

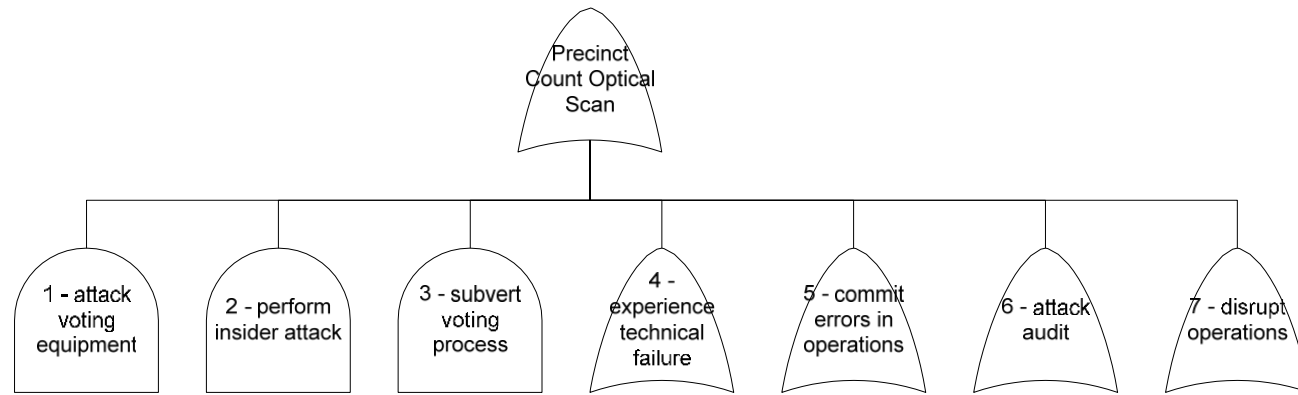


## Precinct Count Optical Scan

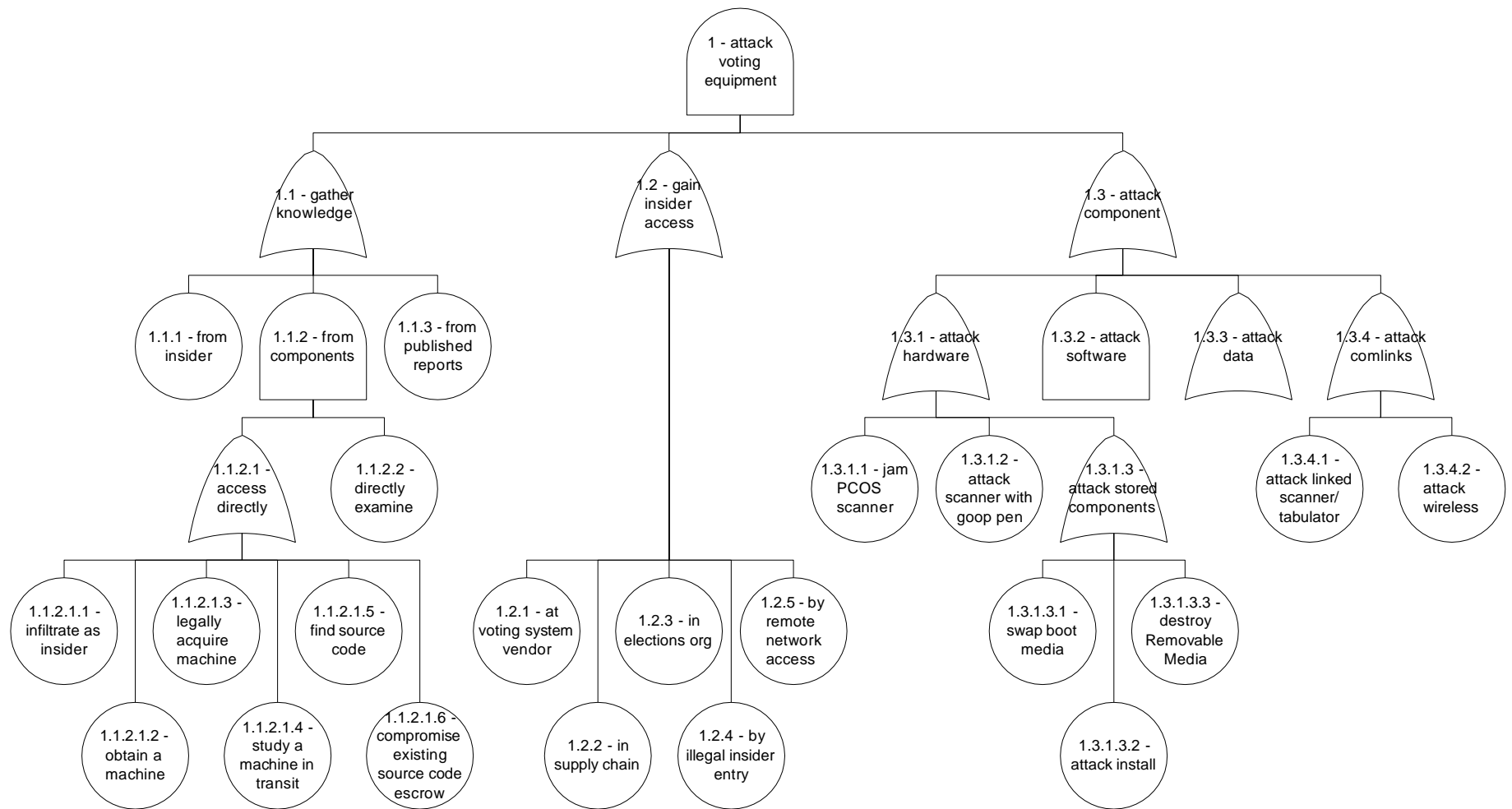
In this tree, we consider threats to voting systems that employ marks sense technology to scan and count committed ballots recorded on a physical medium, such as pre-printed paper ballots, at precinct-based polling places. The primary technology used is a precinct-count optical scan (PCOS) device, used at polling places. A distinctive feature of PCOS devices is that it can be programmed to identify and reject undervotes and overvotes on ballots that it scans.

From a risk assessment standpoint, PCOS has threats associated with the use of computer-based technology, polling places, and paper ballots. The key technologies considered are the PCOS scanning machines, vote tabulators, and ballot creation software. The use of computer-based technologies introduces two categories of threats: attacks on voting equipment and technical failure. We consider threats that occur at polling places and at central operations. This voting system includes physical (paper) ballots, and the provisional ballot process is considered as well.

