

AI4SE & SE4AI Conference 2026 | Washington DC

Absent by *Design*

A Systematic Literature Review uncovering structural gaps between AI advancement and Enterprise Systems implementation practices.

Navendu Bhatt
Dr Kishore Pochiraju

Department of Systems Engineering
Stevens Institute of Technology
Hoboken, NJ 07030

The ERP Implementation Paradox

Why AI advancement has not solved a 30-year problem

ERP: The Persistent Failure Problem

30-year failure record: ERP implementations remain among the most failure-prone enterprise programs in modern organizations.

RE is the Root cause: Requirements Engineering deficiencies like poor capture, misalignment, inadequate fit-gap analysis (Umble et al., 2003; Al-Mashari et al., 2003).

Fit-gap is the bottleneck: Fit-gap analysis determines implementation scope, cost, and risk, yet current methods are manual and expert-dependent (Ancveire, 2018).

Methodology stagnant: ERP implementation approaches have not evolved to incorporate AI despite a decade of AI advancement (Wynn et al., 2024).

AI: Rapid But Disconnected Advancement

Phase 1 (2015–2019): Rule-based NLP for requirements extraction and classification.

Phase 2 (2020–2022): ML and deep learning for classification, ambiguity detection, semantic modeling.

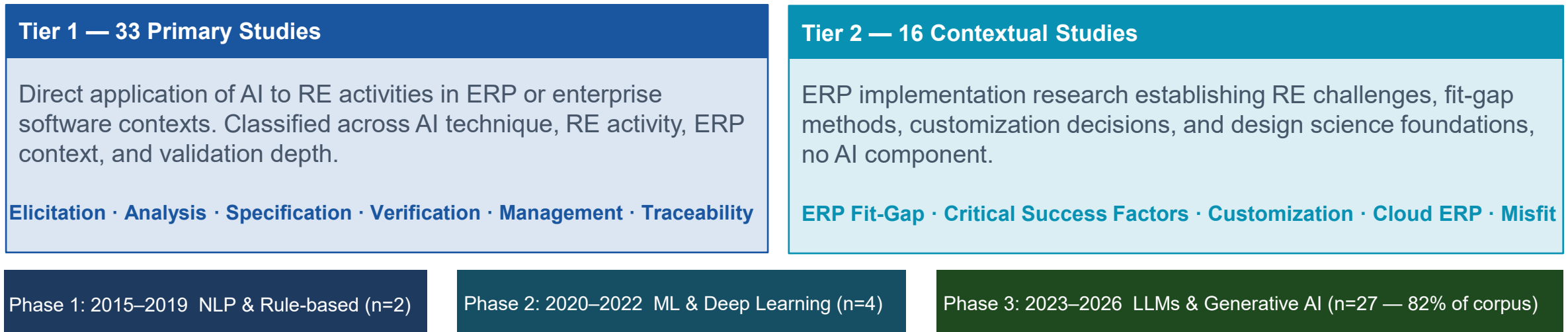
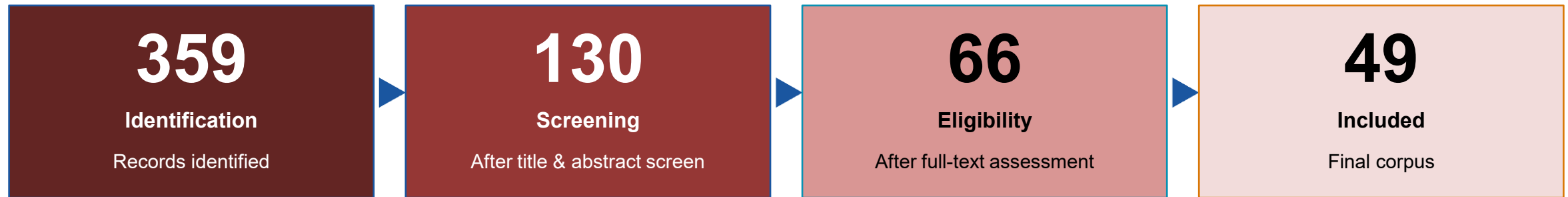
Phase 3 (2023–2026): LLMs for specification generation, completeness checking, quality assessment (Li et al., 2024; Cheng et al., 2026).

