HONG KONG ASIAWORLD-EXPO 亞洲國際博覽館

3RD TO 6TH DECEMBER 2025

World Federation for Hospital Sterilisation Sciences

How We Built CSSDGPT

A Generative AI Assistant Designed for Reprocessing Practitioners

Yongpeng QIN (Jim Chin)
Founder, Honjo Medical

About Me

2000

- Started career in sterile processing

2015

- Founded Honjo Medical
- Set up 68CSSD

2017

- Assembled a team to develop CSSD software

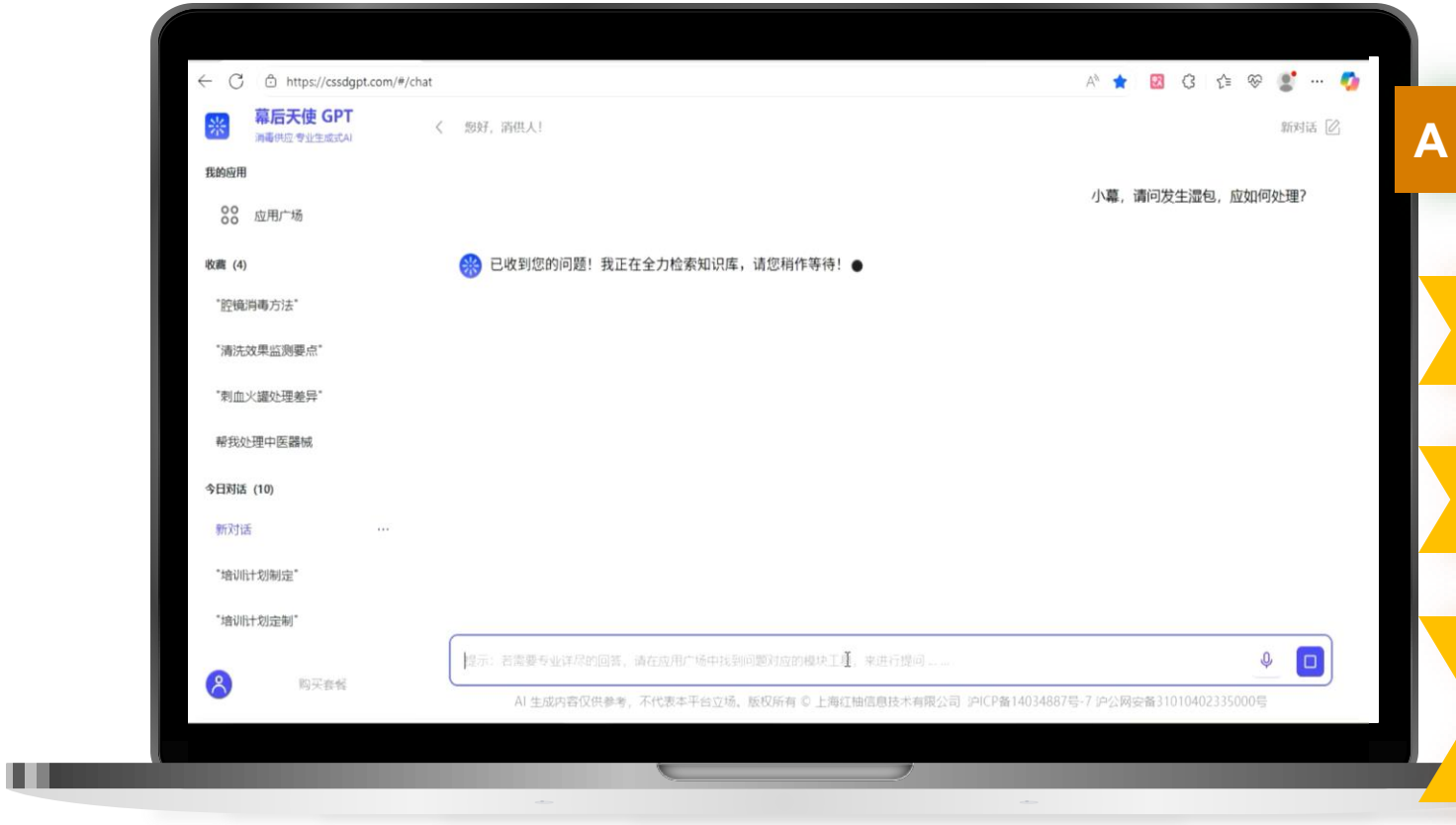
2022

- Built a team to create an intelligent CSSD platform

2024

- Led the team to build CSSDGPT

About CSSDGPT



A Generative AI Assistant

- Tailored for sterile processing
- Query → CSSDGPT → Response
- Chinese (cssdgpt.com; Jan 2025) / English (cssdgpt.AI; Beta now, full functions, Jan 2026)

WHY?

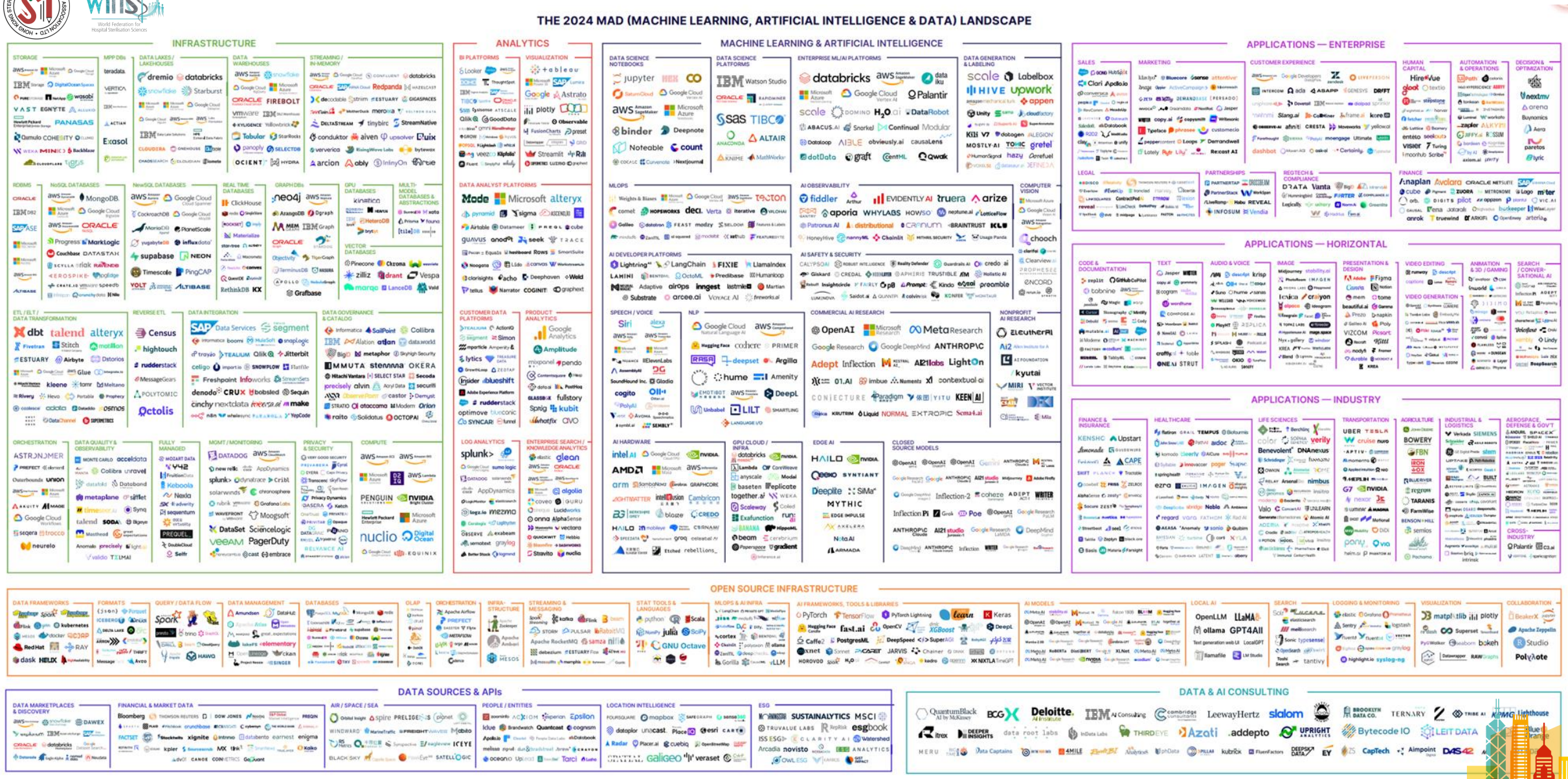
The reasons we built CSSDGPT

HOW?