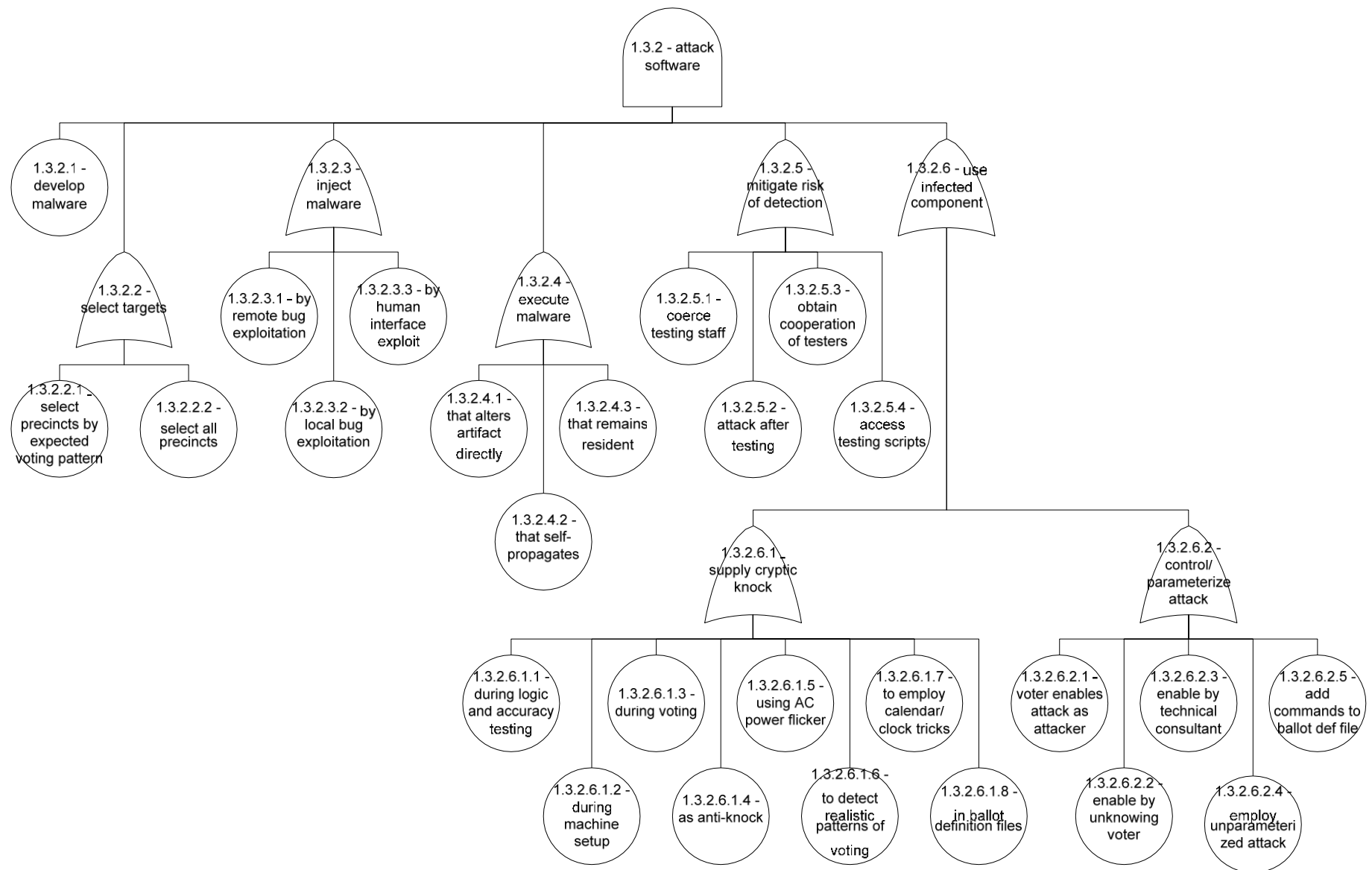
### 3.1 PCOS Threat Tree – Graphic



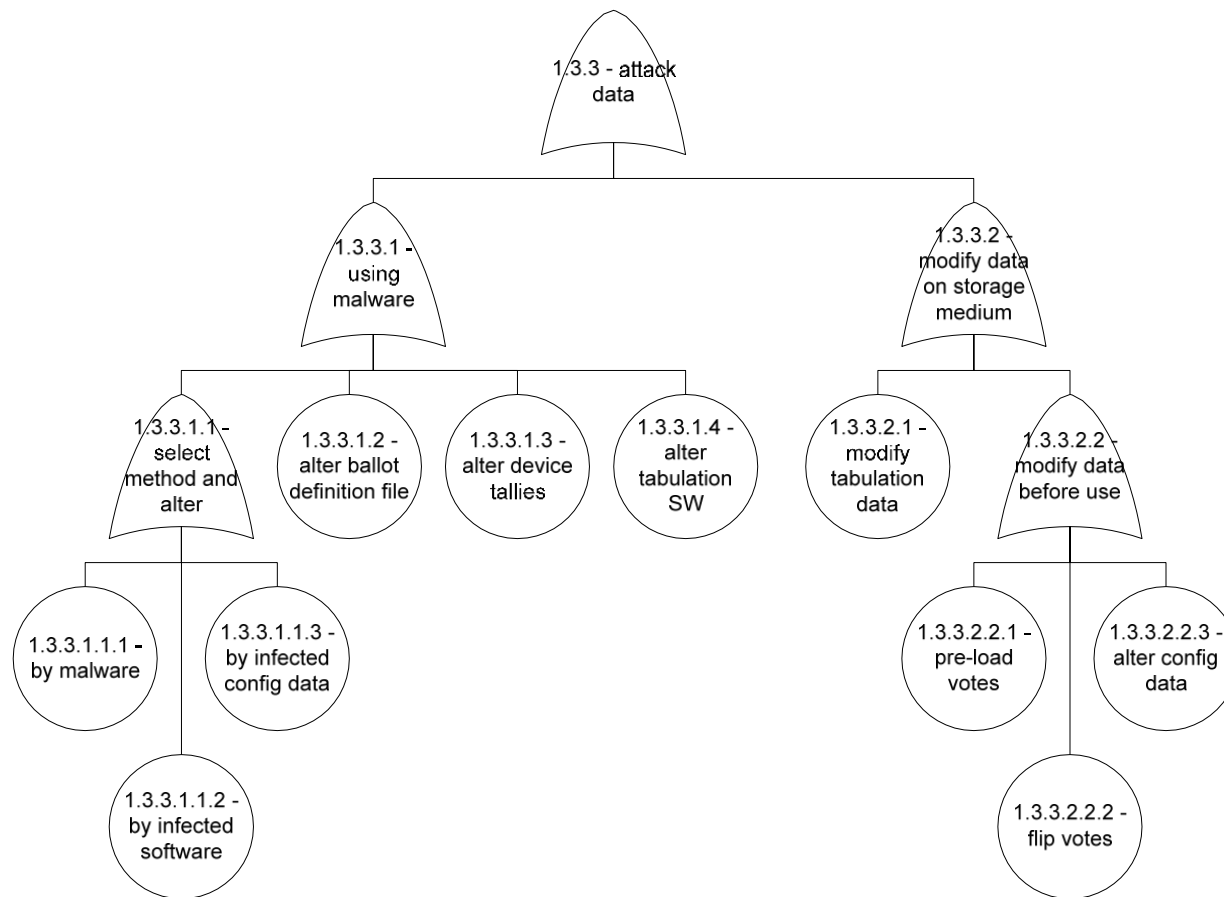
3-1 PCOS Overview



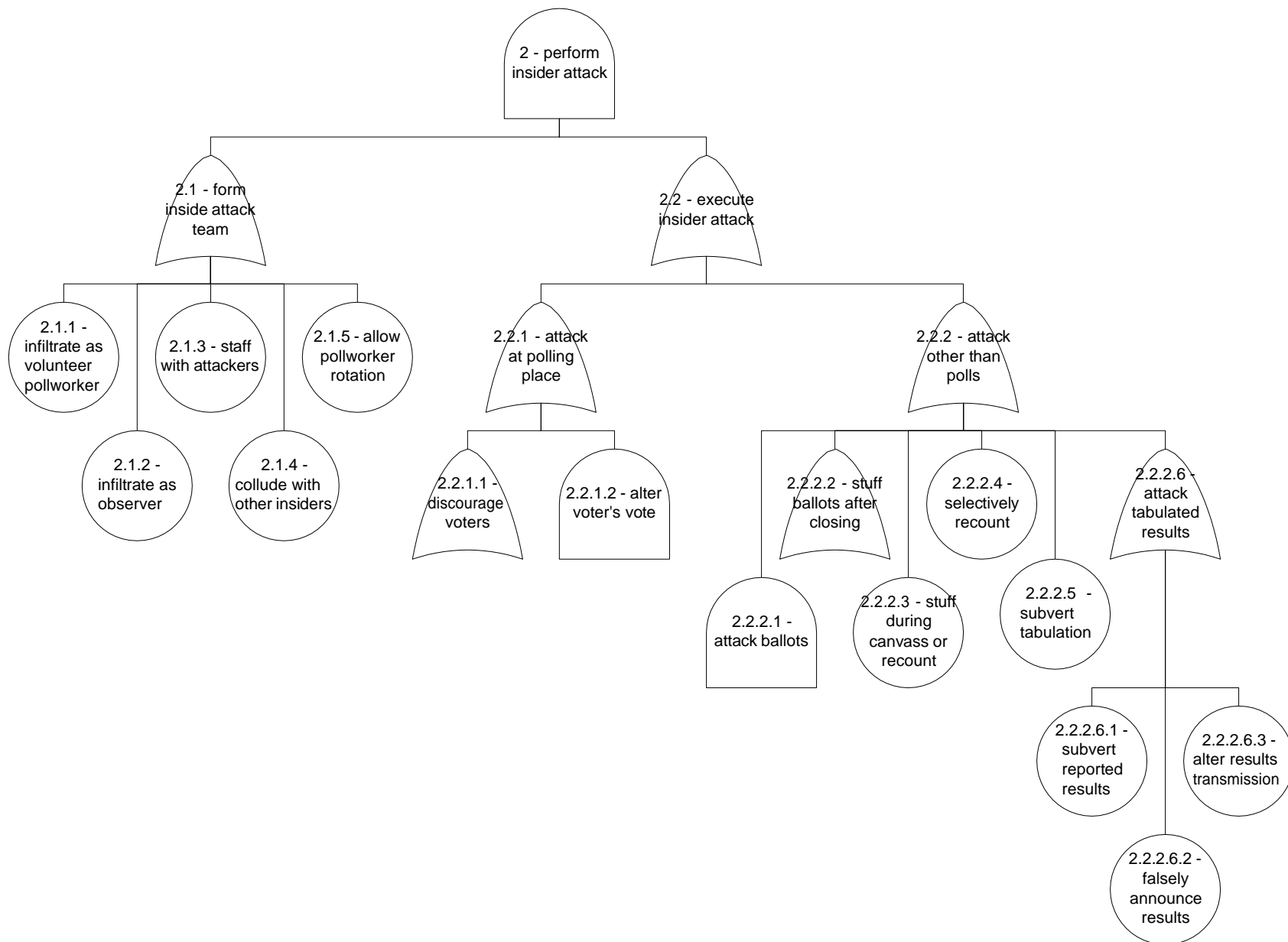
