Modern AI - Enhancing Judicial Efficiency and Access to Justice

Shubham Gaddi, Nandini Devalla, Hugo Bizcek, Ayush Gupta, Saquib Hussain, Darshan Upadhyay, Matthew A. Lanham

Purdue University, Krannert School of Management

hbizcek@purdue.edu; ndevalla@purdue.edu; sgaddi@purdue.edu; gupt1248@purdue.edu; hussai71@purdue.edu; upadhy33@purdue.edu; lanhamm@purdue.edu

BUSINESS PROBLEM FRAMING

Artificial Intelligence has been the rapidly evolving catalyst that has been reshaping industries, conventional workflows and societal norms. The role of AI in the legal system is no exception but the integration and adoption of AI systems into legal workflows comes with a set of challenges.

1. Fear & Stigma Surrounding AI – Lack of Awareness

2. Incorporation of AI in everyday Judicial Processes

3. Identification & Flagging of AI Generated Content

Judges remain wary and slightly hesitant in incorporating AI assisted workflows even though it comes at the cost of streamlined processes. Their inability to identify AI generated and AI altered content has also made them uneasy about how to perceive evidence during trials and discovery. Our solution aims to combat this skepticism, improve efficiency leading to savings in time and costs.

1. **AI Awareness Packet**
2. **AI Aided Daily Workflows**
3. **Synthetic Media Identification**

ANALYTICS PROBLEM FRAMING

This initiative transforms abstract organizational challenges into data-driven tasks: quantifying AI awareness gaps through judicial surveys and usage analytics, identifying workflow automation candidates via process mining , establishing probabilistic thresholds for GenAI text detection, and crafting multimodal media guidelines combining metadata checks and AI tools.

We assumed that repetitive tasks consume 30+% judicial time and synthetic media leaves traceable artifacts that can be used for identification flagging.

Lack of AI Awareness	Quantify Organizational Gaps in AI Awareness
AI Agnostic Daily Workflows	Process Mining for Workflow AI Integration
Identifying GenAI Content	Guidelines for Probabilistic Detection of GenAI Content
Flagging AI Altered Content	Guidelines for Multimodal Synthetic Media Detection

The ideal objective is to successfully create 5+ AI integrated workflows to aid judges from the Indiana courts on a daily basis, bring down the AI skepticism and negative sentiments around AI to under 10% (measured in post initiative survey) and device best practices and guidelines along with a list of recommended tools to identify AI generated and AI altered media with ~80% accuracy.

DATA

The project is built on the foundations of survey responses from judges in the Indiana courts assessing their comfort, requirements, concerns related to AI. This was combined with qualitative research and interviews to identify major pain points and optimal solutions.

1. Survey Responses from 100+ Judges

**2.** Qualitative Interview Transcripts

3. Qualitative Research & Process Mining

Krannert School of Management

METHODOLOGY

We started our work with analysis of the survey responses to understand the existing sentiments around AI and performed semi-structured qualitative interviews to further understand common concerns. The interviews also helped gain visibility into expectations from AI, which helped us device the right integration plan for the judiciary to discuss and implement. The integration plan was also supplemented with a list of recommended AI tools based on cost, transparency, control, security and other factors.

