

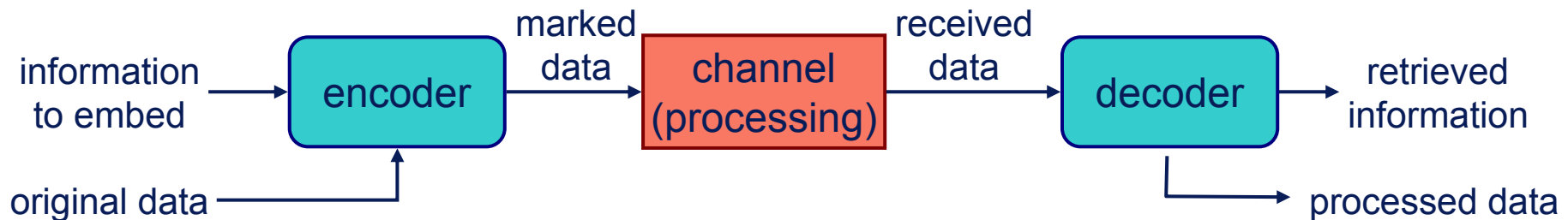
Information Hiding Applications

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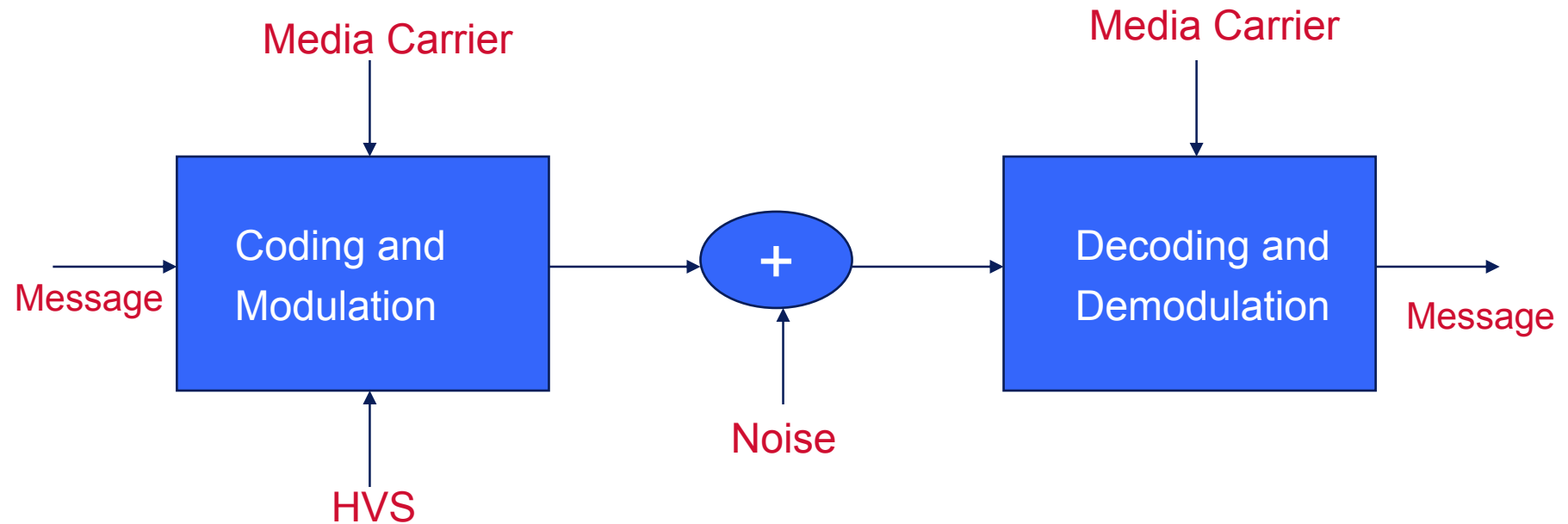
Information Hiding

- Information Hiding: Communication of information by embedding it in and retrieving it from other digital data.
- Depending on application we may need process to be imperceptible, robust, secure. Etc.



Information Hiding

A Communications Framework



More about this tomorrow!!

Where can we hide?

- Media
 - » Video
 - » Audio
 - » Still Images
 - » Documents
- Software
- Hardware designs
- Etc.
- We focus on data hiding in media.
- We mainly use images but techniques and concepts can be suitably generalized to other media.

Why Hide?

