

ECS 235B Module 2

Basic Components

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- Confidentiality
 - Keeping data and resources hidden
- Integrity
 - Data integrity (integrity)
 - Origin integrity (authentication)
- Availability
 - Allowing access to data and resources

McCumber Cube

Critical Information Characteristics

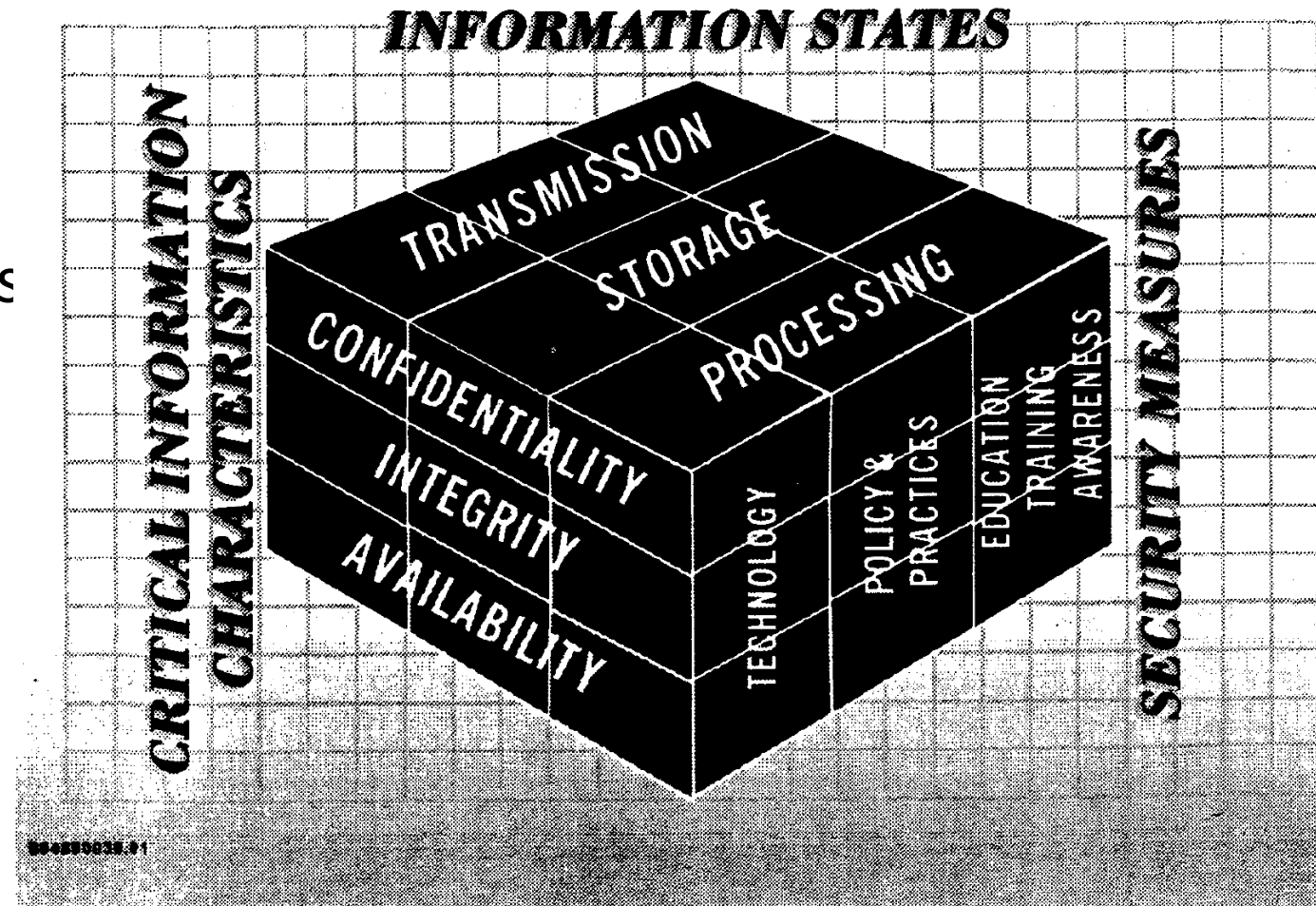
- CIA Triad

Information States

- Stages in handling information

Security Measures

- Controls for information access and handling



Picture from J. McCumber, "Information Systems Security: A Comprehensive Model", *Proceedings of the 14th National Computer Security Conference* p. 328–337 (Oct. 1991); on p.334.

Information States

- Storage
 - Where data is kept
 - Examples: disks, USB memory sticks
- Transmission
 - How data moves from one place to another
 - Examples: network connections, pipes
- Processing
 - Computations using the information
 - Examples: computing statistics, drawing pictures

Security Measures

- Technology
 - Something implemented and used to ensure critical information characteristics maintained through information states
 - Example: encryption, access controls
- Policy and Practice
 - Something which says what information can be accessed, by whom, and how; a procedure to enhance security
 - Example: students may not access one another's homework files
- Education, Training, and Awareness
 - Make people understand security at level appropriate for them
 - Example: cybersecurity training UC Davis folks must take

Assumptions and Trust

- Underlie *all* aspects of security
- Policies
 - Unambiguously partition system states
 - Correctly capture security requirements
- Mechanisms
 - Assumed to enforce policy
 - Support mechanisms work correctly