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(71) Applicant(s):
Proteros Data Systems Ltd
27 Westfield Grove, WAKEFIELD,
West Yorkshire, WF1 3RS,
United Kingdom

(72) Inventor(s):
Mario Toouli
martin Heptinstall
Jeffrey Watkins

(74) Agent and/or Address for Service:
Bailey Walsh & Co LLP
5 York Place, LEEDS, LS1 2SD,
United Kingdom

(51) INT CL:
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G06F 17/27 (2006.01)

(56) Documents Cited:
EP 1582992 A **WO 2005/048054 A**
WO 2005/001729 A **WO 2004/010294 A**
US 20060242087 A **US 20050160359 A**
US 20050060317 A **US 20030200172 A**

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INT CL **G06F, G06Q**
Other: **EPODOC, WPI.**

(54) Abstract Title: **Method for processing messages from an external format into an internal format using a message editor to generate a conversion schema from the formats**

(57) Disclosed is a system for converting messages from an external format used for transmission and an internal format specified by the receiving device. The system has a message editor for defining the internal and external formats, means to generate a schema from the formats and means to convert the messages using the schema. The message formats and schemas may be stored on a database. The external format may be ISO 8583 and the internal format may be XML. The editor may be use to define a mapping between the elements of the incoming and outgoing message, possibly as an XSL style sheet. The system is designed to be part of a financial transaction processing system.

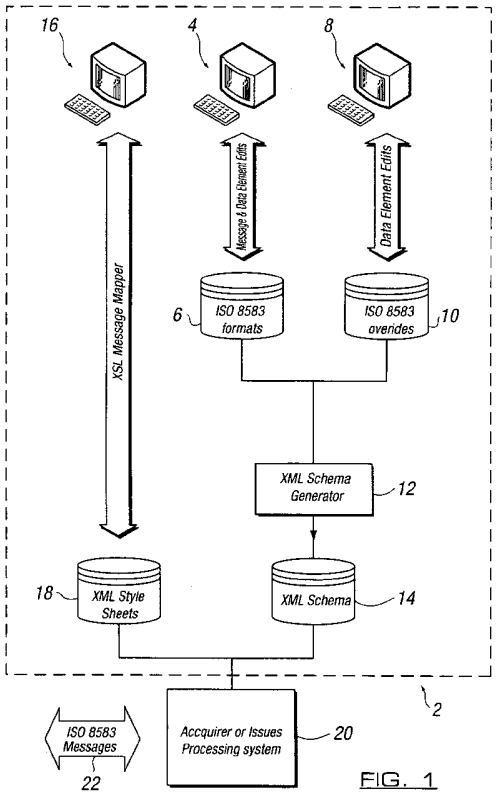

FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 2007.