The processes of building CSSDGPT

WHAT?

What CSSDGPT is today - and where it’s headed



Reference: 2024 AI Landscape Map (source: mattturck.com; accessed Oct 2025)

The WHY: Needed & Deserved

Doctor

IBM Watson
aidoc Always On AI
DeepMind Health
ARTERYS Medical Imaging Cloud AI
.....

Teacher

KHANMIGO by Khan Academy
Socratic
Quillionz
Otter.ai
.....

Lawyer

casetext
Harvey AI
ROSS
DoNotPay
.....

Reporter

grammarly
Jasper
wordtune
Primer
.....

Designer

Midjourney
DALL·E
Stable Diffusion
Canva AI
.....

Programmer

GitHub Copilot
tabnine
Amazon CodeWhisperer
snyk
.....

If you're a CSSDer, which AI tool could help you the most?

Unfortunately, none.

CSSDers need an AI tool - and they deserve it. We will build it!

The HOW: A Five-Step Roadmap

01 Define Needs

Define users and stakeholders, pinpoint the problems to address, and set scope, privacy, and human-oversight boundaries.

02 Prepare Data

Collect, clean/structure, and integrate verified sources - building a reliable, up-to-date CSSDGPT knowledge base.

03 Develop Model

Configure the base model and infrastructure; fine-tune with RAG and citations; then orchestrate, evaluate, and optimize for performance.

04 Integrate System

Deliver the model and knowledge base as a secure, scalable cloud service - with cross-device access, front-cloud alignment, and continuous safeguards and monitoring.

05 Release & Iterate

Validate and pilot; launch and onboard; then measure, enhance, and expand features and content based on user feedback.

01 — 02, 03 — 04 — 05

2024.01 — 2024.04 — 2024.10 — 2024.12 — Now

Step 1: Define Needs

Define users and stakeholders, pinpoint the problems to address, and set scope, privacy, and human-oversight boundaries.

1.1 Identify Target Users

- **Core users** - Management, supervisors, QC, and frontline staff who need accurate guidance during reprocessing workflows.
- **Stakeholders** - Infection control, nursing management, and OR teams that rely on consistent sterile supply practices.
- **Extended groups** - IT, regulators, educators, and investors involved in system implementation and oversight.

(Fig. 1.1A)

1.2 Clarify Core Problems

- **Information overload** - Numerous and frequently updated standards are hard to track *(Fig. 1.2A)*.
- **Lack of real-time expert support** - Staff face practical questions not covered in IFUs and SOPs.
- **Inconsistent interpretation** - Different understandings cause variation in practices and across facilities.

1.3 Establish Safe Boundaries

- **Scope control** - Respond only within CSSD-related domains and redirect out-of-scope inquiries appropriately.
- **Data & regulation** - Block/remove/redact patient-sensitive data or PII (personally identifiable information) and use verified sources only.
- **Human oversight** - Require users to review, interpret, and validate before application; and maintain logs and feedback for improvement.

