

Dear Review Committee,

I am Luo Li, a professor at the School of Public Health at Fudan University. Through my collaboration with Mr. Handong Ma in the Shen Kang Center's Medical-Enterprise Collaborative Innovation Platform and the Specialized Disease Database Assetization Platform projects, I have had the privilege of engaging in in-depth discussions with him. This has allowed me to gain a profound understanding of his professional expertise, project contributions, and technological achievements. Based on this, I am writing this recommendation letter to express my full support for Mr. Handong Ma's application for a senior professional title.

1. Technological Advancements and Personal Contributions

The Shen Kang Center (SHDC) project, led by Mr. Handong Ma, has demonstrated impressive technological advancements:

- 1. AI-Based Multi-Source Heterogeneous Data Integration**
By leveraging artificial intelligence algorithms, the project provides solutions for horizontally aggregating cross-specialty and cross-institutional healthcare big data, as well as vertically integrating personal medical records. This ensures the discoverability and accessibility of specialized disease data within the region, while enhancing data accuracy, processing efficiency, and quality. These innovations have significantly advanced the standardized collection, integration, and collaborative utilization of data resources.
- 2. Medical Data Standardization**
The project has established a unified data representation framework that supports the incorporation of diverse terminology systems. Through data structure governance and semantic mapping, it achieves multi-level standardization of data fields, content, and semantics. This greatly enhances the interoperability and reusability of specialized disease data within the region, significantly improving the standardization and sharing of medical data.
- 3. Cloud-Native Technology and Fully Customizable Workflow Architecture**
By adopting a cloud-native technology framework, the project ensures scalability for the current 45 specialized disease databases and future expansions while maintaining high availability and system stability. Additionally, it supports end-to-end customization of business workflows, effectively accommodating the needs of clinical research operations.
- 4. Lakehouse Integration and Distributed Flexible Architecture**
The project employs a lakehouse integration approach to address data drift issues between data lakes and data warehouses, enabling unified

storage of raw data, processed data, and modeled data. The distributed flexible architecture optimally utilizes existing computing resources, supports online scalability, and ensures uninterrupted business operations.

5. Full-Chain Data Traceability Technology

The project pioneers an industry-first full-chain data traceability solution, ensuring research-grade traceability for specialized disease data.

As a Senior Engineer and Ph.D. in Computer Science, Mr. Handong Ma has demonstrated exceptional theoretical knowledge and technical expertise throughout this project. His contributions extend beyond designing the overall technical framework, system architecture, and deployment strategy—he has also successfully tackled challenges such as real-time full-volume multi-source heterogeneous disease data collection, FAIR data principles in healthcare, PDCA-based data quality management in main and sub-centers, and intelligent matching of large-scale patient datasets.

2. Social and Economic Impact of the Project

Under Mr. Handong Ma's leadership, this project has not only promoted interdisciplinary integration in Shanghai's clinical medicine field—spanning multiple centers and disciplines—but has also enhanced the level of medical data sharing and utilization. It has accelerated the development of research-oriented and future hospitals while supporting the high-quality, collaborative growth of Shanghai's biopharmaceutical industry. The platform's launch has shortened the time required for biopharmaceutical companies to initiate and approve clinical research, improved clinical trial efficiency, and established an innovation pipeline that integrates medical institutions and enterprises. This has played a crucial role in facilitating rapid collaboration among industry, academia, and research institutions.

3. Recommendation for Senior Professional Title Application

Given Mr. Handong Ma's outstanding performance in the Shen Kang Center project, his extensive expertise in the field, and his innovative capabilities, I firmly believe that he fully meets the criteria for a senior professional title. His work has not only led to breakthroughs in technology but has also significantly contributed to the standardization of medical data, artificial intelligence applications, clinical research translation, and the advancement of the pharmaceutical industry. His professional competence, technical skills, and leadership qualities align perfectly with the requirements for a senior professional title.

Therefore, I strongly recommend Mr. Handong Ma and believe that his professional achievements will bring further advancements to the fields of medical informatics and translational medicine in China.

Sincerely,

Luo Li