The determination of acoustic impedance distribution from the seismic data field measurement can be expressed as an ill-posed inverse problem. This work deals with the use of the Elman artificial neural network (ANN) (feedback connection) for the seismic data inversion. In the proposed structure the hidden neuron outputs from the previous time step are fed back to their inputs through time delay units; this enables them to process temporal behaviour and provide multi-step-ahead predictions. The ANN architectures and learning rules are presented to allow the best estimate of acoustic impedance from seismic data. The effects of network architectures using 5 to 60 neurons and 10 to 90 neurons in the hidden layer respectively for synthetic and real data on the rate of convergence and prediction accuracy of ANN models are discussed. The behaviour of networks observed on training data is very similar to the one observed on test data. The results obtained clearly prove the feasibility of the proposed method for seismic data inversion by feedback neural networks. Different tests indicate that the back-propagation conjugate gradient algorithm can easily train the proposed Elman ANN structure without getting stuck in local minima