3-2 PCOS Attack Voting Equipment



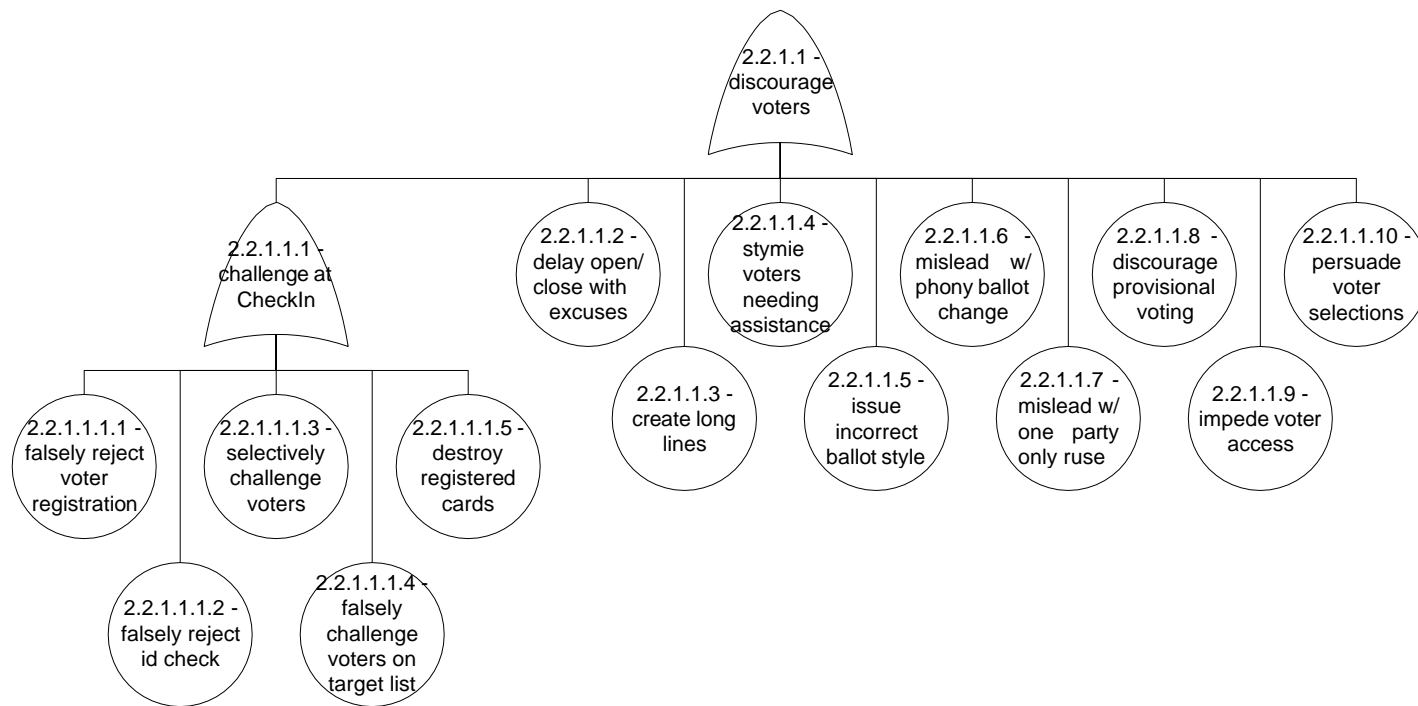
## 3-3 PCOS Attack Software



#### 3-4 PCOS Attack Data

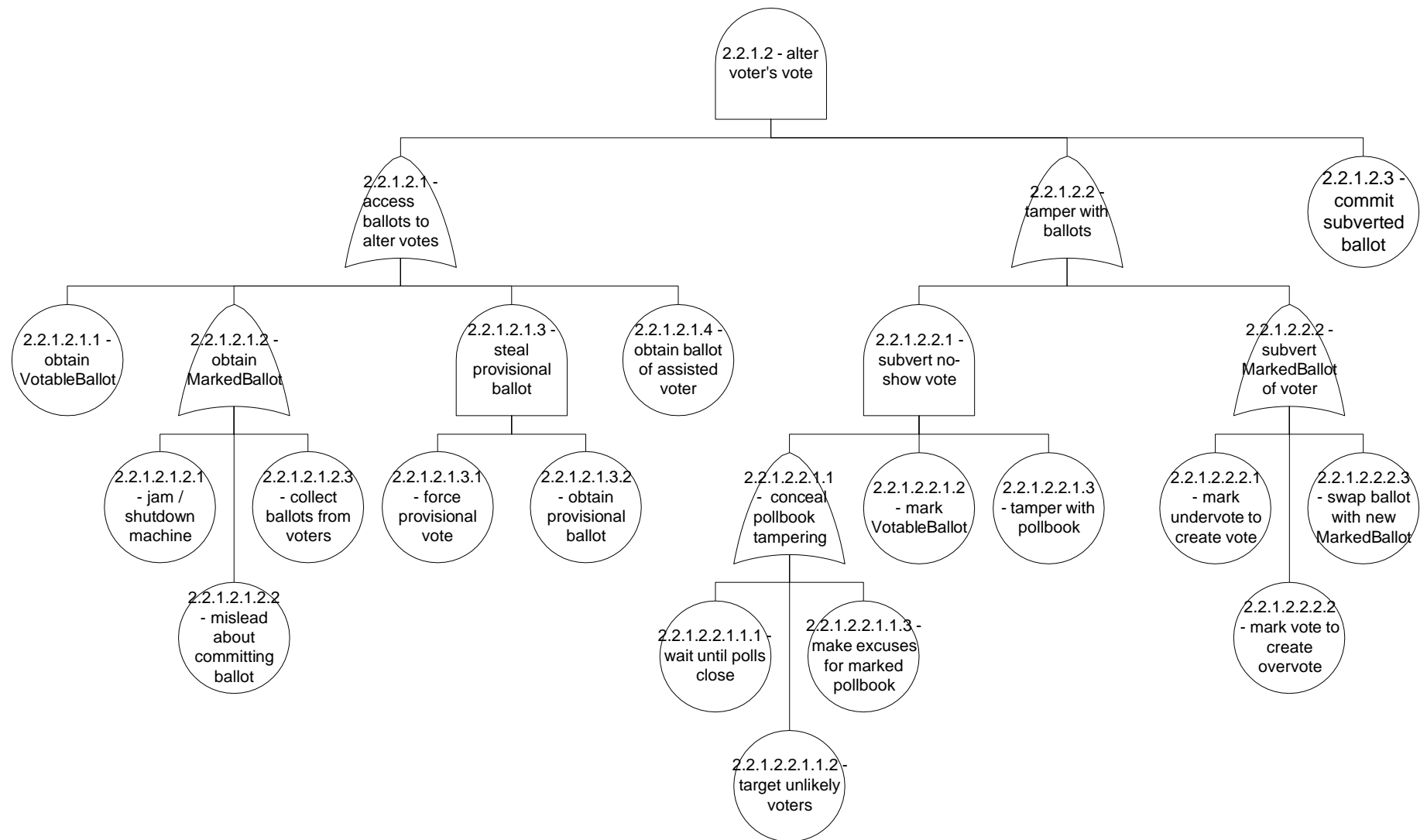