The disconnect: AI capabilities advance rapidly but always outside ERP implementation contexts (Mannan et al., 2025; Önden, 2026).

Neither field has built toward the shared methodology that the convergence of AI capability and ERP implementation need demands.

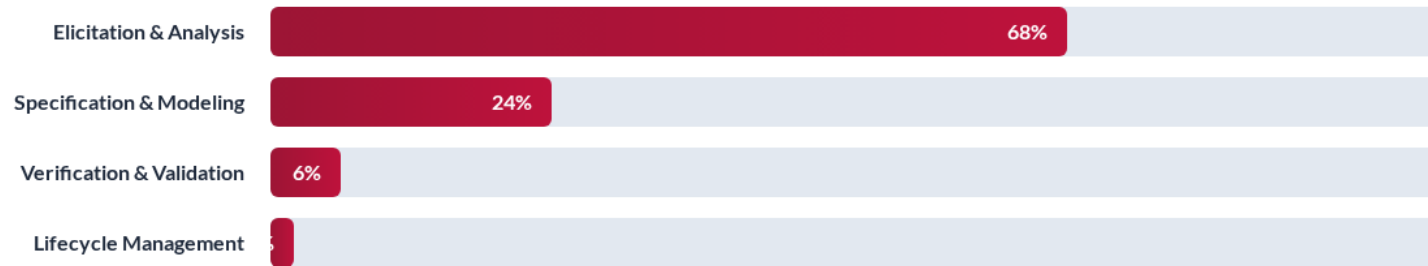
Research Method: PRISMA Systematic Review Protocol

49 studies | IEEE Xplore + ACM DL + ScienceDirect | 2015–2026



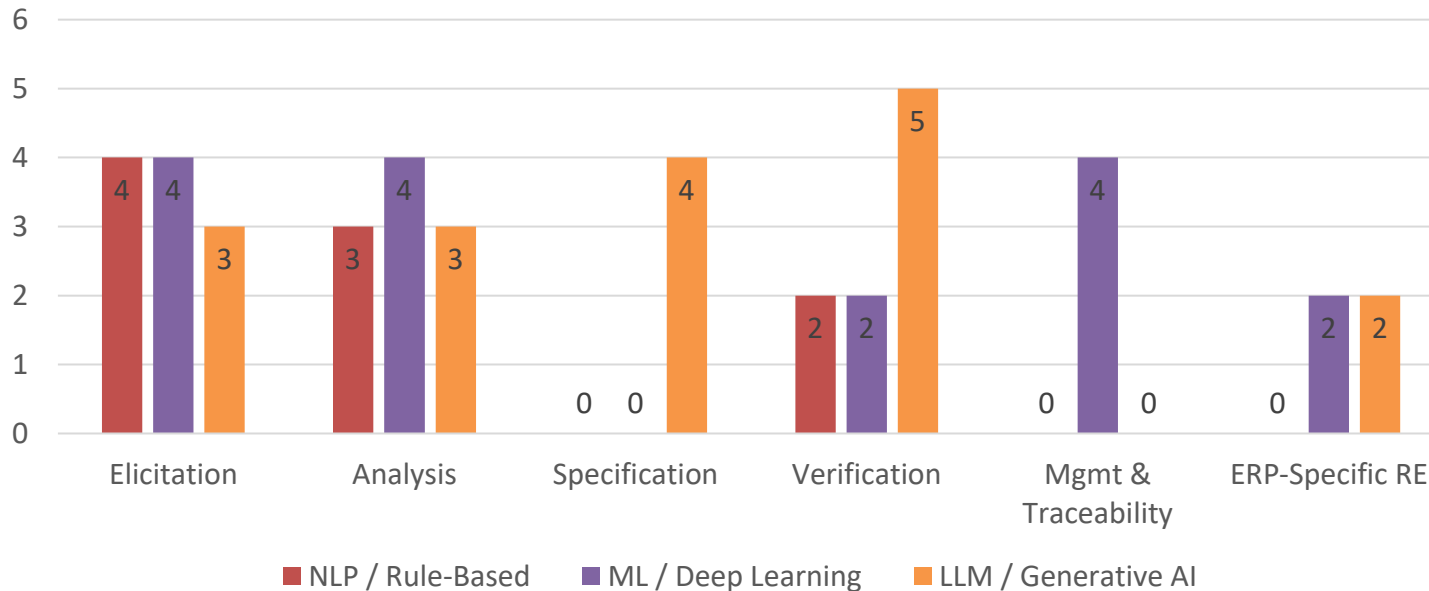
Finding 1: AI Is Front-Loaded — Elicitation & Analysis Dominate

