization of commands to access-control systems.

333 **Alarm and physical security systems**
Operations and configuration changes.

334 **Elevators and vertical transportation**
Auxiliary digital functions without replacing certified controls.

ADDITIONAL ASSURANCE

335 **Facility management**
Maintenance and administration.

336 **Smart cities**
Orchestration of urban digital operations.

337 **Smart parking**
Access, payments, and system control.

338 **Smart street lighting**
Commands and automation.

339 **Urban waste management**
Routing, collection, and monitoring.

340 **Water and wastewater infrastructure management**
Operational and access control.

GROUP R · ACTION PROFILE · CONCEPTUAL, SEE 2.3

○ Financial actions ● **Administrative actions** ○ IT actions ○ Information actions ○ Communication actions ● **Commercial actions** ● **Physical actions initiated digitally** — Scientific actions ○ Autonomous actions ○ Irreversible actions

S

GROUP S · APPLICATIONS 341–355 · 15 ENTRIES

Tourism, Hospitality and Personal Services

DOMAIN

D09 · Professional services and the digital economy

PRIMARY ACTIONS

Financial · Administrative · Communication · Commercial

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

341 **Hotels and resorts**
Reservations, access, and operations.

342 **Travel agencies**
Bookings and itinerary management.

343 **Booking platforms**
Modifications, payments, and automated operations.

344 **Airlines and ticketing services**
Reservation operations.

345 **Restaurants and restaurant chains**
Orders, inventory, and automation.

346 **Catering and institutional food services**
Planning and operations.

347 **Cruise operators**
Reservations and operational workflows.

348 **Amusement parks**
Access, ticketing, and digital systems.

349 **Events and conference management**
Access, credentials, and operations.

350 **Gyms and fitness centers**
Access and account management.

351 **Wellness services**
Appointments and customer data.

352 **Beauty services**
Reservations and operations.

353 **In-home personal services**
Scheduling and information access.

354 **Pet services**
Appointments, documents, and administration.

355 **Adventure tourism operators**
Digital operations and workflow authorization.

GROUP S · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R **S** T U V W X Y

- ● **Financial actions**
- ● **Administrative actions**
- ○ IT actions
- ○ Information actions
- ● **Communication actions**
- ● **Commercial actions**
- ○ Physical actions initiated digitally
- — Scientific actions
- ○ Autonomous actions
- — Irreversible actions

T

GROUP T · APPLICATIONS 356–368 · 13 ENTRIES

Human Resources, Work and Corporate Organization

DOMAIN

D09 · Professional services and the digital economy

PRIMARY ACTIONS

Financial · Administrative · Information · Communication · Irreversible

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

356 **HR and personnel administration**
Data access and operations.

357 **Payroll and salary administration**
Changes, approvals, and payments.

358 **Automated recruitment**
Control of access and agent actions.

359 **Performance management**
Information access and decision workflows.

360 **Employee access management**
Role-based permissions.

361 **Onboarding and offboarding**
Granting and revoking access.

362 **Workforce management**
Scheduling, allocation, and automation.

363 **Freelance platforms**
Contracting, payments, and access.

364 **Temporary employment platforms**
Allocations and administrative operations.

365 **Digital workplace**
Automated actions across internal applications.

366 **Enterprise collaboration**
Document sharing and approvals.

367 **Corporate knowledge management**
Access to internal databases and documents.

368 **Whistleblowing and internal investigations**
Controlled access to sensitive information.

GROUP T · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S **T** U V W X Y

- **Financial actions**
- **Administrative actions**
- IT actions
- **Information actions**
- **Communication actions**
- Commercial actions
- Physical actions initiated digitally
- Scientific actions
- Autonomous actions
- **Irreversible actions**

U

GROUP U · APPLICATIONS 369-383 · 15 ENTRIES

Procurement, International Trade and Corporate Operations

DOMAIN

D06 · Commerce, transport, and supply chains

PRIMARY ACTIONS

Financial · Administrative · Information · Commercial · Autonomous

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

369 **Corporate procurement**
Approval of orders and contracts.

370 **Procurement automation**
Agents selecting suppliers and initiating purchases.

371 **Supplier management**
Onboarding, checks, and modifications.

372 **Contract management**
AI-assisted negotiation, approval, and execution.