1 NLP Analysis
2 Process Mining
3 Thematic Analysis
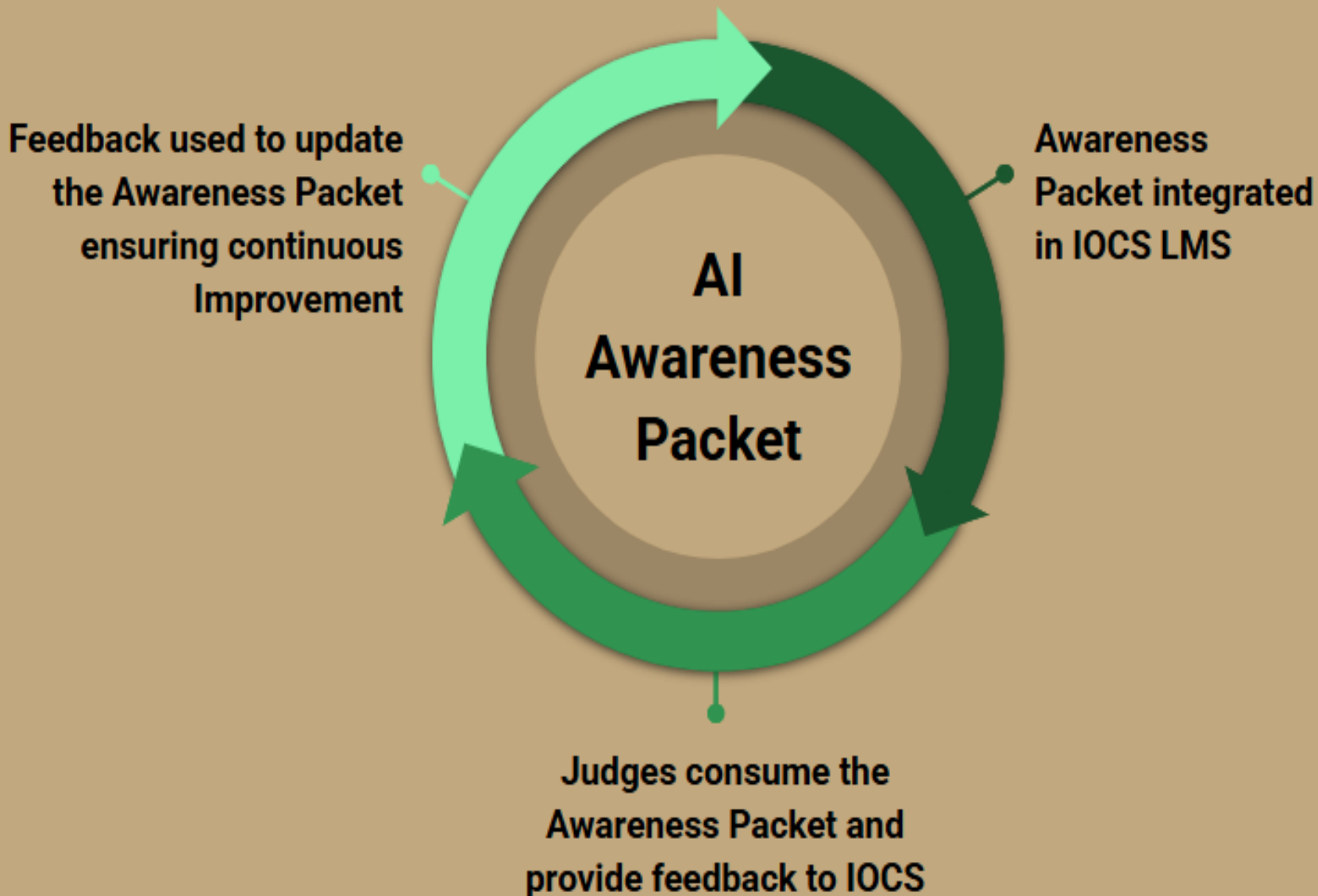4 AI Content Detection
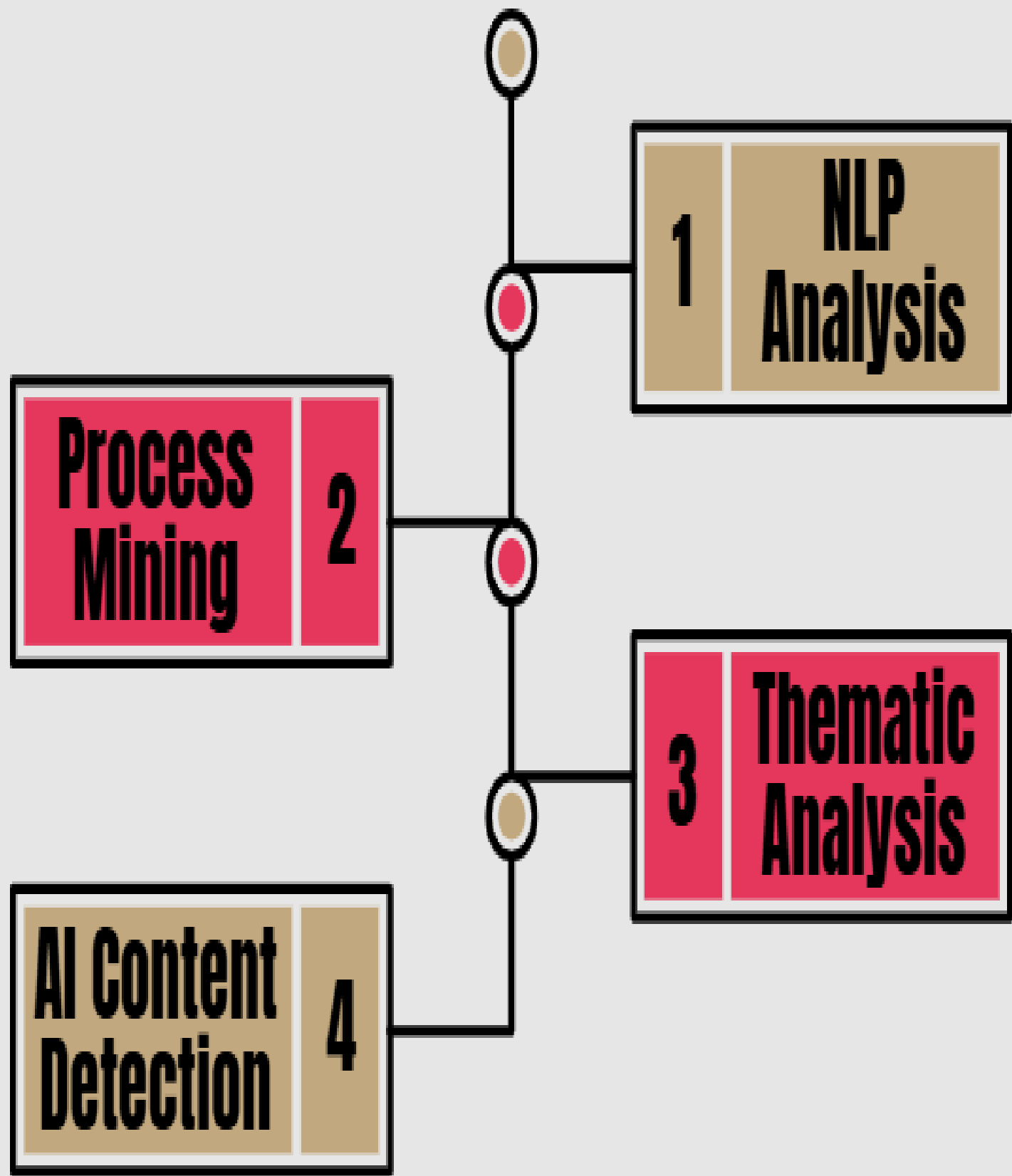
MODEL BUILDING

