

The increase of automated teller machine (ATM) frauds has actuated the development of new authentication mechanisms to overcome security problems of personal identification numbers (PIN). As a rule, ATMs give users three tries for authentication to the bank server. In an event where the user fails to authenticate to the bank server, the ATM card will typically be blocked and also confiscated by the ATM. In this research, a model to provide second-level authentication for ATM transactions was proposed and implemented using Visual Studio and MySQL. To operate this system, the user is to insert the ATM card into the machine, provide the PIN and then set the withdrawal limit. Any amount above this limit will request the user to enter the second level authentication code which is sent to the user's mobile phone by the bank server. The application was tested and found to solve the problem of cards confiscation and stressful existing process of retrieving such cards. It is recommended for implementation by banks and other financial institutions.