

ABSTRACT

Mobile Money business processes and technologies face several security concerns, including weak authentication among others, resulting in financial loss and criminal money transfer. To this end, this study investigated the evolution of payment systems, highlighting the desired security requirements for Mobile Payment Systems. This study adopted a Pragmatic Philosophical stand, Design Science as a methodology and Abduction as a research strategy. Pragmatism views knowledge as a tool for action and seeks to create useful knowledge. The study aimed to design a framework against withdraw transaction attacks in mobile payment systems, making Design Science an appropriate choice to develop a Secure Mobile Money Withdraw Framework. The study adopted a mix-research approach using both qualitative and quantitative data collection and analysis methods. To ensure a sound understanding of the issues, the study reviewed current literature, with 65% of the reviewed literature being less than 5 years old and from reputable sources like journals and peer-reviewed conference papers. Data collection methods used included document reviewing, key informant interviewing, and surveys. Respondents were selected using a purposive sampling technique. The study's findings suggest that Mobile Money services face numerous security challenges, and practical solutions are needed to improve withdrawer authentication. The study finds that traditional financial institutions use multi-factor authentication to mitigate money withdraw risks with customers– a lesson for mobile money service providers for the withdraw transactions. The study designed the Secure Mobile Money Withdraw Framework – SeMWiF, composed of the Detection Protocol, Prevention Protocol and Recovery Protocol. Results show that 66% of the respondents agreed that SeMWiF enhances withdrawer authentication through multi-factor authentication with a 57% ease of rating.

Keywords: Mobile Payment Systems, Mobile Money, Money Withdraw, Security and Near Field Communication – NFC.