The survey data was put through an NLP pipeline built to capitalize on Azure Language AI's pre trained analysis models. This allows us to leverage cutting edge state of the art performance on low volume datasets.

Survey Responses → Azure Language AI → Sentiment Scores / Keyphrase Extraction
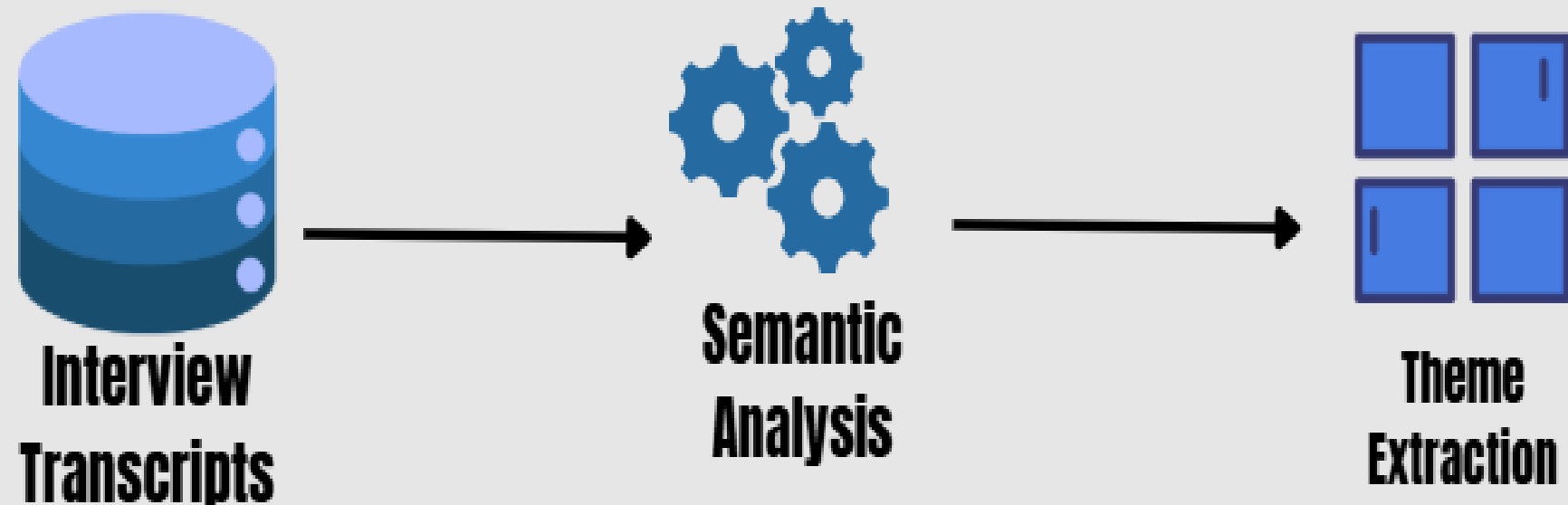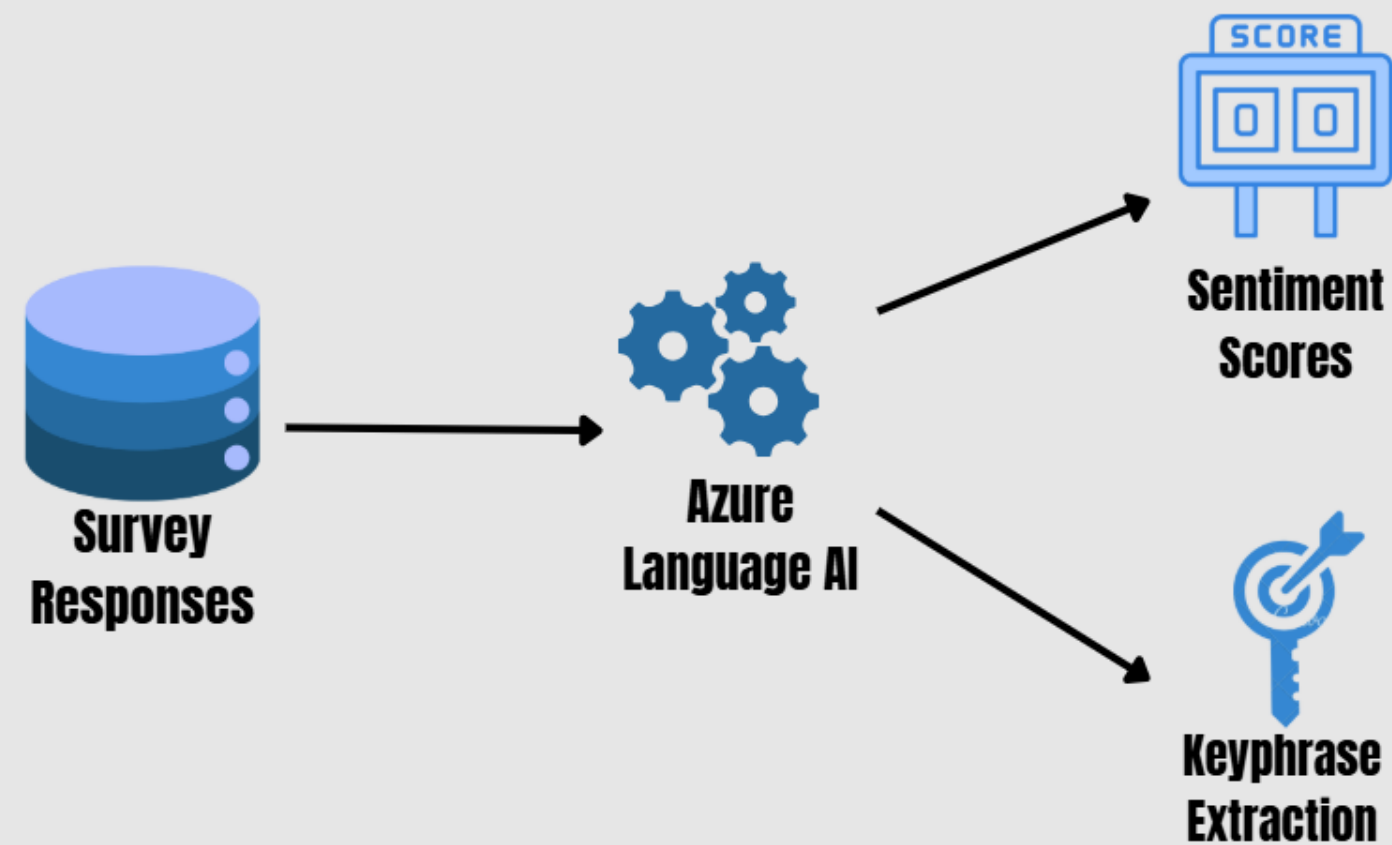
Interview transcripts with ~15 judges from various Indiana courts were put through Atlas.ti to perform Semantic Thematic Analysis to get broad themes of concerns & requirements from AI.

Interview Transcripts → Semantic Analysis → Theme Extraction

DEPLOYMENT & LIFE CYCLE MANAGEMENT

The AI awareness packet will be integrated into the IOCS (Indiana Office of Court Services) learning management system. The current LMS tool being used by IOCS is Moodle.

Once added to Moodle, the packet will be rolled out to all judges under the Indiana court system for consumption and their feedback will be used to iteratively improve the content.

Feedback used to update the Awareness Packet ensuring continuous Improvement

Awareness Packet integrated in IOCS LMS

AI Awareness Packet

Judges consume the Awareness Packet and provide feedback to IOCS

The suggestions for daily workflows along with the relevant tools, supplemented with their risk and performance analysis will be forwarded to the IOCS special panel of judges for review. Upon review the judges can decide, for or against, about the verdict on the suggestions.

The synthetic media identification framework will also be proposed as a suggestion for the IOCS to review and act upon as per their own discretion. The student team has no say or authority to influence their decision in any capacity.

ACKNOWLEDGEMENTS

informs BUSINESS ANALYTICS CONFERENCE