



WebSphere
Data Interchange Services
(Pilot Education)

Student Exercises

ERC 2.0

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Exercise 1. Defining the Record Oriented Data

What This Exercise is About

To be able to process record oriented data, the DIS Client requires that we describe the layout and format of the data. This includes defining loops, records, structures, and fields. Here we will name each of those components of our data, creating a Dictionary to contain all the definitions, and a ROD Document Definition to describe how those components are structured in the source or target data. We will use a shortcut technique, importing a Cobol Copybook, to create our initial Dictionary and ROD Document Definition and then use the ROD Document Definition editor to make some modifications.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Create a Record ID Definition, Dictionary and ROD Document Definition
- Import a Cobol Copybook
- Use the ROD Document Definition editor to edit or create a ROD Document Definition
- Define records, structures, and fields in a ROD Document Definition
- Work with Record IDs and data definitions

Introduction

Purchase order data is currently being created by Ima Coda, your programmer, in a flat file. It is in a format suitable for raw data. The appendix provides a Document Definition that Ima has provided. She has included record IDs to identify the format of each of the four record types. This will allow us to use raw ROD Document Definitions in the DIS Client. Following is a table of the record names and record IDs Ima will be using.

Record	Record ID
HEADER-RECORD	HDR
REF	REF
NAMEADDRESS	NAM
ITEMS	ITM

Notice that in the Document Definition, the NAME and ITEMS records may each repeat as separate records. You will define each of these sets of repeating records just once, defining them as repeating within the document. For the NAME and ITEMS data, each repetition is in a separate record. There will be no more than three REF records and five NAMEADDRESS records passed, but there may be any number of ITEMS records.

Exercise Instructions

Sign on to the the DIS Client and create a new ROD Document Definition as follows:

- ___ 1. Click on the ROD Document Definitions icon, click the Dictionary tab and create a new Dictionary.
Record your Dictionary name here: _____
- ___ 2. Enter a description including your name.
- ___ 3. Click the Save button.
- ___ 4. Close the window.
- ___ 5. Select the Record ID Info tab and create a new record ID definition for Raw Data defining the first three characters of the record as the record ID.
- ___ 6. Save your Record ID Info.
Record your Record ID Info name here: _____
- ___ 7. Open the Dictionary you created. You may need to Refresh the list of dictionaries.
- ___ 8. Click the Import COBOL Copybook button.
- ___ 9. Identify the Copybook **POcopybook.cbl** in the "Select COBOL Copybook File" window in the student materials and click OPEN.
- ___ 10. The Copybook will be imported. Note any error messages and correct any error conditions (then re-start the process).
- ___ 11. After a successful "Import Completed" message is produced, click on Close. As the Copybook was imported, each record created or updated is added to the ROD Dictionary. A record is created or updated for each COBOL record description (01 level). A structure is created or updated for each COBOL group Item. A field is created or updated for each COBOL elementary item. A code list is created or updated for each COBOL elementary item condition name entry (88 level), if requested. An entry in a code list is created or updated for each condition name (88 level), if requested.
- ___ 12. Under the General tab, in the Copybook area, specify the name of the Record ID Info Name you created in Step 5.
- ___ 13. Save the Dictionary.
- ___ 14. To the right of "ROD Document Definition Name", click New to create a new ROD Document Definition.
- ___ 15. Enter a ROD Document Definition Name and description.

Record your ROD Document Definition name here: _____
- ___ 16. Select the Record ID Info you created.

