McKinsey & Company/ Source : Expert Interviews; publicity available information.

Based on the sector or connectivity requirements, you need to often decide which connectivity option is best suited for the job. The Fig. 2.8.1 could probably help you to decide which connectivity option could be right for the purpose for connecting smart objects. Based on these criteria, you can figure out connectivity options for your smart objects.

Note here that these criteria are only general guidelines to help you pick a particular technology over other and should not be considered to be the only factor for making a final choice.

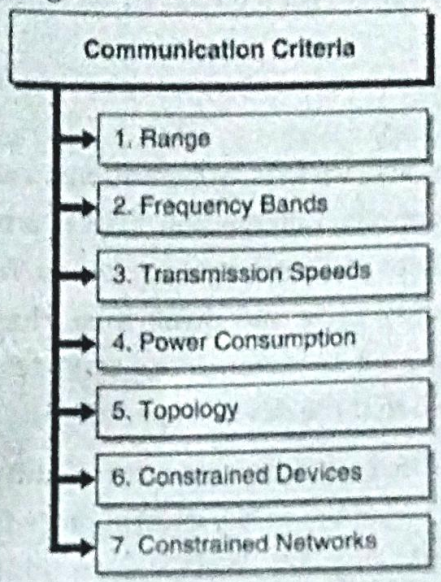

Fig. 2.8.1 : Communication Criteria

1. Range

The Range criteria helps you to decide how far the signal must be propagated and the desired area coverage. There are technologies which are more suitable for indoor wireless connectivity (short range, small coverage) than outdoor wireless connectivity (long range, broad coverage). The Fig. 2.8.2 outlines the various wireless technologies that are popular in the IoT domain (other technologies are purposely omitted for clarity and conciseness) on the basis of range.

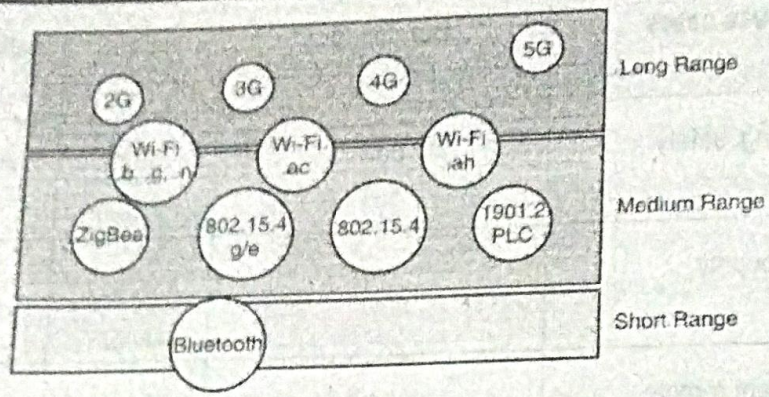

Fig. 2.8.2

(a) Short Range Technologies : Short range communication technologies, such as IEEE 802.15.1 Bluetooth and IEEE 802.15.7 Visible Light Communications (VLC), are used for indoor connectivity. These are often considered to be alternatives to wired communication. The area span of short range technologies is under 100 meters. Note here that Bluetooth Classic and Bluetooth Low Energy (BLE) are two different technologies. Bluetooth Classic is the original Bluetooth radio that is still widely used in streaming applications, especially audio streaming. Bluetooth LE, on the other hand, has traditionally focused on low-bandwidth applications that involve infrequent data transmission between devices. Bluetooth LE is known for its very low power consumption and long range communication.

(b) Medium Range Technologies : Most of the IoT deployments use medium range technologies, such as Wi-Fi and ZigBee, for connectivity. These technologies could span up to a few hundred meters. The maximum distance is generally less than 1 KM between two devices.

(c) Long Range Technologies : Long range technologies provide coverage for area span of greater than 1 KM. Some of the common examples of long range technologies are cellular (2G, 3G, 4G, 5G) and Low-Power Wide-Area (LPWA) technologies. A few Wi-Fi implementations such as IEEE 802.11ah are considered long range as well.