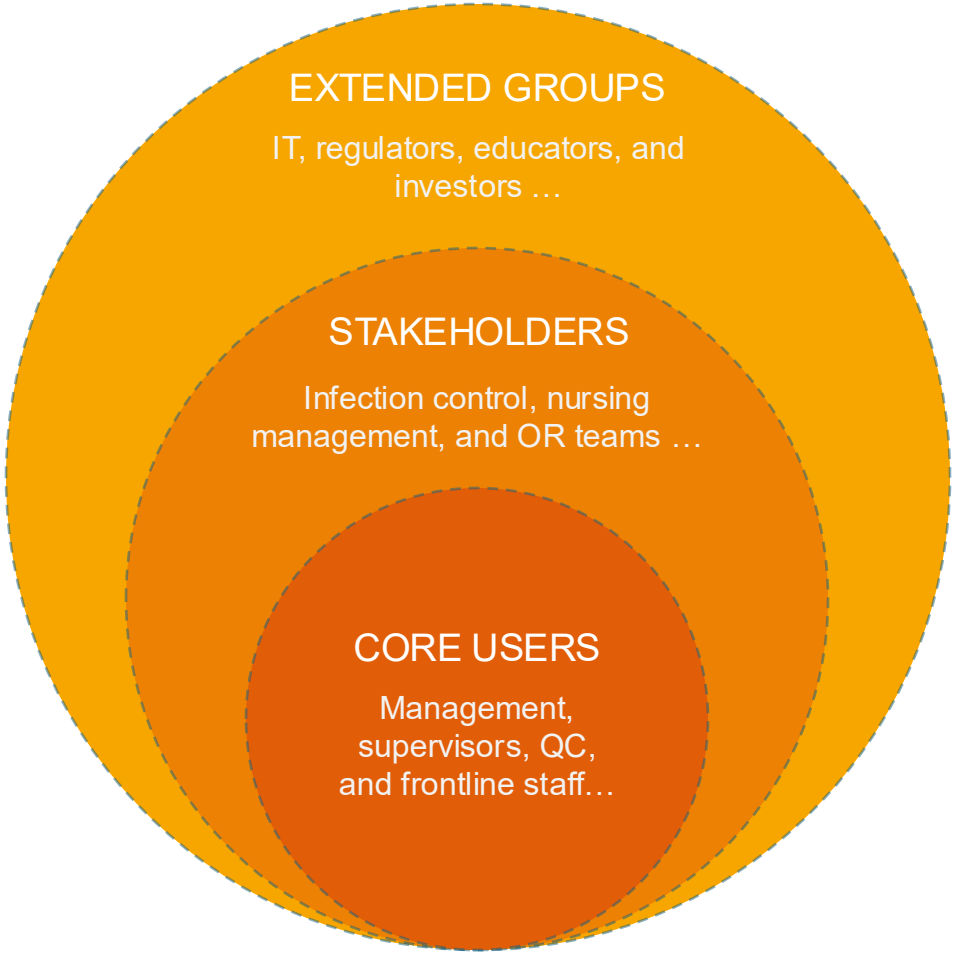


Fig. 1.1A: *Target Users of CSSDGPT.*

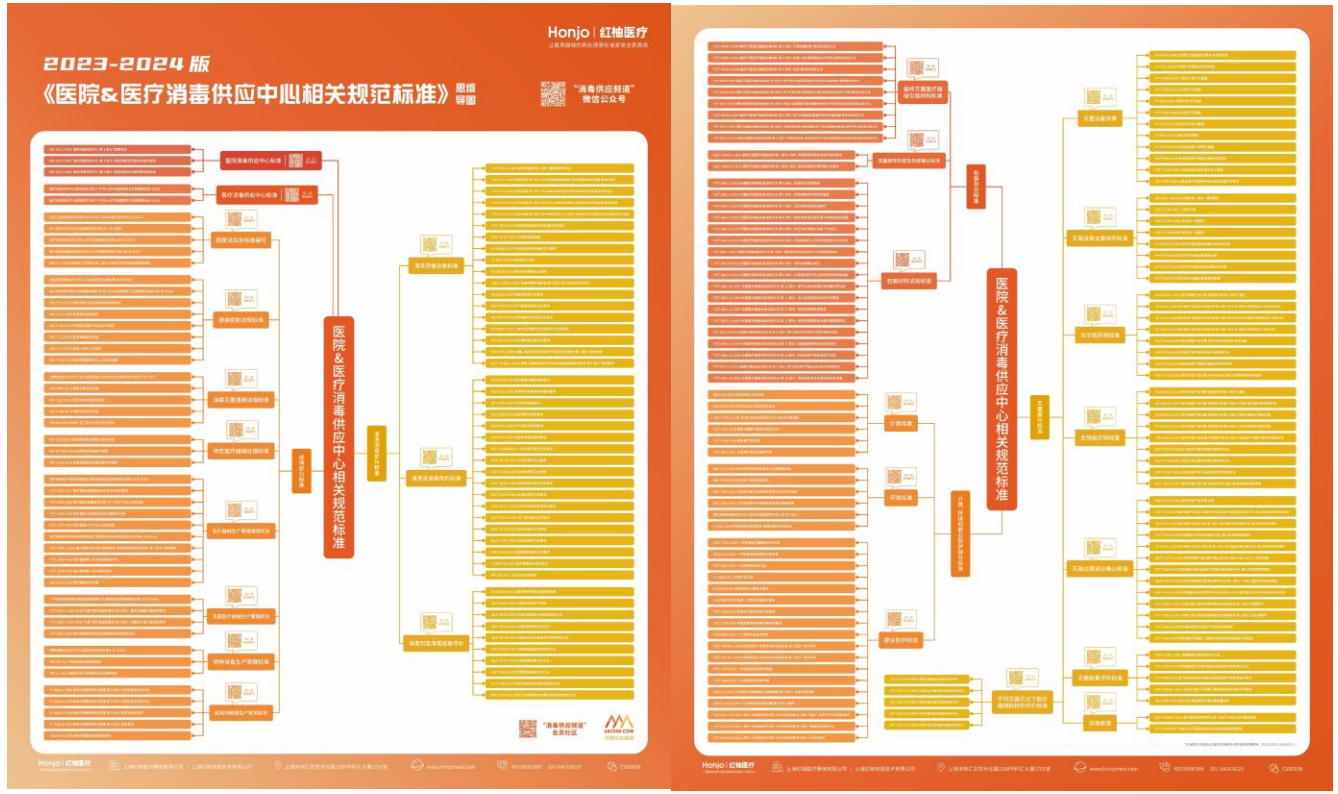


Fig. 1.2A: *Mind Map of Standards and Regulations (China, as of Dec 2024).*

Step 2: Prepare Data

Collect, clean/structure, and integrate verified sources - building a reliable, up-to-date CSSDGPT knowledge base.

2.1 Collect Knowledge & Data

- **Field experience -** Gather ten years of real-world Q&A records and case discussions from the 68CSSD community *(Fig. 2.1A)*.
- **Standards & regulations -** Combine over 215 official standards, 150+ books, and key regulatory documents *(Fig. 2.1B, 2.1C)*.
- **Research evidence** - Include several thousand academic papers published in domestic journals on sterile-processing practices.

2.2 Clean & Structure Data

- **Remove duplicates and errors -** Eliminate outdated or inconsistent information.
- **Format for AI use -** Convert unstructured texts into structured, machine-readable formats *(Fig. 2.2A)*.
- **Categorize logically -** Group content into three main sections - Knowledge, Management, and Operations - with clear subdivisions. *(Fig. 2.2B)*.

2.3 Build Knowledge Base

- **Integration -** Combine cleaned and categorized data into a central, searchable repository.
- **Source reliability -** Ensure each response is based on verified standards and guidelines with citations.
- **Continuous update** - Regularly add new standards, regulations, and research to keep content current.

Fig. 2.1A: *Ten Years of 68CSSD Community Insights and Field Experience (Source: 68CSSD Data Archive, 2015 - 2024).*

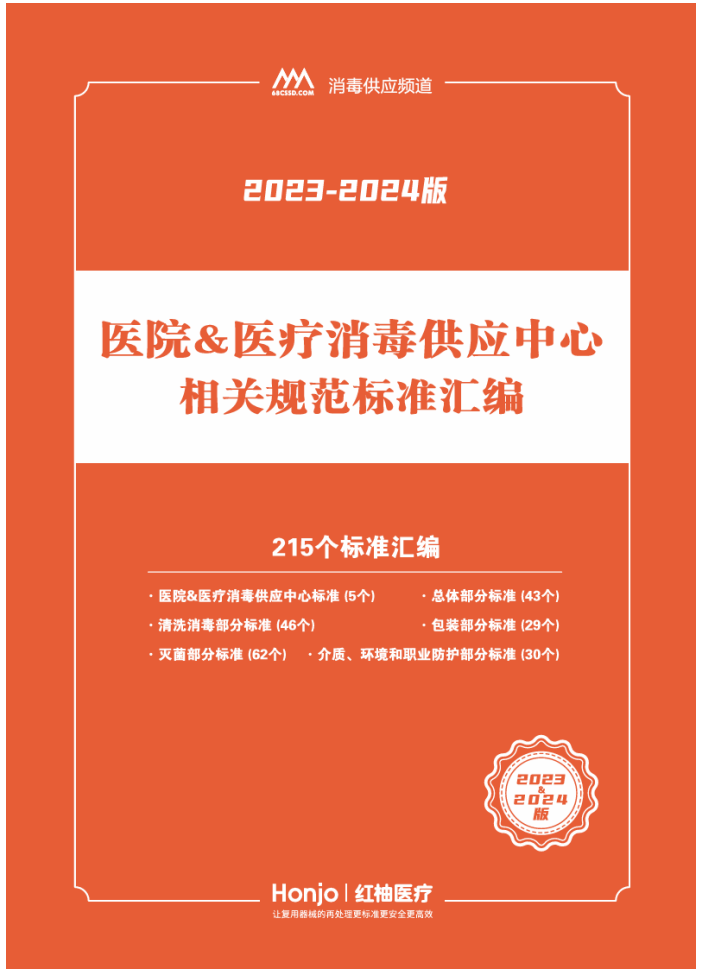


Fig. 2.1B: *Official CSSD Standards & Regulations (215 Total).*

Fig. 2.1C: *Authoritative CSSD Publications (150 + Key Sources).*

1 范围

WS 310的本部分规定了医院消毒供应中心(central sterile supply department ,CSSD)消毒与灭菌效果监测的要求、方法、质量控制过程的记录与可追溯要求。

本部分适用于医院和为医院提供消毒灭菌服务的消毒服务机构。

2 规范性引用文件

下列文件对于本文件的应用是必不可少的。凡是注日期的引用文件，仅注日期的版本适用于本文件。凡是不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB 15982　　医院消毒卫生标准
GB/T 20367　医疗保健产品灭菌 医疗保健机构湿热灭菌的确认和常温控制要求
GB/T 30690　小型压力蒸汽灭菌器灭菌效果监测方法和评价要求
WS 310.1　　医院消毒供应中心 第1部分：管理规范
WS 310.2　　医院消毒供应中心 第2部分：清洗消毒及灭菌技术操作规范
WS/T 367　　医疗机构消毒技术规范

