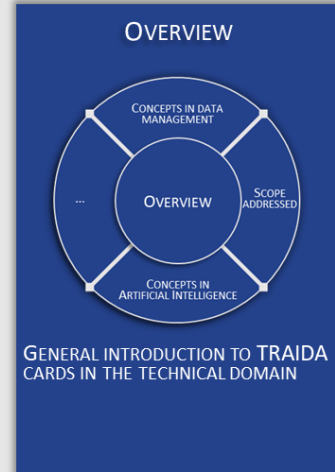# IT DOMAIN OVERVIEW

General introduction to TRAIDA cards in the technical domain. The cards in this domain are universal and apply to all business contexts. You select the practices that correspond to your needs and complete them to manage a roadmap for implementing your minimum architecture to scale AI and data management solutions in your company.

1. CONDITIONS OF SUCCESS

The TRAIDA framework (Transformative AI and Data Solutions) is based on three domains:

1. Technical (blue cards).
2. Governance (green cards).
3. Business (red cards).

To scale AI profitably across the enterprise, these three domains must be aligned. The technical domain is based on a foundational principle that serves as the cornerstone of the entire TRAIDA approach: "***The idea of integrating AI with existing databases is rejected***." The reasons for this recommendation are as follows:

- A strong coupling between AI and the databases of the existing information system creates point-to-point connections that are fragile (difficult to maintain) and poorly auditable (lack of central governance). From a software engineering perspective, this coupling creates technical debt and must be replaced by loose coupling. This allows AI systems to be independent of the physical access layers to production databases.

- A new data repository is necessary to store the tacit knowledge required for AI training. This type of knowledge, also known as informal knowledge, exists in the minds of human actors and is increasingly necessary to enhance AI's capabilities. This new repository is disconnected from production databases and aligns with the objective of loose coupling.

To ensure this separation of concerns between AI and production systems, a semantic platform is implemented. It relies on three repositories that create a digital twin of the existing databases (see the respective TRAIDA cards): MDM (Master Data Management), ODS (Operational Data Store), EKG (Enterprise Knowledge Graph). The semantic platform also integrates processes for data quality control and integration with production systems.

AI systems can then draw training data from this digital twin. The repositories are modeled using ontologies shared at the global enterprise level to ensure a unified view of the data.

Success criteria for AI

To successfully scale AI, TRAIDA highlights the following points:

1. Have a semantic platform with MDM, ODS, and EKG repositories.

2. Clarify the strategic contributions of AI targeted by the company. TRAIDA identifies two universal contributions to consider as a foundation for drafting your strategic approach with AI (see the TRAIDA Artificial Intelligence card):

    a. Process automation.

    b. Knowledge accumulation.

3. Define a progressive roadmap for the implementation of the semantic platform, considering a minimum viable architecture to scale AI. You will find practices in TRAIDA that correspond to your needs. You will need to adapt them to build your roadmap for the implementation of your digital twin. The goal is to establish a minimum architecture within a timeframe that limits AI deployments outside the architectural framework. Without this, it is likely that heterogeneous implementations will lead to AI malfunctions. This situation would negatively impact user adoption and the motivation of decision-makers to support AI investment.

Coordination with the TRAIDA governance domain

The priority coordination points between the technical domain and the governance domain are as follows: Enterprise Architecture card: semantic modeling; Enterprise Governance card: data governance and AI governance. The other cards and topics in the governance domain should be used according to your needs.

Coordination with the TRAIDA business domain

When implementing the first version of your minimum architecture to scale AI, the strategic framing of AI around the two universal contributions proposed by TRAIDA may suffice (see the technical card on Artificial Intelligence). However, you can further detail them with the following cards from the business domain:

- **Productivity card**: all topics on this card should be studied from the perspective of process automation (the first universal contribution of AI), including: Internal process, Client process, Third party process and Compliance process.

- **Creativity card**: all topics on this card can also be analyzed from the perspective of knowledge accumulation to enhance AI capabilities and foster collaboration with humans and robots (the second universal contribution of AI). The topics are identical to those on the previous card regarding productivity.

The other two cards in the business domain, namely Trustworthiness and Treasury & Assurance, are more suitable for use when studying the cards in the governance domain.

Coordination during the implementation of a project with AI

Once the minimum viable architecture to scale AI is established, the coordination of TRAIDA cards revolves around the successive deployment projects for AI use cases, which involves:

1. Updating the architecture according to a predetermined roadmap and considering the needs of business projects as AI and data management solutions are deployed within the company.

2. Ensuring the alignment of the technical and governance domains with business needs. Each project is then analyzed using a set of topics from the business cards (red), a set of governance topics involved in business implementation (green), and the technologies involved (blue).

2. IMPORTANCE OF THIS CARD FOR YOUR TRANSFORMATIVE AI

This card is an introduction to the technical domain of the TRAIDA framework. It helps you become familiar with the other cards in this domain. The following provides some additional information to facilitate your reading and the necessary reflection for your own context.