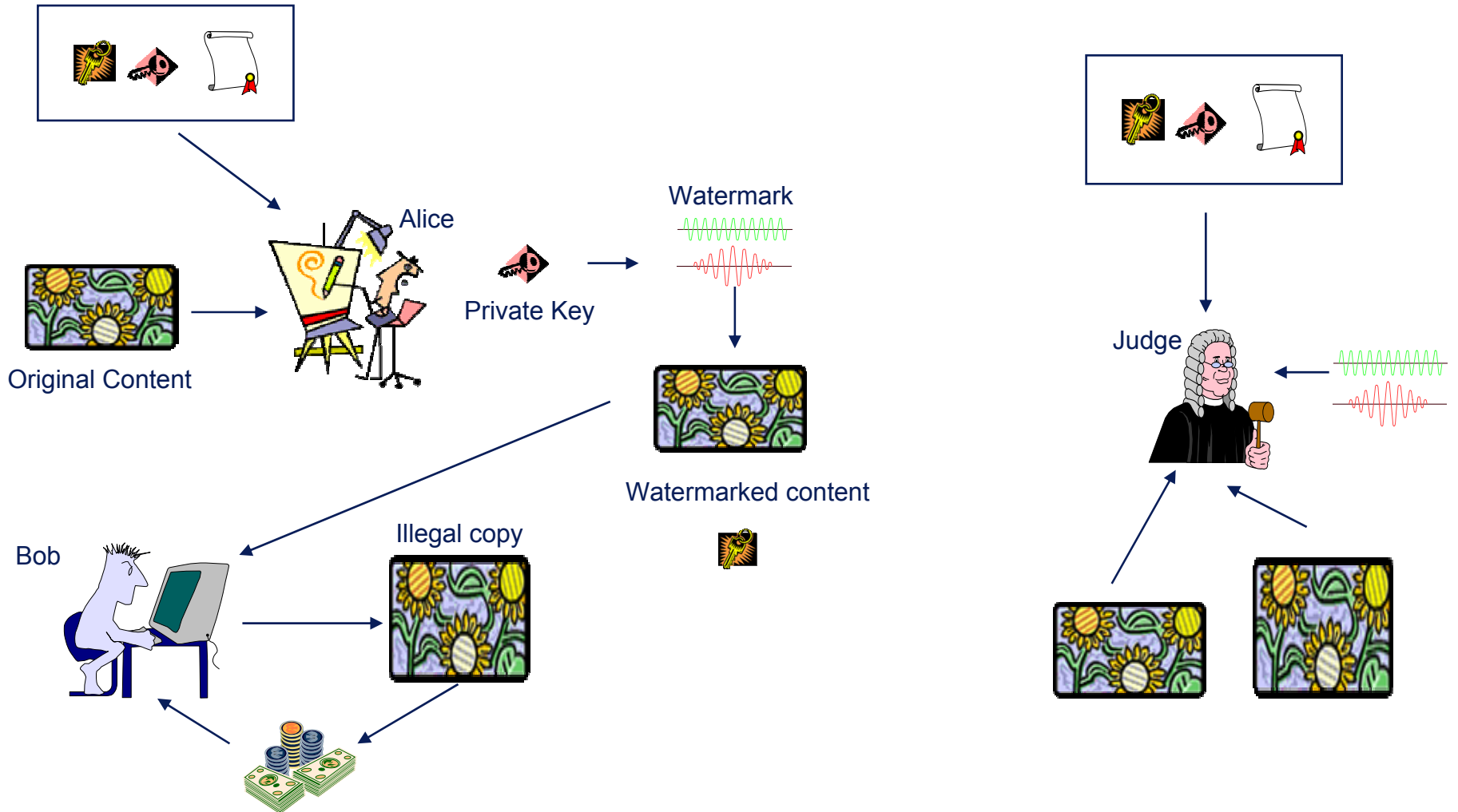
- Because you do not want someone to find it
 - » Copy protection and deterrence - Digital Watermarks
- Because you do not want any one to even know about its existence
 - » Covert communication – Steganography
- Because it is ugly
 - » Media bridging,
 - » Meta Data embedding