3 术语和定义

WS 310.1、WS 310.2界定的以及下列术语和定义适用于本文件。

3.1 可追溯 traceability

对影响灭菌过程和结果的关键要素进行记录，保存备查，实现可追踪。

3.2 灭菌过程验证装置 process challenge device，PCD

对灭菌过程具有特定抗力的装置，用于评价灭菌过程的有效性。

3.3 清洗效果测试物 test soil

用于测试清洗效果的产品。

3.4 大修 major repair

超出该设备常规维护保养范围，显著影响该设备性能的维修操作。

示例1：压力蒸汽灭菌器大修如更换真空泵、与腔体相连的阀门、大型供汽管道、控制系统等。

示例2：清洗消毒器大修如更换水泵、清洗剂供给系统、加热系统、控制系统等。

3.5 小型蒸汽灭菌器 small steam sterilizer

体积小于60L的压力蒸汽灭菌器。

3.6 快速压力蒸汽灭菌 flash sterilization

专门用于处理立即使用物品的压力蒸汽灭菌过程。

4 监测要求及方法

4.1 通用要求

4.1.1应专人负责质量监测工作。

4.1.2应定期对医用清洗剂、消毒剂、清洗用水、医用润滑剂、包装材料等进行质量检查，检查结果应符合WS 310.1的要求。

4.1.3应进行监测材料卫生安全评价报告及有效期等的检查，检查结果应符合要求。自制测试标准包应符合WS/T 367的有关要求。

4.1.4应遵循设备生产厂家的使用说明或指导手册对清洗消毒器、封口机、灭菌器定期进行预防性维护与保养、日常清洁和检查。

4.1.5应按照以下要求进行设备的检测：

a)清洗消毒器应遵循生产厂家的使用说明或指导手册进行检测；

b)压力蒸汽灭菌器应每年对灭菌程序的温度、压力和时间进行检测；

c)压力蒸汽灭菌器应定期对压力表和安全阀进行检测；

d)干热灭菌器应每年用多点温度检测仪对灭菌器各层内、中、外各点的温度进行检测；

e)低温灭菌器应每年定期遵循生产厂家的使用说明或指导手册进行检测；

f)封口机应每年定期遵循生产厂家的使用说明或指导手册进行检测。

Fig. 2.2A: *Structured Text Format for AI Training.*

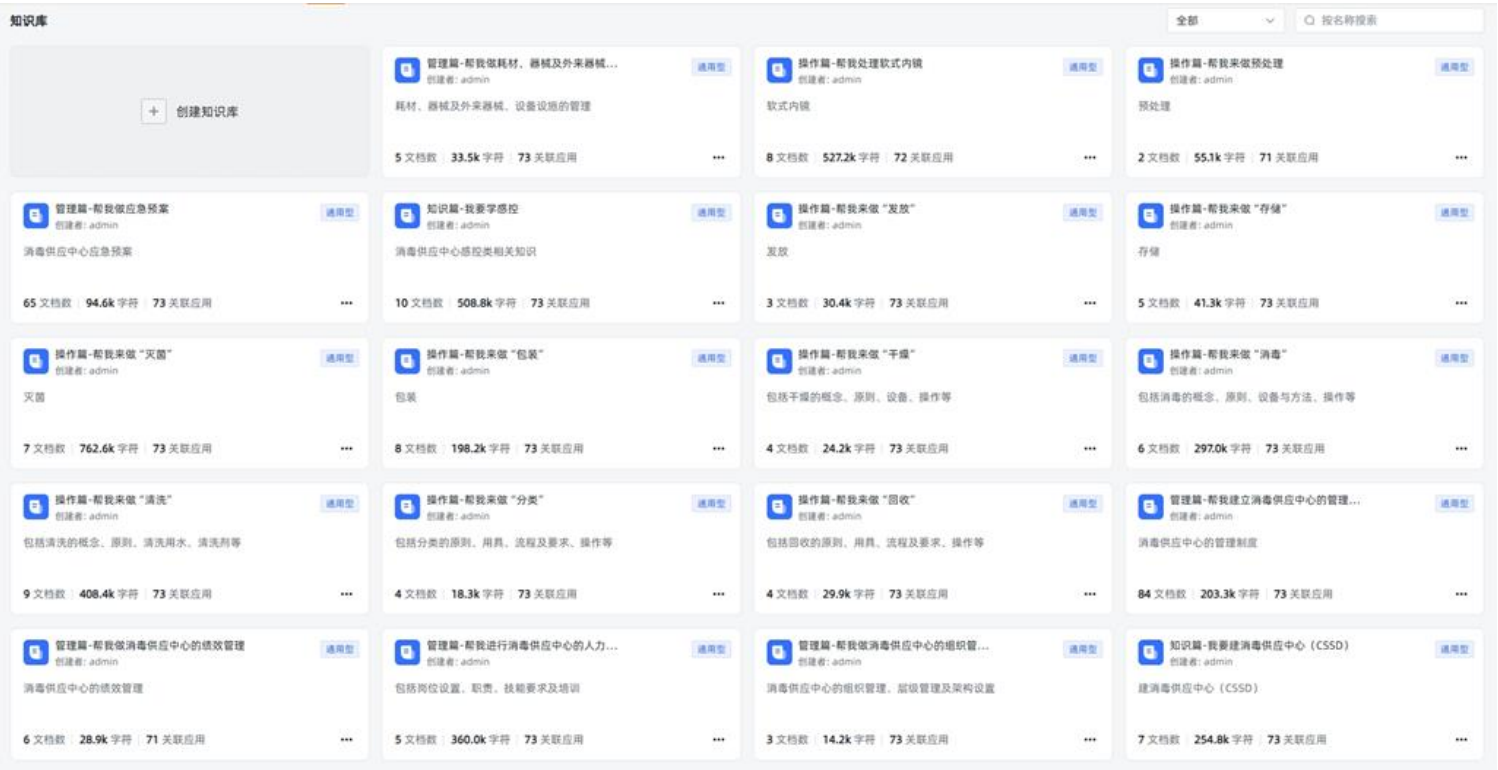


Fig. 2.2B: *Categorized Sections of CSSD Knowledge Data.*

Step 3: Develop Model

Configure the base model and infrastructure; fine-tune with RAG and citations; then orchestrate, evaluate, and optimize for performance.

3.1 Configure Base Model

- **Model selection -** Select DeepSeek as the base LLM based on its performance, scalability, latency, and cost efficiency.
- **Infrastructure readiness -** Establish the computing resources and APIs to support secure, scalable operations.
- **Domain setup -** Configure the model environment to understand CSSD-specific terminology and workflows.

3.2 Fine-tune & RAG

- **Fine-tuning -** Train the base model with a curated CSSD dataset *(Fig. 3.2A)*.
- **Retrieval Augmented Generation (RAG) -** Retrieve from the vectorized CSSD database, augment the queries with retrieved content, and generate an optimized response through the LLM *(Fig. 3.2B)*.
- **Citation support –** Add corresponding references/sources in the returned responses.

3.3 Orchestrate & Optimize

- **Orchestration -** Sequence logical steps to collaboratively execute multiple tasks by calling on AI models (e.g., image, voice), tools (e.g., API, RAG), and code functions for task completion *(Fig. 3.3A)*.
- **Evaluation -** Establish objective and subjective evaluation metrics and rubrics using both human experts and LLM judgments.
- **Optimization** - Refine sub-optimal areas through trace analysis and targeted modifications.