- ___ 17. Select "Carriage Reutrn / Line Feed" as the Record Delimiter.
- ___ 18. Save the ROD Document Definition and close the ROD Document Definition window.
- ___ 19. Back in the Dictionary Window, select the ROD Document Definition Name from the drop-down list to the right of "ROD Document Definition Name".
- ___ 20. Click Save.
- ___ 21. Close the window.
- ___ 22. Click the ROD Document Definitions tab and double click to examine the ROD Document Definition created.
- ___ 23. Click the General, Details, and Overview Tabs. Review the information provided.
- ___ 24. Click the Raw Data tab and select the header record as your beginning record.
- ___ 25. Complete the four fields defining the Interchange Sender and Receiver Qualifiers and IDs. Use fields SENDER-QUAL, SENDER-ID, RECEIVER-QUAL and TRADING-PARTNER. These fields will provide the values for the Interchange sender and receiver qualifiers and IDs. You could also identify the two fields providing the Trading Partner Business IDs for the sender and receiver in which case the server would resolve the interchange addresses at run time.
- ___ 26. Save the ROD Document Definition and close the Window.
- ___ 27. Click the Dictionary tab and reopen your Dictionary.
- ___ 28. Click the Records button to update the Dictionary to identify the correct Record ID values. Record IDs are case sensitive. Open each Record, click the General tab and enter the 3-character Record IDs as shown in the table at the beginning of this exercise. You will need to double click on the record to open the editor and then click the General tab to change the record ID.
- ___ 29. Save each change and close the Record window. Note that only three of the four record types are defined at this time.
- ___ 30. Close the dictionary and click the ROD Document Definitions tab.
- ___ 31. Since the Cobol Copybook was provided, there have been some changes to the data layout. Modify the ROD Document Definition with the changes below.
- ___ 32. Follow the instructions below to add a new record, REF, to the ROD Document Definition Header above the Name and Address record. The new record contains three fields as follows:
 - Record Name: REF**
 - Field RECID-REF - CH - Length 3**
 - Field REF-QUALIFIER - Length 3**
 - Field REFERENCE-NUMBER - Length 20**
- ___ 33. Select the NAMEADDRESS record and click Insert.

- ___ 34. Add a new REF record to contain reference data. It will be in the *Header* area and have a max use of 3. Enter the *Record ID* remembering that Record IDs are case sensitive.
- ___ 35. Identify the HEADER-RECORD and NAMEADDRESS as in the *Header* area of the data. The Cobol Copybook did not provide this information, so *Detail* was used. This information is not used by WebSphere Data Interchange, but is for documentation purposes only.
- ___ 36. Add the *Max Use* values for NAMEADDRESS and ITEMS. NAMEADDRESS may repeat up to five times. Click the *Unlimited Repeat* checkbox to indicate there is no limit for the number of ITEMS records.
- ___ 37. Save the structure and close the NAMEADDRESS windows.
- ___ 38. Double click REF record to add the three fields shown above.
- ___ 39. Save REF.
- ___ 40. Save the ROD Document Definition.
- ___ 41. Close the window.
- ___ 42. If a printer is available, you may wish to produce a report showing your ROD Definition. Select your ROD Definition from the list and select *File / Report*. A report will be produced in HTML and displayed in your Browser.

END OF LAB

Exercise 2. Defining the EDI Data

What This Exercise is About

This lab provides an exercise in the importing of EDI Document Definition data. The imported Document Definition will be used in later exercises.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Import EDI Dictionaries and selected EDI Document Definitions from an Export/Import file.

Introduction

EDI Document Definitions are available in export/import format (*.eif) on the the DIS Client distribution CD-ROM or from the IBM WebSphere Data Interchange Web site (<http://www.ibm.com/software/integration/appconn/the DIS Client/downloads/>). Once the the DIS Client is installed and the database is installed and defined, EDI Document Definitions must be loaded to the database before EDI data maps can be created. This can be done in the Client using the File / Open Import File action. In this exercise we import an EDI Document Definition from the student materials.

Required Materials

Student electronic materials with EDI Document Definitions in export/import format.

Exercise Instructions

Step 1 - Importing the EDI Document Definition

The requirements of our application determine the layout for the record oriented data, but it is the EDI standards bodies that determine the format of EDI data. You will be importing the Document Definition for a purchase order from standards data provided by IBM.

- __ 1. Start the the DIS Client.
- __ 2. Select File / Open Import File.
- __ 3. Select the X12V4R1.eif file.
- __ 4. Expand the standard dictionary and the X12V4R1 standard to display a list of Document Definitions within that standard.
- __ 5. Select the 850 Document Definition. (It is good practice to also import the 997 Functional Acknowledgement into the standard dictionary.)
- __ 6. Click on the import icon.
- __ 7. Select the DB2 database for import.
- __ 8. Click OK.
- __ 9. If it already exists, replace the existing Document Definition.
- __ 10. The import may take some time. Be patient. When it finishes, click Close.
- __ 11. If not present, also import the X envelope standard from file *X.eif*.
- __ 12. Compile the envelope standard.

Step 2 - Reviewing the EDI Document Definition Data

Now that we have the standard installed, we can view the EDI Dictionaries, Document Definitions, Segments, Data Elements, and Code Lists.

