

Merchant Card Interface

Design Specification

Two-way on demand interface between
VISUAL Enterprise and a Merchant Card
Processing System

Release 1.0

Disclaimer

The purpose of this document is to promote discussion of the design of the subject feature. The information contained herein is confidential and shall only be disclosed to employees and officers of the above named company. All rights are reserved. Further, disclosure of this information is strictly prohibited. This is a draft of the working design document for this feature. Presentation of this document should not be construed as a promise of functionality, delivery, or usability of the intended feature.

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Revision History

REVISION	DESCRIPTION	DATE	BY
1	Baseline for client review. Specific areas need clarification.	10/3/05	PDE
2	General release	11/1/05	PDE

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Abstract

Purpose

This interface is to be used to interconnect a third-party merchant credit card processing system with VISUAL Enterprise, which is the primary system of record. The interface supplies information to the merchant card system, and creates the necessary financial transactions for a credit card sale, directly in the VISUAL Enterprise database.

Concepts

This interface only supports one credit card transaction scenario: the credit card is charged after a shipment has been made and is for the full amount. Pre-authorization of the charge can be done at the time of order entry or not at all.

This entire design has a VISUAL Enterprise centricity, in that all analysis features, and limitations are from the requirements of this software package. The interface merely places connect points out to a generic third-party merchant card system, without any particular emphasis on the requirements of that system.

An outbound customer order grand total amount is supplied to the merchant card system for credit card pre-authorization at the time of order entry.

Inbound signaling from the merchant card system tells the interface that a credit card charge has been completed in connection with a customer order shipment. This signal triggers the automatic generation of an invoice, a cash receipt, cash application, bank deposit, and prepares sales representative commissions for generation.

No other data interchange is performed by this interface including any record duplication or synchronization with a third-party database.

Compatibility

VISUAL Enterprise Application

This design is intended for VISUAL Enterprise™ release 6.3.8, and is to be structured in a manner to permit minimal changes to remain compatible with future releases. The financial transactions are all to occur within 'classic' VISUAL Financials, with no reasonable upgrade path to VISUAL Global Financials.

Database

The database running VISUAL Enterprise must be SQL Server 2000. Code specific to this database brand will preclude its use in any other database.

There is no support for any database that may exist within the merchant card processing system.

Critical Customer Requirements

The customer has identified the following to be particularly important because of the way they do business, or as identified deficiencies in prior solutions. This is not intended to be a list of functional requirements.

- Only customer orders on released status are shippable; firm status is not shippable
- Inventory must be available for a shipment to occur
- Customers that will pay by credit card will be identified by user defined field "CC=Y"
- Order totals can't result in "penny rounding" discrepancies among transactions
- Commissions are paid and need to be processed through the system
- No commission is paid on freight
- Since no printed invoice is used, the print reminder flag needs to be cleared

Logic Conflicts

The following logic breaks, or is in direct opposition, to the information flows through VISUAL Enterprise.

None. All logic in this design follows the general spirit of VISUAL Enterprise.

Physical Design

Implementation

All functionality will be contained in SQL Server stored procedures. These objects will reside within the VISUAL Enterprise™ data space, and will be invoked by either VISUAL macros, or by third party applications.

A SQL script will be used to install all objects into the database. Since nothing is required outside of the database, no other installation routines are needed. For installing a newer version of code, the intent is to uninstall all objects with a script, and reinstall with a revised install script. These scripts will be revision controlled.

Database

Database changes include the following new objects. No other schema modifications are required in this design.

New Stored Procedure: vgGetCustOrderGrandTotal

This procedure returns the grand total for a given customer order ID. The grand total is the sum of all the order line totals, sales taxes, and estimated freight charges for a customer order. The customer order line total is calculated based on: order quantity, price, selling unit of measure, and discount. Revision control will be handled in the header comments.

```
bSuccess = vgGetCustOrderGrandTotal( sCustOrderID, sProcessInd)
```

bSuccess	Boolean	-1 = Document creation failed 0 = Document creation success
sCustOrderID	String(20)	Customer order unique identifier
sProcessInd	String(1)	Return: Process indicator

New Stored Procedure: vgCreateInvoiceReceivePayment

This procedure creates a manufacturing type customer invoice from packing list detail, creates a cash receipt transaction, and applies the cash receipt to the invoice. It is assumed that the shipper transaction has already occurred, since the data for this procedure is taken from the packing list. Revision control will be handled in the header comments.

```
bSuccess = vgCreateMfgInvoiceReceivePayment(sCustOrderID, sProcessInd)
```

bSuccess	Boolean	-1 = Document creation failed 0 = Document creation success
sCustOrderID	String(20)	Customer order unique identifier

sProcessInd String(1) Return: Process indicator

Applications

No EXE's are used in this design.

