

Agentic Business Process Management: A Research Manifesto

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Outcome of **Dagstuhl Seminar 25192 AUTOBIZ**: Pushing
the Boundaries of AI-Driven Process Execution and
Adaptation <https://www.dagstuhl.de/25192>



Introduction

“Traditional” BPM = Automation-oriented, process-aware systems executing predefined activities and tasks

- **Robotic** Process Automation (RPA)
- Robots perform repetitive, clearly defined tasks

Agentic BPM (ABPM) = Autonomy-oriented process-aware systems

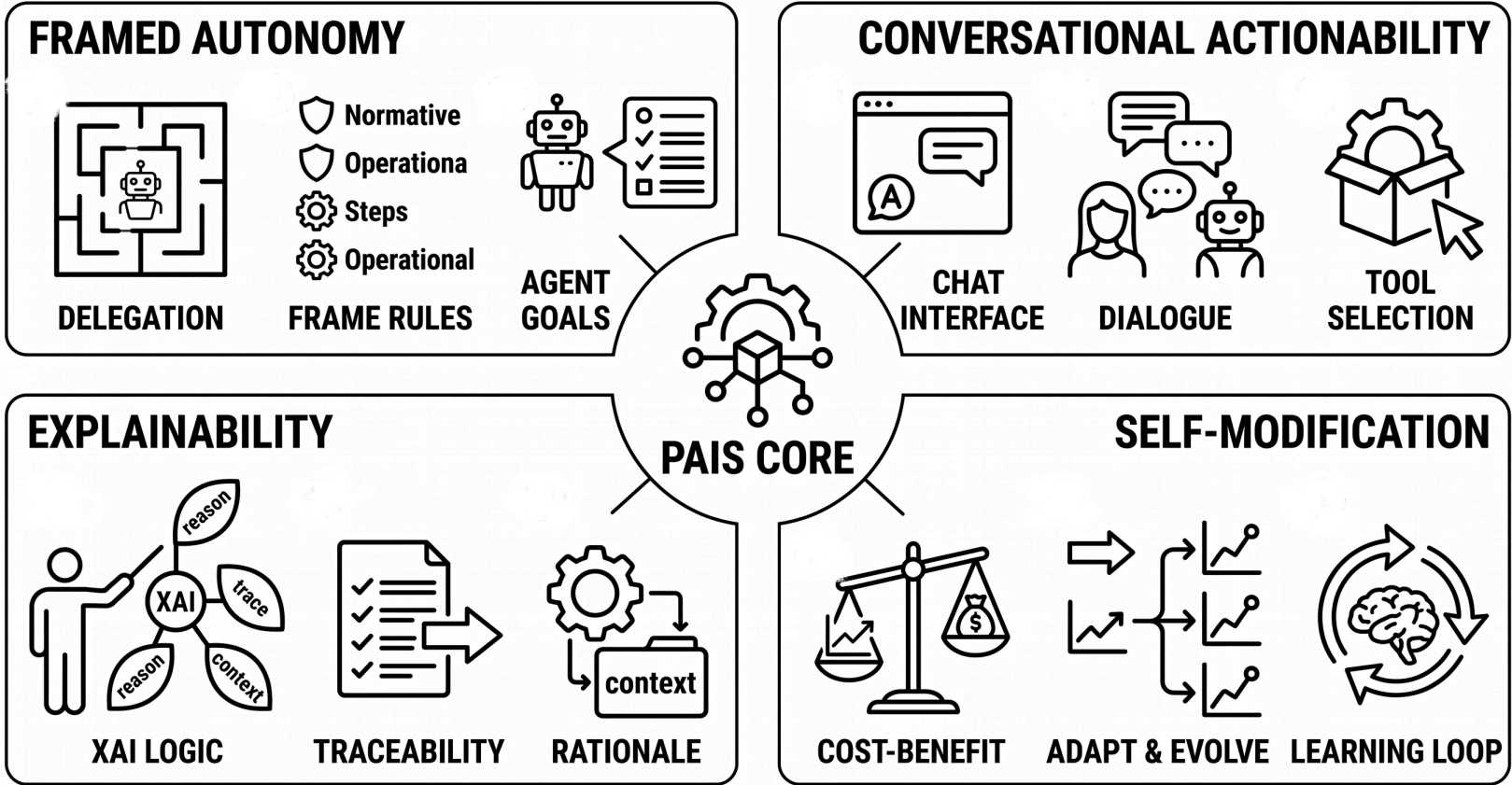
- Collaboration of Human Actors and **AI Agents**
- AI agents (semi-)autonomously perform knowledge tasks