- __ 1. Click on the EDI Document Definitions icon on the Navigator toolbar.
- __ 2. Select the EDI Dictionaries tab, locate the EDI Dictionary you imported and open it.
- __ 3. How many Document Definitions are in your Dictionary? _____
- __ 4. How many segments are in your Dictionary? _____
- __ 5. How many elements are defined? _____
- __ 6. Open the 850 Document Definition. What is the first segment? _____
- __ 7. What is the maximum use count for the first REF segment? _____
- __ 8. Select the 850 Document Document Definition again (don't open it), and click File / Report.

What do you observe?

- ___ 9. Click the Code Lists tab and locate the code list for element 235 for X12 V4R10.
- ___ 10. What is the description of code 'MG'? _____
- ___ 11. Close the Code Lists window.
- ___ 12. Click the EDI Document Definitions tab. How does this compare to the view when you clicked the Document Definitions button for your Dictionary?

- ___ 13. Close all open windows. You may leave the the DIS Client open.

END OF LAB

Exercise 3. Defining the XML Data

What This Exercise is About

This lab provides an exercise in the importing of an XML Document Type Definition (DTD) or Schema. The imported DTD or Schema will be used in later exercises.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Import XML Document Definitions from an Export/Import file.

Introduction

XML DTDs are identified with the file type “DTD”. XML Schemas are identified with the file type “XSD”. Sample DTDs and Schemas are available in the student materials.

Once the the DIS Client is installed and the database is installed and defined, XML DTDs and Schemas must be loaded to the database before XML maps can be created. This can be done in the Client using the File / Open Import File action. In this exercise we import DTD or Schema from the student materials.

Required Materials

Student electronic materials with EDI Document Definitions in export/import format.

Exercise Instructions

Step 1 - Importing the XML Document Definition

You will be importing the XML Document Definitions for a purchase order.

- __ 1. Start the the DIS Client.
- __ 2. Select File / Open Import File.
- __ 3. Select the DTD or Schema identified by your instructor in your student materials.
- __ 4. Click on the import icon.
- __ 5. Select the database for import. (You may only have one database defined.)
- __ 6. Click OK.
- __ 7. If it already exists, replace the existing DTD or Schema.
- __ 8. Click Close.

Step 2 - Reviewing the DTD or Schema

Now that we have the XML Document Definitions in the database, we can view the XML Dictionary, Document Type Definitions, Schema, and Namespace Definitions.

- __ 1. Click on the XML icon on the Navigator toolbar.
- __ 2. Select the XML Dictionaries tab, locate your XML Dictionary you imported. Click the DTD or Schema tab for the definition you imported. What do you observe?

- __ 3. Are there any Namespaces defined? _____
- __ 4. Close all open windows. You may leave the the DIS Client open.

END OF LAB

Exercise 4. Translation Tables and Code Lists

What This Exercise is About

This lab covers the creation of a Translation Table and a Code List.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Create a Translation Table to convert application values to the corresponding X12 codes
- Create a Code List to validate data.

Introduction

When we map the Basis of Unit Price Code in the PO1 segment, we will need to convert the names used in the record oriented data to values consistent with the EDI document Definition requirements for element 639. The following table shows values the application will use and the corresponding EDI codes that will need to be produced.

Local (Application) Value	Standards or TP Value
WHOLESALE	WH
CATALOG	CA
CONTRACT	CT
DISTRIBUTOR	DI
RETAIL	RE
SUGGESTED	SR

When we map the Unit or Basis of Measurement Code in the PO1 and SCH segments, we will want to verify that the values passed in the record oriented data fields are consistent with the EDI Document Definition requirements for element 355. The following table shows values which are acceptable. Note that these are a small subset of all the values allowed by the standard.

Acceptable Value	Description
EA	Each
CA	Case
DZ	Dozen
GS	Gross
HC	Hundred Count
BX	Box

Exercise Instructions

Step 1- Create a Translation Table

- ___ 1. Click the Mapping icon and create a Translation Table to convert the Basis of Unit Price application values to the corresponding X12 codes.
- ___ 2. Record your table name: _____
- ___ 3. Remember that table entries are case sensitive.
- ___ 4. Enter the data type and maximum length for the *Source Value* and *Target Value*.
- ___ 5. Click *New / Insert* to enter the values for source and target values in the first table in the Introduction section above.
- ___ 6. Save the table.

