

Turbo-Fraud: Counter-Deception Support for Forensic Auditing

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Problem

- **Financial deception is common, but still hard for experts to detect.**
 - **Forensic accounting suffers from cognitive limitations.**
 - **MITRE’s Counter-Deception technology seems well-suited to detecting earnings and revenue fraud.**

Audit Report	Case Reality		
	Fraud	Clean	Total
“Fraud”	45	3	48
“Clean”	51	21	72
Total	96	24	120

Background

- **Cognitive analysis of forensic accounting:**
 - Johnson et al. “Fraud detection: deception and intentionality in cognition”
 - Grazioli, “Errors in Detecting Financial Deception: a Cognitive Modeling Approach”
 - Johnson et al. “Detecting deception: adversarial problem solving in a low base-rate world”
- **Model of earnings & revenue fraud:**
 - Howard Schilit, *Financial Shenanigans: How to Detect Accounting Gimmicks and Fraud in Financial Reports*, 2d ed. McGraw-Hill, 2002

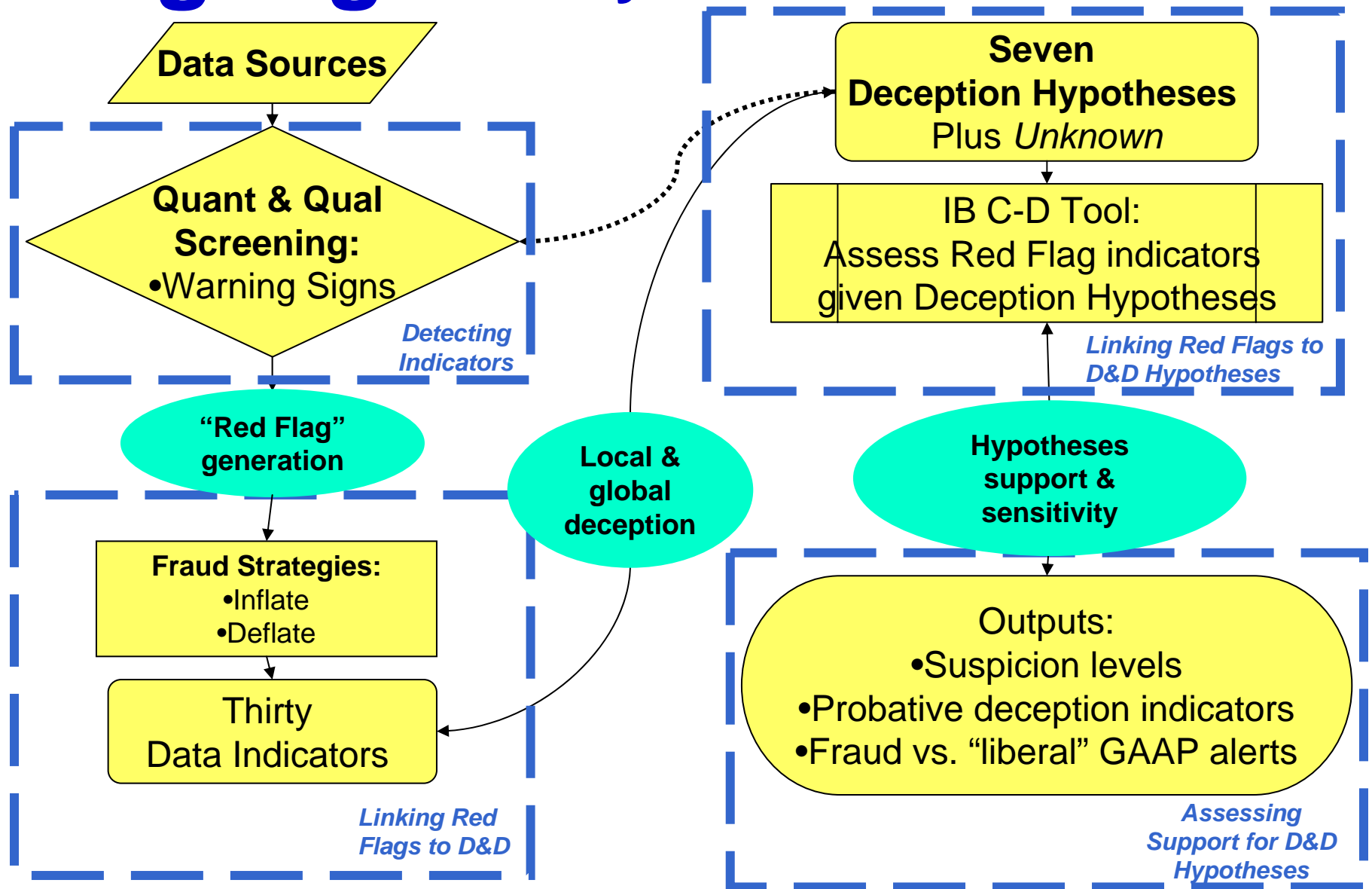
Objectives

- **Develop framework for fast and simple financial fraud detection**
- **Identify requirements for “hardened” fraud detection systems**
 - **Gaining access to data sources**
 - **Screening and representing evidence**
 - **Linking evidence to fraud tactic indicators**
 - **Representing fraud objectives**
 - **Linking fraud tactic indicators to hypothesized fraud objectives**
 - **Weighing hypotheses**

