Chapter 1: Introduction
How is a communication system organized?

◊ **Source** of information: voice, music, picture, videos, data files, email.

◊ **Transmitter**: a generic term for the processing of information in the form provided by the source into a form that is *suitable for transmitting over the channel*.

◊ **Channel**: transmission medium, e.g. cable, optical fiber, free space.

◊ **Receiver**: a generic term for the process of converting the signal transmitted over the channel back to a form that may be understood at the intended destination. The receiver’s function is typically greater than simply being the *inverse of the transmitter*; the receiver may also have to *compensate for distortions introduced by the channel* and perform other functions, such as the *synchronization* of the receiver to the transmitter.
Analog vs. Digital

- All communications are by means of continuous signals and are thus analog in nature.
- It is the information which is to be transmitted that has an analog or digital nature.
- Since most modern communications are digital, the amount of emphasis placed on analog communications is steadily decreasing.
- Reasons to understand analog techniques:
  - Understanding of legacy systems;
  - Many digital communication techniques are motivated from their analog counterparts;
  - Many of the distortions observed in digital transmission systems can be characterized as analog in nature;
  - A thorough understanding of analog modulation systems leads to insight in identifying and compensating these distortions.
Basic Elements of A Digital Communications System
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