CLAIMS

What is claimed is:

1. A computer-implemented method, comprising:

using a transaction processing server computer, receiving data identifying a particular transaction, in association with a request to find the original transaction relating to the particular transaction;

the transaction processing server computer transmitting a search query to a database and receiving a result set comprising thousands to millions of candidate transactions;

executing a plurality of transaction filter operations that implement base criteria for matching original transactions, to result in filtering the result set to exclude a plurality of the candidate transactions with irrelevant ISO 8583 coding;

executing a first plurality of different value matching operations and to weight matching transactions using strong weight values; wherein the first plurality of different value matching operations comprises: strongly weighting one of the candidate transactions when a network reference ID value matches the particular transaction;

strongly weighting one of the candidate transactions when a retrieval reference ID matches the particular transaction; and

strongly weighting one of the candidate transactions when an authorization digest or hash value matches the particular transaction;

executing a first pass of a second plurality of different value matching operations and weighting matching transactions using weak weight values, but excluding transactions in which a completion identifier value is set or in which a reversal identifier value is set;

executing a second pass of the second plurality of different value matching operations and weighting matching transactions using weak weight values in which the completion identifier value and the reversal identifier value are ignored;

forming a final result set of candidate transactions, ordering the final result set according to a magnitude of the match result values of the candidate transactions, and transmitting the final result set to another computer or programmatic process.

2. The method of claim 1, the particular transaction and the original transaction comprising digitally stored electronic messages in ISO 8583 format.

3. The method of claim 1~~ or 2~~, in which executing a plurality of transaction filter operations that implement base criteria comprises excluding the particular transaction, excluding old transactions, and filtering out transactions with irrelevant ISO 8583 coding.

4. The method of claim 1~~ or 2~~, in which executing a plurality of transaction filter operations that implement base criteria comprises executing one or more filter operations to filter out, exclude or remove, from the result set, certain transactions based upon a transaction type value of the particular transaction of a form, given a transaction type X, an original transaction must have an internal transaction code like Y, comprising:

given "Reversal," code shall be LIKE '1%,2%,4%';

given "Clearing," code shall be LIKE '1%,200%';

given "Auth advice" code shall be LIKE '1%,200%';

given "Incremental auth", code shall be LIKE '100%,200%';

given "Financial adjustment advice", code shall be LIKE '1%,2%';

given "Financial advice", code shall be LIKE '1%,200%';

given "Negative ack", code shall be LIKE '1%,2%'.

5. The method of ~~any preceding~~ claim 1, the first plurality of different value matching operations comprising checking network reference ID, checking retrieval reference ID, checking authorization digest or hash value, and certain combinations of approval code, ISO 8583 STAN value, and local transaction date.

~~6. The method of any preceding claim, the first plurality of different value matching operations comprising:~~

~~strongly weighting one of the candidate transactions when a network reference ID value matches the particular transaction;~~

~~strongly weighting one of the candidate transactions when a retrieval reference ID matches the particular transaction; and~~

~~strongly weighting one of the candidate transactions when an authorization digest or hash value matches the particular transaction.~~

~~7.~~6. The method of ~~any preceding~~ claim 1, further comprising strongly weighting one of the candidate transactions when an approval code matches the particular transaction, an ISO 8583 STAN value matches the particular transaction, and a local transaction date matches the particular transaction to exact date and time.

~~8.~~ 7. The method of ~~any preceding~~ claim 1, further comprising weakly weighting one of the candidate transactions in response to any one or more of:

a local transaction date matches to a value of date only, a merchant identification number of a card acceptor matches, and a transaction amount matches;

the local transaction date matches to a value of date only, the merchant identification number of a card acceptor matches, and the transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%;

the local transaction date matches to the value of date only within one day, the merchant identification number of a card acceptor matches, and transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%;

the merchant identification number of a card acceptor specifies any of: service stations; automated fuel dispensers; automobile parking lots and garages; car washes; towing services;

the transaction amount matches and the local transaction date matches to date only;

the original STAN value matches, original acquiring institution identifier matches, and original forwarding institutional identifier matches;

the STAN value matches and the retrieval reference number matches;

the acquirer reference identifier matches, the approval number matches, and the transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%.

~~9.~~ 8. The method of ~~any preceding~~ claim 1, in which executing the first pass of a second plurality of different value matching operations includes executing comparisons in the particular transaction and the candidate transactions of the result set of date values, merchant identifier values, transaction amount values, type of merchant values, and acquirer identifier values.

~~10.~~ 9. The method of ~~any preceding~~ claim 1, the request being one of thousands of other requests that the transaction processing server computer receives and processes concurrently in computer memory in real time.