Original Printed on Recycled Paper

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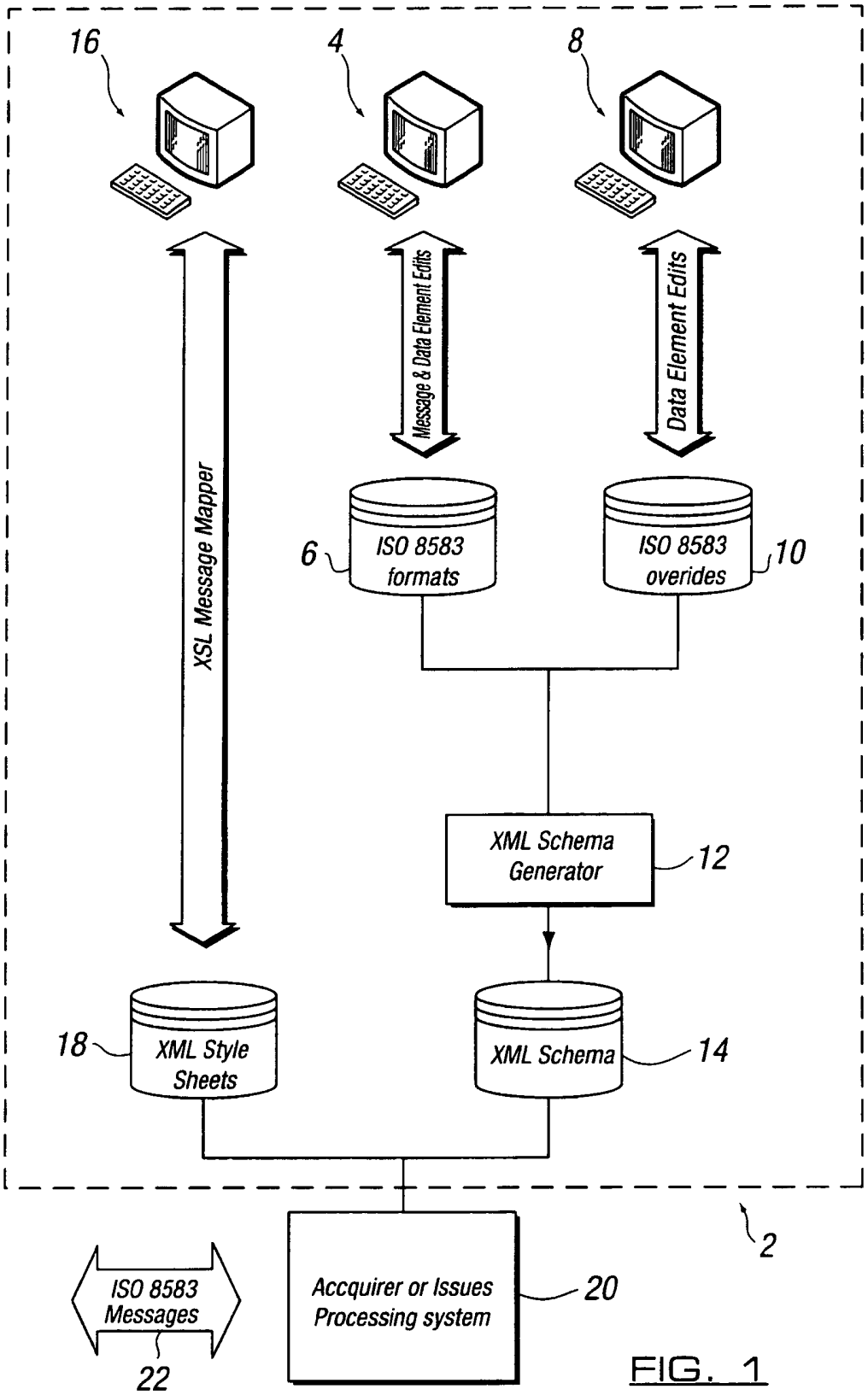
16
4
8
XSL Message Mapper
Message & Data Element Edits
Data Element Edits
6
ISO 8583 formats
ISO 8583 overides
10
XML Schema Generator
12
18
XML Style Sheets
XML Schema
14
2
ISO 8583 Messages
22
Accquirer or Issues Processing system
20