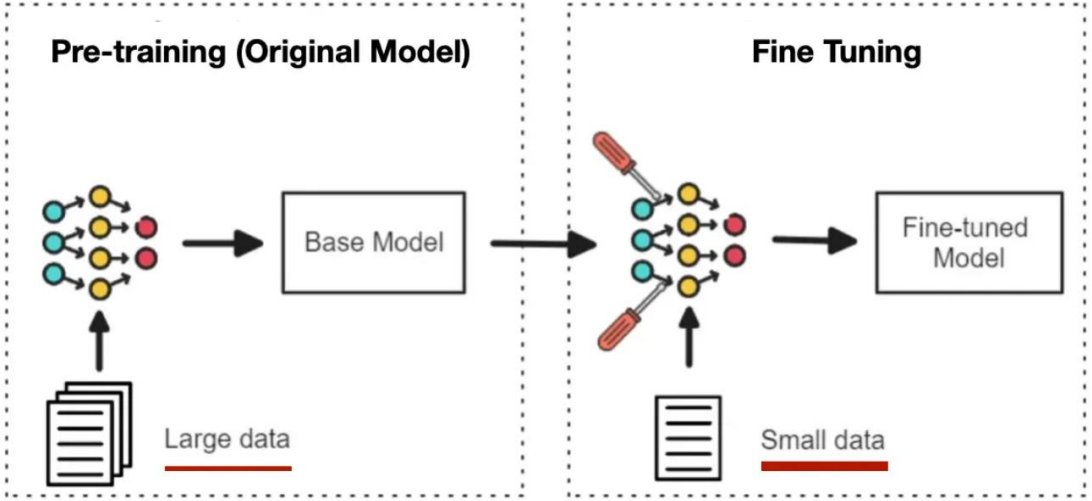


Fig. 3.2A: *Fine-Tuning of the Base LLM.**

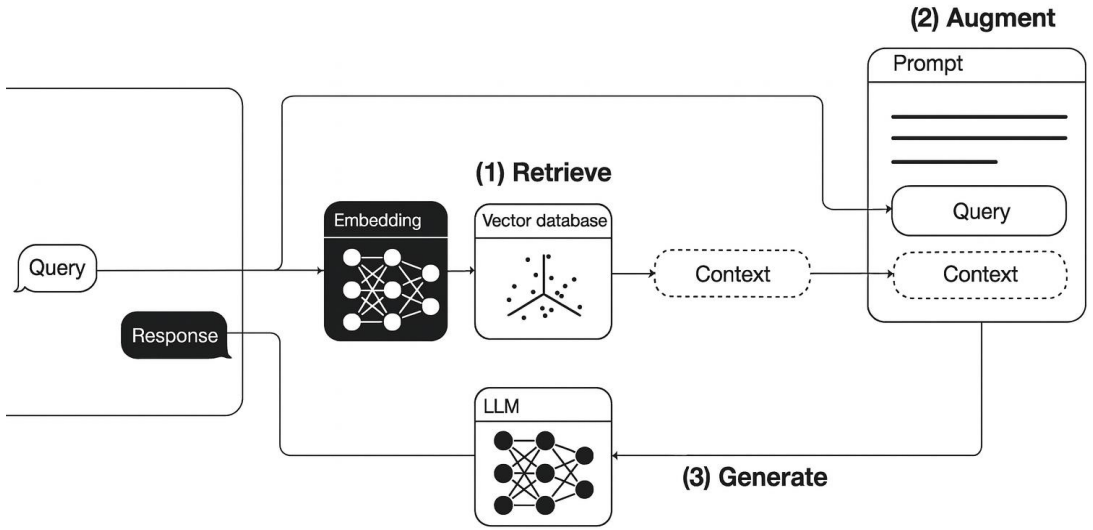
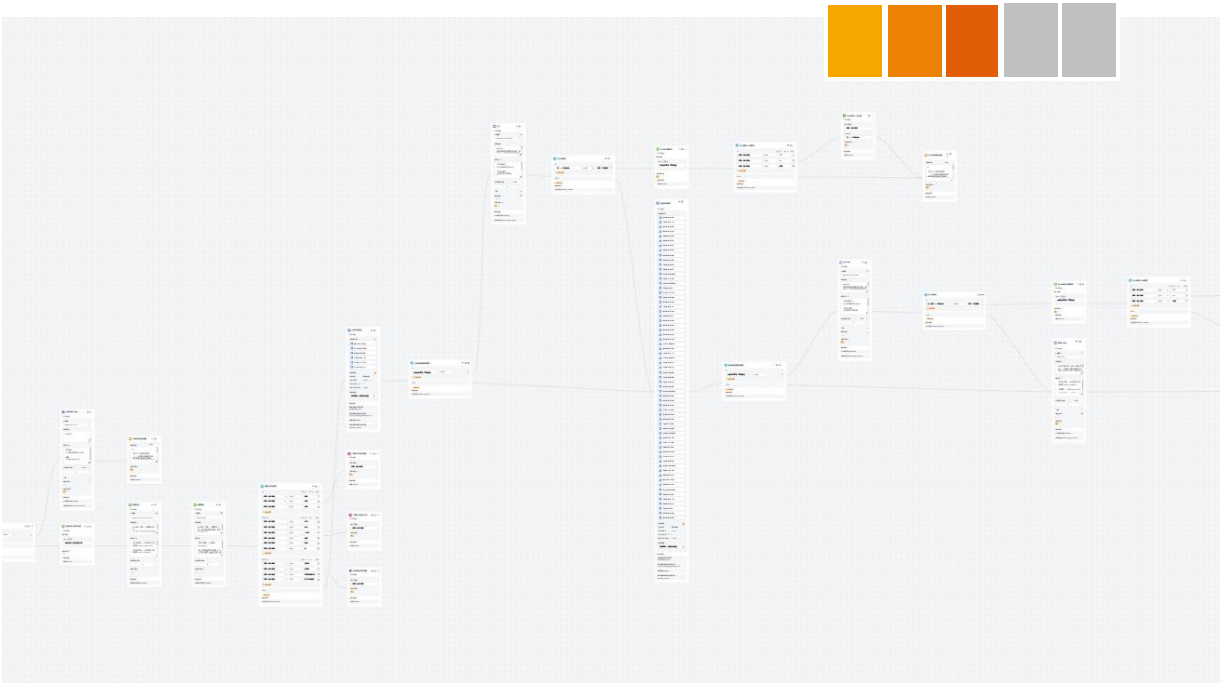


Fig. 3.2B: *RAG Architecture.*

**Source: python.plainenglish.io (Accessed Oct. 2025).*



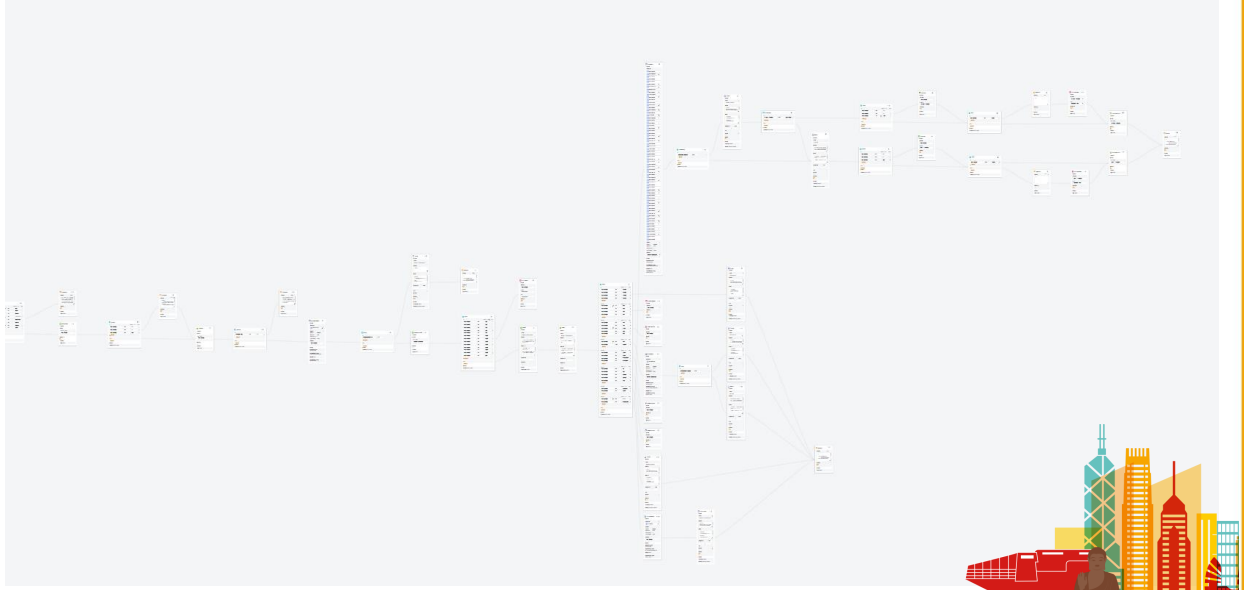


Fig. 3.3A: *Workflow Logic Diagram Samples of CSSDGPT.*

Step 4: Integrate System

Deliver the model and knowledge base as a secure, scalable cloud service - with cross-device access, front-cloud alignment, and continuous safeguards and monitoring.

