

Supplementary Material

Large Language Model Multiagent Systems for Industrial Problem Discovery and Prioritization

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S1. Included sources, with stream and concept classification

This table lists every source on which the synthesis in the main article draws. There is no separate uncited corpus: all 61 sources listed here are cited in the main text, and every source cited in the main text appears here.

Sources are grouped by the stream to which they were assigned during screening and then tagged with the concept under which they were synthesised, following the procedure described in Section 2.4 of the main article. A fourth group, *Methodology and decision analysis*, holds the methodological and decision-analytic references that support the review procedure and the prioritisation model rather than belonging to any of the three substantive streams; these were not retrieved through the database searches of Table 1 but were added because the article makes claims that depend on them.

Group totals: Stream 1, 8 sources; Stream 2, 27; Stream 3, 20; Methodology and decision analysis, 6. Total 61.

A dagger ([†]) marks the 21 sources added during the revision of August 2026. These fall into three groups: items returned by the repeated database searches described in Section 2.1 of the main article, most of them the industrial LLM agent systems now discussed in Section 5.4; three items suggested by a reviewer; and methodological, standards and model-evaluation references added to support specific claims that the submitted version made without citation. Sources without a dagger were in the originally submitted version. A double dagger ([‡]) marks three entries that were retained from the submitted version but whose bibliographic metadata was corrected against the publisher record during this revision.

Source	Year	Concept	Type
Stream 1: Industrial problem identification (8 sources)			
Stamatis, D.H.	2003	Method: FMEA	Book
Mobley, R.K.	2002	Method: predictive maintenance practice	Book
Jebbor, I., Benmamoun, Z., Hachimi, H. [†]	2026	Method: quantitative appraisal of lean outcomes	Journal article, in press
Benmamoun, Z., Hachimi, H., Amine, A. [†]	2018	Method: inventory modelling for working capital	Journal article
IATF 16949 [†]	2016	Standard: automotive quality management	Published standard
AIAG and VDA FMEA Handbook [†]	2019	Standard: FMEA method reference	Handbook
ISO 13485 [†]	2016	Standard: medical device quality management	Published standard
ISO 14971 [†]	2019	Standard: risk management for medical devices	Published standard
Stream 2: LLM-based agents (27 sources)			