CONCEPTS IN DATA MANAGEMENT

If you are a newcomer in the field of data management, it is advisable to read the glossary card of the TRAIDA framework, located in the governance domain (green). The concepts that require a deeper level of expertise in data management are as follows:

- **Digital twin or semantic platform**: This involves creating a data repository that cleanly unifies all existing databases within applications. It does not replace them but acts as a clearinghouse for all data. As mentioned earlier, AI systems are then connected to this digital twin rather than directly to heterogeneous databases, which are often organized in silos. However, even in the case of a more streamlined data architecture, such as one based on a data mesh approach (service-oriented architecture), it remains important to establish the digital twin to decouple AI from production systems. This does not mean that AI is not utilized in operational processes running in production, but rather that the data it uses for training and execution comes from the digital twin, which ensures its quality and security.

- **Ontology**: This refers to the embodiment of a semantic data model that is conducted at the enterprise level to overcome imperfections generated by silos. With databases verticalized on application and organizational domains, duplications of information are inevitable, and sometimes semantic ambiguities arise, reducing the reliability of consolidations. The repositories that form the digital twin, namely MDM, ODS, EKG (see the respective TRAIDA technical cards), share the same unified data model, i.e., the same ontologies. Such a data model requires a specific, phased modeling process led by experienced experts. It is a significant investment; the return of which is the profitable deployment of AI at the enterprise scale.

CONCEPTS IN ARTIFICIAL INTELLIGENCE

The internal functioning of AI relies on complex and rapidly evolving technologies. For a company that uses AI systems, it is not necessary to have expertise in mastering them. The concepts to understand and disseminate within your teams are as follows:

- Distinguish between different types of AI, such as generative, symbolic, and analytical (see the respective TRAIDA technical cards).

- Understand the paradigm shift from conventional software development, which is moving from coding algorithms to training AI. The contribution of NoCode solutions combined with AI further accelerates this movement.

- The corollary of this new paradigm on skill and career management is significant. In particular, developers and analysts will no longer have a monopoly on specifying databases and use cases. Users, provided they are trained to document their needs in a formalism compatible with AI training, will become *de facto* super-analysts and application producers.

- The approximate results of AI in certain situations should not be perceived as definitive malfunctions for two reasons:

  a) AI collaborates with human actors to improve results. AI use cases are constructed with the possibility of human intervention depending on the execution context: see the TRAIDA technical card on Artificial Intelligence with the principles of preconditions and postconditions for AI-driven steps. This working method requires that users involved in the processes maintain a critical mindset toward AI-produced results, with the ability to propose the addition of knowledge to improve AI training.

  b) The level of hallucination generated by AI is regulated by settings. Depending on the desired level of creativity in executing a use case, these settings should be carefully adjusted. For example, in generating text for a marketing context, the level of hallucination (and therefore creativity) can be high to produce original results. Conversely, in the context of legal analysis of a contract, the level of hallucination should be minimized, and AI training should be reinforced to prevent the creation of new ideas.

SCOPE ADDRESSED

The cards in the technical domain are listed in the table below. There is no preferred reading order to follow. From an academic perspective, that is, for discovering the cards with the aim of learning general technical culture, the order of the cards in the table is the most advisable to follow.

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CORE SYSTEM DATA
❑ SILOED DATABASES
❑ DATABASES BY BUSINESS DOMAIN (DATA MESH)

OPERATIONAL DATA STORE (ODS)
❑ READ-ONLY MODE
❑ WRITE-MODE
❑ ANALYTIC-MODE WITH KNOWLEDGE GRAPH

MASTER DATA MANAGEMENT (MDM)
❑ DATA CATALOG (METADATA) & GV. FEATURES
❑ REFERENCE & MASTER DATA
❑ ID MAPPING & DATA LINEAGE
❑ API MANAGEMENT

ENTERPRISE KNOWLEDGE GRAPH (EKG)
❑ ONTOLOGY MANAGEMENT (ANALYTICS, OLTP)
❑ REGULATORY MANAGEMENT
❑ PERSONAL & COLLECTIVE KNOWLEDGE ACC.

DATA LAKE WAREHOUSE
❑ DATA WAREHOUSE, DATA LAKE & METADATA MGT.
❑ DURABLE AND LONG-TERM STORAGE

DATA INTEGRATION
❑ DATA HUB
❑ DATA FABRIC

STYLE OF DATABASE
❑ STRICT-SCHEMA
❑ META-SCHEMA
❑ DOCUMENT SCHEMA
❑ GRAPH SCHEMA & SCHEMA-FREE
❑ VECTOR DATABASE
❑ FULL-TEXT SEARCH DATABASE
❑ ANALYTICAL DATABASE

ARTIFICIAL INTELLIGENCE (AI)
❑ GENERATIVE AI & RAG PROCESS
❑ SYMBOLIC AI
❑ ANALYTICAL AI
❑ DATA COLLECTION & LABELING

3. BLUEPRINT

IT DOMAIN OVERVIEW
SEMANTIC PLATFORM

The three repositories ODS, MDM, and EKG share the same ontologies. This figure is a logical view of the repositories and does not imply the use of one or multiple technologies for their implementation

LEGEND

EKG: Enterprise Knowledge Graph
MDM: Master Data Management
ODS: Operational Data Store

4. YOUR SITUATION & OBJECTIVES