

distributed cache 114 to allow for increased communicative capacity. The distributed cache 114 may be included in and/or associated with a transaction service provider system 108. The profile of ATM activity may include one or more metrics of ATM activity associated with a payment device 104 or an ATM 102, including, but not limited to: ATM transaction value data; ATM transaction count data; ATM transaction time data; ATM transaction location data; ATM identifier data; issuer identifier data; and/or the like.

[0071] The ATM 102, the transaction service provider system 108, or another computing device may compare one or more metrics of the profile of ATM activity to at least one predetermined ATM activity threshold. For example, ATM transaction value data may be compared to an upper predetermined threshold of transaction value. Furthermore, ATM transaction count data may be compared to an upper predetermined threshold of transaction count. See FIGS. 6 and 7 and their corresponding discussion for further non-limiting embodiments or aspects of evaluating metrics in relation to predetermined ATM activity thresholds. It will be appreciated that many configurations are possible.

[0072] The one or more predetermined ATM activity thresholds may be generated at least partly by a machine learning model trained on historic transaction data for one or more payment devices 104. The transaction service provider system 108 may include or be communicatively connected to a machine learning model engine 116 that accepts historic transaction data as a model input and generates recommended ATM activity thresholds that may be indicative of fraud associated with a payment device 104. Transaction data for one or more payment devices 104 may be stored in real-time relative to the processing of transactions by the transaction service provider system 108. Thresholds may be generated specific to a payment device 104, group of payment devices 104, or made general to all payment devices 104. For thresholds specific to a particular payment device 104, the machine learning model of the machine learning model engine 116 may be trained on historic transaction data of a specific payment device 104, may be trained on similar payment devices 104 (e.g., transactions of a plurality of payment devices 104 at an ATM), and/or may be trained on a wider or entire sample of payment devices 104. The transaction service provider system 108 may include or be communicatively connected to a transaction database 110 for storing historic transaction data. Historic transaction data may be stored, in addition to or instead of the transaction database 110, in the distributed