Wire is wire . . . not necessarily

It's a common misconception that a good video cable will also make a good digital cable. Take a high quality coax cable and terminate it with RCAs and you're done. In video and digital cables (like audio cables) conductor materials and primary insulating (dielectrics) materials are very important. But there are many other characteristics that are also very important for optimum performance. Specifications such as dielectric constant, dissipation factor, velocity of propagation, time delay, and characteristic impedance (just to name a few) are used to characterize the materials used to construct a cable, and in turn, its electrical performance. Building a cable with premium materials exhibiting a high velocity of propagation and constant characteristic impedance vs. frequency is extremely important for video applications, and generally, this is also true for digital applications.

However, digital cables require an important additional characteristic, damping. Digital cables used for audio applications require electrical damping at a single (digital) frequency, either 44.1 kHz, 88.2 kHz, or 96 kHz. If the damping is wrong, the cable will induce unwanted jitter to the digital signal resulting in audible distortions.

A comparison of various brands and models of video & digital cables

brand	model	VP	Capacitance	Damping	Retail Price (1 meter)
Audioquest (dual purpose video/digital cable)					
	VSD-2	73%	61pf/m	very low	$80
note: termination of this cable was not impedance matched and not 75Ω					
Monster Cable (dual purpose video/digital cable and digital specific cable)					
	M1000 Silver	68%	63pf/m	low	$50 (video) $100 (digital)
digital	IDL 100	not applicable	73pf/m	very low	$35
note: impedance was not 75Ω					
Straightwire (dual purpose video/digital cable)					
dual	Silver link	77%	52pf/m	very low	$60
note: though a good video cable, this cables damping is too low to function well as a digital cable					
Tributary (dual purpose video/digital cable)					
dual	SCV 1000	61%	93pf/m	low	$90
note: this cable falls in the middle, it's damping is too low to function well as a digital cable and the high capacitance extremely limits its bandwidth as a video cable					
MIT (application specific video and digital cables)					
video	OneWire	80%	52pf/m	not applicable	$18.50
digital	AVt 3	not applicable	71pf/m	proper/critical	$49.95
	AVt 2	not applicable	70pf/m	proper/critical	$99.95
	AVt 1	not applicable	61pf/m	proper/critical	$149.95

Summary:

Though very similar, video & digital signals require different electrical performance chacteristics. This is why, MIT only builds and recommends utilizing interface cables designed specifically for the application they are being used.

Low damping is a major cause of signal jitter in digital cables, only MIT digital cables feature patented MIT digital network technologies providing proper signal damping, reduced jitter & optimum performance.

Glossary of terms used

1 **Conductor**: A material suitable for carrying an electric current. Copper is the most common conductor material used in A/V applications.

2 **Dielectric:** An insulating (non-conducting) medium.

3 **Dielectric Constant:** Dielectric constant can be described as the non-conductivity of a material relative to air, which is considered the perfect insulator have a dielectric constant value of 1.0. It is also very important to note that time delay, or it's inverse, velocity of propagation is determined by the dielectric constant.

4 **Capacitance:** The ability of a dielectric material, when placed between conductors (or plates), to store voltage (or charge) when a difference of potential exists between the conductors/plates.

5 **Time Delay:** The lower the dielectric constant the less time required for a signal to travel down a given length of cable.

6 **Velocity of Propagation:** Is the speed at which a signal travels over the transmission medium. This value is expressed as a percentage of the speed of light (300 million m/sec.), which is used as the reference velocity.

7 **Characteristic Impedance:** The ratio of the electric field strength to the magnetic field strength in an electromagnetic wave. The predominant impedance in RF transmission lines is 50 ohms. This represents a compromise between the impedance of the minimum attenuation at 77 ohms and the impedance of the maximum power transfer impedance of 30 ohms. When very long transmission lines are used the impedance is typically 75 ohms to minimize attenuation.

8 **Jitter:** Random variations of the pulse repetition period, that modify the digital signal and created audible distortions.

9 **Damping:** To cause the amplitude of a signal to decay. The lack of proper/critical signal damping causes jitter, which is the primary distortion mechanism with digital signals transported down cables.