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In several engineering applications there is a need for evaluating a cumulative quantity from a group of individual components. The functional dependence between the fused quantities might help determining the aggregation form. However, such a functional dependence might not exist or might be undefined for the problem in hand. In such cases, some classes of generalized aggregation operators may be needed. The Ordered Weighted Average (OWA) method introduced by Ronald Yager in 1988, provides a simple, adaptable and commonly used fusion operator. However, the OWA requires defining a vector of weights additional to the quantities to be aggregated. Several methods have been proposed for defining such weights including maximum entropy, learning and curve fitting. Here, we present our investigations on the implications of choosing one method over the other. We also suggest guidelines for choosing an aggregation method based on the nature of the aggregands and the intended application area. (Received August 21, 2007)