Solving the KYC-AML Problem with Provable Algorithmic KYC-AML Enforcement, Generalized on the DataGrid Blockchain

> *-What if KYC-AML rules and regulations could be intrinsically enforced without "specially authorized" intermediaries on the blockchain?*

Overview

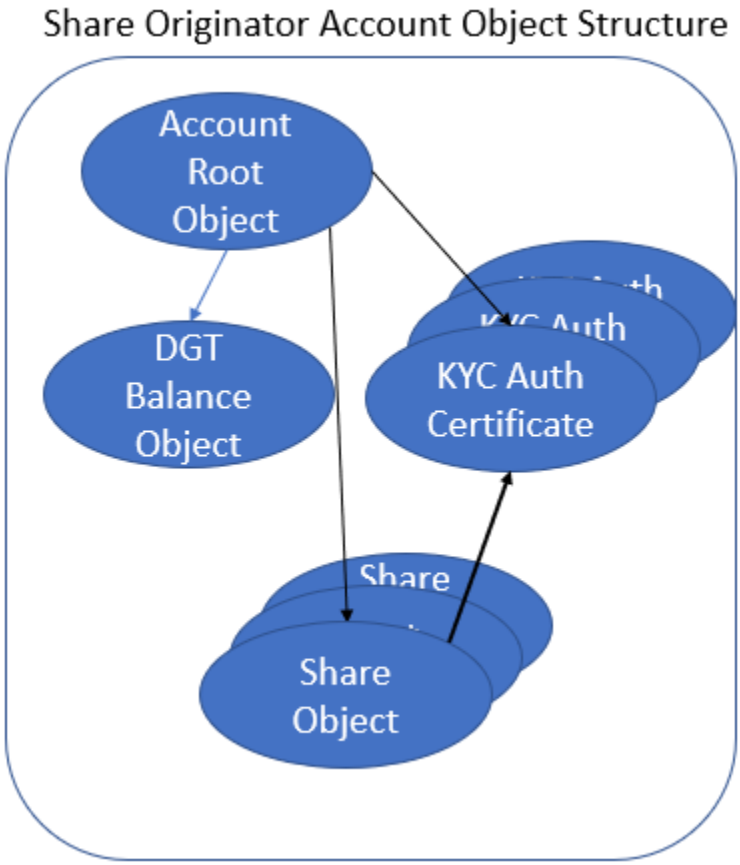
The following expands on the paper titled, "**Anatomy of Asset and Value Transfers with the Extensible Blockchain Object Model and Extensible Smart Object Assets on the DataGrid Blockchain**"[1], describing an example of enabling managing Know-Your-Customer ("KYC") and Anti-Money-Laundering ("AML") requirements using authorization objects. Sales of security assets such as corporate shares are regulated by governing bodies in various jurisdictions around the world. An example of such a requirement is selling to an accredited investor[2] in the US.

Using the concept of the "Smart Share Object", which is based on the Extensible Smart Object Asset ("XSOA^{tm}"), as will be shown, enabling KYC-AML tracking becomes an automatic, intrinsic operation, independent of the origination share account, seller account or buyer account. The following is a conceptual description of how the DataGrid Blockchain ("DGB^{tm}"), Extensible Blockchain Object Model ("XBOM^{tm}"), and XSOA can enable meeting KYC regulations.

[1] https://medium.com/@dbeberman/anatomy-of-asset-and-value-transfers-with-the-extensible-blockchain-object-model-and-extensible-2c560f42b9b2

[2] https://www.investopedia.com/terms/a/accreditedinvestor.asp

Share Originator Account



The account that create the shares is called the share originating account. An example of such an account might be a startup corporation offering a private sale with a private placement memorandum. Such an account is bound by the regulations of its incorporation jurisdiction, which includes registration of the corporation and adherence to the rules and regulations therein. Provable, algorithmically enforced adherence is directly enabled with the creation of the following account structure by the account owner.