Step 2 - Create a Code List

- ___ 1. Select the EDI Document Definitions icon and create a Code List that will allow us to validate the six values shown in the second table in the Introduction section.
- ___ 2. Code List name: _____
- ___ 3. Enter the values for Data Type and maximum Length of Entries.
- ___ 4. Enter the values for Acceptable Value and Description based on the in the Introduction section above.
- ___ 5. Save your Code List.
- ___ 6. After you have created your Code List, return to the list of Code Lists.
- ___ 7. View your Code List.
- ___ 8. How does it differ from appearance compared to the way you entered it?

- ___ 9. Close all windows.

END OF LAB

Exercise 5. Mapping an ROD Document Definition to an EDI Document Definition

What This Exercise is About

This lab covers mapping of individual elements of a ROD Document Definition to their corresponding EDI Document Definition elements.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Create a new Data Transformation Map
- Define the Data Transformation Map
- Map data elements
- Define loop correspondences
- Compile the map to produce a Control String.

Introduction

Mapping is at the heart of translation. The map provides instructions for the translator to do its job. As with programming, a "clean" compile does not mean that the map is correct. Map carefully. If you get errors in mapping, read the messages carefully. Ask if you do not understand a message. Do not ignore errors. Review your map when it is complete.

Exercise Instructions

Preface

- We are now ready to map the Record Oriented Data to the X12 Standard.

Step 1 - Create a new Data Transformation Map

- ___ 1. Start the Client.
- ___ 2. Click the Mapping icon.
- ___ 3. Create a new Data Transformation Map.
- ___ 4. Name your map. Record your map name here: _____
- ___ 5. Enter a description, include your name. Click Next.
- ___ 6. Select *Target* to indicate that the mapping will be based on the target (EDI) data.
- ___ 7. Our source data will be based on a ROD Document Definition. Select your ROD Dictionary and ROD Document Definition you created in Exercise 2.
- ___ 8. Our target data will be EDI. Select your EDI Dictionary and the EDI 850 Document Definition you imported in Exercise 3.
- ___ 9. Review your selections.
- ___ 10. Correct any problems.
- ___ 11. Click *Finish* when you are satisfied with your selections.

Step 2 - Begin the Mapping Process

The Implementation Guide in Appendix D represents your trading partner's specification for the standard data expected. It will be your basic guide to mapping. All data may or may not be present in your application file. Satisfy your trading partner's requirements, but recognize that there may be some limitations.

You will note that the envelope segments (ISA, IEA, GS, GE, ST, and SE) are not shown. They will be created automatically during the enveloping process and do not need to be mapped.

Much of the mapping will be "drag and drop" from the Source pane to the Target pane. You can drag in either direction to establish the source-target relationships. Notice how the Command pane (lower left) is updated as the mappings are defined. We see the EDI Document Definition in the Command pane because we identified this map as being "Target Based." Remember

that you can only map fields to elements and that you may need to expand records and segments to view this level of detail.

- ___ 1. Maximize your mapping window.
- ___ 2. As required, expand the Records, Tables, and Segments as required and map those segments identified in your trading partner's Purchase Order Implementation Guide (see Appendix D). Begin by expanding the HEADER-RECORD, Table 1, and the BEG segment
- ___ 3. For your first mapping, drag the PURPOSE-CODE field from the HEADER-RECORD to the Transaction Set Purpose Code (Element 353 in Segment BEG in Table 1).
- ___ 4. Notice the MapFrom command generated in the Command pane. Adjust the pane sizes as required. This would have been a MapTo command if the map had been Source Based.

Step 3 - Complete the BEG segment mapping

The second mapping requires the mapping of a literal. The Purchase Order Type Code element does not have a corresponding field in the record oriented data. However, our trading partner has specified in the Implementation Guide that this field is to be set to "NE" indicating a new purchase order.

- ___ 1. Select the *Purchase Order Type Code* element in the Command pane.
- ___ 2. Right mouse click and select **Insert Within / Command /Assignment**.
- ___ 3. The Client will generate a "path=expression" command.
- ___ 4. Replace the word "path" with the path identifying the element to be mapped by dragging the Purchase Order Type Code element from the target pane to the word "path" in the command.
- ___ 5. To store the value to be mapped, select the word "expression" and replace it with "NE" (in apostrophes or quotes). This is the X12 code for a new purchase order.
- ___ 6. Click "OK".
- ___ 7. Continue mapping the remaining elements for the BEG segment. Reference the Implementation Guide in Appendix D.

Step 4 - Mapping the REF Segment

One REF segment will be produced for each REF record.

- ___ 1. Collapse the BEG segment.
- ___ 2. Expand the REF record and REF segment.