Applications of Information Hiding

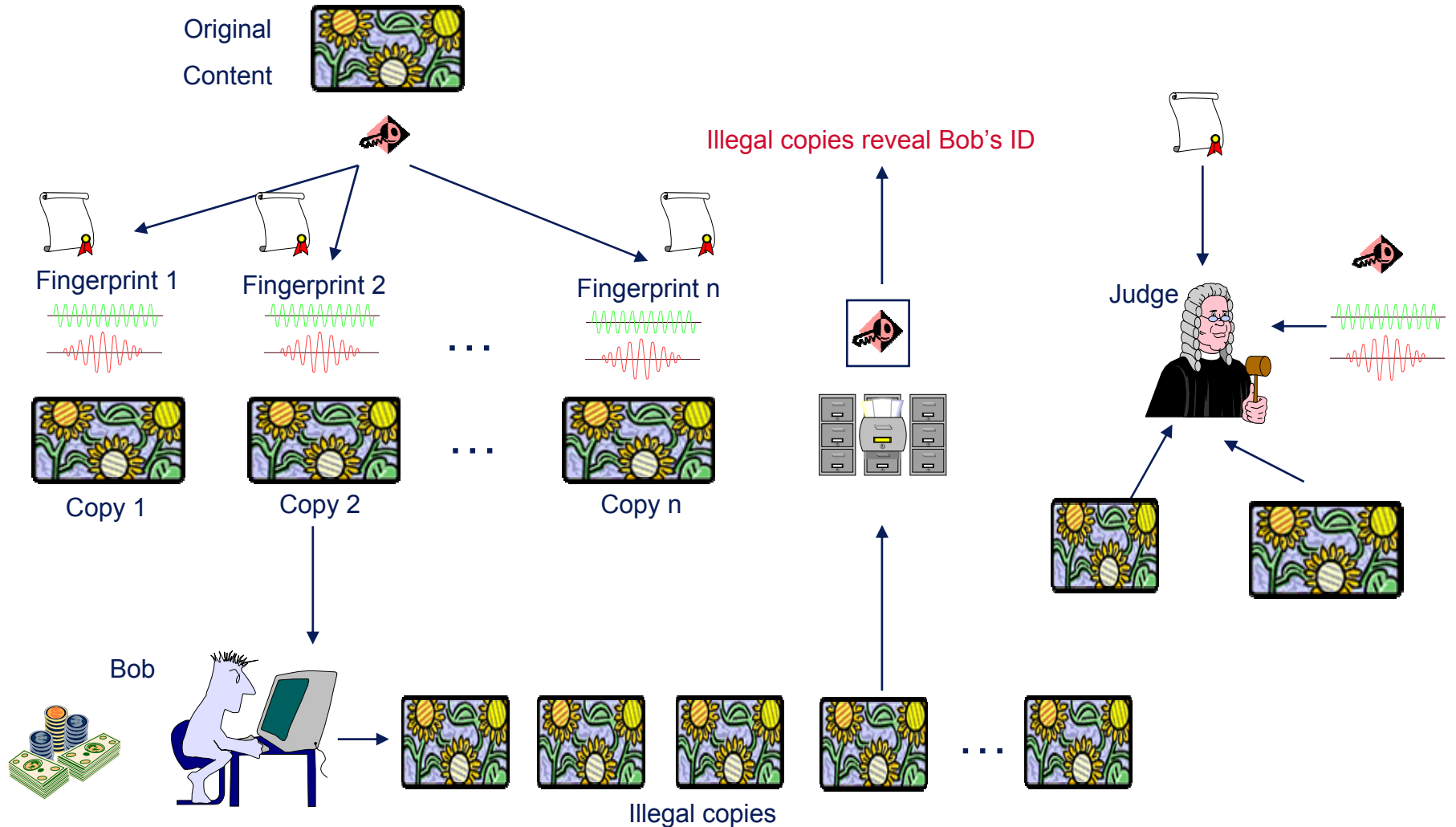
- Ownership assertion.
- Fingerprinting.
- Copy prevention or control.
- Authentication.
- Broadcast Monitoring
- Media Bridging
- Meta data Hiding
- Covert communication
- Etc.

