FMP Monograph — Experimental Programme (Rewritten)
AIUZ Terra CodeX Ecosystem as Object–Subject of Inquiry

1. Research Stance and Scope

This chapter replaces the synthetic experiments of the original FMP monograph with an empirical programme grounded in the real-world development of the AIUZ Terra CodeX ecosystem (v1–v4). In keeping with the Fractal Meta■Science Paradigm (FMP), Terra is treated simultaneously as (i) the object of inquiry (a socio■technical platform) and (ii) a co■constructive subject that changes its own conditions of observation through reflexive feedback. The empirical stance is thus second■order and living■lab oriented: researchers, developers, users, and governance modules continuously co■evolve the artefact and the study design.

We adopt four FMP-aligned principles as operational axioms:
1) **Fractality & Recursion** — every unit of analysis mirrors the whole through scale■consistent processes (design, governance, learning).
2) **Holographic Coherence** — global properties (safety, inclusivity, accountability) must be projectable from local traces (logs, audits, ethics checks).
3) **Synchronic–Diachronic Coupling** — momentary states are analysed together with their developmental trajectories (versions v1.0→v4.0).
4) **Emergence Under Constraint** — desirable behaviour arises from constraints encoded in ethics, audit, and interaction protocols.

2. Setting and Materials

Platform versions. The corpus spans AIUZ v1.0 (static DE–UZ dictionary), v2.0 (Semantic Core), the missing transitional v3.0, and v4.0 (industrial microservices + Terra education stack).

Empirical artefacts. We analysed 37 documents (white papers, modules, logs, standards) preserved in the archived snapshot dated 16 July 2025 18:16 (local), validated by strict technical audit. The audit reported: structure validation 28/37 (75.7%), metadata completeness 15/37 (40.5%), content validity 35/37 (94.6%), security 37/37 (100%). Critical gaps: absent hashes for all 37 files; lack of QR signatures; inconsistent metadata (notably missing SESSION_ID). These figures are used as ground truth for experimental baselines.

Protocols and instruments.
- **AI Interaction Protocol** with validator enforcing understanding/limits/persistence checks (max 25 min, 50k tokens, 3k words per session).
- **AIUZ Audit Regulation** that programmatically checks metadata, structure blocks, OpenAI references, ∅■language markers, content hash, and generates an audit log.
- **Co■Creation Ethics** module validating actions against (a) non■harm, (b) transparency, (c) preservation of value.
- **Postlingua Semantic Trace (Σ)** and **E■■/EXO** principles used as meta■representations of sub■linguistic meaning flow across modules.
- **Terra Continuous Simulation Mode** (logical, not physics■based): the platform executes end■to■end dry■runs of governance, education, token incentives, and safety pathways on live configuration/state, with all synthetic data replaced by archival logs and reproducible mock fixtures derived from real incidents and decisions.

3. Methods