FIG. 1

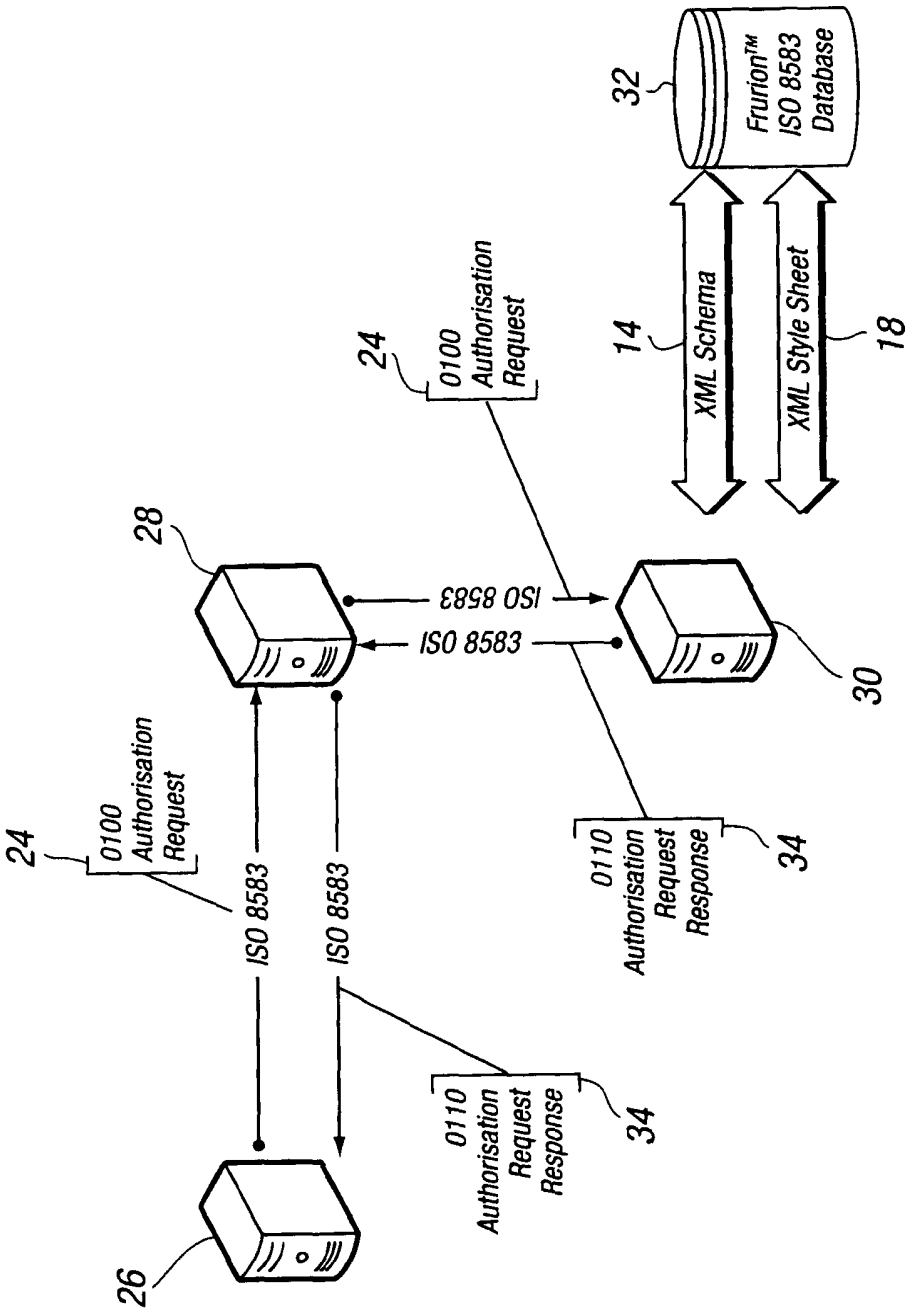
32
Frurion™
ISO 8583
Database
14
XML Schema
18
XML Style Sheet
24
0100
Authorisation
Request
28
ISO 8583
ISO 8583
30
24
0100
Authorisation
Request
ISO 8583
ISO 8583
0110
Authorisation
Request
Response
34
0110
Authorisation
Request
Response
34
26

FIG. 2

Conversion system

The invention to which this application relates is a conversion system for a processing system, particularly but not necessarily limited to financial transaction processing systems.

A card-based transaction typically travels from a transaction acquiring device, such as a point-of-sale (POS) terminal or an Automated Teller Machines (ATM), through a series of networks, to a card issuing system for authorisation against the cardholder's account. The transaction data contains information derived from the card (e.g., the account number), the terminal (e.g., the merchant number), the transaction (e.g., the amount), together with other data which may be generated dynamically or added by intervening systems. The card issuing system will either authorise or decline the transaction and generate a response message which must be delivered back to the terminal in a timely manner.

ISO 8583 defines a message format and a communication flow so that different systems can exchange these transactions. The vast majority of transactions made at ATM or POS use ISO 8583 at some point in the communication chain. In particular, both the MasterCard (RTM) and Visa (RTM) schemes base their transactions on the ISO 8583 standard, as do many other institutions and networks.

Cardholder-originated transactions include purchase, withdrawal, deposit, refund, reversal, balance inquiry, payments and inter-accounts transfers. ISO 8583 also defines system-to-system messages for secure key exchanges, reconciliation of totals, and other administrative purposes. Although ISO 8583 defines a common standard, it is not typically used directly by systems or

networks. Instead, each scheme has adapted the standard for its own use with customised fields and customised usages.

Twice a year, each scheme publishes changes to their implementation of the ISO 8583 standard to reflect changes in their business and operational rules. Most card-processing systems in use today have been written and developed over many years. The traditional approach has been to define the ISO 8583 message formats within the computer software programs themselves, meaning that every time there is a change to a message the software has to be changed and re-tested. This usually results in systems that take considerable time to develop and which cannot be readily expanded. All of these drawbacks add cost and complexity to financial transaction processing systems.