Major shift: From *passive Robot* to *active Agent*, cf. Software Eng.¹

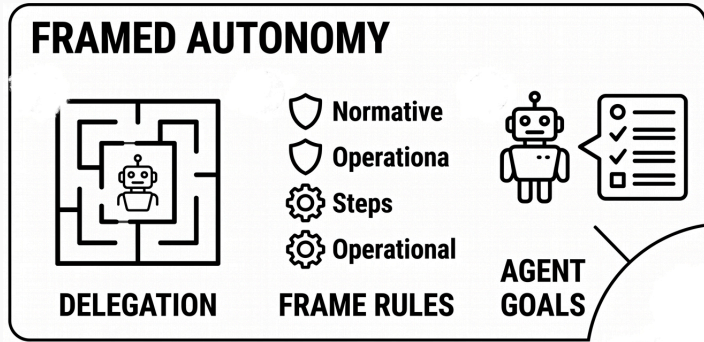


¹Domenico Amalfitano et al., “A Research Roadmap for Augmenting Software Engineering Processes and Software Products with Generative Ai,” *TOSEM* 35, no. 9 (2026), <https://doi.org/10.1145/3788879>.

Four Core Capabilities of ABPM



Capability 1: Framed Autonomy



Impose **guardrails** on agents via

- obligations, permissions and prohibitions
- strategies to satisfy goals

Framed autonomy is more than...

- **AI Sandbox** = “playground” for agents (not connected to real world)
- **AI Harness** = software/process layer around LLM to turn it from passive generator to autonomous agent

Want to know more?

- *Diego et al.'s PMAI@ECAI paper¹*
- *Marco's keynote @ FRID-AI*

¹Diego Calvanese et al., “Autonomy in Business Process Execution: Why We Need First-Class Abstractions for Goals and Normative Frames,” in *PMAI@ECAI 2025*, vol. 4087 (CEUR-WS.org, 2025), <https://ceur-ws.org/Vol-4087/paper6.pdf>.

Capability 2: Conversational Actionability



- **Conversation:** one human $\leftrightarrow$ one agent
- **Coordination:** many humans $\leftrightarrow$ many agents
- **Alignment:** AI behaviour = human expectations

Good alignment

⇒ effective collaboration¹

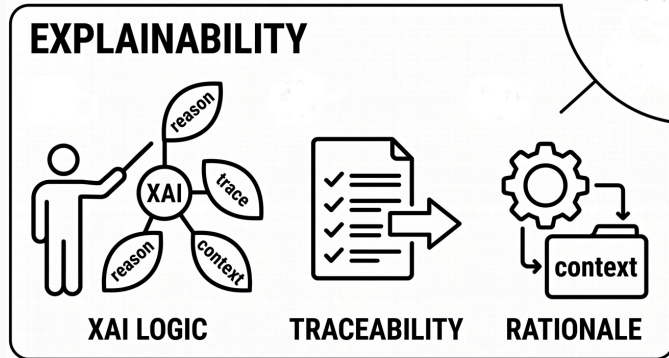
Want to know more?

- *Marco's PMAI@ECAI paper²*
- *Saimir et al.'s PTF paper*

¹Saimir Bala et al., "Using Process Mining to Generate AI Agents from Software Engineering Process Records, BPM 2026," in *BPM 2026*, vol. 12127 (Springer, 2026), <https://doi.org/10.1016/j.is.2026.102738>.

²Marco Montali et al., "Towards Conversational Actionability in AI-Augmented Business Process Management Systems," in *PMAI@ECAI 2025*, vol. 4087 (CEUR-WS.org, 2025), <https://ceur-ws.org/Vol-4087/paper8.pdf>.

Capability 3: Explainability



- **Trust** by understanding AI-based decisions
- Detecting **bias**
- **Compliance** to standards and law

- **Accountability**
- **Debugging**
- Increased task **quality**¹

Explanations need **process context**²

Want to know more?

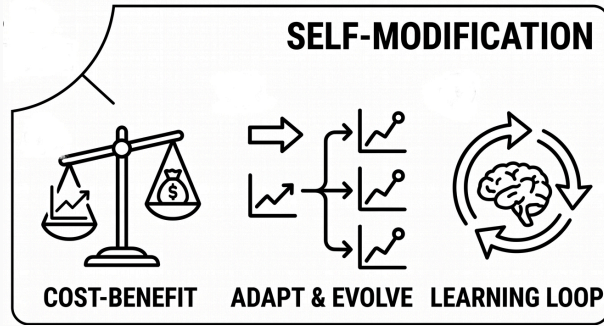
- *Peter et al.'s PMAI@ECAI paper*³

¹Andreas Metzger et al., "A User Study on Explainable Online RL for Adaptive Systems," *ACM TAAS* 19, no. 3 (2024), <https://doi.org/10.1145/3666005>.

²Hoang Vu et al., "Practitioner Perspectives on Agent Governance in Business Processes," in *Responsible BPM Forum 2025* (Springer, 2025), https://doi.org/10.1007/978-3-032-02936-2_3.

