Slide 1 — Title Slide
"Generative AI for Process Modeling: Can AI Automatically Generate BPMN Models from Natural Language Descriptions?"

Speaker Notes:
Good [morning/afternoon], everyone. Today, I'll present our research on using generative AI to automatically create BPMN models from natural language descriptions. We explored the potential, limitations, and practical applications of AI in business process modeling.

Slide 2 — Motivation
Speaker Notes:
Business process modeling is a core activity in organizations for documenting, analyzing, and improving workflows. Traditionally, it requires trained analysts and can be time-consuming, often taking 45–90 minutes per process.

Generative AI, especially large language models, promises rapid, semi-automated BPMN generation. Our research asks: *Can AI produce accurate, usable BPMN models directly from natural language descriptions?*

Slide 3 — Research Approach
Speaker Notes:
Our methodology combined three main components:

1. **Literature Review:** We analyzed prior work on AI-assisted process modeling, NLP-to-BPMN translation, and existing BPMN automation tools.
2. **Case Study:** We designed a multi-actor service request workflow to test AI capabilities.
3. **Experiments:** Multiple AI models — GPT-5, Claude 3.5, Llama 3, and Mixtral — were tested alongside rule-based tools like SketchMiner and Camunda templates. Outputs were evaluated for syntactic correctness, semantic accuracy, and pragmatic usability.

Slide 4 — AI Modeling Pipeline
Speaker Notes:
The AI modeling workflow consists of five steps:

1. **Entity Extraction:** Identifying actors, tasks, events, and decisions.
2. **Activity Structuring:** Ordering tasks correctly, including parallelism and optional steps.
3. **Gateway Identification:** Classifying logic into XOR, AND, OR, and event-based gateways.
4. **Diagram Construction:** Producing BPMN-compliant diagrams.
5. **Validation:** Checking syntax, semantics, and practical usability.

This structured pipeline allows us to systematically evaluate AI outputs.

Slide 5 — Key Findings from Case Study and Experiments
Speaker Notes:

- **Task Coverage:** Closed-source models like GPT-5 captured 85–97% of tasks.
- **Gateway Accuracy:** Accuracy declined for complex control flows, with nested or parallel gateways being the most challenging.
- **Message Flow:** AI struggled with multi-actor communication loops, but clarity improved with iterative prompts.
- **Speed:** AI generated diagrams in seconds versus tens of minutes for manual modeling.

Conclusion: AI works very well for simple or moderately complex processes but still requires human oversight for complex workflows.

Slide 6 — Comparative Analysis
Speaker Notes:
When compared to traditional BPM:

- **Speed:** AI is significantly faster.
- **Accuracy:** Humans still outperform AI in complex processes.
- **Consistency:** AI produces consistent layouts and naming conventions.
- **Stakeholder Engagement:** AI can accelerate collaboration but cannot replace workshops or interviews.

The optimal approach is a **hybrid workflow**, combining AI-generated drafts with human review and validation.

Slide 7 — Recommendations
Speaker Notes:
For organizations and practitioners:

1. Use AI as a **supportive tool**, not a replacement.
2. Implement **human-in-the-loop validation** for semantic and structural correctness.
3. Train stakeholders on **effective prompt design** to reduce errors.
4. Start with **simple processes** before scaling to complex workflows.
5. Maintain **documentation and governance** for AI outputs.

Slide 8 — Future Directions
Speaker Notes:
Future research and development could focus on:

- Fine-tuning AI models for **domain-specific processes**.
- Integrating AI with **process mining and automation**.

- Developing **standardized evaluation metrics** for AI-generated BPMN models.
- Exploring **iterative human-AI feedback loops** to improve performance over time.

Slide 9 — Closing
Speaker Notes:
In summary, generative AI can dramatically speed up BPMN model creation and improve consistency, but human expertise remains essential for complex processes. The most effective approach is **AI-assisted, human-validated modeling**, providing a practical balance between speed, accuracy, and usability.