Nowadays, the amount of competition in retail environments is huge. When a product is out of stock, a customer either buys a substitute product or visits another store. Either way, the original demand is usually lost in practical settings. However, most inventory models in literature assume that excess demand is being backordered (i.e., customers wait for a new delivery to arrive). In order to analyze representative inventory models, the customer behavior to a stock out should be included to control inventory levels more accurately and to obtain good customer service. The goal of this thesis is to develop these inventory models and to design related solution techniques to determine (near) optimal values of the inventory control variables (such as the order moment and order size) which revolve around customer service. We call this service inventory management. In this thesis, we show the applicability of our approaches for different practical settings.