29 of 33 primary studies address only early-stage RE activities



⚠ Front-Loading

- Elicitation + Analysis = 88% of non-ERP primary studies.
- Verification: only 9 studies.
- Lifecycle Management: 4 studies.



📊 Phase 3 Replicates the Pattern

82% of studies (n=27) published 2023–2026. LLMs are more capable but the structural front-loading bias is unchanged.

Only 4 studies address the AI + RE + ERP intersection

Findings 2 & 3: Empirical & Fit Gap

Two structural absences that define the gap

Finding 2 — Empirical Validation Deficit

0

of 33 studies
validated in a live
ERP environment

- 13 SLRs / mapping studies
- 7 experimental on benchmark datasets
- 3 conceptual / roadmap papers
- 10 mixed-methods (no ERP deployment)

Reproducibility inconsistencies identified even in controlled NLP-for-RE studies (Abualhaija et al., 2024).

Finding 3 — Fit-Gap Analysis Has No AI Counterpart

What is fit-gap analysis?

The systematic mapping of organizational requirements against standard ERP capabilities to determine configuration, customization, or process redesign decisions. It sets project scope, cost, and risk — before a single line of configuration is written.

- **Ancveire (2018):** Manual, expert-dependent, not amenable to automation.
- **Wynn et al. (2024):** ERP implementation methodology has not evolved to incorporate AI.
- **Closest attempt:** Maged & Kassem (2024): NLP in ERP modeling, post-elicitation only.
- **Literature result:** Zero primary studies apply AI to upstream fit-gap identification.

The AI-Native ERP Implementation Methodology Gap

A structural void: The technical components exist — an integrated, validated methodology does not

THE GAP

1. Activity Fragmentation

29 of 33 studies address elicitation or analysis only.
No study spans >2 RE phases.

2. Fit-Gap Analysis Absence

Zero primary studies apply AI to the core ERP RE activity: Fit-Gap Mapping.

3. Empirical Validation Deficit

All 33 primary studies validate outside live ERP deployment contexts.

4. ERP Contextual Misalignment

Only 4 studies reach the AI + RE + ERP intersection.