4.1 User Access & Interface

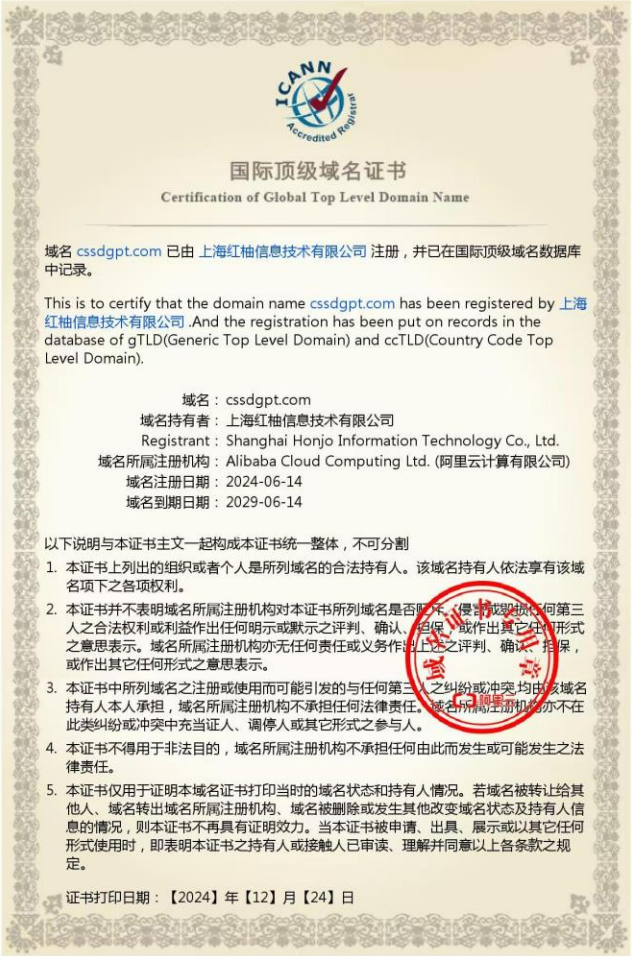
- **cssdgpt.com portal -** Provide an easy-to-remember access portal *(Fig. 4.1A)*.
- **Multi-platform access -** Enable smooth operation across different terminals and systems, with a WeChat login option aligned with local digital habits *(Fig. 4.1B)*.
- **Cross-device synchronization -** Ensure seamless user experience across devices, maintaining query history, usage tracking, quotas, and personalized settings consistently.

4.2 Scalable Cloud Hosting

- **Cloud deployment -** Host CSSDGPT on scalable cloud infrastructure, e.g., storage, CPU, memory, and bandwidth *(Fig. 4.2A)*.
- **Integration & workflow -** Integrate the fine-tuned model with the RAG-enabled knowledge base & execute multi-turn Q&A mechanisms.
- **Front–cloud alignment -** Connect the front-end portal with cloud infrastructure to synchronize configurations, performance, and user experience.

4.3 Security & Reliability

- **Data protection -** Apply access control, content filtering, and data-redaction mechanisms to protect patient-sensitive data and PII.
- **Abuse prevention -** Implement safeguards against malicious registration, spam queries, and automated attacks.
- **System monitoring -** Conduct real-time performance tracking, fault detection, and quick recovery to ensure continuous, stable service *(Fig. 4.3A)*.



国际顶级域名证书

Certification of Global Top Level Domain Name

域名 cssdgpt.com 已由 上海红柚信息技术有限公司 注册，并已在国际顶级域名数据库中记录。

This is to certify that the domain name cssdgpt.com has been registered by 上海红柚信息技术有限公司 .And the registration has been put on records in the database of gTLD(Generic Top Level Domain) and ccTLD(Country Code Top Level Domain).

域名：cssdgpt.com
域名持有者：上海红柚信息技术有限公司
Registrant：Shanghai Honjo Information Technology Co., Ltd.
域名所属注册机构：Alibaba Cloud Computing Ltd. (阿里云计算有限公司)
域名注册日期：2024-06-14
域名到期日期：2029-06-14

以下说明与本证书主文一起构成本证书统一整体，不可分割

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证书打印日期：【2024】年【12】月【24】日

Fig. 4.1A: *Registered Domain Certification of cssdgpt.com.*

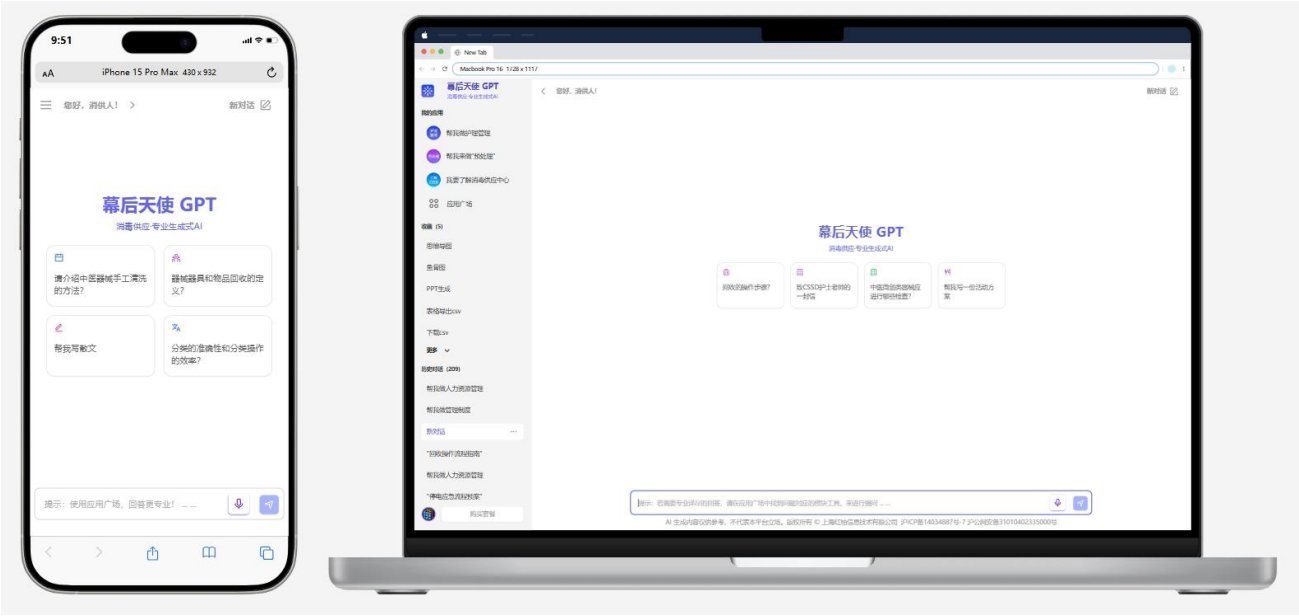

Fig. 4.1B: *CSSDGPT Interfaces on Mobile and Desktop Platforms.*

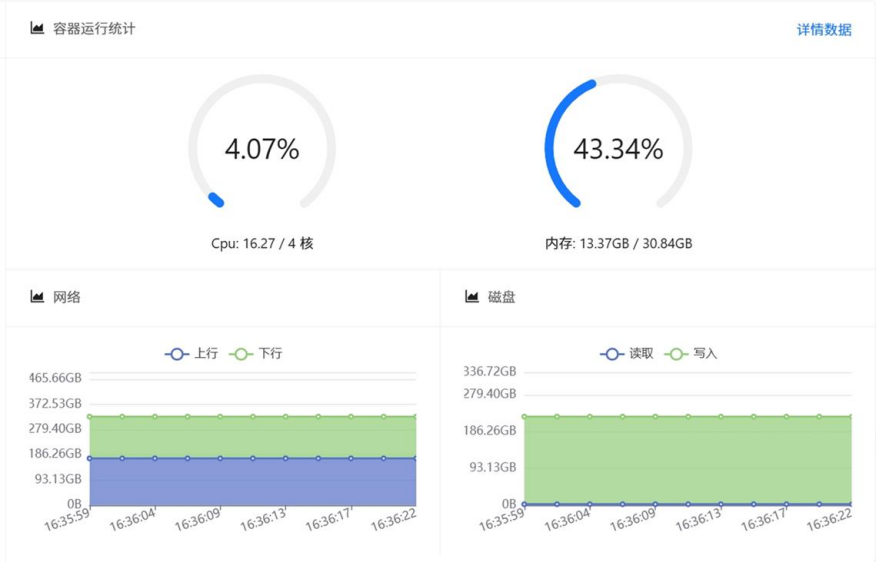

Fig. 4.2A: *Configurations of Cloud Resources (CPU, Memory, Storage, and Bandwidth).*