Ownership Assertion

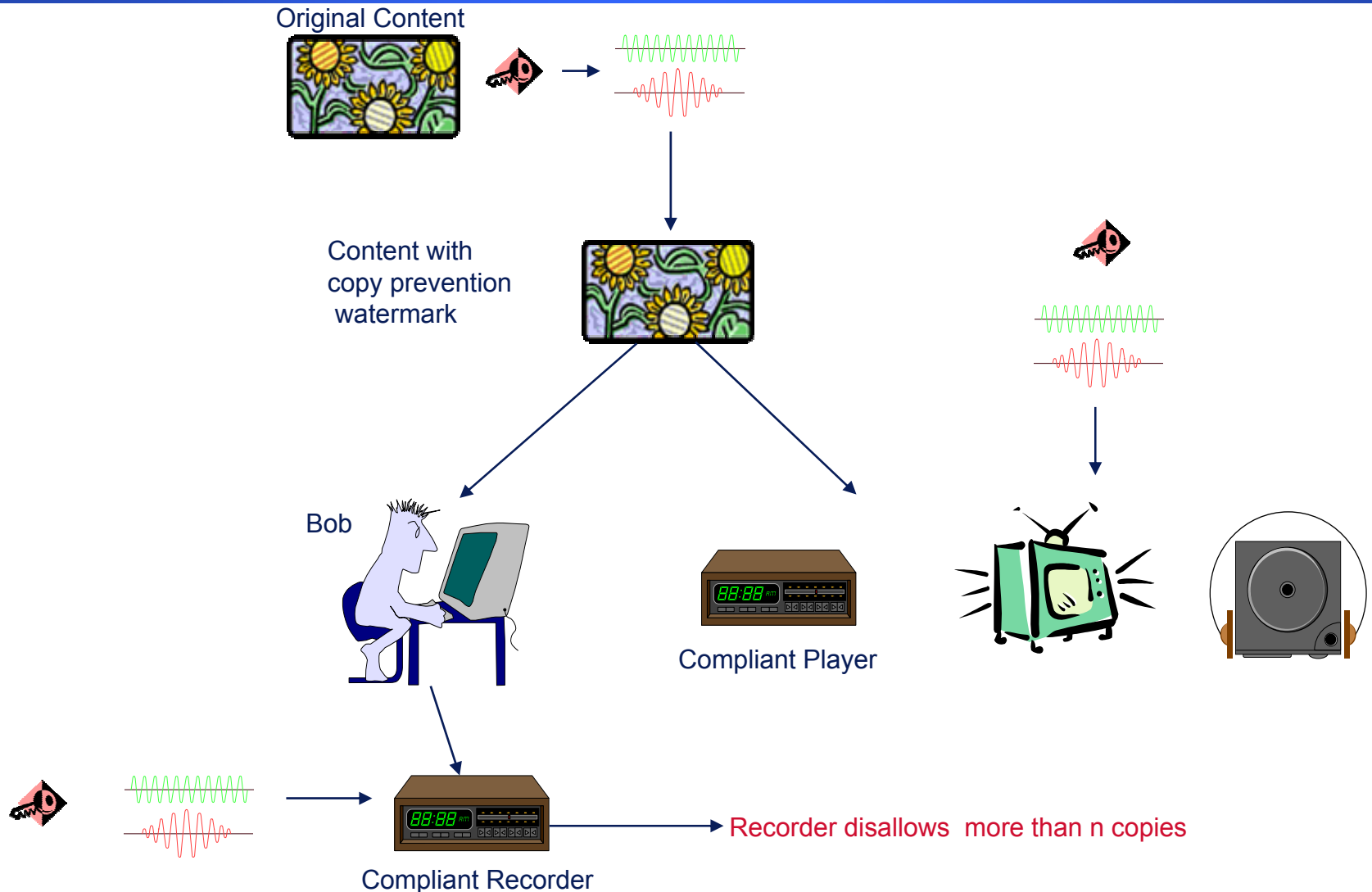
Public-Private Key Pair, Digital Certificate



Fingerprinting



Copy Prevention and Control



Requirements

- Requirements vary with application.
 - » Perceptually transparent - should not perceptually degrade original content.
 - » Robust - survive accidental or malicious attempts at removal.
 - » Oblivious or Non-oblivious - Recoverable with or without access to original.
 - » Capacity – Number of bits hidden
 - » Efficient encoding and/or decoding.
- Requirements are inter-related.

Security

- One requirement often ignored or at least shabbily treated – Security.
- What does security mean?
- This has been generally interpreted as “embedded information cannot be detected, read (interpreted), and/or modified, or deleted by unauthorized parties”
- But there is more to security ...

There is More to Security

- Depends on application –
 - » Ownership Assertion
 - » Authentication
 - » Steganography
- Rest of the day we review above applications and proposed solutions and examine security aspects a bit more carefully.
- We shall assume that we know how to meet other requirements like robustness etc. efficiently and effectively.