## 3-5 PCOS Perform Insider Attack

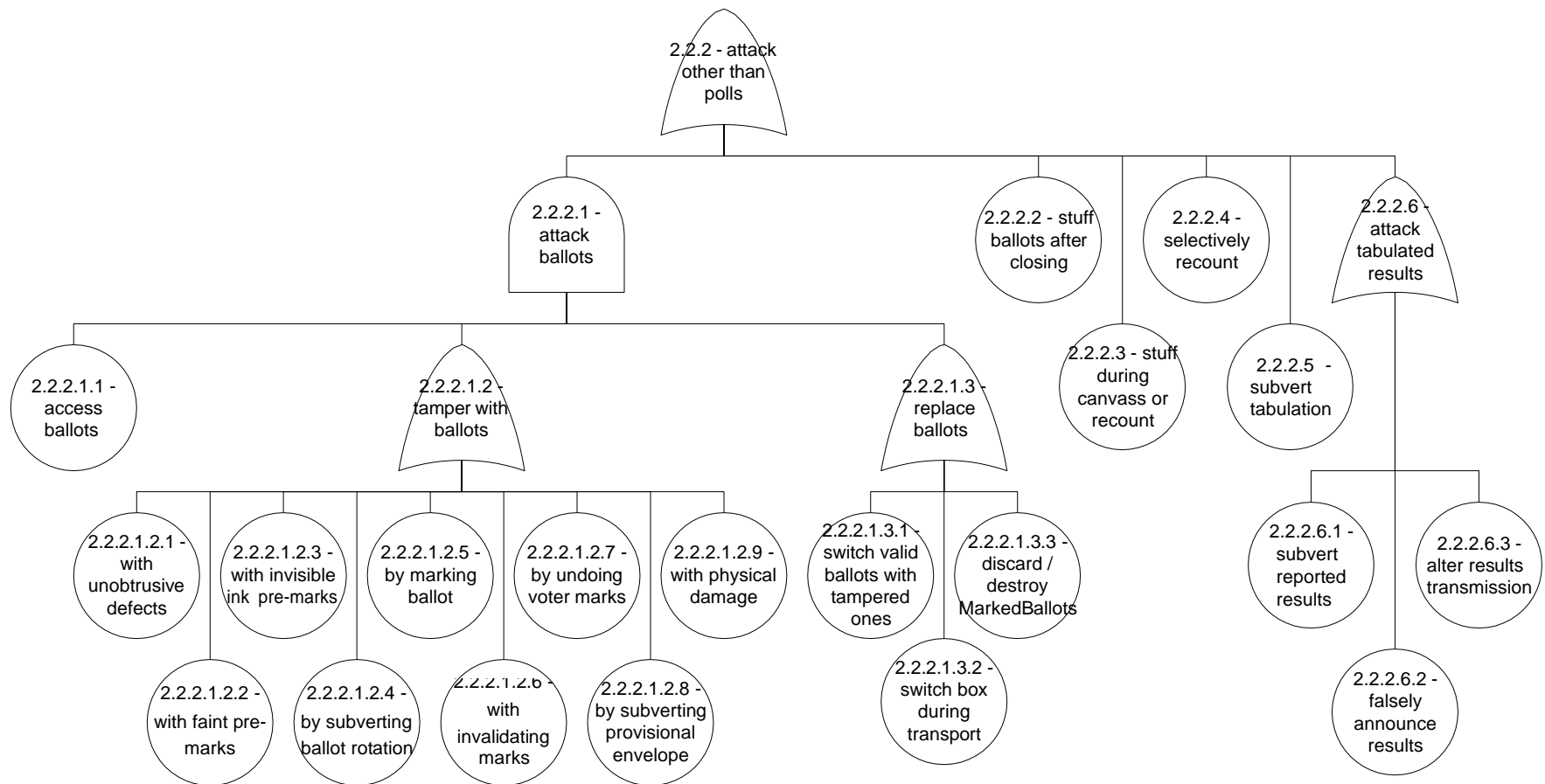


### 3-6 PCOS Discourage Voters

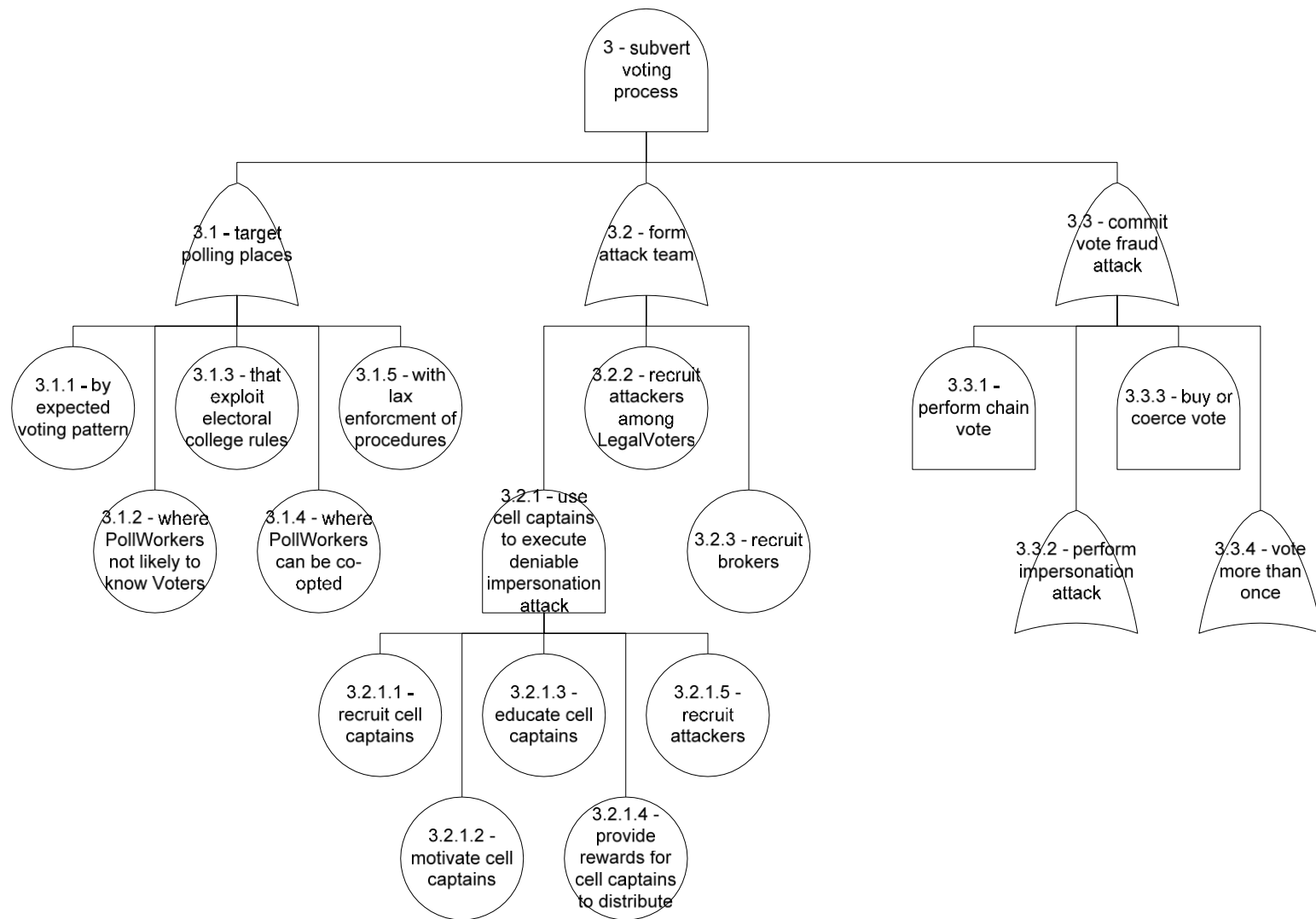




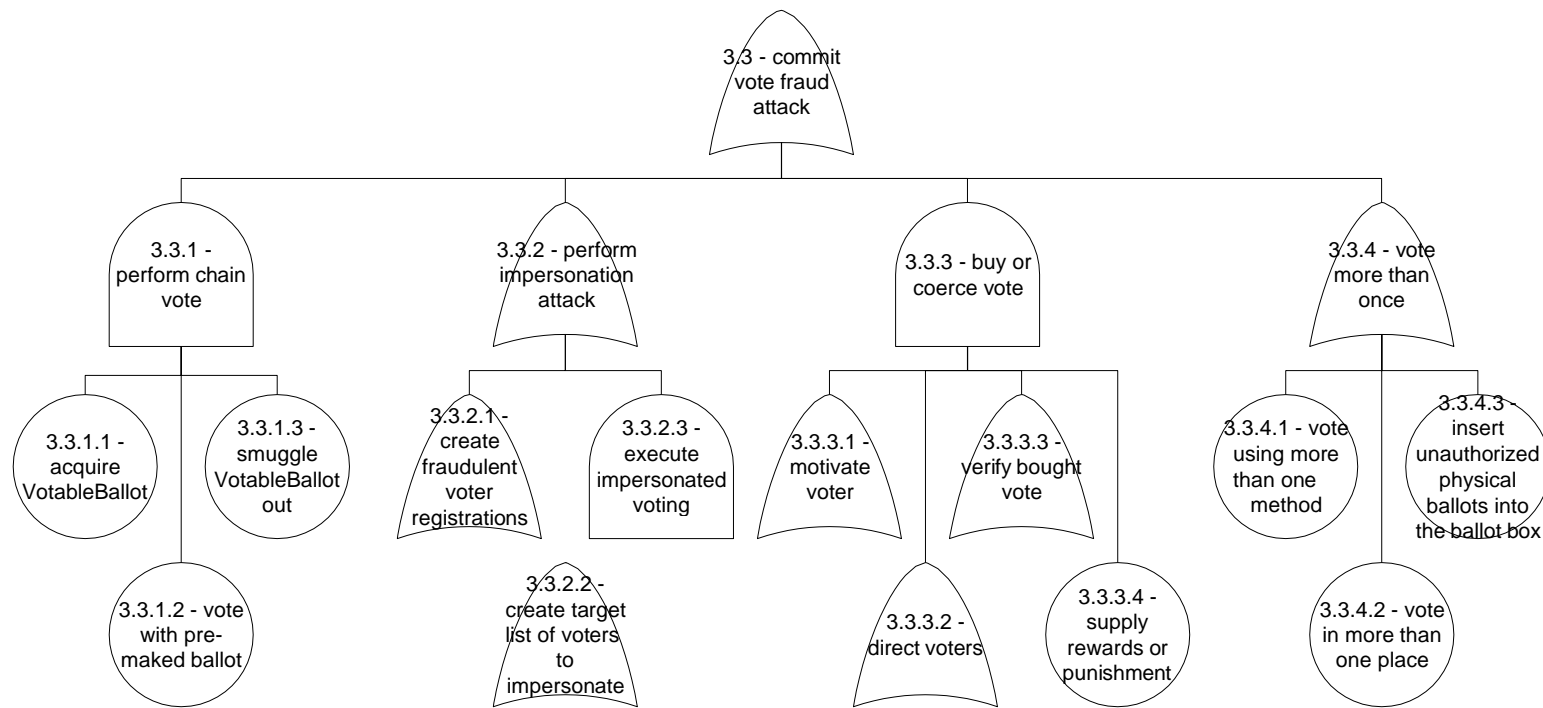
