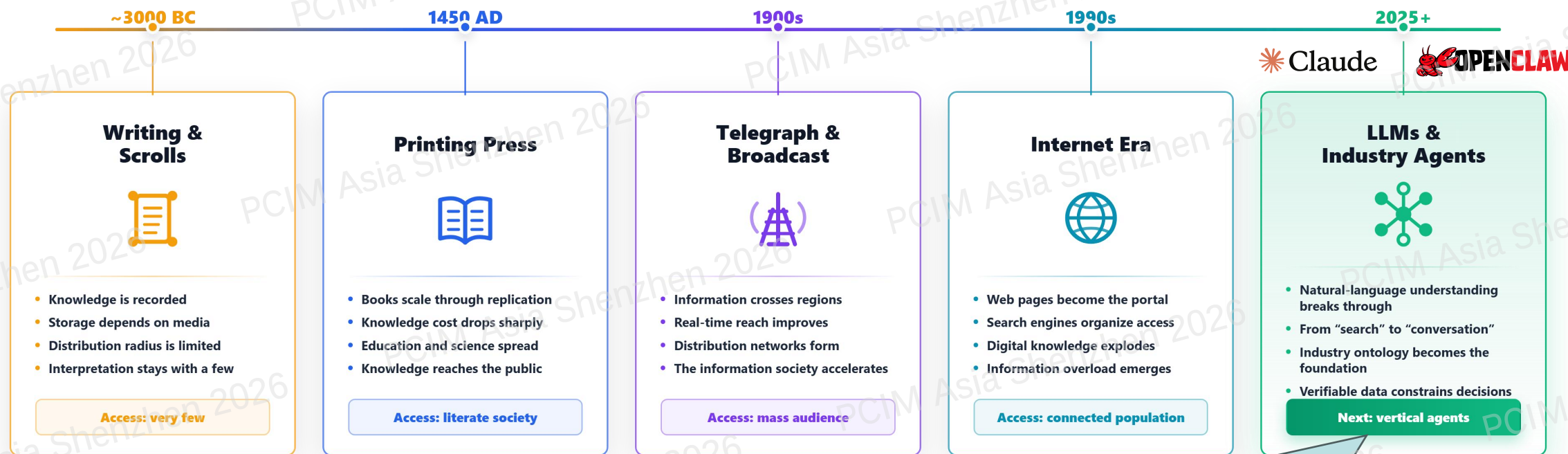


Understanding, Not Just Search Domain-Specific AI Agents for Semiconductor Engineering

Bo Zhang
Hangzhou Junction Magic Technology Co., Ltd.

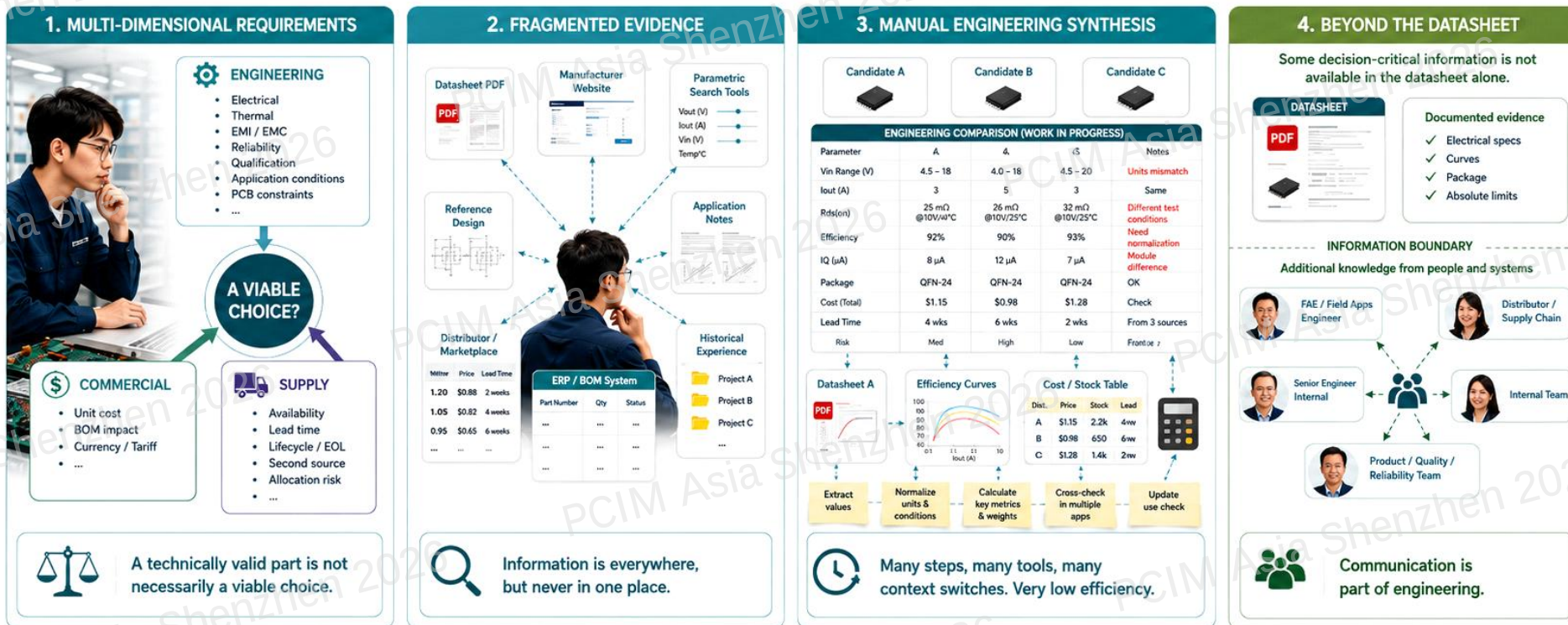
Information Technology Moves Faster and Faster, What's the Next?