- ___ 3. Drag the REF record from the ROD Document Definition to the REF segment in the EDI Document Definition to map this correspondence. A “For Each” mapping will be generated in the command pane to cause one REF segment to be produced for each REF record.
- ___ 4. Map REF-QUALIFIER to element 128, *Reference Identification Qualifier*.
- ___ 5. Map REFERENCE-NUMBER to element 127, *Reference Identification*. You may want to try dragging this one in the other direction.
- ___ 6. Map the literal ‘SPECIAL’ to REF03 (Element 352). The process is similar to the method you used to map the Purchase Order Type Code in the BEG segment.

Step 5 - Mapping the NAMEADDRESS Field

The NAMEADDRESS field will be mapped to the N1 loop at location 310 in the EDI header. Note you will need to scroll down in the standard to locate N1, but map the N1 loop in Table 1. There is another loop in Table 2 that will not be mapped.

- ___ 1. Right-click on the NAMEADDRESS record and select “Expand All.” Also “Expand All” for the N1 loop.
- ___ 2. Drag NAMEADDRESS from the ROD Document Definition to the N1 loop in the EDI Document Definition to map this correspondence.
- ___ 3. A “For Each” mapping will be generated to cause one N1 loop to be produced for each NAMEADDRESS record in the record oriented data.
- ___ 4. Map the name and address fields in the ROD Document Definition to the corresponding elements in the standard.

Step 6 - Additional mappings

- ___ 1. Expand Table 2 and ITEMS in the source pane and Table 2 and the PO1 loop in the target pane.
- ___ 2. Drag ITEMS to the PO1 loop to establish the “For Each” qualification.
- ___ 3. Map ASSIGNED-ID, ORDER-QTY, UNIT-OF-MEAS, UNIT-PRICE and UNIT-PRICE-BASIS to the corresponding elements in the PO1 segment.
- ___ 4. Map MFG-PART-NUMBER, BUYERS-ITEM-NUMBER, and UPC-CODE to the first three Product/Service ID elements (element 234) in the PO1 segment.
- ___ 5. Map qualifiers for each of these in the Product/Service ID Qualifiers (element 235) that precede the Product/Service IDs being qualified. Map the qualifiers by inserting an assignment statement within each of the Product/Service ID Qualifier mappings. See the Implementation Guide, Appendix D, for the qualifier values.
- ___ 6. Save your map.

Step 7 - Compiling the Control String

- ___ 1. Compile the Control String when your map is complete.
- ___ 2. Correct any errors and recompile until a Control String is successfully produced.
- ___ 3. Produce a printed report of your map.

END OF LAB

Exercise 6. Mapping using Commands, Functions and Variables

What This Exercise is About

This lab covers the use of functions and variables in advanced data transformation mapping.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Modify an existing map
- Create local variables
- Produce line numbers
- Map fields to elements
- Validate data fields
- Create an error message
- Perform calculations on variables
- Translate values to X12 codes
- Change an element mapping
- Map variables to elements
- Create a Command Group
- Conditionally map an element
- Finalize the mapping process

Introduction

Much of the mapping process simply involves dragging and dropping, making associations between source and target elements. However, often there are challenges and requirements for special processing. The DIS Client provides a powerful set of tools, including variables, commands, and functions that allow us to manipulate data. Here we will exercise a few of those tools.

Exercise Instructions

Preface

- We have received new requirements from our EDI director and our trading partner. To satisfy these requirements, we will need to make some mapping changes, recompile the map, and re-run our unit test. You will need use a new record oriented data file as directed by the instructor.

Step 1 - Creating a new map

- ___ 1. From the list of maps, select your map and use *Actions / Copy* to create a new copy of your map.
- ___ 2. New map name: _____
- ___ 3. Update your map as directed in the following steps.

Step 2 - Creating local variables

You will be using a local variable to generate the line numbers for the mapping of PO101. A second local variable will be required to sum the number of all order quantities for mapping in the CTT segment. A third local variable will accumulate the total amount for the order.

- ___ 1. Create two integer variables and one real variable as described in the following steps.
- ___ 2. Right click on the local variable pane to create local variables. Notice that if you haven't closed the window, you can click *Insert* to add the second and third variables after the first is created.
- ___ 3. Record your variable names below:

Line number: _____

Hash total (sum of quantities): _____

Total amount or order: _____

- ___ 4. Establish an initial value of zero for each of these variables.
- ___ 5. Specify that the variables have "Document" scope.
- ___ 6. Decide carefully on the data type for each of the variables. Select a data type that will allow the total amount may include cents.