373 **Order management**
Processing and modification of orders.

374 **Enterprise resource planning**
Coordinated operations across departments.

375 **Supply chain finance**
Financial operations related to supply chains.

376 **International trade**
Documents, approvals, and cross-border operations.

377 **Export controls and trade sanctions**
Verification and control of relevant operations.

378 **Partner due diligence**
Data access and workflow approval.

379 **Supplier risk management**
Application of limits and approval conditions.

380 **Mergers and acquisitions operations**
Access to data rooms and confidential documents.

381 **International subsidiary management**
Permissions and approval workflows.

382 **Shared services and service centers**
Automated execution of repeatable operations.

383 **Business process automation**
Control of workflows across departments.

GROUP U · ACTION PROFILE · CONCEPTUAL, SEE 2.3

● **Financial actions** ● **Administrative actions** ○ IT actions ● **Information actions** ○ Communication actions ● **Commercial actions** — Physical actions initiated digitally — Scientific actions ● **Autonomous actions** ○ Irreversible actions

V

GROUP V · APPLICATIONS 384–397 · 14 ENTRIES

Environment, Climate and Circular Economy

DOMAIN

D10 · Environment, agriculture, and societal infrastructure

PRIMARY ACTIONS

Financial · Administrative · Information · Scientific

INDICATIVE WAVE

Wave 2 · strategic sequence, not status

384 **Environmental monitoring**
Data access and processing.

385 **Emissions management**
Data workflows and reporting operations.

386 **Carbon accounting**
Approval and traceability of reported data.

387 **Carbon markets**
Operations and transfers in integrated systems.

388 **Carbon capture projects**
Control of digital workflows.

389 **Recycling and circular economy**
Processes and records.

390 **Wastewater treatment** ADDITIONAL ASSURANCE
Commands and automation with industrial safeguards.

391 **Hazardous waste management**
Traceability and authorized operations.

392 **Biodiversity conservation**
Access to data and analytical tools.

393 **Wildfire monitoring**
Alerting and coordination operations.

394 **Natural disaster monitoring**
Warning systems and digital workflows.

395 **Climate risk management**
Data, analysis, and approved actions.

396 **ESG reporting**
Data access, workflow validation, and traceability.

397 **Environmental consulting**
Documents and AI-assisted processes.

GROUP V · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S T U V W X Y

- ● **Financial actions**
- ● **Administrative actions**
- ○ IT actions
- ● **Information actions**
- ○ Communication actions
- ○ Commercial actions
- ○ Physical actions initiated digitally
- ● **Scientific actions**
- ○ Autonomous actions
- ○ Irreversible actions

W

GROUP W · APPLICATIONS 398–408 · 11 ENTRIES

Water, Sanitation and Essential Services

DOMAIN

D02 · Critical infrastructure and physical systems

PRIMARY ACTIONS

IT · Physical · Autonomous

INDICATIVE WAVE

Wave 3 · strategic sequence, not status

398 **Drinking water operators** ADDITIONAL ASSURANCE
Access and infrastructure operations.

399 **Water treatment plants** ADDITIONAL ASSURANCE
Digital commands and validated automation.

400 **Water distribution networks**
Operational and access control.

401 **Sewerage systems**
Monitoring and control.

402 **Wastewater treatment plants**
Operational workflows and maintenance.

403 **Desalination**
Operations and optimization.

404 **Municipal sanitation services**
Operations management.

405 **Waste management infrastructure**
Access and commands.

406 **Sanitation services**
Routing and automation.

407 **Flood protection infrastructure** ADDITIONAL ASSURANCE
Commands and integrated alerts.

408 **Public irrigation systems**
Access and operational control.

GROUP W · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S T U V **W** X Y

- ○ Financial actions
- ○ Administrative actions
- ● **IT actions**
- ○ Information actions
- ○ Communication actions
- — Commercial actions
- ● **Physical actions initiated digitally**
- ○ Scientific actions
- ● **Autonomous actions**
- ○ Irreversible actions

X

GROUP X · APPLICATIONS 409–423 · 15 ENTRIES

Science, Engineering and Emerging Technologies

DOMAIN

D01 · Artificial intelligence and autonomous systems

PRIMARY ACTIONS

IT · Information · Scientific

INDICATIVE WAVE

Wave 2 · 3 · strategic sequence, not status

409 **Industrial research laboratories**
Control of instruments and digital workflows.