³Peter Fettke et al., "XABPS: Towards Explainable Autonomous Business Processes," in *PMAI@ECAI 2025*, vol. 4087 (CEUR-WS.org, 2025), <https://ceur-ws.org/Vol-4087/paper2-Long.pdf>.

Capability 4: Self-Modification



Self-Adaptation:¹

- Modification at instance level
- Aka. **prescriptive process monitoring**²

¹Elisabetta Di Nitto et al., “A Journey to Highly Dynamic, Self-Adaptive Service-Based Applications,” *Autom. Softw. Eng.* 15, nos. 3–4 (2008), <https://doi.org/10.1007/S10515-008-0032-X>.

²Andreas Metzger et al., “Automatically Reconciling the Trade-Off between Prediction Accuracy and Earliness in Prescriptive Business Process Monitoring,” *Inf. Syst.* 118 (2023), <https://doi.org/10.1016/J.IS.2023.102254>.

³Achiya Elyasaf et al., “Toward Self-Modifying Autonomous Business Process Systems,” in *PMAI@ECAI 2025*, vol. 4087 (CEUR-WS.org, 2025), <https://ceur-ws.org/Vol-4087/paper1-Long.pdf>.

Self-Evolution:

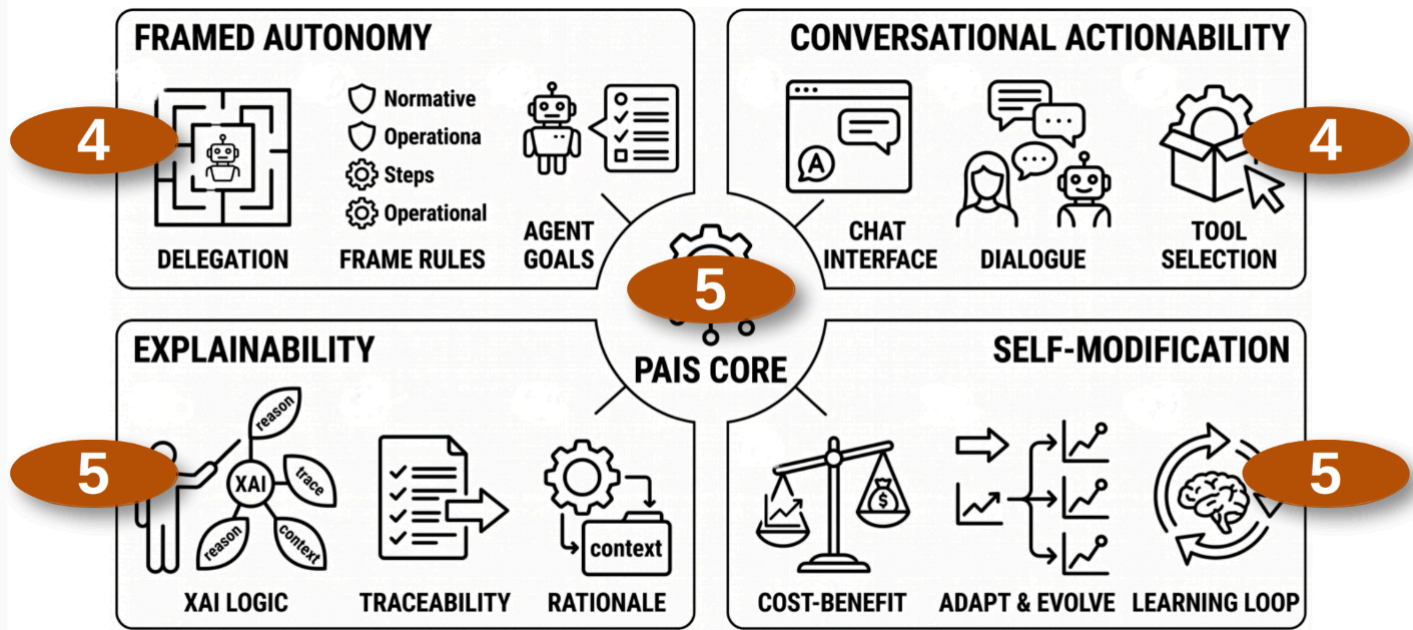
- Modification at model level
- Aka. **process redesign**

Want to know more?

- Achiya et al.’s *PMAI@ECAI Paper*³

Challenges

Overall, **23** challenges identified:



e.g., How to elicit and specify frames?, How to generate causally sound explanations?, How to balance autonomy, delegation, and control?, How to govern self-modification?, How to benchmark and evaluate APMs?

Summary

Agentic BPM = major paradigm shift

- Made possible by convergence of BPM, AI, SE, and multi-agent systems
- Requires framing, actionability, explainability, and self-modification

Want to know more?

- *Tim's scientific talk @ FRID-AI*
- *Scientific panel @ FRID-AI*

Thank you!



<https://orangeshirtday.org/>

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