Decisions Create Productivity(生产力)



The foundation of decision-making in Semiconductor: understandable-可理解, verifiable-可验证, and executable-可执行.

Issue1: Engineers Remain in Repetitive Work Because the Long and Fragmented Information-to-Decision Chain



1.8h/day

每位工程师花在信息查找上的时间

21% Lost

文档低效导致的生产力损失

30M+ Engineers

全球硬件相关工程师

Search gives you candidates. Understandable logic and verifiable evidence turn them into executable decisions

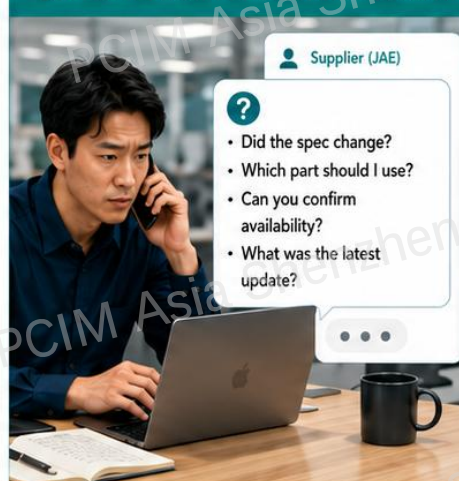
Issue2: Unsynchronized Knowledge and Repeated Confirmation goes down Collaboration

1. NEW PRODUCTS NEED REPEATED TRAINING



New product knowledge must be re-explained before different teams can support customers confidently.

2. PEOPLE FORGET DETAILS AND ASK AGAIN



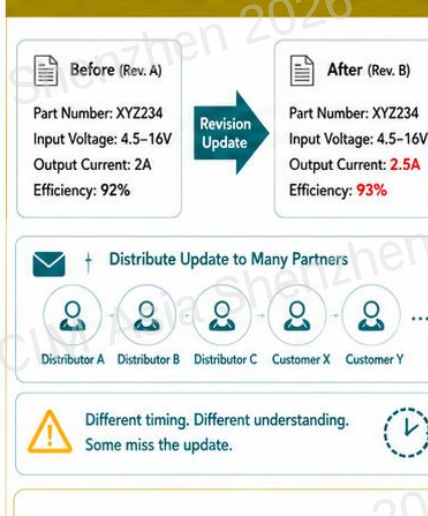
When knowledge stays in people's memory, details are forgotten and the same questions return.

3. ONE QUESTION TRIGGERS REPEATED INTERNAL CONFIRMATION



One request can trigger repeated cross-checking across sales, FAE, product, and supply chain teams.

4. PRODUCT CHANGES ARE HARD-TO SYNCHRONIZE



When product information changes, updates are hard to synchronize across partners, so needs are delayed and opportunities are missed.

2.7%+ Revenue

Fully loaded learning & knowledge-transfer cost

65% of workweek

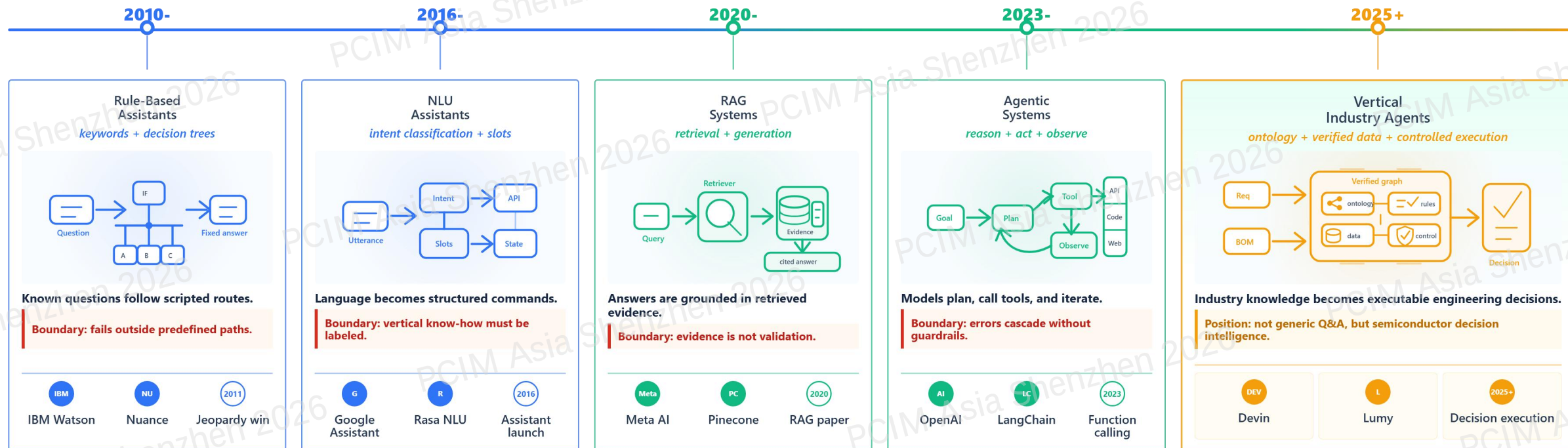
Spent on email, information search, and collaboration

\$12.9M / Year

Average annual cost of poor data quality

Beyond individual productivity, the real bottleneck is collaboration efficiency across teams and companies.

