PROPOSAL A – ID Index™ | DIGITAL DIAGNOSTICS |

This text is **fully aligned** with:

- AARGA_Application_LOI-DRAFT (scientific backbone)
- index.icf-advanced.mk (public positioning)
- ICF Advanced™ master narrative
- EIT HEI evaluator logic (clarity, innovation capacity, HEI relevance)

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EXCELLENCE

1. Problem Definition and Context

Neurodegenerative and cognitive disorders, including Alzheimer's disease and related conditions, represent a growing societal, healthcare, and economic challenge across Europe. Despite advances in neuroscience and digital health, **diagnostic practices remain fragmented**, relying heavily on isolated psychometric tests or single-modality biomarkers that fail to capture the multidimensional nature of cognitive and functional decline.

Higher Education Institutions (HEIs) face a structural gap between:

- cutting-edge neurotechnology research,
- applied diagnostics development,
- and translation into innovation-ready, validated, and institutionally deployable solutions.

This gap limits the ability of HEIs to actively participate in the development, validation, and adoption of advanced digital diagnostics aligned with European policy priorities on personalized medicine, mental health, and active ageing.

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2. Proposed Solution: ID Index™ Digital Diagnostics

ID Index™ is a **digital diagnostics framework** designed to address this gap by enabling the **integration of psychometric, biometric, and neurometric data** into a unified, interpretable diagnostic index.

The solution is developed under the **ICF Advanced™ initiative**, which provides the institutional, regulatory, and conceptual framework ensuring alignment with:

- WHO International Classification of Functioning, Disability and Health (ICF),
- EU digital health and innovation policies,
- and HEI-driven research and innovation ecosystems.

ID Index™ does **not deliver therapeutic interventions**. Instead, it provides **advanced diagnostic profiling and decision-support indices**, intended for research, educational, and pre-clinical innovation environments.

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3. Scientific and Technological Excellence

3.1 Multimodal Diagnostic Architecture

ID Index™ is based on a **psycho-bio-metrics approach**, combining:

- **Psychometrics**
  Standardized cognitive and functional assessment tools (e.g. memory, executive function, attention, behavioral profiles).
- **Biometrics**
  Physiological and behavioral signals such as heart-rate variability, galvanic skin response, facial expression analysis, and related digital biomarkers.
- **Neurometrics**
  Neurophysiological measurements (e.g. EEG-based features) enabling objective insights into brain function and cognitive load.

These data streams are synchronously captured and processed through digital pipelines, allowing **multidimensional assessment rather than isolated measurements**.

3.2 Index-Based Interpretation

A key innovation lies in the transformation of raw multimodal data into **composite diagnostic indices** (“ID Index™”), enabling:

- standardized interpretation across institutions,
- comparability in longitudinal and cross-cohort studies,
- and usability for non-technical stakeholders (clinicians, researchers, educators).

This index-based logic significantly enhances **translation readiness**, a critical weakness in many academic diagnostic tools.

3.3 ICF-Mapped Diagnostic Framework

All diagnostic outputs are explicitly mapped to the **WHO ICF framework**, ensuring:

- alignment with internationally recognized health classification standards,
- holistic representation of body functions, activities, participation, and contextual factors,
- and policy relevance at institutional and system levels.

This ICF-based mapping is a major differentiator, enabling **interoperability between diagnostics, education, healthcare systems, and innovation policy frameworks**.

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4. Innovation Beyond the State of the Art

ID Index™ advances beyond the current state of the art by:

1. **Integrating psychometrics and biometrics into a single diagnostic index**, rather than parallel, disconnected assessments.
2. **Embedding diagnostics within an institutional innovation framework (ICF Advanced™)**, enabling HEI-led deployment and scaling.
3. **Focusing on validation-ready digital diagnostics**, rather than experimental prototypes without translation pathways.
4. **Supporting longitudinal and comparative diagnostics**, essential for neurodegenerative and cognitive research.

   The project positions HEIs not only as research providers, but as **active innovation actors** in advanced diagnostics.

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5. TRL Positioning and Advancement

At the start of the project, ID Index™ components operate at **TRL 4–5** (validated in controlled research environments).
Through the proposed actions, the project aims to reach **TRL 6**, by:

- validating the diagnostic framework in HEI-linked pilot environments,
- strengthening data integration and index reliability,
- and establishing institutional workflows for diagnostics innovation.

This TRL progression is realistic, measurable, and aligned with EIT HEI expectations.

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6. Role of Higher Education Institutions

HEIs play a **central and active role** in the proposed solution by:

- co-developing diagnostic methodologies,
- validating psycho-bio-metrics approaches in academic and clinical research settings,
- integrating diagnostics innovation into education and training,
- and strengthening institutional capacity for digital health innovation.

The project directly supports the **entrepreneurial and innovation capacity of HEIs**, in line with HEInnovate principles.

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7. Complementarity with Digital Therapeutics (ENTRAINE®™)

While this proposal focuses exclusively on **digital diagnostics (ID Index™)**, it is strategically designed to be **complementary to digital therapeutics initiatives** (e.g. ENTRAINE®™), without functional or regulatory overlap.

This separation ensures:

- regulatory clarity,
- scientific focus,
- and future interoperability without dependency.

Conclusion

By combining scientific rigor, institutional innovation frameworks, and HEI-centered deployment, **ID Index™ represents an excellent and credible digital diagnostics solution** aligned with the objectives of the EIT HEI Call for Proposals 2025.