Entropy and the Second law; Information theoretical approach

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We start with a clear distinction between Shannon's Measure of Information (SMI) and the Thermodynamic Entropy. The first is defined on *any* distribution, and therefore it is a very general concept. On the other hand Entropy is defined on a very special set of distributions. Next we show that the Shannon measure of Information provides a solid and quantitative basis for the interpretation of the thermodynamic entropy. For an ideal gas the entropy measures the uncertainty in the location and momentum of a particle, as well as two corrections due to the uncertainty principle and the indistinguishability of the particles