

Information

Experience shows that the **information value** of certain *news* depends on their probability.

$$I_{E_i} = f(p_i)$$

in which I_{E_i} means the information value. In this aspect the more unexpected or unlikely (rumour) a *news* is the bigger it's *news* value.

So the f function was selected according to Shannon's suggestion:

$$I_E = \log_2 \frac{1}{p_E} = -\log_2(p_E) \text{ [bit]}$$

The properties of a logarithm function play an important role in the modeling procedure of the quantitative properties of a given information.

If an event space consist of two equal-probability event $(p(E_1) = p(E_2) = 0.5)$ then,

$$I_{E_1} = I_{E_2} = \log_2 \frac{1}{0.5} = -\log_2 0.5 = 1 \text{ [bit]}$$

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