Application Extensions

No DLL's are used in this design.

Report Definitions

No QRP's are used in this design.

Macros

VISUAL Enterprise macro's are to be used in calling these stored procedures through ADO. They are not supplied as part of this design.

Scripts

New SQL Script: Install Merchant Card Interface 1.x.sql

This script will be used to install the stored procedures in an existing VISUAL Enterprise database running on SqlServer. This script includes a revision counter for use in controlling updates to this code.

New SQL Script: Uninstall Merchant Card Interface 1.x.sql

This script will be used to remove all stored procedures from the database that are used in this design. Since no schema changes are used, it is safe to run this script at any time without consequences of losing data. This script includes a revision counter for use in controlling updates to this code.

Configuration Files

This design may read existing VISUAL Enterprise .ini files for global settings, however no new files are required. The stored procedures need to be edited to point to the specific directory where these files are located.

Help Files

None used in this design.

Other Files

None used in this design

Logical Design

Key Calculations

Customer Order Grand Total

There are several ways of looking at the total amount of a customer order, and neither the database nor the user interface is very consistent in what is included. For this design, the grand total from order entry is used for the amount to be invoiced, charged to the credit card, and deposited. Since this total is not recorded in the database, the logic must be reproduced to match the order entry algorithm.

VISUAL Enterprise occasionally has 'fractional cents' rounding problems where it rounds up on one entry, and rounds down on another other entry. This is primarily due to inconsistent application of rounding rules. For example, selling price is carried to six decimal places and then extended by the quantity for a line total. In some instances the extended amount is then rounded to two places, and all the lines are totaled. In other instances the six decimal place precision is kept as the lines are totaled, then the overall total is rounded. This can result in a different total being calculated.

Sales Tax

Sales taxes are computed at the line, not at the order total. Because of this there will be instances where the invoice will reflect a slightly different tax being collected than what would be normally expected. The accrual amounts will also be slightly different than what normal tax preparation procedures will determine.

This design will use the approach of duplicating what VISUAL Enterprise currently does for sales tax calculations.

Transactions

Customer Invoice

Primary logic is contained in the stored procedure: `vgCreateInvoiceReceivePayment`

Support logic is contained in the following stored procedures: `vgCalcCustOrderGrandTotal`

Support logic is contained in the following user defined functions:

Invoice generation in VISUAL Enterprise is much more than simply printing a report. There are many options for where information comes from, the method of calculation, and the manner in which it is presented on the page. In addition, there are certain transactions that occur as the result of printing an invoice, which in turn have many options of their own. These options are controlled by settings at various levels of the system including: global, entity, customer type, customer, order, order line, and delivery schedule. These settings typically resolve through inheritance of the levels; however there are also settings to break inheritance in some cases. VISUAL Enterprise stores these behavioral settings in both the

database, and in a series of 'ini' files, which can exist both on the client machine and the server, with inheritance settings (and overrides) of their own.

To control the scope of this transaction, only a fraction of the standard VISUAL functionality will be made part of this design. The scope is reduced by limited implementation of functionality, and certain assumptions of behavior to eliminate logic that would need to be in place to support every permutation of settings. ***It is critical that these two restrictions are understood, and are consistent with the business processes of the company.***

This logic assumes the packing list (shipper) has already been successfully created, along with the attendant inventory transactions, trace transactions, and cost records. This is validated by checking that the packing list exists, and is eligible for invoice generation. The invoice is then generated using a sub-set of settings, and with limited features.

The following are pre-requisites for this transaction:

- The shipment has occurred and a packing list has been successfully created
- The order shipped complete on one packing list
- No prior packing lists are associated with the customer order
- The pro-forma freight charges on the customer order are accurate for copying to the invoice
- No service charges are included on the customer order

This table shows all documents available in standard VISUAL Enterprise for invoice generation, and if they are supported in this design.