Step 3 - Producing line numbers automatically

- ___ 1. In the mapping command window, expand the PO1 segment to display the mapping of element 350.
- ___ 2. Delete the old command that mapped this element from application field ASSIGNED-ID.
- ___ 3. Insert two assignment commands within this mapping.
- ___ 4. The Mapping Command Editor will display with "path = expression" in the dialog box.
- ___ 5. Drag your line number variable to both "path" and "expression".
- ___ 6. Edit the command to produce a command of the form "LINENUMBER = LINENUMBER + 1".
- ___ 7. To insert an assignment command to map the line number variable to the Assigned Identification element, drag the line number variable to element 350 (Assigned Identification). The ASSIGNED-ID field in the ROD Document Definition will no longer be used.

Step 4 - Accumulating the quantity ordered

In your mapping of field ORDR-QTY to the Quantity Ordered element, use your local "Hash Total" variable to accumulate the total of all quantities for this order. This hash figure is sometimes checked to validate the line items based on the order quantity totals.

- ___ 1. Select the existing mapping for Quantity Ordered and right-click to insert an assignment statement of the form:
`HASHTOTAL = HASHTOTAL + \ITEMS\ORDR-QTY\`
- ___ 2. Do not delete the original mapping of the application field.
- ___ 3. Later you will map the hash total to the CTT segment.

Step 5 - Validating the Unit-of-Meas field

You are required to validate the UNIT-OF-MEAS field in the record oriented data before mapping it to the corresponding element.

- ___ 1. Insert an *If* command before the "Unit or Basis for Measurement Code" mapping.
- ___ 2. Use the *Validate* function to check the contents of the UNIT-OF-MEAS field against the Code List you created.
- ___ 3. The syntax for the *If* expression is:
`(Validate('tablename',path,True/False))`
 where path is the Unit-of-Meas in the ROD Document Definition source and "True"

indicates that a warning message is to be issued if the value is not found in the table. Click OK.

- ___ 4. Drag your original mapping to the *If* statement to perform the mapping of this element only if it passes validation.

Step 6 - Creating an error message

There was a data entry error which caused a dollar amount to be entered as \$199,500.00 instead of \$1,995.00.

- ___ 1. Check the unit price to issue a message if any unit price dollar amount is greater than \$10,000.00.
- ___ 2. Hint: You will need to use the Error command. The Syntax is:
Error(error-level,message-code,'message')
error levels: 0 - no error, 1 - element error, 2 - segment error, 3 - Document Definition error
message-code - a value between 5000 and 5999
message - your message text
- ___ 3. Remember to *insert* the Error command *within* the If command.

Step 7 - Calculating the total price

- ___ 1. Add a statement to the Unit Price mapping to calculate the total price by multiplying the unit price by the quantity. Add the product to the local variable you created to store the total amount. Create an assignment statement in the following form:

```
TOTALAMOUNT = TOTALAMOUNT + (\ITEMS\UNIT-PRICE\\ *  
\ITEMS\ORDR-QTY\\)
```

- ___ 2. Retain your original mapping.
- ___ 3. You will map this to the AMT segment in Step 10 at the end of the mapping process.

Step 8 - Translating values to corresponding X12 codes

For the Basis of Unit Price Code, the application normally provides one of six values (WHOLESALE, CATALOG, CONTRACT, DISTRIBUTOR, RETAIL, or SUGGESTED). We need to translate those values to the corresponding X12 codes. However, sometimes this field is blank, causing translation to fail. If the Basis of Unit Price Code field is not found in the table, we would like to default the value mapped to the code 'WH' (wholesale).

- ___ 1. Replace the old mapping to use the Translate function to perform the translation.
- ___ 2. Do not issue a warning message if the search value is not found.
- ___ 3. Set the code to 'WH' if the search value is not found in the table.
- ___ 4. The syntax for the Translate function is:
Translate('table name','direction',path,True/False,'default value')

where table name is the Translation Table created in Exercise 4, Step 1, direction is 'S' to search the Source Value column or 'T' to search the Target Value column.