AI Has Evolved from Rule-Based Assistants to Vertical Agents for Executable Decisions



From useful answers to validated actions

Hallucination Risk

幻觉风险：答案看似合理，但不一定真实可靠。

Domain Depth Gap

垂类理解不足：缺少行业知识、业务语境和专业知识。

Live Data Gap

实时数据缺口：没有最新、可验证、可调用的业务数据。

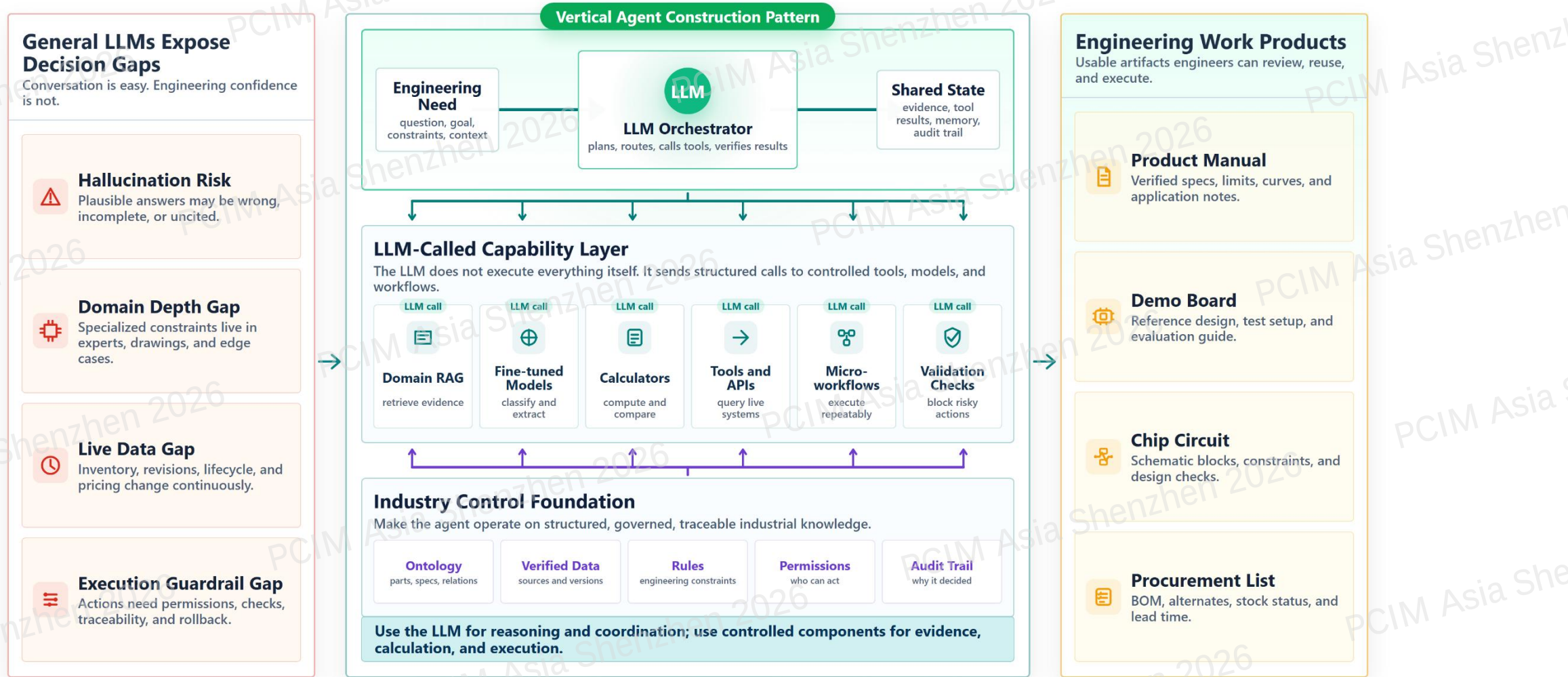
Execution Guardrails

可信度不足：从“回答”到“行动”还需要校验、验证和审批流程。



From General LLMs to Vertical Agents: Making AI Controllable for Engineering

LLMs for reasoning and coordination; use verified data, specialized models, tools, workflows, and guardrails for reliable execution.



Building Vertical Agents Starts with a High-Quality Industry Data Foundation

01



CONNECTED INFORMATION
Across Sources

02



REUSABLE KNOW-HOW
Lived in Peoples

03



TRUSTED DECISIONS
With Evidence and Checks

0 Data Processing Tech Stack

24/7 refresh · OCR · multimodal models · fine-tuning · RL · skills



24/7 Data Refresh
continuous source monitoring and updates



OCR Extraction
PDFs, tables, curves, images and schematics



Multimodal Models
understand text, diagrams, charts and layouts



Model Fine-tuning
adapt models to domain terms and tasks



Reinforcement Learning
improve extraction and decisions through feedback



Skill Accumulation
save expert workflows as reusable capabilities

Data Engine



1 Engineering Sources

Datasheets · Reference Designs · Technical Papers

Texas Instruments LMR33620
36 V, 2-A SIMPLE SWITCHER® Step-Down Converter

6.3 Electrical Characteristics

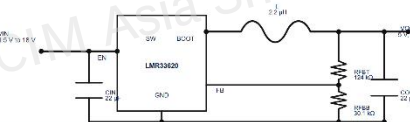
(T_J = 25°C, V_{IN} = 12 V, unless otherwise noted)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input voltage range		4.5	35	35	V
Output voltage	V _{OUT} = 1.2 V	1.85	1.250	1.262	V
Output current			2	2	A
Efficiency	V _{OUT} = 6 V, I _{OUT} = 2 A		90		%
Switching frequency		2.5			MHz