410 **AI-assisted engineering**
Authorization of modifications and operations.

411 **Simulation and digital twins**
Control of actions that change system state.

412 **Computational modeling**
Resource and job access.

413 **Supercomputing**
Execution authorization and resource allocation.

414 **Quantum computing and quantum services**
Job and access control.

415 **Nanotechnology**
Access to data, equipment, and tools.

416 **Materials science**
Control of experimental workflows.

417 **Geology and geophysics**
Data access and processing.

418 **Seismology and ground monitoring**
Data workflows and alerts.

419 **Oceanography**
Instrument access and processing.

420 **Meteorology and forecasting**
Model access and operations.

421 **Automated laboratory technologies**
Command and workflow control.

422 **Fusion energy research** ADDITIONAL ASSURANCE
Auxiliary digital operations and access control.

423 **Metrology and calibration**
Authorization of operations and records.

GROUP X · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S T U V W **X** Y

— Financial actions
○ Administrative actions
● **IT actions**
● **Information actions**
— Communication actions
— Commercial actions
○ Physical actions initiated digitally
● **Scientific actions**
○ Autonomous actions
○ Irreversible actions

Y

GROUP Y · APPLICATIONS 424–450 · 27 ENTRIES

Specialized Domains and Emerging Markets

DOMAIN
D09 · Professional services and the digital economy

PRIMARY ACTIONS
Financial · Administrative · Information · Communication · Autonomous · Irreversible

INDICATIVE WAVE
Wave 2 · strategic sequence, not status

424 **Digital identity and credential verification**
Control of identity-related operations.

425 **Electronic signatures and trust services**
Authorization of signing workflows.

426 **Notifications and transactional communications**
Control of sensitive message delivery.

427 **Electronic voting and digital governance**
Control of permitted operations within legal requirements.
ADDITIONAL ASSURANCE

428 **Decentralized autonomous organizations (DAOs)**
Verification of permissions and proposal execution in compatible systems.

429 **Real-world asset tokenization (RWA)**
Control of tokenized asset operations.

430 **Digital asset infrastructure**
Access, authorization, and traceability.

431 **Crowdfunding platforms**
Access, approvals, and financial workflows.

432 **Donation and philanthropy platforms**
Authorization of transfers and operations.

433 **Nonprofits and NGOs**
Data access and financial control.

434 **International organizations**
Permissions and administrative workflows.

435 **Religious institutions and community organizations**
Digital access and operational management.

436 **Funeral services**
Document management and operations.

437 **Cultural heritage management**
Access and digital operational control.

438 **Historical archives and digital collections**
Access, publication, and modifications.

439 **Dating platforms and online communities**
Accounts, access, and automated operations.

440 **Digital family services**
Permissions and account access based on roles.

441 **Personal AI assistants**
Actions involving email, calendars, files, and services.

442 **Home automation systems**
Commands to smart devices.

443 **Connected consumer electronics**
Digital operations and updates.

444 **Wearables and personal sensors**
Data access and actions triggered by them.

445 **Assistive technologies for people with disabilities**
Authorization of digital assistant actions.

446 **Aging-assistance technologies**
Access and digital operations.

447 **Crisis-support services**
Control of digital workflows and access.

448 **Risk management platforms**
Approval of operations resulting from assessments.

449 **AI certification and technical assessment services**
Integration of execution evidence into verification processes.

450 **Cross-sector digital infrastructure**
Any compatible system where an action must be verified before execution.

GROUP Y · ACTION PROFILE · CONCEPTUAL, SEE 2.3

A B C D E F G H I J K L M N O P Q R S T U V W X **Y**

- ● **Financial actions**
- ● **Administrative actions**
- ○ IT actions
- ● **Information actions**
- ● **Communication actions**
- ○ Commercial actions
- ○ Physical actions initiated digitally
- — Scientific actions
- ● **Autonomous actions**
- ● **Irreversible actions**

PART 04

04

The Framework

How applicability is qualified: three levels of assurance, one reusable control core, and three strategic expansion waves.