~~11.~~ 10. A transaction processing server computer comprising one or more hardware processors, memory coupled to the one or more hardware processors, the memory storing sequences of instructions which when executed using the one or more hardware processors cause the one or more hardware processors to execute:

receiving data identifying a particular transaction, in association with a request to find the original transaction relating to the particular transaction;

transmitting a search query to a database and receiving a result set comprising thousands to millions of candidate transactions;

executing a plurality of transaction filter operations that implement base criteria for matching original transactions, to result in filtering the result set to exclude a plurality of the candidate transactions with irrelevant ISO 8583 coding;

executing a first plurality of different value matching operations and to weight matching transactions using strong weight values; wherein the first plurality of different value matching operations comprises: strongly weighting one of the candidate transactions when a network reference ID value matches the particular transaction;

strongly weighting one of the candidate transactions when a retrieval reference ID matches the particular transaction; and

strongly weighting one of the candidate transactions when an authorization digest or hash value matches the particular transaction;

executing a first pass of a second plurality of different value matching operations and weighting matching transactions using weak weight values, but excluding transactions in which a completion identifier value is set or in which a reversal identifier value is set;

executing a second pass of the second plurality of different value matching operations and weighting matching transactions using weak weight values in which the completion identifier value and the reversal identifier value are ignored;

forming a final result set of candidate transactions, ordering the final result set according to a magnitude of the match result values of the candidate transactions, and transmitting the final result set to another computer or programmatic process.

~~12.~~11. The transaction processing server computer of claim ~~11~~10 , the particular transaction and the original transaction comprising digitally stored electronic messages in ISO 8583 format.

~~13.~~12. The transaction processing server computer of claim ~~11 or 12~~ 10, in which executing a plurality of transaction filter operations that implement base criteria comprises excluding the particular transaction, excluding old transactions, and filtering out transactions with irrelevant ISO 8583 coding.

~~14.~~13. The transaction processing server computer of claim ~~11 or 12~~ 10, in which executing a plurality of transaction filter operations that implement base criteria comprises executing one or more filter operations to filter out, exclude or remove, from the result set, certain transactions based upon a transaction type value of the particular transaction of a form, given a transaction type X, an original transaction must have an internal transaction code like Y, comprising:

given “Reversal,” code shall be LIKE ‘1%,2%,4%’;

given “Clearing,” code shall be LIKE ‘1%,200%’;

given “Auth advice” code shall be LIKE ‘1%,200%’;

given “Incremental auth”, code shall be LIKE ‘100%,200%’;

given “Financial adjustment advice”, code shall be LIKE ‘1%,2%’;

given “Financial advice”, code shall be LIKE ‘1%,200%’;

given “Negative ack”, code shall be LIKE ‘1%,2%’.

~~15.~~14. The transaction processing server computer of ~~any of~~ claim~~s 11 to 14~~ 10, the first plurality of different value matching operations comprising checking network reference ID, checking retrieval reference ID, checking authorization digest or hash value, and certain combinations of approval code, ISO 8583 STAN value, and local transaction date.

~~16.~~15. The transaction processing server computer of ~~any of~~ claim~~s 11 to 15~~ 10, the first plurality of different value matching operations comprising:

strongly weighting one of the candidate transactions when a network reference ID value matches the particular transaction;

strongly weighting one of the candidate transactions when a retrieval reference ID matches the particular transaction; and

strongly weighting one of the candidate transactions when an authorization digest or hash value matches the particular transaction.

~~17.~~16. The transaction processing server computer of ~~any of~~ claim~~s 11 to 16~~ 10, further comprising strongly weighting one of the candidate transactions when an approval code matches the particular transaction, an ISO 8583 STAN value matches the particular transaction, and a local transaction date matches the particular transaction to exact date and time.

~~18.~~17. The transaction processing server computer of ~~any of~~ claim~~s 11 to 17~~ 10, further comprising weakly weighting one of the candidate transactions in response to any one or more of:

a local transaction date matches to a value of date only, a merchant identification number of a card acceptor matches, and a transaction amount matches;

the local transaction date matches to a value of date only, the merchant identification number of a card acceptor matches, and the transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%;

the local transaction date matches to the value of date only within one day, the merchant identification number of a card acceptor matches, and transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%;

the merchant identification number of a card acceptor specifies any of: service stations; automated fuel dispensers; automobile parking lots and garages; car washes; towing services;

the transaction amount matches and the local transaction date matches to date only;

the original STAN value matches, original acquiring institution identifier matches, and original forwarding institutional identifier matches;

the STAN value matches and the retrieval reference number matches;

the acquirer reference identifier matches, the approval number matches, and the transaction amount matches with a positive variance of up to 25% or a negative variance of up to 25%.

~~19.~~18. The transaction processing server computer of ~~any of~~ claim~~s 11 to 18~~ 10, in which executing the first pass of a second plurality of different value matching operations includes executing comparisons in the particular transaction and the candidate transactions of the result set of date values, merchant identifier values, transaction amount values, type of merchant values, and acquirer identifier values.

~~20.~~19. The transaction processing server computer of ~~any of~~ claim~~s 11 to 19~~ 10, the request being one of thousands of other requests that the transaction processing server computer receives and processes concurrently in computer memory in real time.