Efficiency vs Output Current



Output Voltage vs Output Current



4K+ Brands 80K+ Datasheets 13K+ Reference Designs 30K+ Technical Articles 2417K+ Chunks

2 Data Structures

Structured Data

- PPN / OPN
- Product identity
- Parameters
- Values & units
- Conditions

Example (Structured Fact): VIN = 4.5 – 18 V
For precise query, filter, and compare.



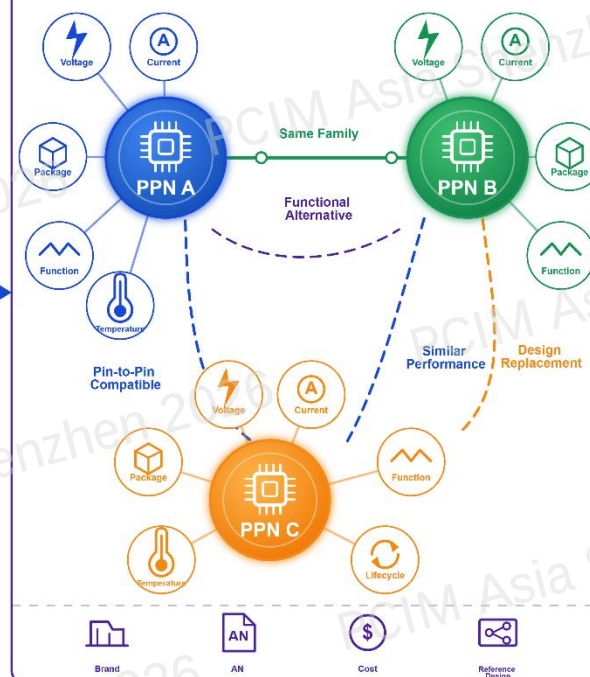
One fact, two views

Unstructured Data

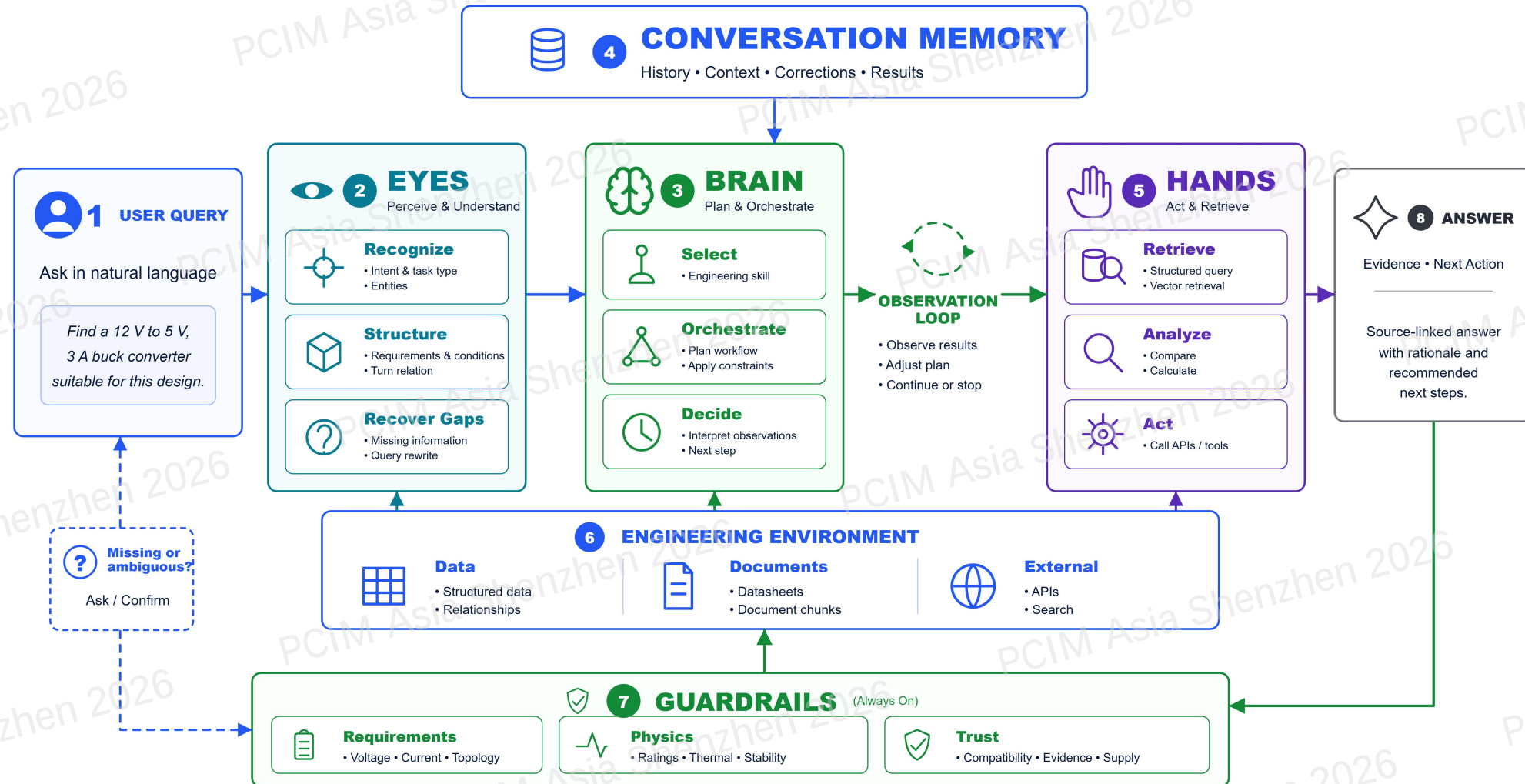
- Text
- Tables
- Curves
- Images
- Page / revision / source