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4.2 Cross-industry reuse architecture 43

4.3 Three strategic expansion waves 44

4.4 Boundaries of applicability 45

4.1 DIAGRAM 7 · APPLICABILITY AND ASSURANCE LEVELS

Three levels of applicability

LEVEL 1

Existing capabilities

LEVEL 1

Existing capabilities described in the source

The reusable core. These capabilities are described in the QODIQA architecture and are the foundation every application draws on.

- Cryptographic verification
- Request verification
- Replay protection
- Deterministic and semantic policies
- Pre-execution control
- AI provider integration
- Evidence mechanisms

LEVEL 2

Integration-dependent

LEVEL 2

Integration-dependent opportunities

Requires adapters, policy configuration, resource identification and enforcement at the relevant execution point. Value depends on coverage of the execution paths.

- ERP and enterprise software
- Banking and payments
- Logistics and supply chain
- Cybersecurity tooling
- Robotics and other systems

LEVEL 3

Safety-critical & regulated

LEVEL 3

Safety-critical and regulated domains

May require independent validation, certification, redundancy, fail-safe behavior and integration with existing safety systems. QODIQA complements certified controls; it does not replace them.

- Nuclear
- Aviation
- Medical devices
- Industrial control
- Defense
- Other safety-critical systems

ASSURANCE & INTEGRATION BURDEN INCREASES

4.2 DIAGRAM 2 · CROSS-INDUSTRY REUSE ARCHITECTURE

Build the core once. Configure policy, integration and assurance per industry.

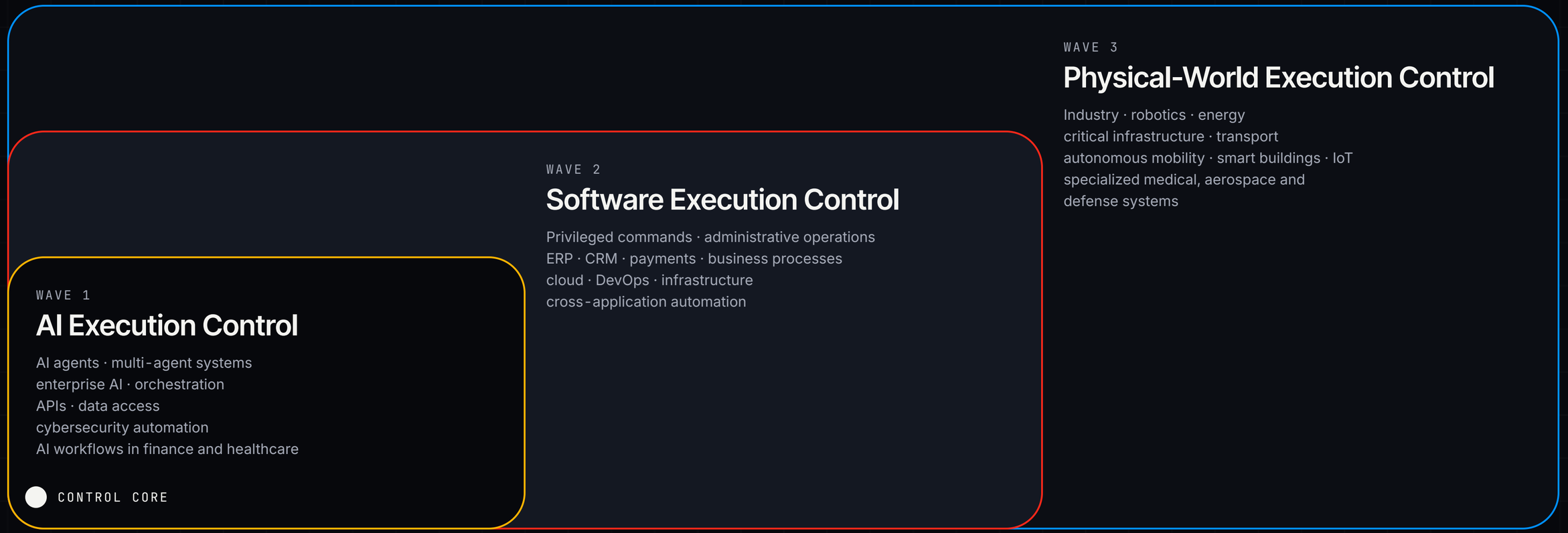
01 COMMON CONTROL CORE	**QODIQA Control Core: reused unchanged across industries** CRYPTOGRAPHIC VERIFICATION · REQUEST VERIFICATION · REPLAY PROTECTION · DETERMINISTIC POLICY · SEMANTIC POLICY · PRE-EXECUTION CONTROL · EVIDENCE				
02 INDUSTRY-SPECIFIC POLICIES	**Finance** Limits, dual control, payment approval rules	**Healthcare** Consent, role and data-sensitivity rules	**Industrial** Operating envelopes, change-window rules	**Enterprise IT** Privilege, change and data-handling rules	**Public sector** Legal authority and case-handling rules
03 INTEGRATIONS & ADAPTERS	Payment rails · core banking APIs	EHR · lab · imaging system adapters	Gateways to OT and robotics controllers	ERP · CRM · cloud · IaC · agent tools	Registry · case-file · identity systems
04 PROTECTED EXECUTION POINTS	Transfer · order · settlement instruction	Record access · order · data export	Command · recipe · configuration change	Admin command · deploy · deletion	Record change · decision · issuance
05 AUDIT & EVIDENCE	One evidence model across industries: decision records exportable to audit, risk and compliance processes.				