Step 9 - Conditionally mapping an element

We discovered that if the Part Number, Item Number, or UPC Code field (Element 234) is missing, element 235, being hardcoded, is still produced, resulting in the following requirement:

- ___ 1. Change the mapping of element 235 to check to see if there is data in the field for element 234 and only map the qualifier if the corresponding data field is present. This logic is to be placed in a Command Group. You will need this logic for the three pairs of 235/234 elements mapped.
Hint: One solution is to use the *If* command and *StrCompN* function to control the mapping of the qualifiers. Compare one character of the Product/Service ID against a blank (' ') to see if it is blank.
- ___ 2. Once you have created the logic for the first set of 235/234 pairs, you can Shift-Drag to copy the command group to the other elements. Then you will need to update the commands to reference the elements being mapped for the other two element pairs.
- ___ 3. Try to complete this mapping without looking at the steps below. Here is one solution:
 - a. Right click element 235 and *Insert / Within / Command Group*.
 - b. Enter a description of the function of these commands.
 - c. Right click on the Command Group description and *Insert / Within / Command / If*.
 - d. Enter (**StrComp**(
 - e. Drag the Product/Service ID field (MFG-PART-NUMBER, BUYERS-ITEM-NUMBER or UPC-CODE) being tested after the parenthesis at the end of the above *If* expression.
 - f. To check for data in a field before mapping its qualifier you may use a statement such as:
If (StrComp(path, ' ') NE 0), where *path* points to the field being checked and the number of spaces must exactly match the length of the ROD Document Definition field being compared. As an alternative, you could assume the field is blank if the first character is blank and use the *StrCompN* function to compare only the first character: *StrCompN(path, ' ', 1)*.
 - g. In mapping command pane, drag the original element mapping to the *If* statement to have the qualifier mapped only if the logical expression is true (the qualified field is not blank).
 - h. Save your map. (You should occasionally save your map as you would any large document you are editing!)
 - i. Click on the Command Group command and shift-drag the Command Group to copy it to the next occurrence of element 235.
 - j. Open the newly copied *If* command and replace the field name with the field name being mapped for this 235/234 pair.

k. Copy the command group to the next pair again replacing the field name with the field name for the current mapping.

Step 10 - Mapping the line number variable as the total number of line items

- ___ 1. Scroll to the bottom of the command pane.
- ___ 2. Expand Table 3. the CTT loop and the CTT segment.
- ___ 3. Map your line number variable to the Number of Line Items element. You can drag the variable directly to the element being mapped.
- ___ 4. Map your hash total variable to the Hash Total element.
- ___ 5. Expand the AMT segment. **Be sure you are mapping the AMT segment in Table 3 as there is also an AMT segment in Table 2.**
- ___ 6. Map a literal '1' to the Amount Qualifier Code.
- ___ 7. Map your total amount variable to the Monetary Amount element.
- ___ 8. Compile your map.
- ___ 9. Produce a printed report of your map.

END OF LAB

Exercise 7. Mapping EDI Data to XML

What This Exercise is About

This lab covers the mapping of EDI data to XML format.

What You Should Be Able to Do

At the end of the lab, you should be able to:

- Create a new Data Transformation Map and translate data to XML
- Create an XML Dictionary
- Import a Document Type Definition (DTD)
- Create a source-based map
- Create a “Qualify by Value” mapping
- Map elements based on qualifying elements

Introduction

So far we have dealt with application data defined by an ROD Document Definition and EDI standard data defined by an EDI Document Definition. In this exercise we will be defining our target data with an XML Document Type Definition (DTD) or XML Schema. Our source file will be the EDI data we just created and our target will be XML.

A NEW ROLE

Bad News!

Your company has just reorganized and your position as Coordinator of Electronic Commerce has been eliminated.

Good News!

Your former trading partner, SweetTooth Limited, has offered you a position in their Electronic Commerce department. You will be responsible for translating incoming purchase orders to the XML format used by SweetTooth.

Beginning with the standard EDI data you mapped in the previous exercise, you will now map it to XML. We will use the same EDI Dictionary we used to map the EDI data. An XML Document Type Definition will be used to define the target data. You will be provided with the Document Type Definition (DTD) or a Schema file defining the XML.

Exercise Instructions

Step 1 - Create an XML Dictionary and import the DTD or Schema provided.