An aim of the invention is to provide a processing system that is more readily adaptable to changes in standards and transaction schemes.

In one aspect of the invention there is provided a conversion system for a financial transaction processing system comprising:

one or more message editors for defining external and internal message formats;

processing means for generating a schema from the external and internal message formats;

wherein messages are converted between external and internal formats according to the schema.

Typically the message formats and/or schemas are stored in a database.

In one embodiment the external message format is ISO 8583.

In one embodiment the internal message format is XML.

Thus the provision of a separate conversion system allows the corresponding financial transaction processing system to dynamically adapt to changes in ISO 8583 message formats, without requiring changes to the underlying financial processing software for either Acquirers or Issuers alike.

The ISO 8583 message formats are processed to generate a schema which is then used by the financial transaction processing system to convert external ISO 8583 messages into a standard internal format, in this case XML, and back again for output from the system.

In one embodiment an editor is provided to allow the definition of bespoke and/or future message formats. Thus the standard ISO 8583 format can be overridden if required.

In one embodiment an editor is provided to define the mapping between the elements of incoming and outgoing messages. Typically the mapping is defined by XSL style sheets.

In one embodiment a graphical user interface (GUI) is used to manipulate the message formats stored in the database. This enables the system configuration to be readily changed and facilitates modification of the system to process transactions.

In one embodiment simulation means are provided to allow creation and manipulation of test data, and simulation of said test data in a financial processing system. This allows any modifications made to the financial processing system to be tested, typically via the GUI.

In a further aspect of the invention, there is provided a method of processing financial transactions comprising:

receiving an incoming message in an external format;

converting said incoming message to an internal format;

processing said incoming message in the internal format and generating an outgoing message in an internal format;

converting said outgoing message to an external format;

sending said outgoing message;

wherein messages are converted between external and internal formats according to a schema generated by pre-processing the external and internal message formats in a system separate from the financial transaction processing system.

When a message format is changed, a new schema is generated. As the schema is separate to the rest of the financial transaction processing system, it can be updated more easily, and it is thus not necessary to change the main processing software.

In a further aspect of the invention, there is provided a schema for a financial transaction processing system, said schema generated by processing means on the basis of internal and external message formats with respect to a financial transaction processing system, wherein messages are converted between external and internal formats according to the schema.

Specific embodiments of the invention are now described wherein:-

Figure 1 illustrates a conversion system for a financial transaction processing system.

Figure 2 illustrates a financial transaction processing system in use.

With reference to Figure 1, there is illustrated a conversion system 2 for a financial transaction processing system 20.

The conversion system includes an editor 4 for defining external ISO 8583 message formats and the data-elements that make them up, and storing the resulting definitions in a database 6.

A further editor 8 is provided to allow bespoke definitions 10 of any of the data-elements to be created and stored in the database, which can then override the standard ISO 8583 definition. This allows for the creation of future or bespoke ISO 8583 formats.

The ISO 8583 formats are then processed by processing means 12 to generate an XML schema 14.

A further editor 16 is provided in the form of an XSL mapper software component to create XSL style sheets 18, which map incoming to outgoing messages.

Once the XML schema and XSL style sheets have been created, the financial processing system can process new ISO 8583 message formats without the need for rewriting the system software. By simply using the XML schema to convert the incoming ISO 8583 message to an internal XML message format, it is possible to process the incoming message, create a response message using the XSL style sheet, and then reformat the response into an ISO 8583 message ready to be sent back to the initiating system.

The design is capable of handling both authorisations and clearing message formats within the Acquirer or Issuer transaction processing system.

It will be appreciated that the conversion system does not require details of the initiating system itself as it operates on the basis of the format of messages received, independent from the type of initiating system.

Thus in use, a user simply has to update the schema 14 via the editors when the ISO 8583 message formats change, rather than the whole of the financial transaction processing software, as messages 22 are converted from the ISO 8583 external format to an internal XML format according to the schema 14, processed by the financial transaction processing software 20, then converted back to the ISO 8583 external format according to the schema 14 for output back to the initiating system.