Example (Source Evidence):
Datasheet · Rev. H · Page 6 · Table 6-1
Preserves original evidence and traceability.

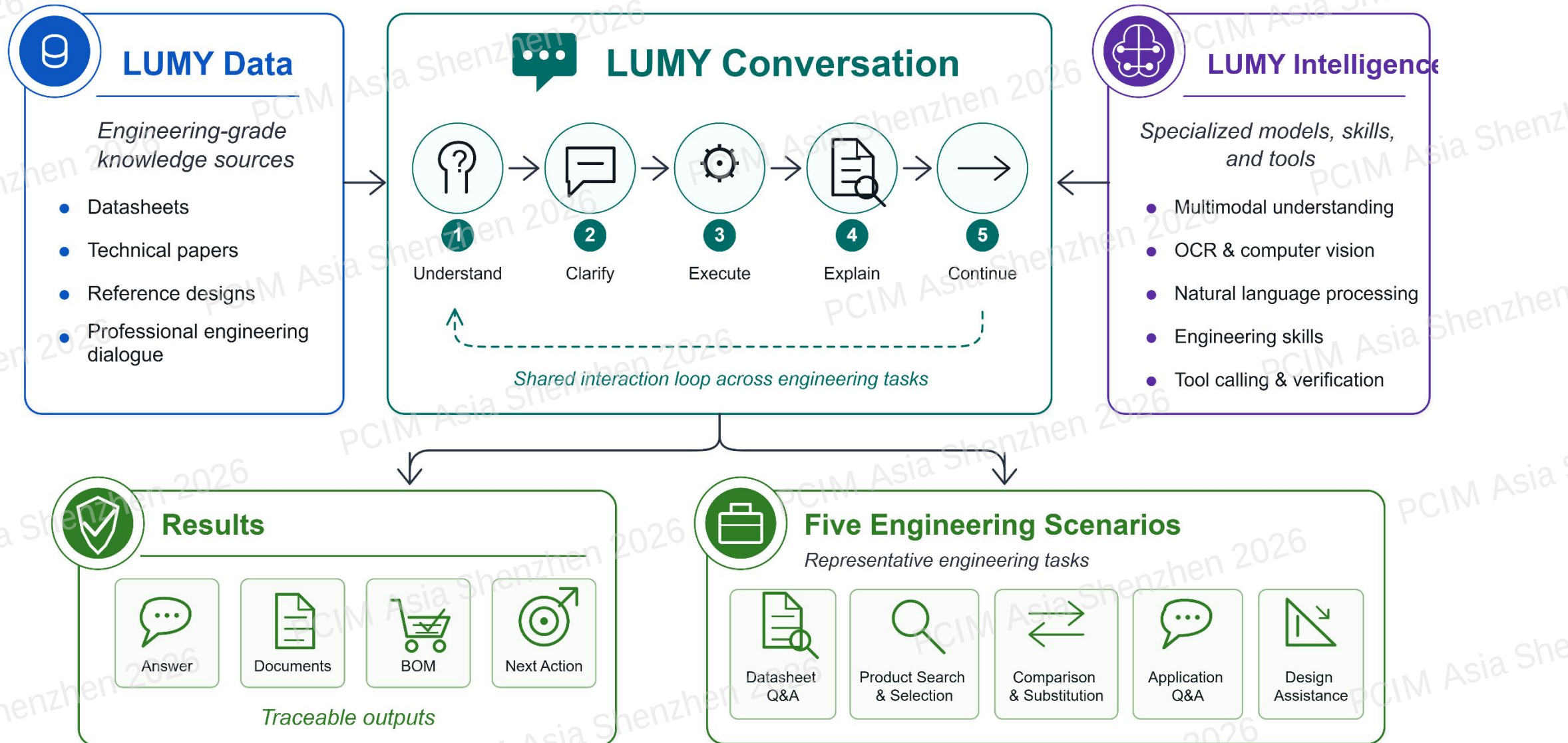
3 Product Relationship Graph



From Data Foundation to Agentic Execution: Building a Multi-Agent Collaboration System



LUMY Engineering Agent: Data, Dialogue, Intelligence, and Verified Outcomes



LUMY from Junction Magic

Junction Magic was founded in April 2025 in Hangzhou High-Tech Zone, one of Zhejiang's leading digital industry hubs. As an AI-native company, Junction Magic is dedicated to bringing advanced AI capabilities and data-driven intelligent systems to the semiconductor and hardware R&D industry.