## 3-7 PCOS Alter Voter's Vote



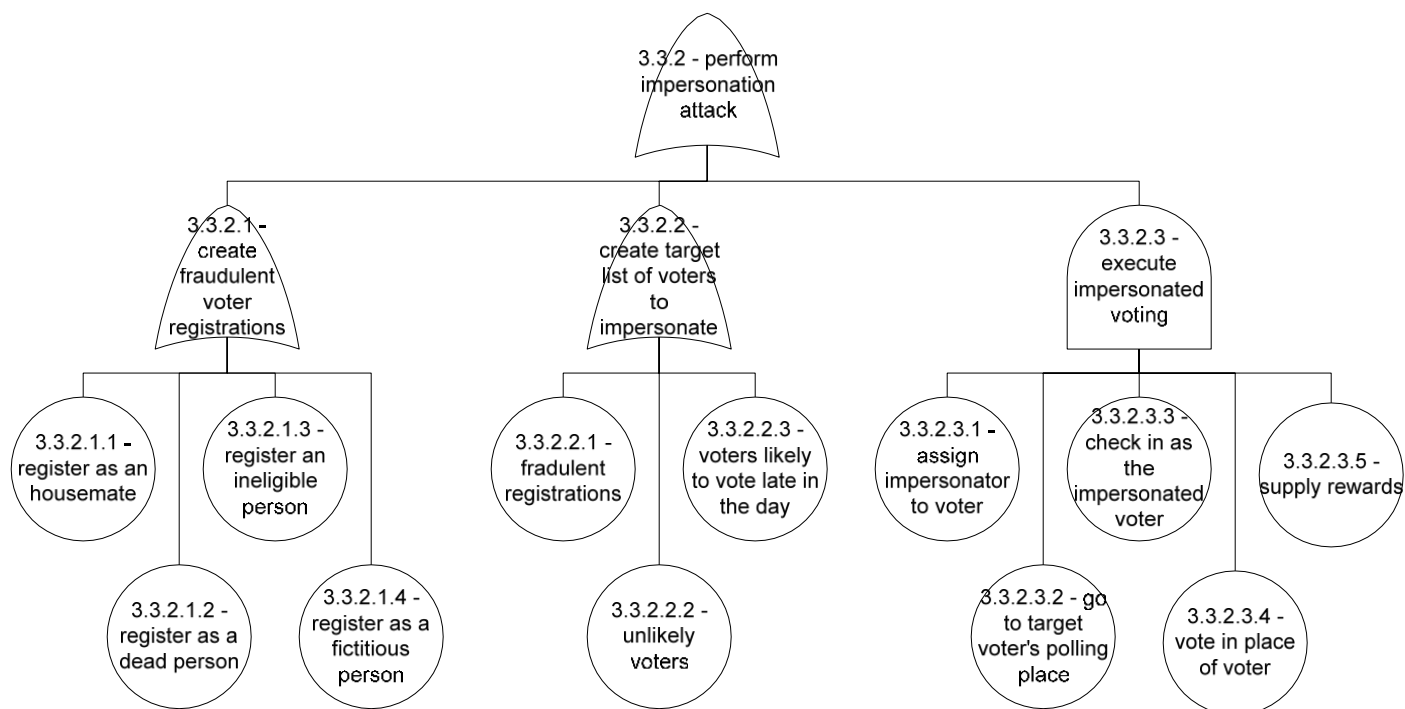
## 3-8 PCOS Attack Other than Polls



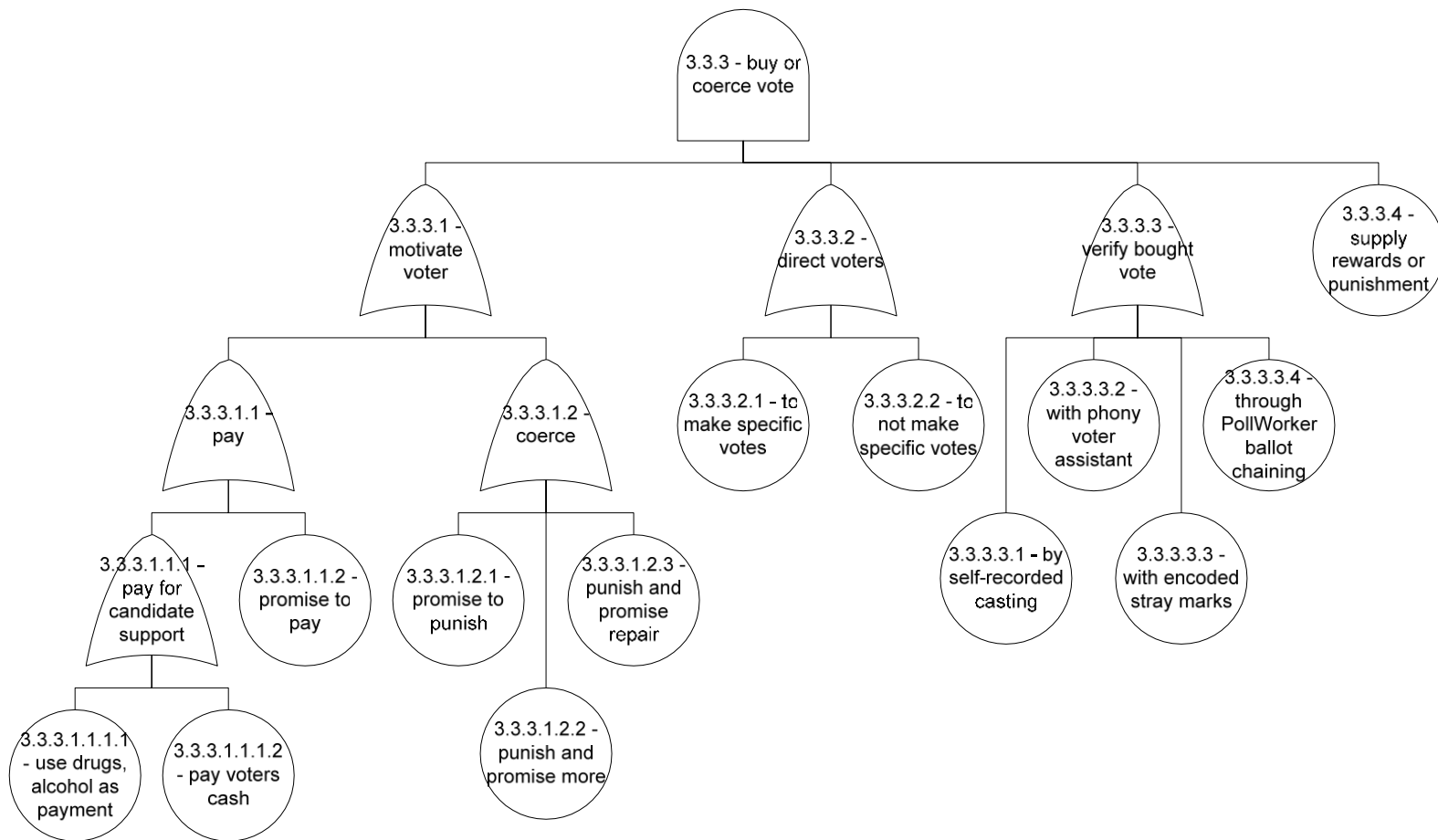
3-9 PCOS Subvert Voting Process



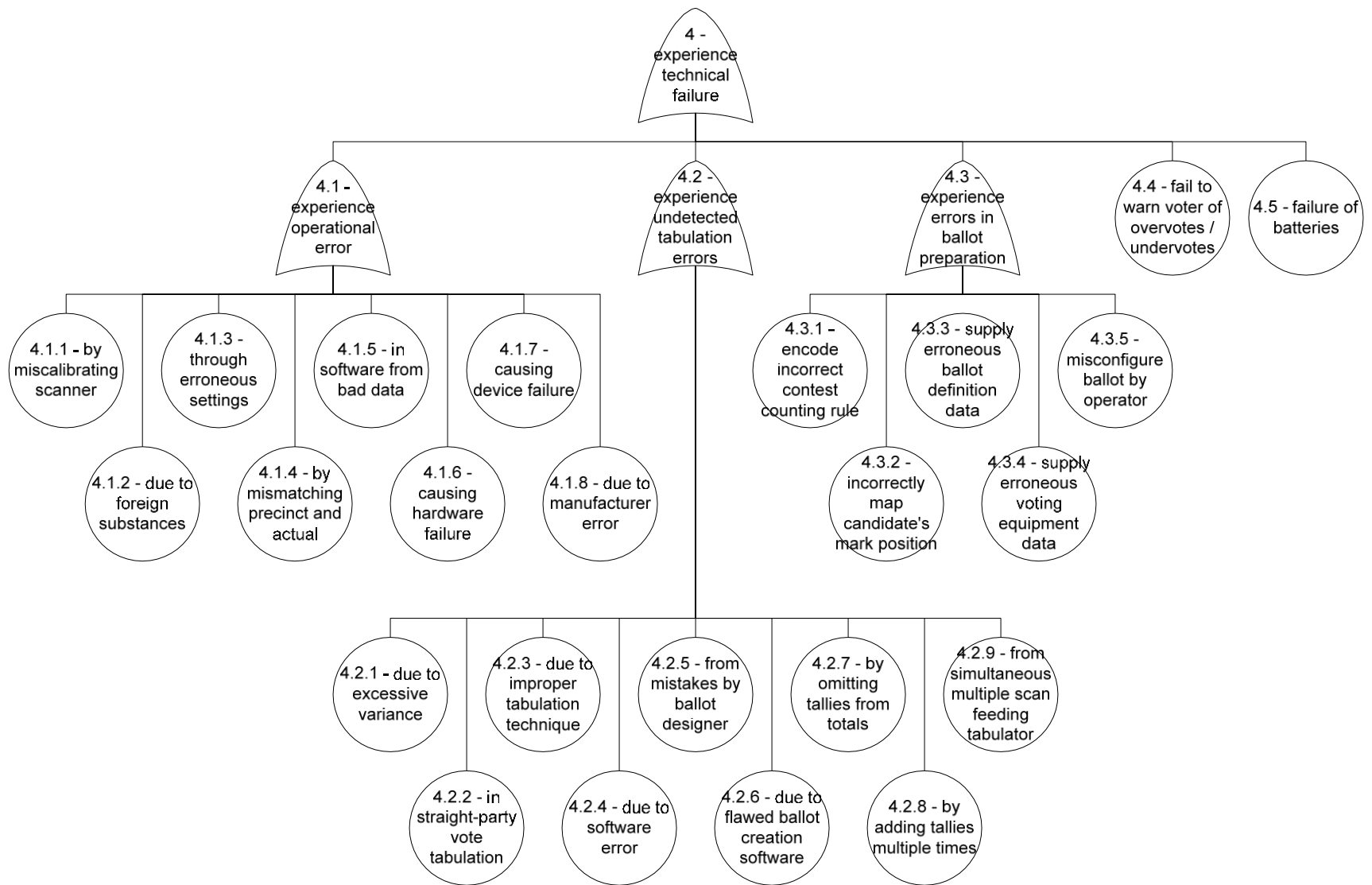