As such the processing system is more readily adaptable to changes in standards and transaction schemes.

Figure 2 illustrates the use of the financial transaction processing system in making a transaction. An incoming ISO 8583 message in the form of an authorisation request 24 is sent by the acquirer system 26 i.e. the point of sale, to the scheme host 28 such as VISA (RTM), Mastercard (RTM) etc.

The scheme host 28 forwards the message to the issuer system 30 which converts the message to XML using the schema 14. The XML message is validated for data integrity, security and authorisation against the account database 32.

An XML response is constructed using an XSL style sheet 18. Response codes and other response specific data is added to the XML response. An outgoing ISO 8583 message 34 is then constructed from the response, which is sent back to the acquirer 26 via the scheme host 28.

Thus from the perspectives of the acquirer and scheme host, there is no change in procedure, as the messages are still passed in an ISO 8583 format. However, if the format of the ISO 8583 message changes, the invention provides means to update the system quickly and efficiently.

Of course it will be appreciated by persons skilled in the art that the present invention may convert between other formats as required.

Claims

1. A conversion system for a financial transaction processing system comprising:

one or more message editors (4) for defining external and internal message formats (6);

processing means (12) for generating a schema (14) from the external and internal message formats;

wherein messages are converted between external and internal formats according to the schema.

2. A conversion system according to claim 1 wherein alterations to the financial transaction processing system are not required to allow the same to still be used when a message format is changed

3. A conversion system according to claim 1 or 2 wherein the message formats and/or schemas are stored in a database.

4. A conversion system according to any preceding claim wherein the external message format is ISO 8583.

5. A conversion system according to any preceding claim wherein the internal message format is XML.

6. A conversion system according to any preceding claim wherein an editor is provided to allow the definition of bespoke and/or future message formats.

7. A conversion system according to any preceding claim wherein an editor is provided to define the mapping between the elements of incoming and outgoing messages.

8. A conversion system according to claim 7 wherein the mapping is defined by XSL style sheets.

9. A conversion system according to any preceding claim wherein a graphical user interface is used to manipulate the message formats stored in the database.

10. A conversion system according to any preceding claim wherein simulation means are provided to allow creation and manipulation of test data, and simulation of said test data in a financial processing system.

11. A method of processing financial transactions comprising:

receiving an incoming message in an external format;

converting said incoming message to an internal format;

processing said incoming message in the internal format and generating an outgoing message in an internal format;

converting said outgoing message to an external format;

sending said outgoing message;

wherein messages are converted between external and internal formats according to a schema generated by pre-processing the external and internal message formats in a system separate from the financial transaction processing system.

12. A schema for a financial transaction processing system, said schema generated by processing means on the basis of internal and external message formats with respect to a financial transaction processing system, wherein messages are converted between external and internal formats according to the schema.

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Application No: GB0811641.0 **Examiner:** Mr David Maskery

Claims searched: 1 - 12 **Date of search:** 16 October 2008

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X,Y	1 - 12	WO 2005/048054 A (SIZE TECH) See pages 38 - 42.
X,Y	X: 11 and 12, Y: 1 - 10	WO 2005/001729 A (JHA I-COMMERCE) See pages 4 and 5.
X,Y	X: 11 and 12, Y: 1 - 10	US 2006/242087 A (NAEHR et AL) See paragraphs 14 - 26.
X,Y	X: 11 and 12, Y: 1 - 10	US 2003/200172 A (RANDLE et AL) See paragraphs 20 - 26.
X,Y	X: 11 and 12, Y: 1 - 10	WO 2004/010294 A (COMMERCE ONE OPERATIONS) See paras 21 - 26.
Y	1 - 10	US 2005/160359 A (FALK et AL) See whole document.
Y	1 - 10	US 2005/060317 A (LOTT et AL) See whole document.
Y	1 - 10	EP 1582992 A (FUJITSU) See whole document.

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art
Y	Document indicating lack of inventive step if combined with one or more other documents of same category	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application

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Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[X] :

Worldwide search of patent documents classified in the following areas of the IPC

G06F; G06Q

The following online and other databases have been used in the preparation of this search report

EPODOC, WPI.

International Classification:

Subclass	Subgroup	Valid From
G06Q	0020/00	01/01/2006
G06F	0017/22	01/01/2006
G06F	0017/27	01/01/2006