Preparing the Share Originating Account

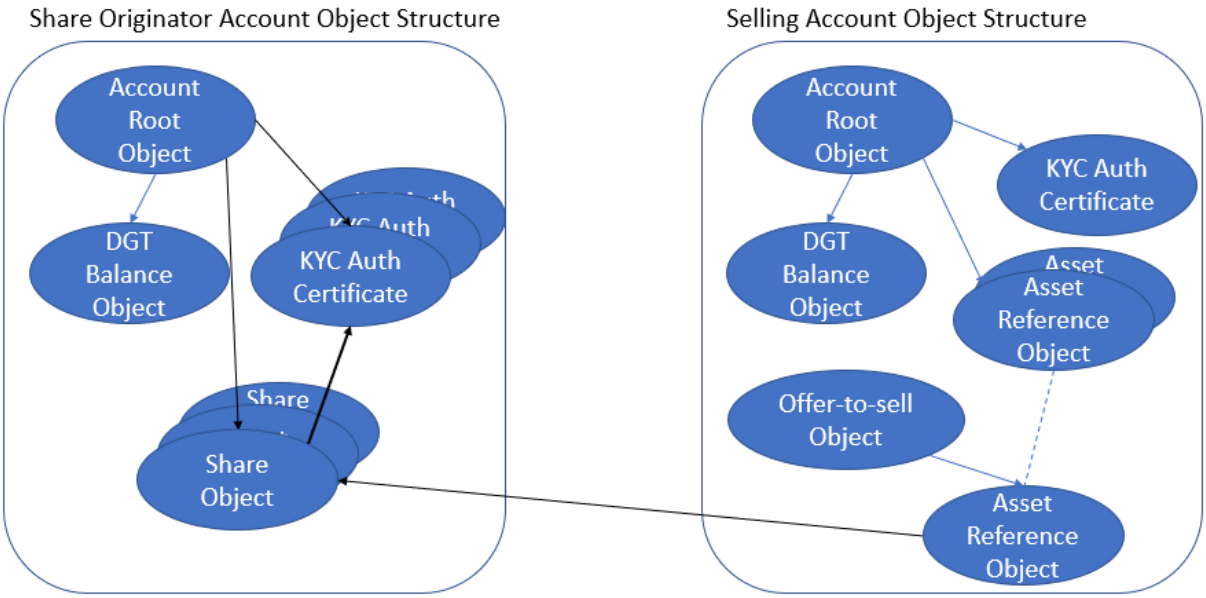
The originator account sends a share creation transaction to its own account, populating the account with the total authorized shares as share objects.

The originating account proves, on the DGB, it is authorized to offer its share objects by creating a KYC-AML authorization certificate object in its account. The originating account may contain multiple authorization certifications depending on various jurisdiction requirements.

The final step for preparing the originating account is to add a reference from the share object to one or more KYC-AML authorization certificate objects. The reference enables the share object to compare its authorizations with that of a buyer account and allow or reject the purchase accordingly. We describe this feature, intrinsic to the share object's code, as a Smart Share Object.

Current Seller Account

Tracking KYC-AML authorization from share originator to current seller



The account that offers share object for sale is called the current seller account. There can be multiple such accounts. Each account must adhere to the rules and regulations of the originating account's jurisdiction. Further a current seller account may also be required to explicitly register with the jurisdiction of the share originating account to prove that it is authorized to hold and sell such shares. Provable algorithmic enforcement is directly enabled with the following account structure.

