

## **7. A SMART ATM WITH A SECURE PIN-ENTRY METHODS**

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A numeric password named a personal identification number(pin) is widely used. The 4-digit pin numeric password is being used as authentication in many important applications such as, an ATM. An ATM is a place where the shoulder surfing attack is of great concern. There may be some existing methods that provide security to the pin entry. But, those methods use only limited intellectual abilities of the human adversary. The major disadvantage in this is that human attackers can be more effective at eavesdropping and assumptions by training themselves. The method called improved black white (IBW) method is used in this application, which can be more secure, as it uses bi-colored keys. Another contribution is the authentication service that uses local databases and a hash function, which is mainly used to send the pin securely to the server through the public channel. An ATM application is created as an android application, where transactions can be performed in smart phones using a virtual money concept. When this application is installed in a particular smart phone, the entire ATM transactions can be performed using that particular application.

Key words: personal identification number; improved black white (BW) method; virtual money; hash function; shoulder surfing attack, Android application.

*Journal of Science and Innovative Engineering & Technology*