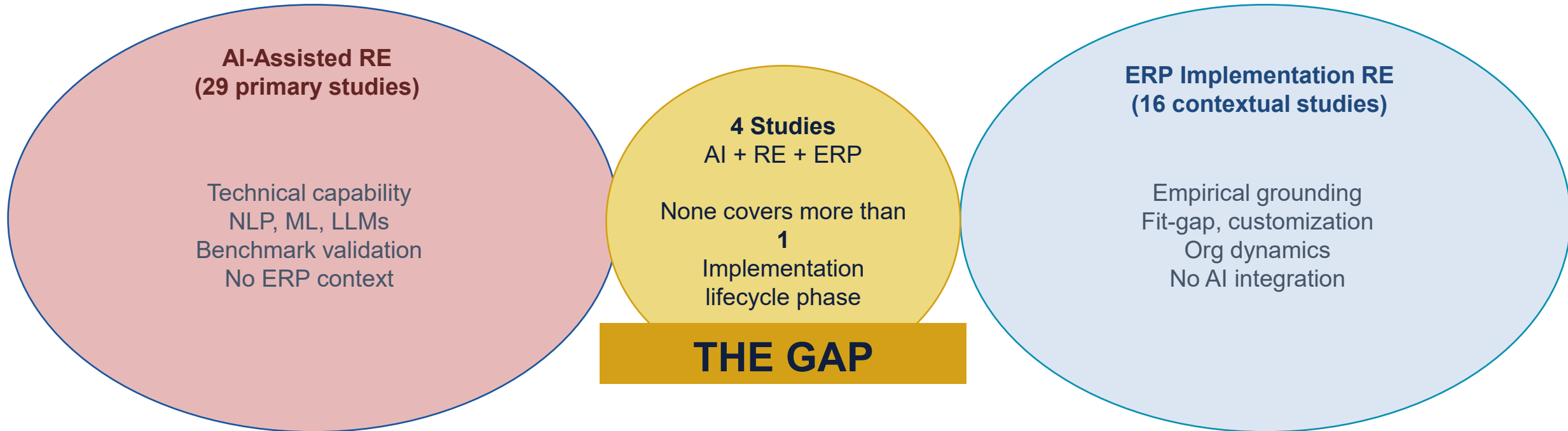
5. Sociotechnical Imbalance

AI addresses technical RE. Stakeholder dynamics and human-AI collaboration absent.

These five dimensions are mutually reinforcing. The gap is not incidental. It has persisted through three generations of AI technique advancement.

The Three-Way Structural Separation

Two Rich Set of Literatures – ZERO Intersection and NO Shared Methodology



Community Fragmentation

SE venues vs IS venues: Different foundations, no cross-citation

Commercial Access Barriers

Fit-gap data, test libraries, go-live logs:
Commercially sensitive

No Methodological Anchor

Without a validated example, studies address local tasks only

Research Roadmap & Frontier Challenges



Domain-Grounded Prompt Architectures: Developing LLM prompt engineering tailored to canonical ERP process models (e.g., SAP Signavio, Oracle Modern Best Practice).



Sociotechnical Human in the Loop Design: Balancing automated fit-gap recommendation algorithms with expert consultant oversight and domain validation.



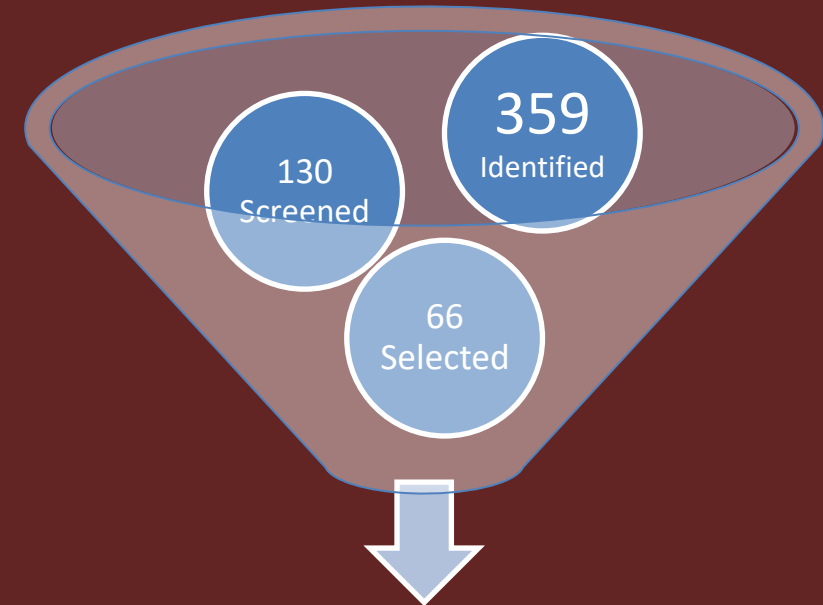
Empirical Industrial Benchmarking: Establishing open, anonymized ERP implementation datasets to enable reproducible AI-assisted RE benchmarking.

Thank You

Questions & Discussion

Navendu Bhatt
Dr Kishore Pochiraju

Department of Systems Engineering
Stevens Institute of Technology
Hoboken, NJ 07030



0

Live ERP validations
In 33 primary studies

49

Studies reviewed
PRISMA protocol

0

AI fit-gap methods and beyond
In entire literature

"Absent by Design: A Systematic Literature Review of AI-Assisted Requirements Engineering in ERP Implementations"
Navendu Bhatt, Dr Kishore Pochiraju