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## *Being digital*

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## Being digital

*What are we talking about?*

1. What does “digital” mean?
2. “Being digital” as a 1995 book
3. Is digital richer or poorer than analogue?





## Being digital

*What does "digital" mean?*

**Digital** derives from the Latin word *Digitus*, meaning finger. In short, digital is what can be represented with **numbers**, which can be counted with fingers.

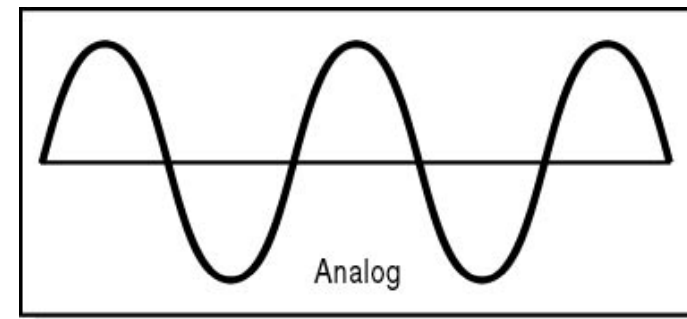
Digital is opposed to **analogue**, which is related to what is not countable: what cannot be considered within a discrete set of elements.

Digital refers therefore to **discrete** mathematics, working with a finite set of elements, while what is analogue is modeled by the **continuum**, that is mathematics dealing with infinite elements (countable or uncountable).

**0 1 2 3 4**  
**5 6 7 8 9**



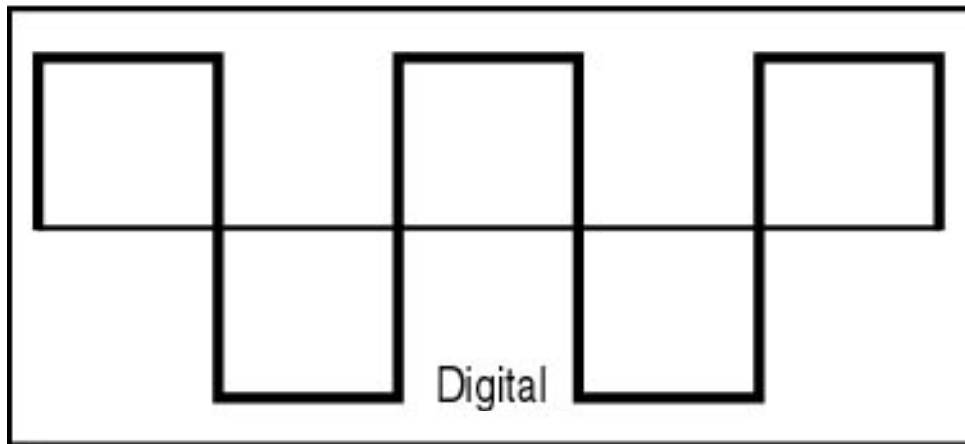
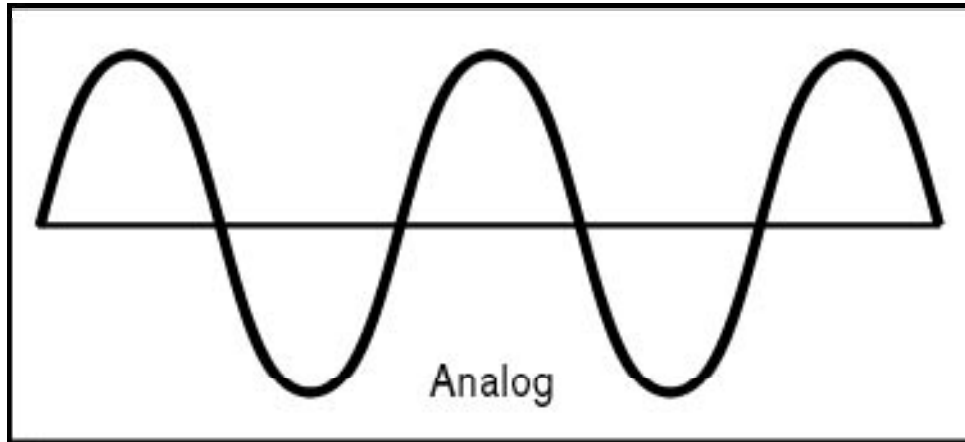
**The analog hole  
is my ear.**





## Being digital

*A wave, and a digital wave*





## Being digital

### *Mechanical vs. digital watches*

A **mechanical watch** is analogue inasmuch as the position of each of its three hands (hours, minutes and seconds) can represent any of the infinite points forming the circle of the watch itself – points that cannot be numbered.

In a **digital watch**, instead, only the figures which make up hours, minutes and seconds are usually represented – only the 86,400 moments (24 hours x 60 minutes x 60 seconds) making up the seconds of a day.