3-10 PCOS Commit Vote Fraud Attack



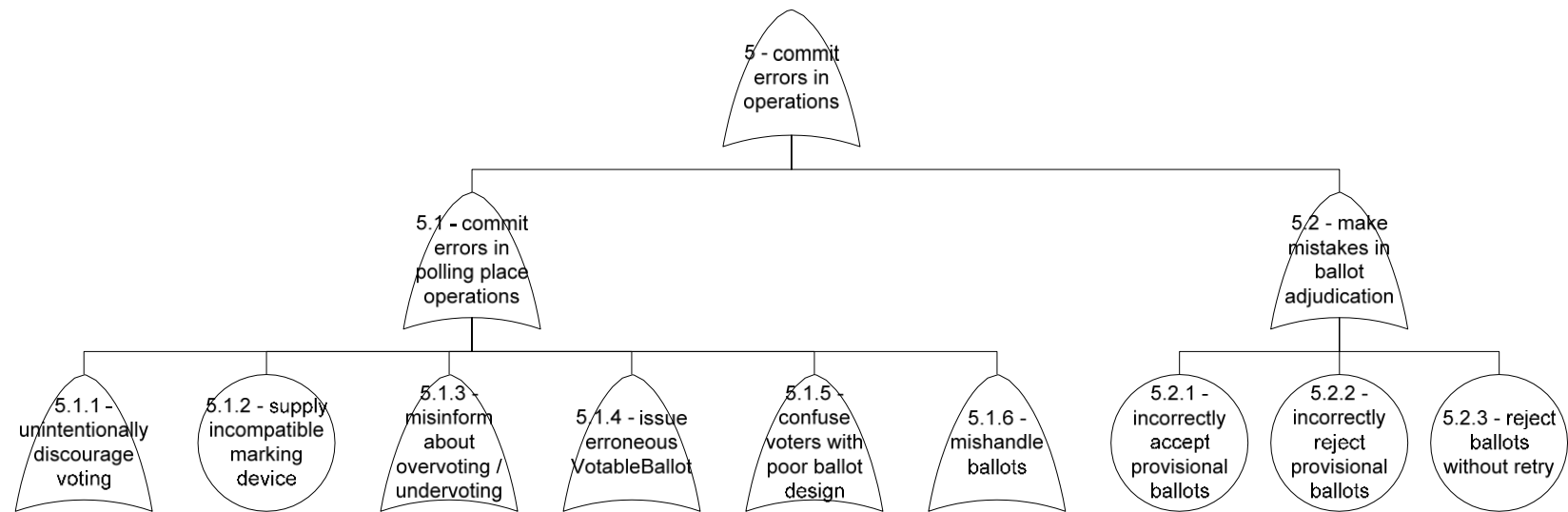
3-11 PCOS Perform Impersonation Attack



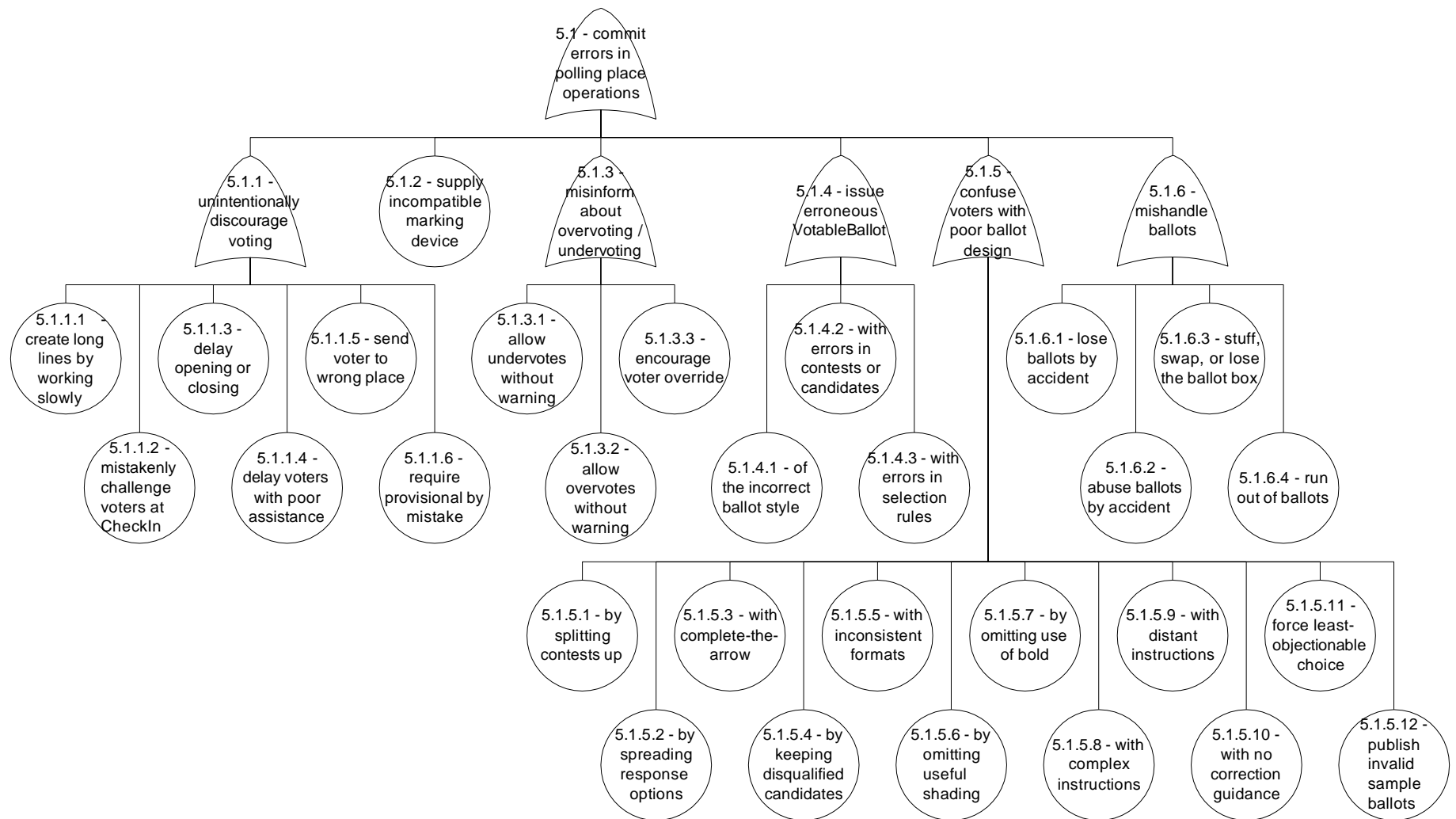
3-12 PCOS Buy or Coerce Vote