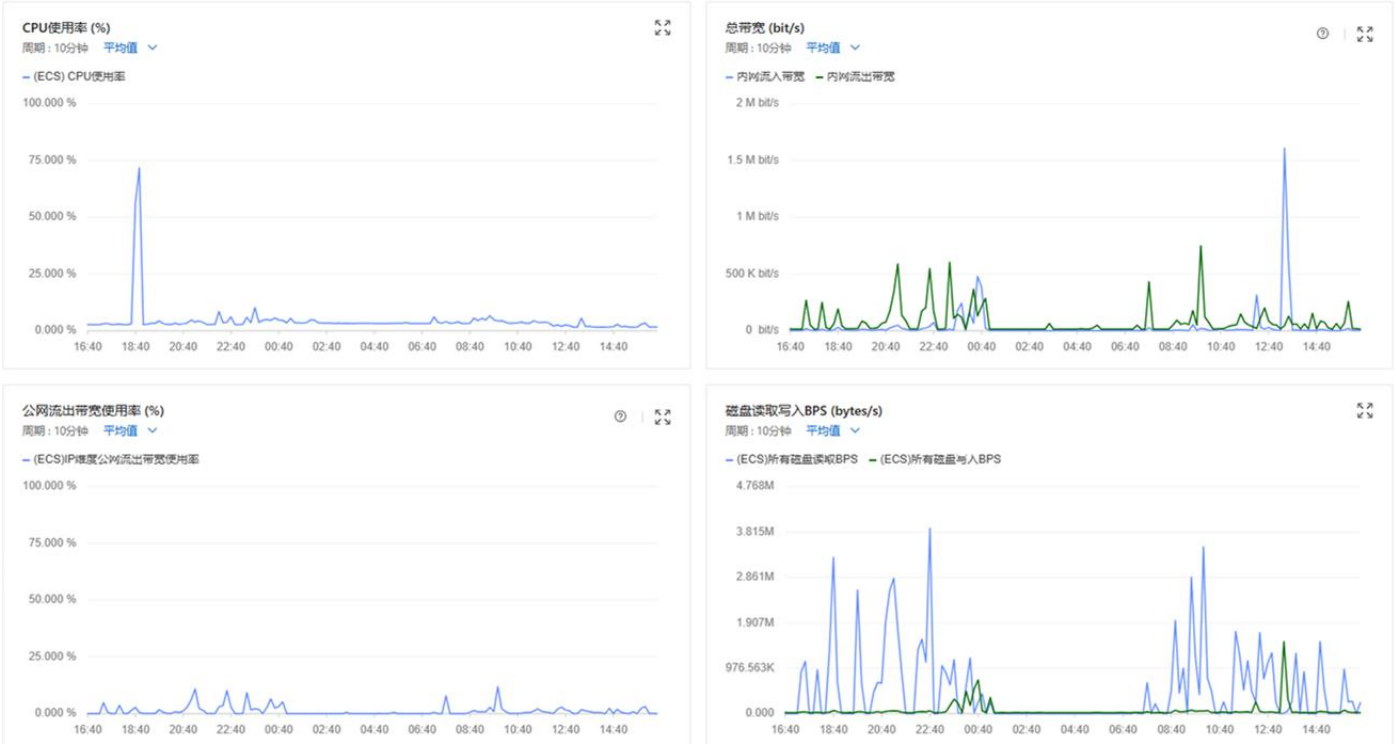

Fig. 4.3A: *Real-Time 24/7 Cloud Resource Monitoring.*

Step 5: Release & Iterate

Validate and pilot; launch and onboard; then measure, enhance, and expand features and content based on user feedback.

5.1 Test & Validate

- **Internal testing** (Dec. 2024) **-** Before release, the team conducted thousands of simulated questions and scenario tests to verify logic, accuracy, and stability.
- **Closed beta program** (Dec. 2024) **-** 30 invited professionals joined pilot testing, offering early feedback to refine usability and precision.
- **Quality assurance -** The validation process confirmed that CSSDGPT met practical and regulatory requirements before public launch.

5.2 Launch & Adoption

- **Official release** (Jan 1, 2025) **-** Launched through a 4-hour live online event, attracting over 1,000 registrants in a day *(Fig. 5.2A)*.
- **User onboarding -** A structured rollout through daily WeChat posts, livestreams, and videos introducing key functions and benefits *(Fig. 5.2B)*.
- **Performance assessment** (Apr. 2025) **-** Qualitative and quantitative analyses involving over 200 users evaluated accuracy, usability, and workflow impact *(Fig. 5.2C)*.

5.3 Improve & Expand

- **Feature enhancement -** Added voice queries, file upload/download, PPT generation, and visualization tools for charts and flowcharts.
- **Database renewal -** Continuously updated the database with new standards, regulations, and articles.
- **Additional tools -** Introduced themed modules, e.g., Nurses' Day, Sterilization Science Day, and Spring Festival Couplets, to foster CSSD culture and a sense of belonging *(Fig. 5.3A)*.

2025年1月24日 星期五

■编辑/谢文博 刘欣茹

电话:(010)64621090

健康报

HEALTH NEWS

AI技术助力消毒供应中心高效运营

近日,红柚信息发布生成式AI助手"幕后天使GPT",为医疗机构消毒供应中心工作人员提供作业辅助。据悉,该产品能够帮助医疗机构消毒供应中心工作人员更高效地完成日常工作,提升无菌物品的供应质量以及科室的运营效率。

社会进步和公众健康意识的提升,复用器械再处理国家标准与行业规范的日益严格,以及医疗技术和器械的飞速发展,对消毒供应中心从业人员的专业水平提出了更高的要求。"幕后天使GPT"致力于从专业角度提供精准指导。

在知识上,"幕后天使GPT"涵盖各类消毒剂使用方法、不同材质器械清洗要点、无菌技术基本原则等基础理论知识,满足工作人员学习需求;在管理上,提供包括人员管理、质量管理、设备管理、成本控制等在内的管理知识,帮助管理者优化流程,提高效率;在操作上,详细介绍各种消毒供应操作的步骤和注意事项,如器械预处理、清洗、消毒、包装、灭菌和储存等,帮助操作人员规范操作。

据了解,目前"幕后天使GPT"的注册用户已达数千人。其开发者、红柚信息总经理何取伟表示,下一步,红柚信息将快速、持续地对产品进行优化和升级,不断扩充其模块和功能,为消毒供应人员提供更全面、更深入的支持,助力医疗机构消毒供应中心高质量发展。

国际智慧消毒供应协会(IAISP)执行董事李东兵称,作为消毒供应行业首个生成式人工智能大模型,"幕后天使GPT"的问世标志着我国在引领国际消毒供应专科发展方面迈出了重要一步。

(王一晴)

