A Cognitive Support Platform

F E N R I R

AI Data Management Systems: Helping Carry the Cognitive Load

Forensic Evaluation and Neutralization of Reasoning, Inference and Response

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PRIME

Primary Contribution

Exploring the Dynamics of Human-AI Collaboration in Investigative Contexts

1

Before

Planning & analysis

- *Organize*
- *Compare*
- *Prioritize*
- *Prepare*

2

During

The Interview

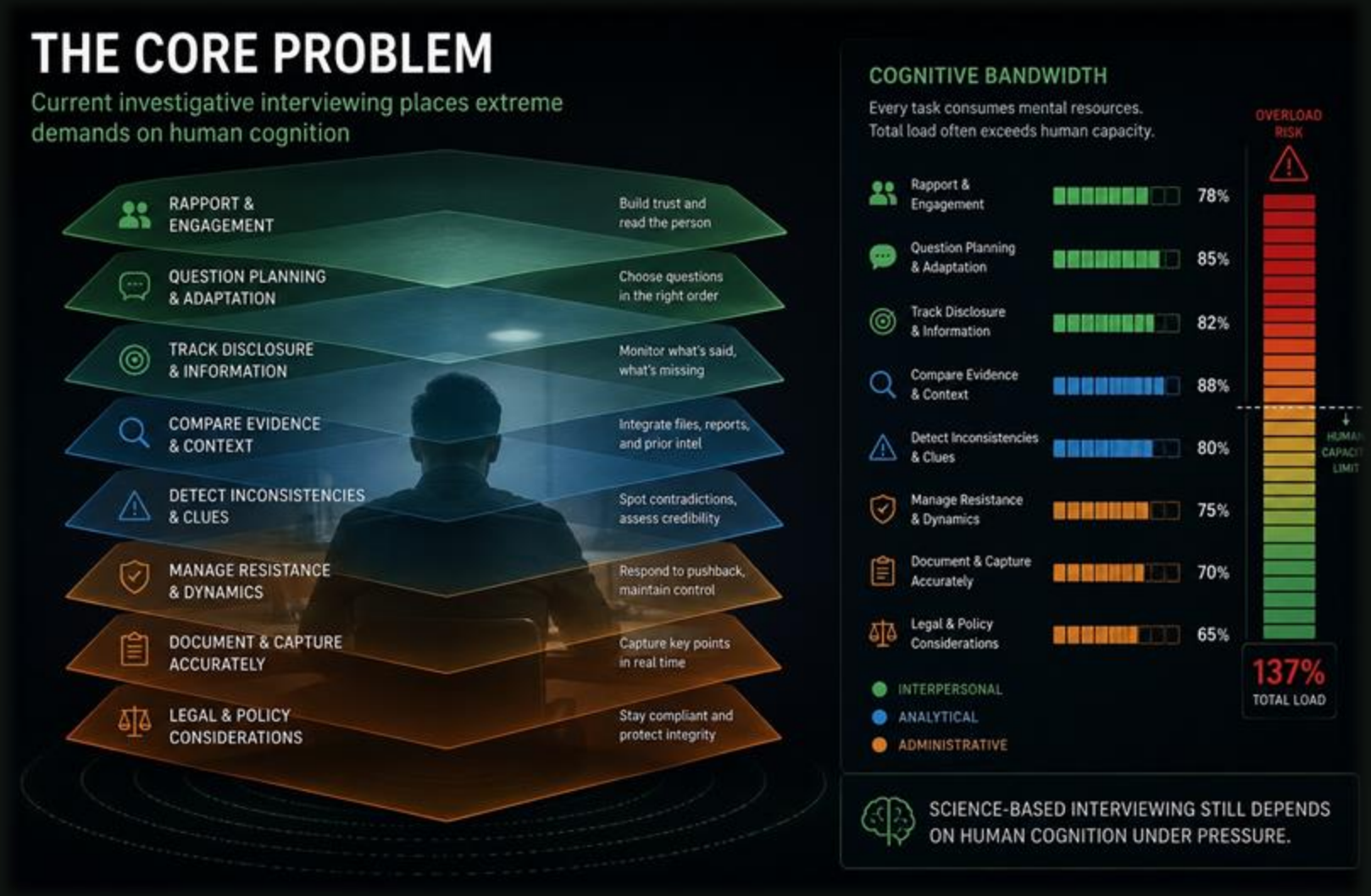
- *Monitor*
- *Disclosure*
- *Compare*
- *Retrieve*

3

After

Evaluate

- *Review*
- *Adherence*
- *Reflect*
- *Document*


THE CORE PROBLEM
Current investigative interviewing places extreme demands on human cognition
RAPPORT & ENGAGEMENT
Build trust and read the person
QUESTION PLANNING & ADAPTATION
Choose questions in the right order
TRACK DISCLOSURE & INFORMATION
Monitor what's said, what's missing
COMPARE EVIDENCE & CONTEXT
Integrate files, reports, and prior intel
DETECT INCONSISTENCIES & CLUES
Spot contradictions, assess credibility
MANAGE RESISTANCE & DYNAMICS
Respond to pushback, maintain control
DOCUMENT & CAPTURE ACCURATELY
Capture key points in real time
LEGAL & POLICY CONSIDERATIONS
Stay compliant and protect integrity
COGNITIVE BANDWIDTH
Every task consumes mental resources.
Total load often exceeds human capacity.
OVERLOAD RISK
Rapport & Engagement 78%
Question Planning & Adaptation 85%
Track Disclosure & Information 82%
Compare Evidence & Context 88%
Detect Inconsistencies & Clues 80%
Manage Resistance & Dynamics 75%
Document & Capture Accurately 70%
Legal & Policy Considerations 65%
HUMAN CAPACITY LIMIT
137%
TOTAL LOAD
INTERPERSONAL
ANALYTICAL
ADMINISTRATIVE
SCIENCE-BASED INTERVIEWING STILL DEPENDS ON HUMAN COGNITION UNDER PRESSURE.