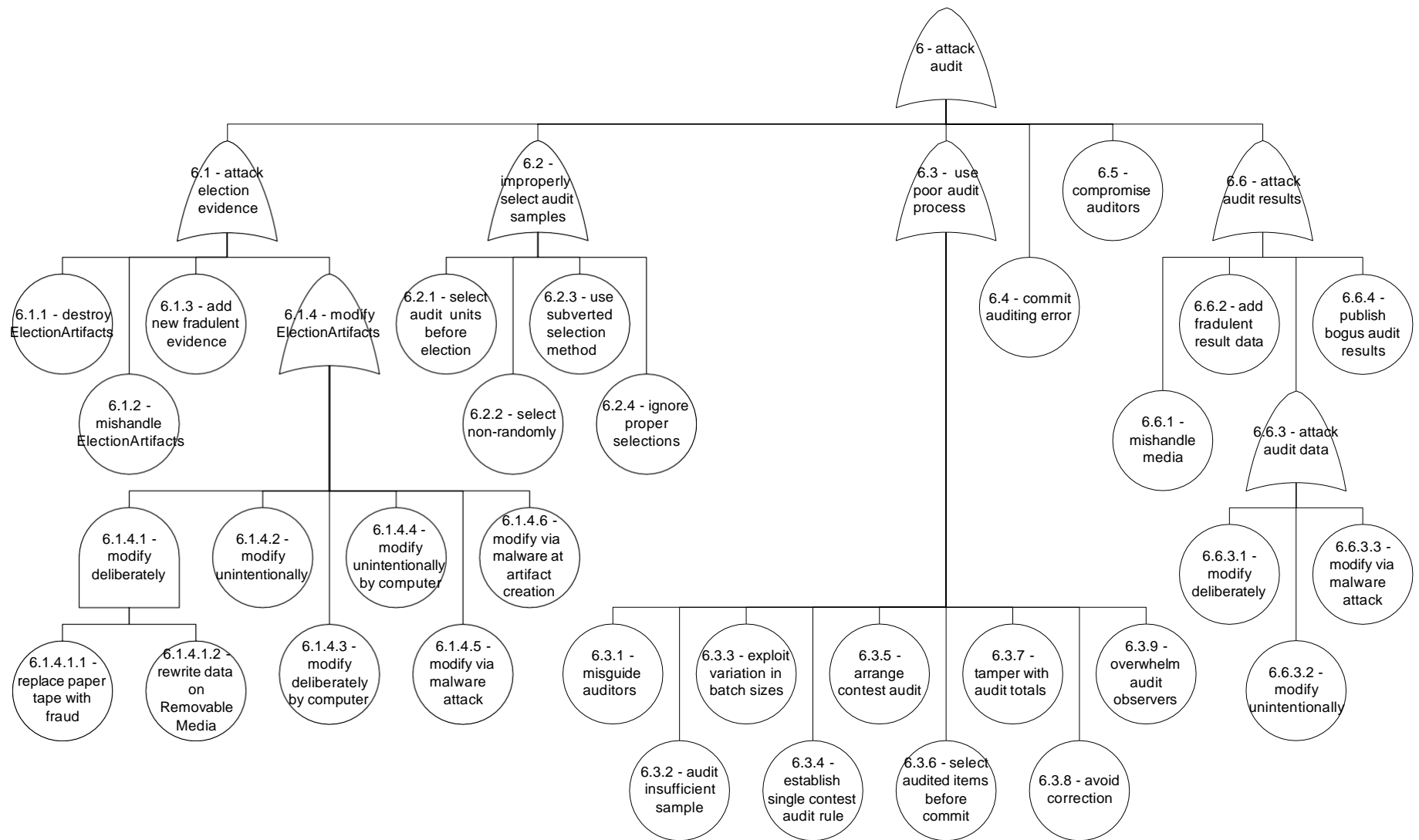
3-13 PCOS Experience Technical Failure

**3-14 PCOS Commit Errors in Operations**

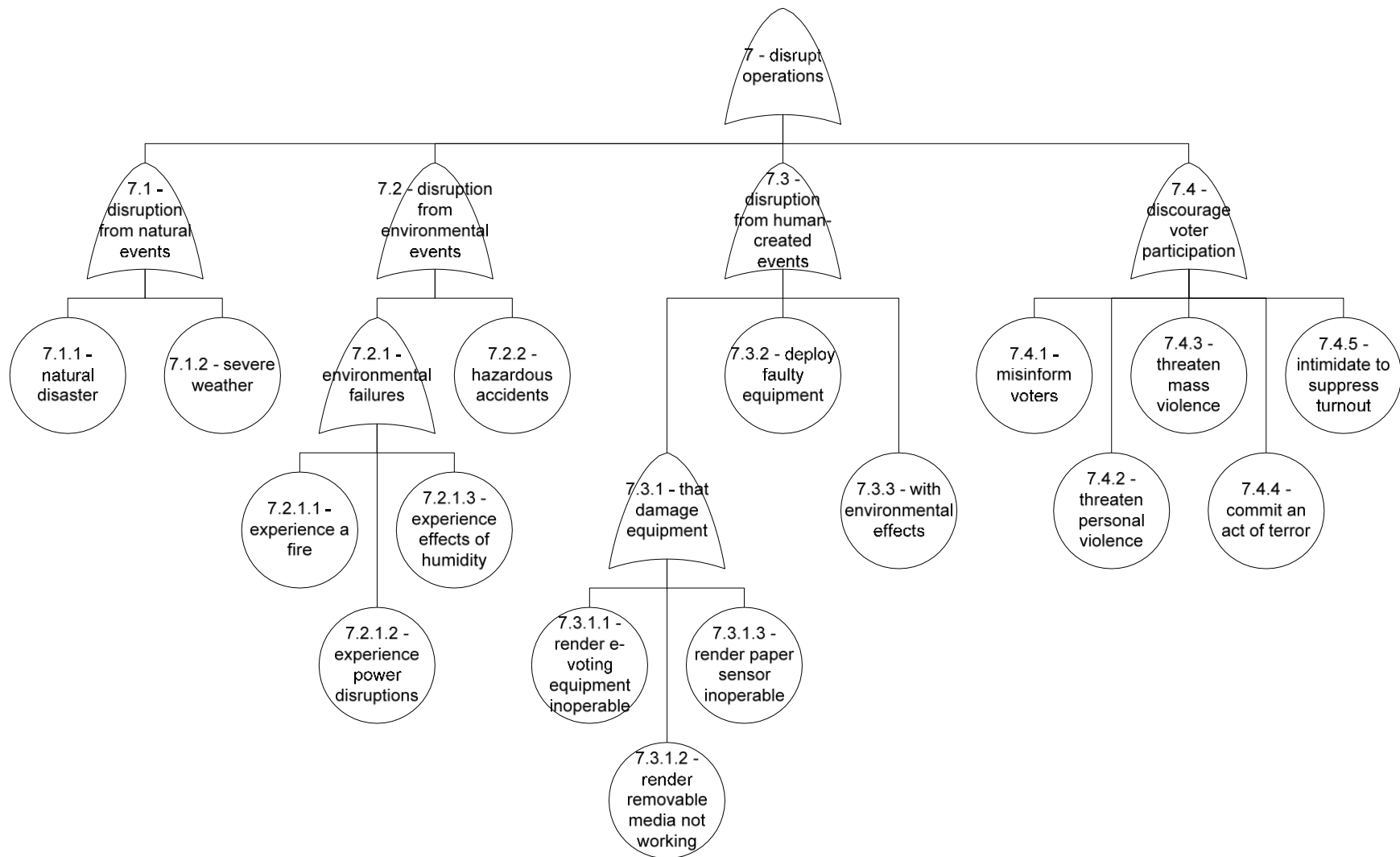




3-15 PCOS Commit Errors in Polling Place Operations



3-16 PCOS Attack Audit



3-17 PCOS Disrupt Operations

## 3.3

Threat Trees and Matrices and Threat Instance Risk Analyzer

Election Operations Assessment