Fig. 5.2A: *Launch Ceremony and Media Coverage of CSSDGPT in "Health News".*

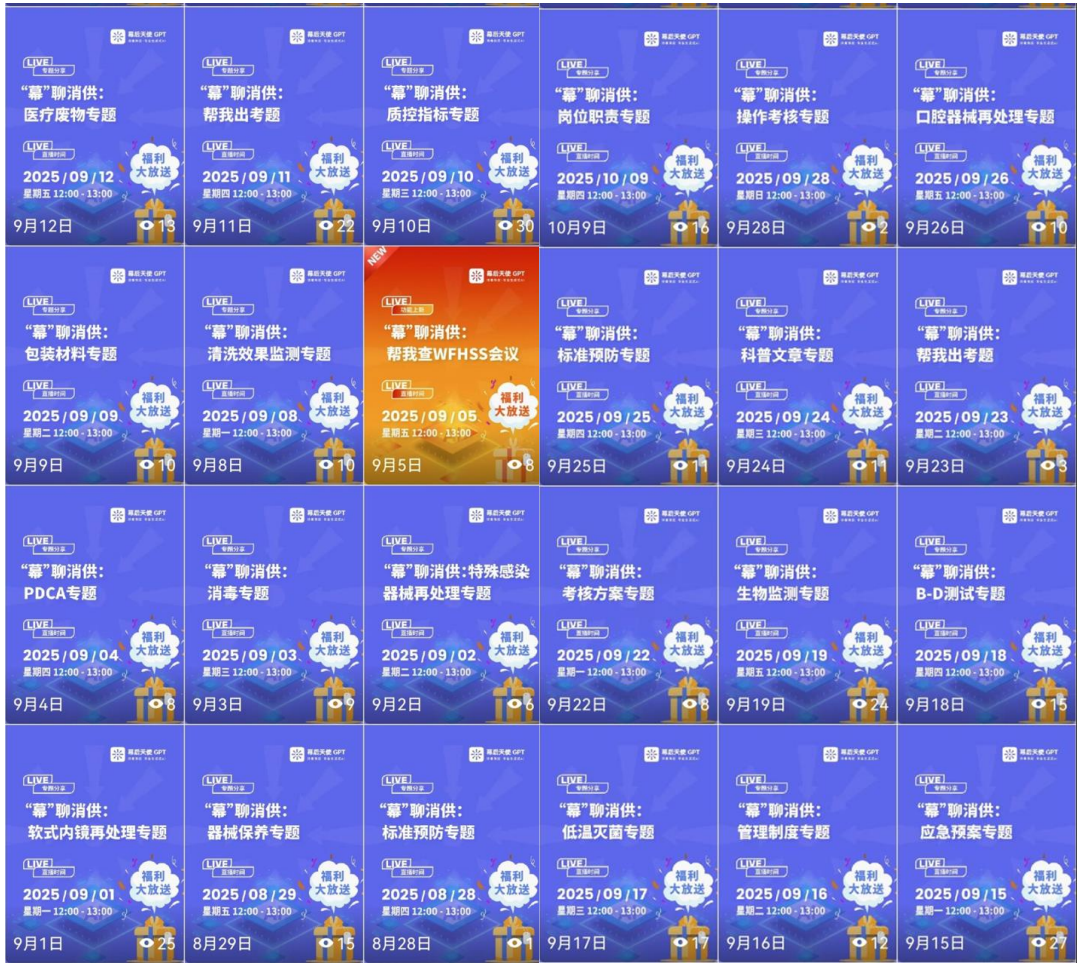

Fig. 5.2B: *Screenshot of the CSSDGPT Noon-Hour Livestream Preview (September 2025).*

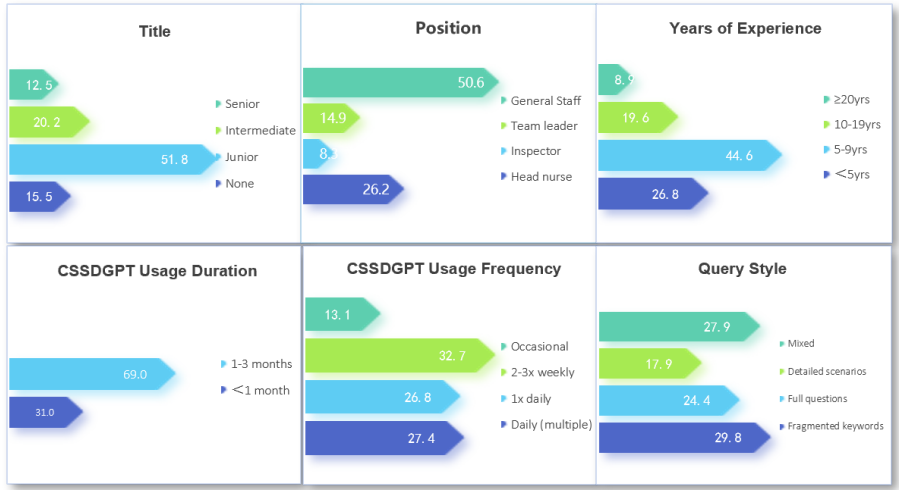

Table 4 Scores of User Satisfaction Evaluation Indicators for CSSDGPT

Evaluation Indicator	Weight	Score
Functional Value (U1)	0.079	0.367
Content Breadth (U2)	0.080	0.372
Decision Support (U3)	0.080	0.373
Efficiency Improvement (U4)	0.083	0.388
Content Accuracy(A1)	0.046	0.196
Standards Compliance (A2)	0.079	0.375
Professional Consistency (A3)	0.057	0.271
Detail Depth (A4)	0.058	0.279
Interface Friendliness (E1)	0.078	0.355
Interaction Naturalness (E2)	0.077	0.368
Result Readability (E3)	0.062	0.301
Learning Cost (E4)	0.052	0.211
Recommendation Intention (I1)	0.085	0.398
Continuous Usage Intention (I2)	0.085	0.397

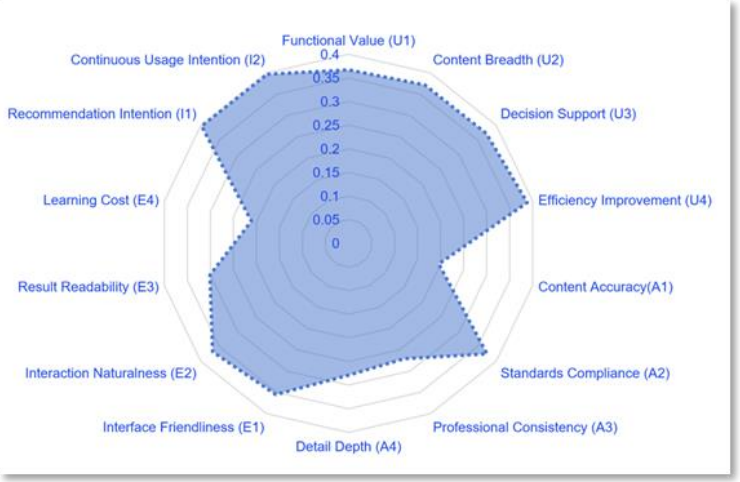

Fig. 5.2C: *User Profiles and Partial Survey Results (April 2025).*

Fig. 5.3A: *Sample Themed Modules in CSSDGPT.*

Recap: The HOW

01

Define Needs

Define users and stakeholders, pinpoint the problems to address, and set scope, privacy, and human-oversight boundaries.

02

Prepare Data

Collect, clean/structure, and integrate verified sources - building a reliable, up-to-date CSSDGPT knowledge base.

03

Develop Model

Configure the base model and infrastructure; fine-tune with RAG and citations; then orchestrate, evaluate, and optimize for performance.

04

Integrate System

Deliver the model and knowledge base as a secure, scalable cloud service - with cross-device access, front-cloud alignment, and continuous safeguards and monitoring.

05

Release & Iterate

Validate and pilot; launch and onboard; then measure, enhance, and expand features and content based on user feedback.

The WHAT: Now and The Road Ahead

- **Figures** (as of Oct 20, 2025)

Registered Users | 15,154

Submitted Questions | 334,509

Page Views | 592,116

- **The Road Ahead**
  - **Capability Expansion:** IFU retrieval, instrument identification, etc.
  - **International Access:** Global availability in English (*cssdgpt.AI, beta now!)* and additional languages.
  - **Workflow Integration:** Integrate with existing software and hardware.
  - **Automation & Robotics:** Connect devices/robots to link information, decisions, and actions.

WHY?

Needed
Deserved

HOW?

Define
Prepare
Develop
Integrate
Iterate

WHAT?

Information
Decisions
Actions

BRING THE STERILIZATION SCIENCE TO THE NEXT LEVEL

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