LIMITS

Cognitive Load Creates Predictable Failure Points

Investigative Interviewing Places Simultaneous Demands on Attention, Memory, and Decision-Making

COGNITION

Human Cognitive Risks

- Fatigue reduces recall
- Cognitive load narrows focus
- Bias shapes interpretation
- Important details are missed

AI SUPPORT

AI Supported Mitigation

- Persistent Memory Support
- Information Integration
- Structured Comparison
- Traceable documentation

AI support can reduce cognitive burden while preserving human judgement

MITIGATING RISKS

The Trust Framework

AI support without surrendering human judgement

Human Oversight	**Investigators remain responsible for all decisions**
Grounded Outputs	**Every output traceable to source material**
Calibrated Uncertainty	**The system abstains when uncertain**
Local & Secure	**No cloud dependency by default**

ISO 27001 compliant with immutable audit logs

The Interview

From planning to evaluation

PLANNING

- Summarize evidence
- Identify disclosure goals
- Define key questions
- Organize timelines
- Compare prior interviews
- Identify gaps

INTERVIEW

- Persistent memory support
- Disclosure tracking
- Transcript-linked retrieval
- Evidence comparison
- Identification of missed topics

EVALUATE

- Structured reporting
- Source-linked documentation
- OBRIT adherence review
- Disclosure analysis
- Interviewer reflection
- Feedback

RESEARCH

The Research Opportunity

Unlocking Insights into Investigative Processes through Controlled Research

STRUCTURE

Fenrir allows us to study:

- Interviewer cognition
- Bias
- Noise
- Decision-making
- Human-AI interaction

For example: comparing novice and expert interviewers under identical evidence conditions

RQs

Scientific Contribution

Exploring the Dynamics of Human-AI Collaboration in Investigative Contexts

1

AI impact on performance

- *When does AI improve interviewer performance*
- *Can AI reduce investigative noise*
- *Can AI improve framework adherence*

2

Trust and reliance

- *When does AI create overreliance*
- *When do investigators ignore correct AI suggestions*
- *How do investigators calibrate trust in AI systems*

3

Communication and uncertainty

- *How should uncertainty be communicated*

Controlled Experimental Environment

Comparative Analysis of Human and AI-Enhanced Interviewing Dynamics

Condition	Description
Human only	Traditional interviewing
AI-assisted	Human + FENRIR support
AI-generated analysis	AI output compared against human output
Different training levels	Novice vs experienced interviewers
Different frameworks	ORBIT vs non-ORBIT
Different stress levels	Low vs high cognitive-load

The platform enables controlled comparisons between human and AI-supported investigative performance

Exploring Cognitive Pitfalls and Variability in Outcomes

Biases to Investigate

Confirmation Bias

Investigators selectively attend to information confirming existing hypotheses.

Availability Bias

Recent or emotionally salient information influence interpretation.

Automation Bias

Overreliance on AI-generated suggestions or findings.

Noise Sources to Investigate

Inter-Interviewer Variability

Different interviewers produce different outcomes from the same case.

Temporal variability

Same interviewer performs differently depending on time, level of fatigue and stress.

AI-Prompt Variability

Different AI-prompts produce different recommendations.

BUILT FOR THE FIELD

Measuring Science Based Interviewing

Evaluating Key Metrics for Effective Investigative Practices

IFA — Interviewing Framework Adherence

- ORBIT adherence
- PEACE adherence

QUAL — Interaction quality

- Rapport quality (HEEAAR + Engagement)
- Resistance handling

IM — Information Management

- Disclosure timing
- Missed opportunities (losing the rabbit)
- Yield

PC — Performance Consistency

- Cognitive workload
- Inter-interview consistency
- Human vs AI agreement

RESEARCH TO COME

Research and analyses to come

More data. More fine-grained analysis. A wider operational base.

AI-aided interrogation

- AI-supported disclosure strategies
- AI and rapport development
- AI-assisted PEACE planning
- Bias detection systems
- Training Simulations
- Adaptive Interviewer Feedback and Coaching

Data from the Swedish Armed Forces - Exercise Tyr

- Which techniques and behaviours promote disclosure of intelligence?
- Which techniques and behaviors increase engagement from the simulated PoW?
- Which techniques reduce resistance?

Explore whether findings generalize across high-stakes operational environments

Subject to appropriate legal and ethical safeguards, lessons and data derived from contemporary PoW interrogation environments would increase our ability to predict what works in real operational settings.

NEXT STEP

Science Based Interviewing Increasingly Depends on

- Information management
- Cognitive support
- Understanding the interaction between humans and AI

The future challenge is not replacing investigators with AI,
it is understanding how investigators and AI systems perform together under real cognitive pressure.

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