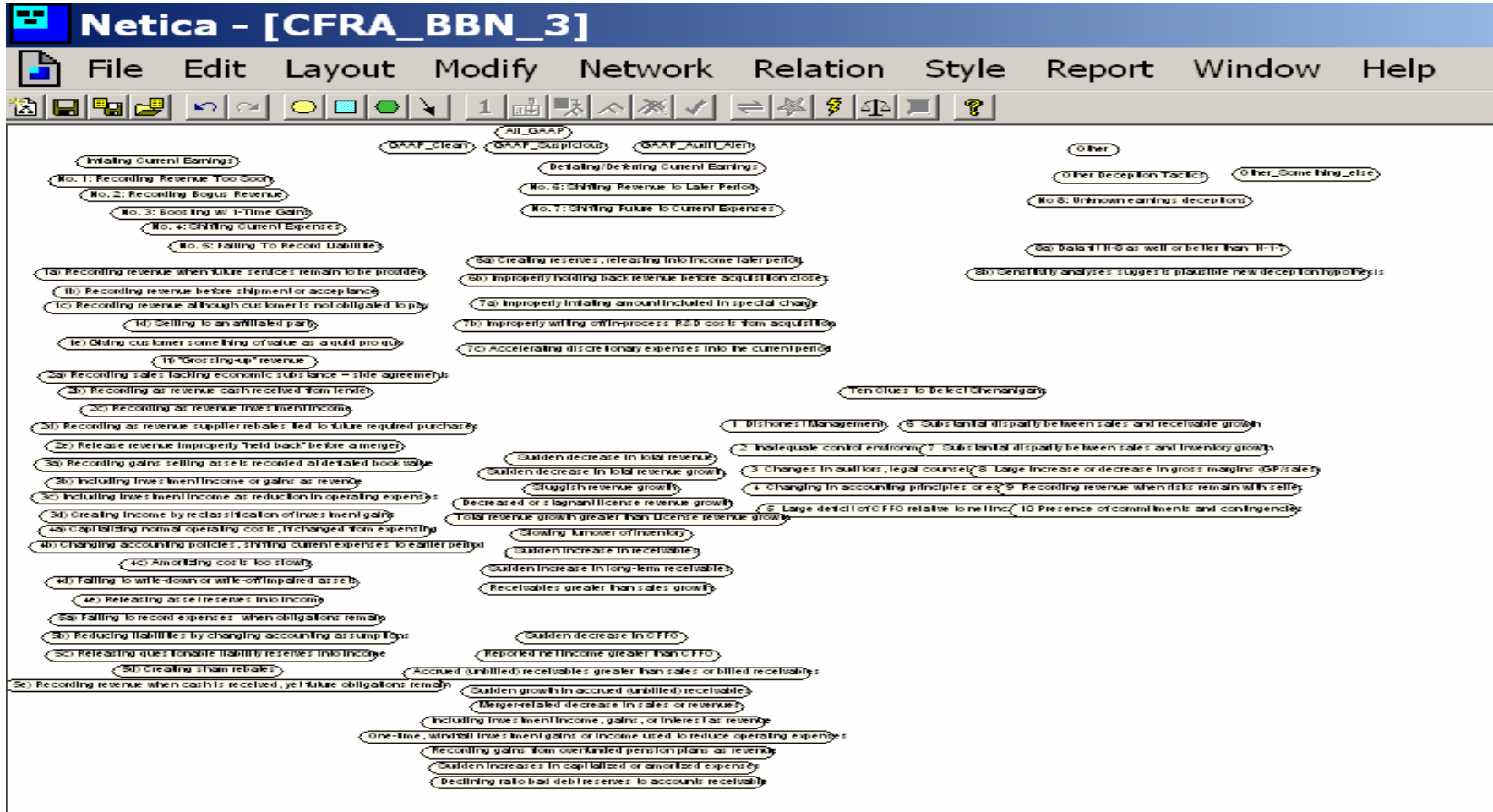
Activities

- Choose suitable test domain
- Map domain to counter-deception model developed in CD MSR
- Develop prototype
- “Hand test” on series of cases with known outcomes (true positives fraud cases, plus matched “innocent” cases)
- Assess pros and cons, requirements for production system

Highlight—System Overview



Demonstration



■ Bayesian Belief Network for Detecting Earnings Manipulation

Impacts

- **Improve productivity of government auditors:**
 - Reduce cases requiring in-depth inspection
 - Increase fraud detection rate
 - Control false positives
- **Identify where simple-and-fast screening works as well – or not – as current investigative protocols**
- **Identify “hard problems” in extending to related financial diversions and defalcations:**
 - Money laundering and tax avoidance schemes

Future Plans

- 2Q:
 - Develop computational framework
 - Encode domain knowledge of fraud detection

- 3Q:
 - Refine prototype
 - Collect test data

- 4Q:
 - Evaluate initial hypothesis
 - Report