In this paper algorithm based upon artificial neural networks (ANNs) approach is proposed to predict an unknown mapping i.e. availability function of a manufacturing system namely tab manufacturing plant. Data of availability testing of several years is taken from management of concern plant. This data is used to train and validate the neural network. Afterward validated neural network is used to predict the availability of concern plant. Main objective of using neural network approach is that no assumption, no explicit coding of the problem, no complete knowledge of system configuration is required, only raw data about system failure and repair is required. (Received December 30, 2013)