The founding team brings over a decade of deep industry expertise across the semiconductor value chain, together with strong capabilities in AI engineering, agent architecture, industry data governance, and software platform commercialization. Junction Magic focuses on key workflows across the end-to-end hardware R&D lifecycle, including engineering knowledge management, enterprise data flow, design decision-making, supply chain management and optimization, and R&D collaboration. The company has built an AI-powered industrial collaboration platform that enables R&D-driven enterprises to move beyond traditional linear development models and transition toward a new generation of data-driven, intelligently collaborative, and human-AI co-creative R&D.

Junction Magic combines advanced large language model technologies with proprietary AI agent architecture, domain model adaptation, knowledge engineering, and enterprise-grade software platform development. Drawing on deep semiconductor value-chain know-how, the company has built a proprietary semiconductor database and industry-specific knowledge graph, which together serve as the foundation for LUMY, its specialized AI agent for semiconductor and hardware R&D workflows. With capabilities in autonomous task planning, tool orchestration, multi-source data retrieval, and domain-specific reasoning, LUMY supports critical engineering workflows including component selection and cross-reference matching, domestic-source alternative recommendations, circuit and reference design generation, design risk identification, intelligent analysis of manufacturer datasheets, application notes and technical documentation, as well as BOM and supply chain data integration.

Junction Magic is committed to building a China-developed digital R&D copilot for hardware engineers and engineering-driven companies, helping the electronics industry improve quality, efficiency, and independent innovation across the value chain.



愿景：打造硬件工程师与研发型企业的国产研发数字副驾驶

核心功能导航



管理历史对话
开启新对话

AI对话入口

典型问题



个人中心，先登录享受更多额度



长按开启语音输入、语音播报

相关产品卡片可
跳转至产品详情
页了解更多



一个对话框，覆盖工程师的五大高频场景



S1

资料解读

有型号，查一切：参数、封装、丝印、原理

“NCP1342最高开关频率？”



S2

应用答疑

判断特定条件下能否用、怎么用

“AW9962E支持4并6串吗？”



S3

对比替代

跨厂商找替代，多型号横向对比

“替代 MPQ8633A的国产型号？”



S4

方案选型

从需求反推推荐型号，含丝印反查

“推荐几款10W充电器芯片”



S5

故障分析

从异常现象定位原因，给排查步骤

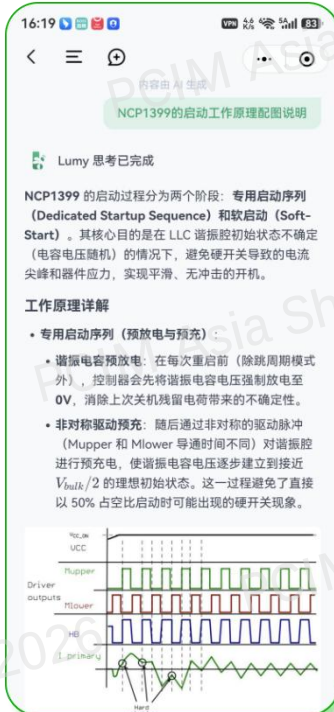
“正常输入时不启动，为什么？”

带来的效果：等效为企业内的数字员工——每个人身边的智能助手、智能队友、智能导师

核心能力——AI问答： 答案基于真实数据

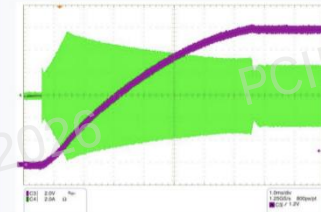


Real Data Presentation



关键设计要点

- **启动波形监测:** 在实际调试中, 应观察初级电流和输出电压波形。正常的启动波形应表现为频率从高到低平滑过渡, 初级电流无异常尖峰。



图注: Figure 52 展示了 NCP1399 驱动 LLC 应用的典型启动波形, 绿色为初级电流, 品红色为输出电压, 可见频率滑降过程。

- **软启动时间调整:** 软启动速度由内部选项决定的增量步长 ($t_{SS,INCREMENT}$) 和时钟分频系数 ($K_{SS,INCREMENT}$) 共同决定。若需更长的软启动时间以减小输入冲击, 可通过选择不同后缀的型号或在外围设计上配合更大的输出电容来实现。

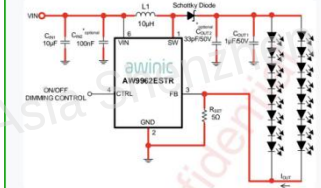
- **高压启动源:** 启动能量来自 HV 引脚 (Pin 1), 该引脚直接连接整流后的高压母线或大电容, 内部高压电流源为 VCC 电容充电直至达到启动阈值。

以上数据来自 Lumy 产品数据库，具体参数以厂家最新规格书为准。

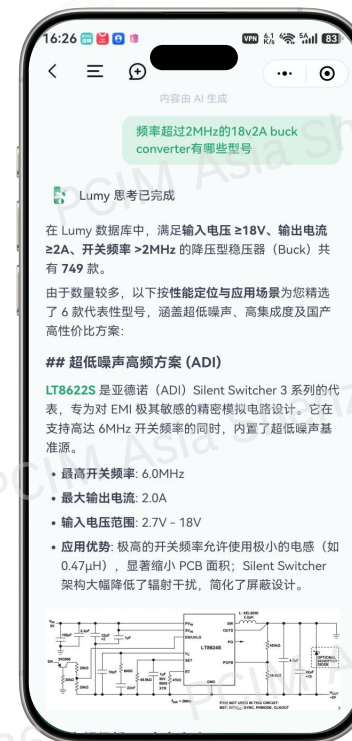
应用建议

如果您计划的单串 LED 电流较大 (如 $>150\text{mA}$) 或输入电压较低 ($<3.7\text{V}$), AW9962E 可能无法驱动 4 并 6 串的全负载。建议:

1. 降低并联数: 改为 2 并 6 串或 1 并 6 串。
2. 提高输入电压: 确保 V_{in} 接近 5V。
3. 选用更大电流能力的驱动: 如需更大功率, 可考虑开关电流限值更高的型号 (如 3A 或 4A 开关管的 Boost LED 驱动器)。



以上分析基于 Lumy 数据库收录的规格书数据, 实际应用建议在目标工况下实测验证。



LUMY

什么是 LUMY?



用AI技术重构产业新数据、准数据、好数据，形成行业知识大脑



Lumy模式

通过自然语言描述，**快速找产品、查替代、找方案、匹配供应商**



以数据跟模型驱动从选型、设计、采购的全链条协作与决策流程



自建行业数据系统与多模态推理模型，**回答全面、准确、无幻觉**



开放式生态定位，旨在构建芯片与用户间快速对接的桥梁



基于自研垂类智能体模型，**智能选型、文档写作、方案设计、比价寻源、技术答疑全链路智能化协作**



打造产业效率新引擎



4级产品型号体系、5级产品分类层级、6大数据链路、百余项单产品参数，**链路加工全自动化、数据颗粒度极细、数据更新延时极低**；实时监控产品生命周期、销售状态，**供应链风险管理成本极低**

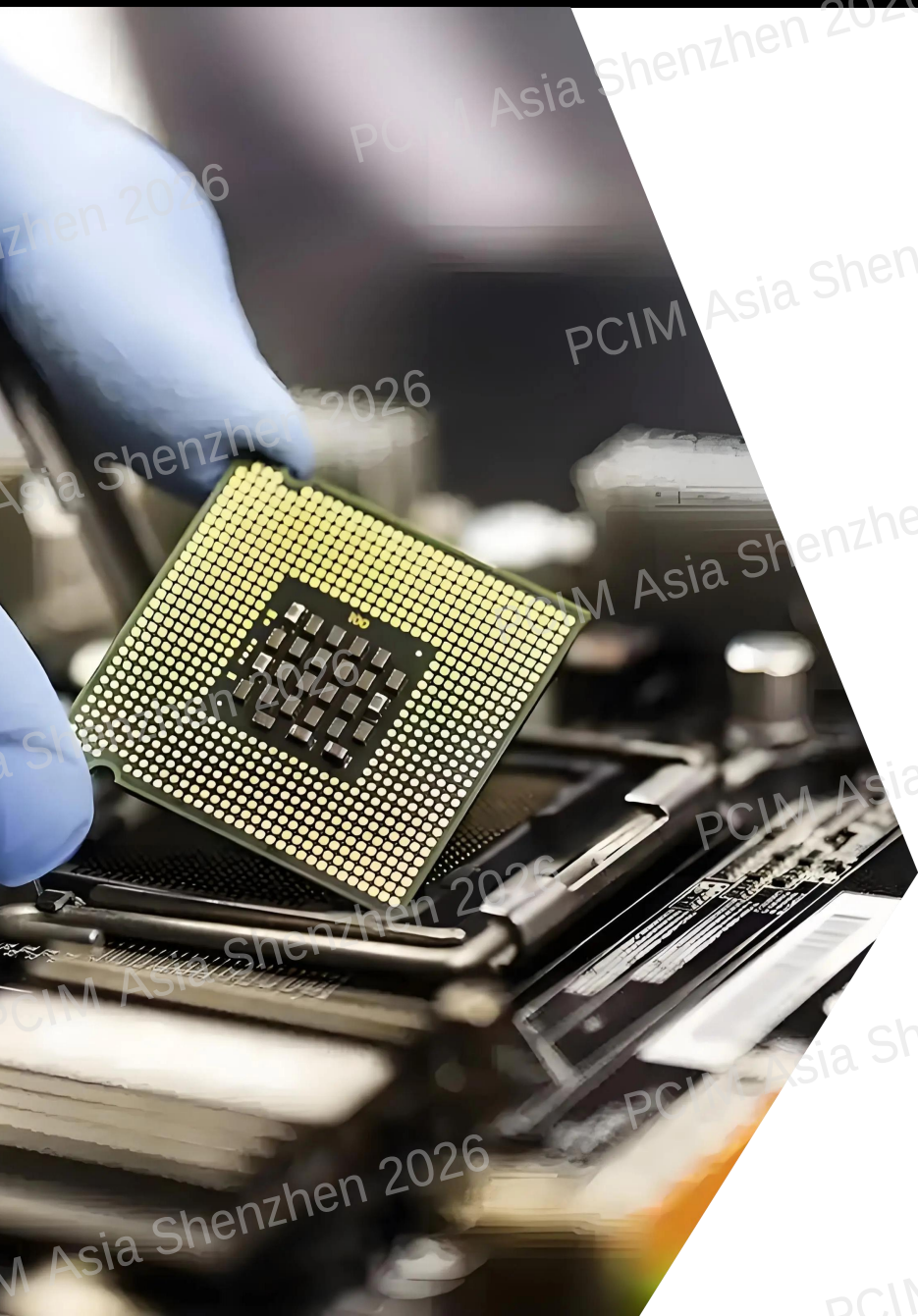
传统模式

只能根据物料型号查资料、查价格、查交期，**选型效率低**

通用大模型训练数据有周期、垂类知识有盲区，**答案有幻觉、答案精度低**

数据形态各异非结构化，工作流之间信息依靠**人工重复**搬运，服务离散片段化，**时间成本高、决策失误率高**

行业数据缺乏统一标准，体系混乱、层级少、错误率高，**大量人工投入，耗时耗力，产销研风险高难优化**