Source	Year	Concept	Type
Achiam, J. et al.	2023	Model capability	Technical report (arXiv)
Anthropic	2024	Model capability	Technical report
Brown, T. et al.	2020	Model capability	Conference paper
Wei, J. et al.	2022	Model capability: chain-of-thought	Conference paper
Zhao, W.X. et al.	2023	Model capability: survey	Preprint (arXiv)
Schick, T. et al.	2024	Agent architecture: tool use	Conference paper
Shinn, N. et al.	2023	Agent architecture: self-reflection	Conference paper
Yao, S. et al.	2023	Agent architecture: reasoning and acting	Conference paper
Significant Gravitas (Auto-GPT)	2023	Agent architecture	Software repository
Nakajima, Y. (BabyAGI)	2023	Agent architecture	Software repository
Wang, G. et al. (Voyager)	2023	Agent architecture: embodied agent	Preprint (arXiv)
Wang, L. et al.	2024	Agent architecture: survey	Journal article
Xi, Z. et al.	2023	Agent architecture: survey	Preprint (arXiv)
Lewis, P. et al. [†]	2020	Agent architecture: retrieval augmentation	Conference paper
Hong, S. et al. (MetaGPT)	2024	Collaboration protocol	Conference paper
Qian, C. et al. (ChatDev)	2024	Collaboration protocol	Conference paper
Wu, Q. et al. (AutoGen)	2023	Collaboration protocol	Preprint (arXiv)
Li, G. et al. (CAMEL)	2024	Collaboration protocol	Conference paper
Park, J.S. et al.	2023	Collaboration protocol: social simulation	Conference paper
Chase, H. (LangChain)	2022	Collaboration protocol: infrastructure	Software repository
Du, Y. et al.	2023	Debate and consensus	Preprint (arXiv)
Liang, T. et al.	2023	Debate and consensus	Preprint (arXiv)
Chan, C.-M. et al. (ChatEval)	2023	Debate and consensus: evaluation	Preprint (arXiv)
Guo, T. et al.	2024	Multi-agent systems: survey	Preprint (arXiv)
Ji, Z. et al. [†]	2023	Evaluation: hallucination	Journal article
Turpin, M. et al. [†]	2023	Evaluation: faithfulness of explanations	Conference paper
Panickssery, A. et al. [†]	2024	Evaluation: self-preference bias	Conference paper
Stream 3: AI in manufacturing (20 sources)			
Jardine, A.K. et al.	2006	Predictive maintenance	Journal article
Lei, Y. et al.	2020	Predictive maintenance	Journal article
Carvalho, T.P. et al.	2019	Predictive maintenance: review	Journal article
Dalzochio, J. et al.	2020	Predictive maintenance: review	Journal article
Zonta, T. et al.	2020	Predictive maintenance: review	Journal article
Leitão, P.	2009	Pre-LLM agent systems	Journal article
Monostori, L. et al.	2006	Pre-LLM agent systems	Journal article
Shen, W. et al. [†]	2006	Pre-LLM agent systems	Journal article
Makatura, L. et al. [†]	2023	LLM applications: design and manufacturing	Preprint (arXiv)
Khlie, K. et al. [†]	2024	LLM applications: supply chain	Conference paper
Xia, Y. et al. [†]	2023	LLM agent systems: production control	Conference paper
Zhao, Z. et al. [†]	2026	LLM agent systems: shopfloor scheduling	Journal article
Jannelli, V. et al. [†]	2025	LLM agent systems: supply chain consensus	Journal article
Shyalika, C. et al. (SmartPilot) [†]	2025	LLM agent systems: manufacturing assistant	Conference paper
Henkel, V. et al. [†]	2026	LLM agent systems: systematic review and TRL assessment	Preprint (arXiv)
Tang, Y. et al. [†]	2025	LLM agent systems: survey	Preprint (arXiv)
Lee, J., Kao, H.-A., Yang, S.	2014	Industry 4.0	Conference paper
Xu, X. et al.	2021	Industry 5.0	Journal article

Source	Year	Concept	Type
Maddikunta, P.K.R. et al. [‡]	2022	Industry 5.0: survey	Journal article
Tao, F. et al. [‡]	2019	Digital twin	Journal article
Methodology and decision analysis (6 sources)			
Webster, J., Watson, R.T.	2002	Review method: concept-centric	Journal article
Page, M.J. et al. (PRISMA 2020) [†]	2021	Review method: reporting standard	Journal article
Saaty, T.L.	1980	Decision analysis: AHP	Book
Hwang, C.-L., Yoon, K.	1981	Decision analysis: TOPSIS	Book
Emerson, P. [†]	2013	Decision analysis: Borda count	Journal article
Roy, B. [†]	1991	Decision analysis: outranking, non-compensatory	Journal article

Note on the corpus figure

The originally submitted manuscript reported a corpus of 65 sources against a bibliography of 44. That figure counted records read during screening but not retained, and reporting it as the corpus was an error. It has been withdrawn. The article now cites 61 sources, all of which are listed above.

S2. Reproducing the worked calculation

Every intermediate value of the worked calculation in Section 6.6 of the main article is printed there, so the calculation can be reproduced by hand or in a spreadsheet from the following inputs:

- the pairwise comparison matrix of Equation (5), from which the criteria weights follow by the row geometric mean method;
- the decision matrix of Table 4, normalised by columns using the vector norm and weighted by those criteria weights;
- the six agent rankings listed in Section 6.6, scored $n - r$ points for rank r and normalised by $m(n - 1) = 24$;
- the six agent financial estimates of Table 3, from which the medians and interquartile ranges follow.

All of these inputs were constructed by the authors for illustration. They are not measurements, and no plant, agent or model produced any of them.