Preparing the Current Seller Account

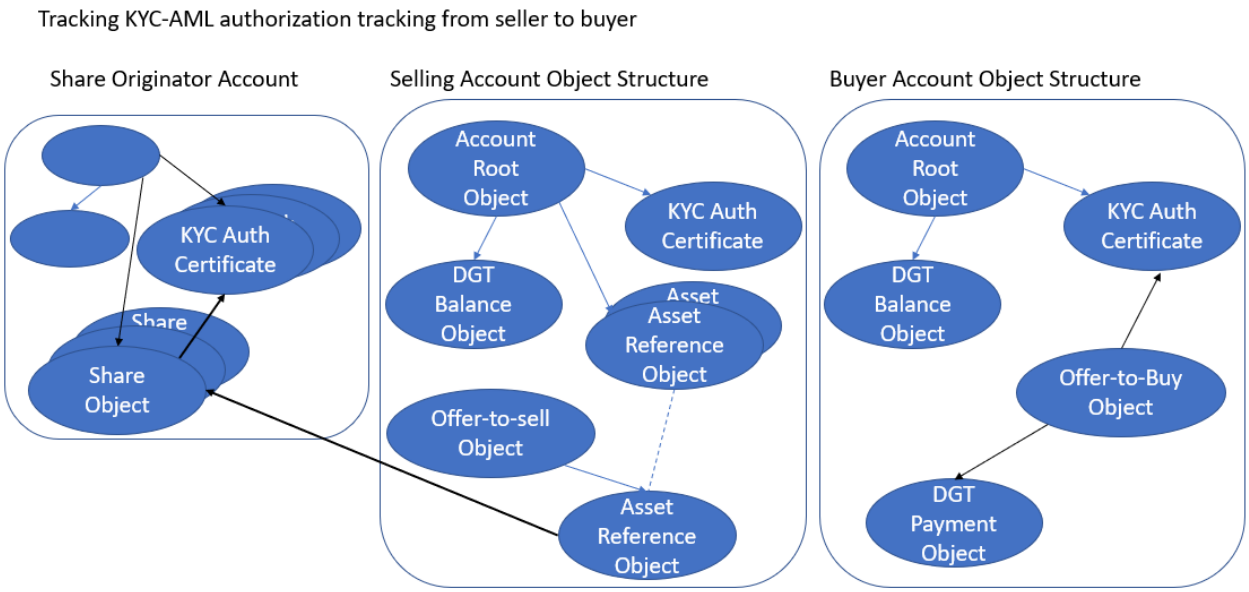
The current seller account sends a transaction to itself creating one or more KYC-AML authorization certificates. These certificates are required for the seller account to prove to the share originating account that the seller is authorized to hold the shares and perform sales.

The share originating account transfers a portion of shares to the seller account. The share originating account owner is directly assured that the seller account has appropriate authorization, otherwise the smart share objects would reject the transfer. Note that as depicted, the share objects remain

permanently in the share originating account, it is the reference to the share objects, in the form of asset reference objects that are created and transferred between share owner accounts.

Sale of the shares by the current seller account proceeds identically as with any other smart object asset sale. As depicted, the current seller account creates an offer-to-sell object (i.e. quote), with one or more asset reference objects. The current seller is assured that any successful sale provably adheres to all of the share's jurisdiction's rules and regulations, without any further actions.

Buyer Account



An account that buys shares that are offered for sale is called a buyer account. Each account must adhere to the rules and regulations of the originating account's jurisdiction to own shares from the originating account. Further a buyer account may also be required to explicitly register with the jurisdiction of the share originating account to prove that it is authorized to hold such shares. Provable algorithmic enforcement is directly enabled with the following account structure.

Preparing the Buyer Account

The buyer account sends a transaction to itself creating one or more KYC-AML authorization certificates. These certificates are required for the buyer account to prove to the current seller account that the buyer account is authorized to hold the shares.

The buyer account creates an offer-to-buy (i.e. purchase order) with a reference to a KYC-AML authorization certificate object owned by the buyer account, along with the appropriate amount of DGT to pay for the shares. The addition to the containment relations is depicted above.

Sale of the shares proceeds identically as with any other smart object asset sale. As depicted, the current seller account contains the offer-to-sell object and the buyer account contains the offer-to-buy object. A transaction associates both objects, and once accepted by both parties, the transfer of asset

and value proceeds. Both the current seller and the buyer are assured that any successful sale provably adheres to all of the share's jurisdiction's rules and regulations, without any further actions.

Additional Comments

The above is a simplified example of the object structures that may be easily created with the XBOM to enable adherence to various rules and regulations for specific assets and specific accounts without impacting the general features and capabilities of the DGB. Consider that accounts that are not required to adhere to a jurisdiction's rules and regulations are not impacted, with respect to assets that are similarly not governed by the jurisdiction's rules and regulations. As an example, private sales between accounts of ungoverned assets may take place directly between any accounts.

The concept of provably algorithmic enforcement removes the onus of enforcement of rules and regulations from the individual account implementations: originator, seller, buyer. The XBOM enables such algorithmic enforcement with the use of common live code eliminating the risk of rules and regulations violations for all of the individual accounts.

Note that in all of the above descriptions all interactions are direct between accounts and associated objects. The smart share object enabled by the XSOA eliminates the need for a specially authorized intermediary for enforcement. This has the salutary side effect of eliminating the intermediary as a point of centralization. Thus, the DGB, XBOM and XSOA and related technologies fosters decentralization for both cryptocurrency and assets.

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