DOCUMENT	TYPE	SUPPORTED	COMMENTS
Invoice	Invoice	YES	
Invoice	Credit Memo	NO	Return shipment (contra)

The following matrix shows all available functional areas and settings for invoice generation in standard VISUAL Enterprise, and if they are supported for each document type. ***It is probably more important to review what is not included, than what is included.***

SPACE	FEATURE / SETTING	INVOICE	CR MEMO
Feature	Automatic numbering of invoices	YES	
Feature	Automatically copy invoice to accounts receivable invoice document	YES	
Feature	Value Added Tax (VAT)	NO	
Feature	Multiple currencies	NO	
Feature	Currency conversions	NO	
Feature	Customer currency hedging	NO	

Feature	Master product configured (MPC) options carried to invoice	NO	
Feature	Standard part descriptions	NO	
Feature	Alternate language part descriptions	NO	
Feature	Equipment maintenance bill of materials options printed on invoice	NO	
Feature	Installment payments	NO	
Feature	Freight cost currency translation	NO	
Feature	Consolidation of multiple packing lists to one invoice for same customer	NO	
Feature	Consolidation of multiple packing lists to one invoice for same ship to address	NO	
Feature	Harmonized tariff code (HTS)	NO	
Feature	Exchange rate (fixed or variable)	NO	
Feature	European trade documents	NO	
Feature	VISUAL Price Book integration	NO	
Feature	Language substitutions for printed reports	NO	
Feature	Wholesale prices	NO	
Feature	Lot trace parameter comments on invoice	NO	
System	Semaphore support for multiple simultaneous users generating invoices	NO	
Setting	Use customer flag to force match invoice ID to pack list ID	NO	
Feature	Reformat all addresses based on user defined layout and formatting rules	NO	
Feature	Multiple document language support	NO	
Feature	Invoice line description built following complex rules based on nature of the line item.	NO	
Feature	Delivery schedule information carried to document	NO	
Feature	Inheritance of sales rep from header to line	YES	
Feature	Sales tax exemption number inheritance from header to line	YES	
Feature	Prepayments applied to invoice	NO	
Feature	More than one sales taxing authority per order	YES	
Feature	Multiple inheritance of G/L accounts: global -> product code -> customer ->	??	

	order		
Setting	Use persistent choices made in print dialogs from previous invoice printing	NO	
Feature	Use country profiles to determine symbols used in currency amounts	NO	
Feature	Conversions of stocking and sales units of measure	YES	
Feature	Commission sharing	YES	
Feature	Commission inheritance: customer -> customer order -> invoice	YES	
Feature	Inheritance of customer discount: header -> line	YES	
Feature	Binary data (specifications) support for shipper header and line	YES	
Setting	Invoice date source: current, shipped, specified	NO	
Setting	Use pre-numbered invoice forms	N/A	
Feature	Print duplicate invoice(s)	Use VISUAL	
Feature	Determine eligibility to generate invoice based on order status (only released)	YES	
Setting	Calculate invoice due date: Y or N	NO	
Setting	Freight charges: collect or prepaid	NO	
Feature	Suppress sales tax calculations on tax exempt customers	YES	
Setting	Use approval status on pack list when determining invoicing eligibility	NO	
Feature	Sales taxes calculations including: ceiling, effective date, amount, rate	YES	
Feature	Payment date calculated based on complex parameters of customer order terms	NO	
Feature	Inheritance of terms: customer -> customer order -> invoice	NO	
Security	Program permission user authentication	NO	
Security	Application user permission authentication for explicit status changes	NO	
Security	Application user permission authentication for implicit status changes	NO	
Feature	Backordered line quantities on invoice	NO	
Feature	Extended query support	N/A	

Feature	Advance Ship Notice (ASN)	NO	
Feature	Use pro-forma freight on customer order as actual freight on shipper	YES (Always)	
Feature	Carry actual freight from shipper to invoice	YES	
Feature	Multiple entities	YES	
Setting	Global packing list default status	NO	
Feature	Intrastat support	NO	
Feature	Shipment tracking support	NO	
Setting	Match invoice ID to packing list ID	NO	

Copy Printed Invoice Information to Accounts Receivable

Primary logic is contained in the stored procedure: vgCreateInvoiceReceivePayment

Support logic is contained in the following stored procedures:

Support logic is contained in the following user defined functions:

The manufacturing side of VISUAL Enterprise only computes, formats, and prints invoices, without any consideration to a particular accounting system. The creation of records in accounts receivable can be done optionally at the time of printing, or as a batch import task. This transaction copies information from the invoice generation transaction into the accounts receivable sub-system, for further downstream processing. General ledger journals entries are then created for the invoice with a status of un-posted.