Illustrative policy packs, adapters and execution points. Each requires industry-specific integration and configuration.

4.3 DIAGRAM 8 · THREE STRATEGIC EXPANSION WAVES

AI first. Then software. Then, through appropriate integrations, the physical world.

SEQUENCE = STRATEGIC LOGIC · NOT A SCHEDULE · NOT A COMPLETION STATUS



No dates are implied. The waves describe a strategic logic of expansion: each wave reuses the core and adds integration and assurance requirements. They are not a schedule, and none is presented as completed. Each atlas group shows its indicative wave.

4.4 BOUNDARIES OF APPLICABILITY

Credibility depends on stating the limits.

Enforcement depends on integration

QODIQA cannot prevent every unauthorized action in every system. A protected action is controlled only where the relevant execution point is integrated and the relevant execution paths are covered. Paths that bypass the integration are outside its control.

Safety systems remain in place

Where a system is safety-critical, QODIQA does not automatically replace existing safety controls, certified systems, human authorization requirements or regulatory obligations. Entries such as 107, 136, 161, 166 and 334 state this qualification directly.

No fabricated numbers

This publication contains no market-size figures, revenue forecasts, adoption rates, customer references, certification badges or effectiveness metrics.

Potential, not status

None of the 450 applications is presented as implemented, commercially deployed, validated or certified. The atlas describes where the principle could apply.

Evidence has a scope

Decision records evidence what was verified and authorized. Proof that an external action actually completed requires a signal from the target system (see 1.4).

Editorial mappings are conceptual

Domain assignments, the action-to-industry matrix, indicative waves and the Additional assurance markers are editorial navigation aids, not measurements.

PART 05

05

Conclusion & Index

The strategic argument in one page, followed by a complete numbered index of all 450 applications.

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5.2 Atlas index · 001–450 48
5.3 Closing 52

5.1 STRATEGIC CONCLUSION

A market broader than the AI industry.

QODIQA may address a potential market broader than the AI industry. AI is the natural entry point, but the same execution control principle may extend to other software systems and, through appropriate integrations, to operations affecting the physical world.

THE STRATEGIC ADVANTAGE

The potential strategic advantage is the reuse of a common verification and authorization core, with industry-specific policies, integrations and assurance requirements.

THE TECHNICAL OBJECTIVE

The fundamental technical objective is to ensure that protected actions cannot pass through the relevant execution point without the required verification.

450	25	10	10	1
NUMBERED POTENTIAL APPLICATIONS	TAXONOMY GROUPS, A–Y	STRATEGIC DOMAINS	CROSS-INDUSTRY ACTION TYPES	EXECUTION CONTROL PRINCIPLE

Counts describe the structure of this publication, not market or deployment metrics.

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004 Enterprise AI 16
005 Generative AI 16
006 AI for programming 16
007 AI for search and research 16
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009 Multimodal AI 16
010 Local AI and edge AI 16
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012 AI-as-a-Service and ML platforms 16
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014 AI for robotics 16
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Specialized Domains and Emerging Markets

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The future of digital control is not just about what systems can do. It is about what they are authorized to do, before they do *it.*

QODIQA

VERIFY FIRST · AUTHORIZE FIRST · EXECUTE SECOND