数据准 效率高



封装命名标准化: XXX个行业原始封装归一为XXX个封装, 封装选型命中率**98%+**

产品型号标准化: 4个型号层级——产品系列、产品家族、PPN、OPN

生命周期标准化: 3000余家企业的数据统一为5级生命周期

产品功能参数标准化: 100+项常见功能参数

时间短 效率高



界面功能响应时间<1s

AI问答响应时间<10s

数据更新上线时间<20分钟

好协作 效率高



关注通知: 产品生命周期、数据资料变更自动通知

收藏分享: 产品的智能收藏夹管理, 支持多端登录、团队分享, 随用随看

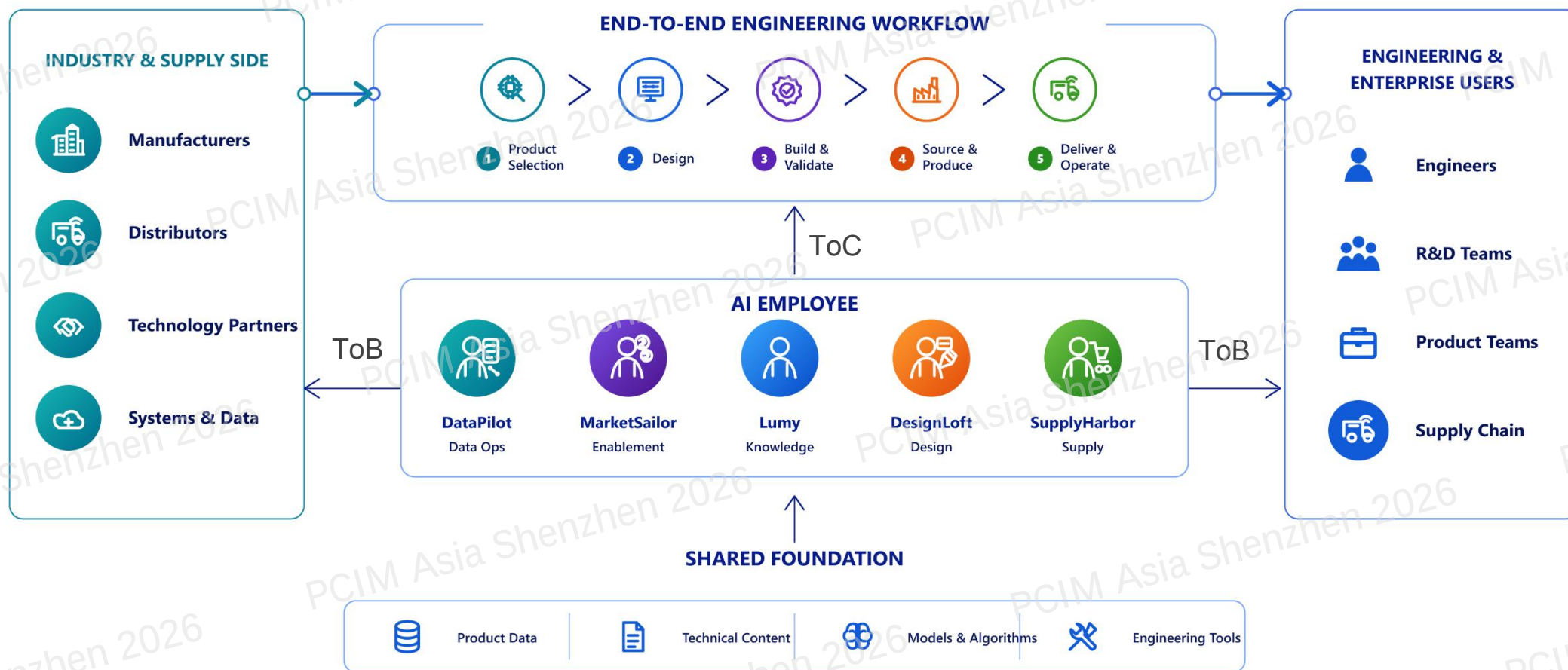
AI文档: 对话式生成文档, 可下载、可分享

AI问答: 不同角色不同回答, 深度适配角色需要, 千人千面

80家全球知名品牌电源管理芯片企业、**3万+**产品文档、**20万**订购产品型号

Lumy 的目标：打造面向半导体未来的端到端产业智能

连接产业供给、工程流程、AI Employee 与企业用户，让智能覆盖半导体产业链的每个关键环节。



LUMY

www.lumychip.com

2026

Impact
Report

Hangzhou, China

立足国内，走向全球



微信搜索启动

打开微信App，在顶部
搜索栏中输入关键词
“Lumy”进行检索



进入Lumy官网

www.lumychip.com
支持更大视窗、更多功
能、更好的体验



即开即用核心功能

手机、PC端都支持，进
入后即可立即使用所有
核心功能



微信扫码 · 立即体验 LUMY 小程序