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:

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

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,

$$ I_{E_1} = I_{E_2} = \log_2 \frac{1}{0.5} = - \log_2 2 = 1 [bit] $$