## Being digital

### *Photographs and pixels*

A traditional **photograph** (a photograph based on a chemical film) consists of an infinite number of points in an infinite range of colours.

A chemical photograph can be digitized (scanned, for instance) and then translated into a **digital photo** when its surface is represented as divided into a discrete number of “points” (usually small squares or rectangles called **pixels**), each of which reproduces only one colour in an available range of 16,777,216 (a combination of 256 shades of red, 256 of green and 256 of blue – according to the widely used RGB colour model).



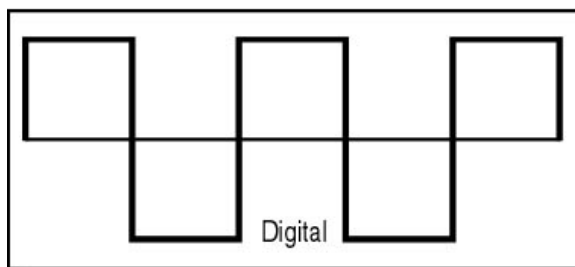
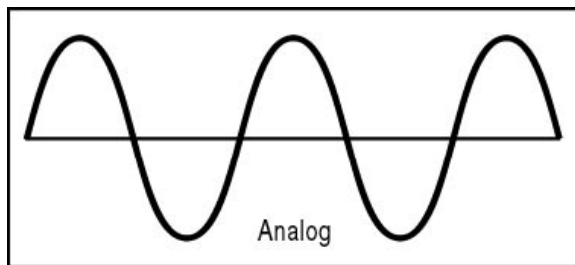


## Being digital

### *Waves and bits*

Many technologies rely on digital to reproduce a **wave** (a sound or a light wave) that was originally analog.

A **modem** converts an analog sound signal that can be sent through telephone wires into a digital signal, of the sort requested by computers or other electronic devices working by **bits** (0/1).





## Being digital

### *Bits and bytes*

A **bit** (a contraction of binary digit) is the basic unit of information in computing and telecommunications; it is the amount of information stored by a digital device or other physical system that exists in one of two possible distinct states. These may be the two stable states of a flip-flop, two positions of an electrical switch, two distinct voltage or current levels allowed by a circuit, two distinct levels of light intensity, two directions of magnetization or polarization, etc.

The **byte** is a unit of digital information in computing and telecommunications that most commonly consists of eight bits. Historically, a byte was the number of bits used to encode a single character of text in a computer and for this reason it is the basic addressable element in many computer architectures.



## Being digital

*"Being digital" as a 1995 book*

"I am optimistic by nature. However, every technology or gift of science has a dark side. Being digital is no exception. The next decade will see cases of intellectual-property abuse and invasion of our privacy. We will experience digital vandalism, software piracy, and data thievery. Worst of all, we will witness the loss of many jobs."



"We are not waiting on any invention. It is here. It is now. It is almost genetic in its nature, in that each generation will become more digital than the preceding one.

The control bits of that digital future are more than ever before in the hands of the young. Nothing could make me happier."

— *Nicholas Negroponte [MIT]*

<http://addesign.springdaleschools.org/Volumes/Americans+ELibra/Docs/Reconst/DOCS/UNIT7/Digital7.pdf>



## Being digital

*Is digital richer or poorer than analogue?*

A few socially relevant consequences:

- ✓ Communication Technologies (modems, broad band, wireless...)
- ✓ Information sharing (cellphones, the Internet...)
- ✓ Email (travelling through the Internet)
- ✓ Music (Mp3, iTunes...)
- ✓ Photography (Kodak no longer manufactures chemical films)
- ✓ Television (satellite television)

Is digital a revolution?

Yes!

**Digital has changed our lives.**

Nonetheless, digital is innerly poorer than analogue inasmuch as it conveys a simplified message.

(This, by the way, may imply that digital communication is invariably poorer than personal communication.

Let's not forget it, when communicating through the Internet.)



## Being digital

*The real thing is better...*

The best way to communicate is talking to someone **in person**.

✓ When you call her/him through a **videophone** (or Skype) you miss at least the physical context around her/him.

✓ When you call her/him on the **phone**, you miss the physical context, and you don't see her/him.

✓ When you send her/him an **e-mail** message, you miss the physical context, you don't see her/him, and you don't know when and where she/he will get your message.

✓ When you send her/him a **text message**, you miss the physical context, you don't see her/him, you don't know when and where she/he will get your message, and you must keep it short.

✓ When you post something on the **Web**, you miss the physical context, you don't see your audience, you don't know when and where your audience will get your message, you must keep it short, and you don't know – or know little of – your audience. Let's not forget it, when communicating through the Internet!