Link 7.1 Interoperability Model

Interoperability refers to the ability to exchange data transmissions between information technology (IT) devices. The communication protocols of each device need to correspond to ensure that the data can be transmitted and received accurately without being corrupted. The Open Systems Interconnection (OSI) reference model (Day & Zimmerman, 1983) is a conceptual framework of standards that defines the requirements for communication across different equipment and applications by different vendors. The framework divides the communication processes into seven self-contained levels, referred to as layers, shown in Table 7.1.1. The upper layers (5-7) focus on application issues and are closest to the person using the device; the lower layers (1-4) focus on data transport issues in the underlying software, which enable transmission of data from one device to another. Information being transferred from a software application in one computer system to a software application in another system must pass through all the OSI layers.

Table 7.1.1 Open Systems Interconnection (based on: Day & Zimmerman, 1983)

Layer	Description
Layer 1 Physical Layer	Includes protocols responsible for establishing, maintaining and ending physical communication connections between the devices for the transmission of data bits.
Layer 2 Data Link Layer	Provides protocols to control logical links to transfer data and identify any errors in the transmission of the data between the two devices.
Layer 3 Network Layer	Deals with protocols to establish, maintain and terminate end to end network links routing messages across the network.
Layer 4 Transport Layer	Includes the protocols that are responsible for the reliability of end to end connections for the flow of data transmission and recover connections when errors occur.
Layer 5 Session Layer	Includes protocols for establishing, maintaining and ending sessions of communication between systems so that differences between platforms are transparent to the user.

Table 7.1.1 Continued

Layer	Description
Layer 6 Presentation Layer	Deals with data syntax during transfer between two application processes to enable computers using different file formats to communicate. This includes compressing and encrypting data.
Layer 7 Application Layer	Includes the protocols that support user applications and addresses issues of file access and management, authenticating communication and establishing privacy mechanisms.

Reference

Day, J. D. & Zimmerman, H., (1983), 'The OSI Reference Model', *Proceedings of the IEEE,* **71**(12), pp. 1334-1340.