This table shows all documents available in standard VISUAL Enterprise for invoice generation, and if they are supported in this design.

DOCUMENT	TYPE	SUPPORTED	COMMENTS
Invoice	Invoice	YES	
Invoice	Credit Memo	NO	Return shipment (contra)
Journal	ARI	YES	
Journal	ARI Contra	NO	

The following matrix shows all available functional areas and settings for invoice generation in standard VISUAL Enterprise, and if they are supported for each document type in this design. ***It is probably more important to review what is not included, than what is included.***

SPACE	FEATURE / OPTION / SETTING	INVOICE	CR MEMO
Security	Program permission user authentication	NO	

Setting	Invoice date source: current, shipped, specified	?	
Setting	Calculate invoice due date: Y or N	NO	

Cash Receipt and Application Transaction

Primary logic is contained in the stored procedure: vgCreateInvoiceReceivePayment

Support logic is contained in the following stored procedures:

Support logic is contained in the following user defined functions:

It is assumed that an invoice has been prepared from a shipper, and has been transferred to the receivables sub-system in a manner that it awaits payment. This transaction records the receipt of a credit card payment for the customer, applies the payment to the associated invoice, and creates a bank deposit. General ledger journals entries are then created for the cash receipt, and bank deposit, all with a status of un-posted.

This table shows all documents available in standard VISUAL Enterprise for invoice generation, and if they are supported in this design.

DOCUMENT	TYPE	SUPPORTED	COMMENTS
Cash Receipt	Check	YES	
Cash Receipt	BACS	NO	
Cash Receipt	Export	NO	
Journal	ARC	YES	
Journal	ARC Contra	NO	

The following matrix shows all available functional areas and settings for invoice generation in standard VISUAL Enterprise, and if they are supported for each document type in this design. ***It is probably more important to review what is not included, than what is included.***

SPACE	FEATURE / OPTION / SETTING	CASH RCT	
Feature	Multiple currency conversion and display capability	NO	
Feature	Receive payment with alternate exchange rates	NO	
Feature	Permit over/under amounts to be received as payment in full	NO	
Feature	Support for voiding a cash receipt without deleting the transaction	Use VISUAL	
Feature	Automatic numbering of cash receipts	?	

Security	Program permission user authentication	NO	
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Bank Deposit Transaction

Primary logic is contained in the stored procedure: vgCreateInvoiceReceivePayment

Support logic is contained in the following stored procedures:

Support logic is contained in the following user defined functions:

This transaction associates the cash receipt with an existing bank deposit. If the bank deposit does not exist it is created as part of this transaction. No specific bank journal entry needs to be made since the ARC journal will be associated with this transaction.

This table shows all documents available in standard VISUAL Enterprise for invoice generation, and if they are supported in this design.

DOCUMENT	TYPE	SUPPORTED	COMMENTS
Deposit		YES	
Journal	BAJ	NO	Not required with implementation design

The following matrix shows all available functional areas and settings for invoice generation in standard VISUAL Enterprise, and if they are supported for each document type in this design. ***It is probably more important to review what is not included, than what is included.***

SPACE	FEATURE / OPTION / SETTING	DEPOSIT	
Feature	Automatic numbering of bank deposits	?	
Security	Program permission user authentication	NO	

Graphical User Interface

Menus

None used in this design.

Windows

None used in this design; however it may be helpful for the macros to include a dialog box in the event of an error in the interface.

Error Handling

Process Indicator Code

Each stored procedure returns a code indicating the result of the process in the database. Should a failure occur, this code will indicate the area that caused the problem for troubleshooting purposes.

Process indicator codes

<i>CODE</i>	<i>EVENT</i>	<i>REASON</i>
Y		Process was successful
S	Validate	Packing list was not on approved status
T	Validate	Order total not a positive number
A	Validate	General ledger account number invalid
G	Error	General SQL error returned

Macro Handlers

Each macro should be designed in a way that any error condition will result in the transaction, as a whole, will be rolled back to a consistent state in the database.