- ___ 1. Click the XML icon.
- ___ 2. Create a new XML Dictionary.
Record the name here:
XML Dictionary: _____
- ___ 3. Save your XML Dictionary.
- ___ 4. Select **File/Open Import File**.
- ___ 5. Change the file type to *.dtd or *.xsd.
- ___ 6. Import the DTD or Schema from the location and file name identified by your instructor.
- ___ 7. Select the database with which you are working.
- ___ 8. Verify the DTD name or Schema.
- ___ 9. Enter the name of the Dictionary you created in Step 2.
- ___ 10. Enter the Root Element name (see Appendix C for a listing of the DTD).
The Root Element is the first element defined in the DTD.
- ___ 11. Enter a description. Include your name.
- ___ 12. Click Import.
- ___ 13. Click View/Refresh.
- ___ 14. Double-click your DTD or Schema.
- ___ 15. Click the View tab to view the DTD or Schema.

Step 2 - Map the EDI source to the XML target format

Create a Data Transformation map to map the EDI source to the XML target format. You only need to map elements for which fields are present in the X12 data produced. Information from the CTT and AMT segments is not required in the XML, therefore, they need not be mapped. Some fields will need to be populated by literals and commands.

- ___ 1. Click the Mapping icon.
- ___ 2. Click the Data Transformation Maps tab.
- ___ 3. Create a new map.
- ___ 4. Name your map - include your initials.

- ___ 5. Enter a description.
- ___ 6. You will be creating a Source Based map.
- ___ 7. Your source data will be the EDI data you created.
- ___ 8. The target data will be based on the DTD that you imported.
- ___ 9. When the source and target document definitions are identified, expand the Source Table1 BEG segment, the Target Header and Elements and also the Table1 BEG segment in the Mapping Command pane.
- ___ 10. Drag the corresponding fields from the source pane to the target. You should perform five drag and drop mappings. Remember that you can only map fields to elements and that you may need to expand records and segments to view this level of detail.

Step 3 - Map the TRADING_PARTNER element from the EDI Interchange Envelope

- ___ 1. Insert an Assignment Command at the beginning of the BEG segment.
- ___ 2. Replace the path with the TRADING_PARTNER field by dragging the TRADING_PARTNER field from the target pane to the word path in the command pane.
Note: Be sure to map the trading partner element TRADING_PARTNER.PCDATA [PCDATA], not the compound element TRADING_PARTNER [{#PCDATA}].
- ___ 3. Replace the word *expression* in the command pane with the GetProperty function reference required to obtain the sender ID (ISA06) from the Interchange Envelope.
Remember to put the property name in quotes.

Step 4 - Map the REF Segment - Qualification by Value

The REF segment will require *Qualification by Value*. Each time you select Qualify By Value, the Client will produce another copy of the loop being mapped.

- ___ 1. Right click on the REF segment in the command pane and select the Qualify / By Value. You will be qualifying the mapping of the entire segment based on the contents of element 128. This qualification is therefore mapped on the REF segment itself, not one of its elements.
- ___ 2. A Qualify command will appear with the StrComp function for string comparison.
- ___ 3. Drag the qualifying element (128) to the “path” in the command.
- ___ 4. Enter the value for the reference number qualifier. Select any of the four qualifiers (“11”, “23”, “2S”, or “TX”), you will be mapping the other three later.

- ___ 5. Drag the Reference Identification element to the XML element corresponding to the Qualifier you selected. For example, if you are qualifying the mapping of REF based on element 128 being:
- 11 - Account number
 - 23 - Client number
 - 2S - Catalog number
 - TX - Tax exempt number
- Element 127 will be mapped to the corresponding field defined in the DTD. See the REF segment in the Implementation Guide.
- ___ 6. For each of the remaining three qualifiers, repeat the process shown in Steps 1-5 above. Each successive REF segment definition will be placed above the previous one defined. You would have four sets of REF segment mappings when you are done.

Step 5 - Map the N1 Loop

- ___ 1. Establish the correspondence between the N1 loop and the NAME_ADDRESS element by dragging the N1 loop to the NAME_ADDRESS definition in the DTD.
- ___ 2. Map the N1 loop. Make sure that you select the N1 loop in Table 1. Expand the loop and corresponding XML element to the lowest level to map XML and X12 elements.
- ___ 3. The X12 Identification Code Qualifier is mapped to XML attribute "CodeQual". Notice that XML attributes are identified with green tag symbols.
- ___ 4. The Identification Code element is mapped to the XML CUST_ID element, which is defined as PCDATA (parsed character data).
- ___ 5. Map all available N1 elements. When mapping the address, note that address is mapped to the XML LINE element which may repeat.

Step 6- Map the PO1 loop line item details

- ___ 1. Drag the PO1 loop to the Items loop to produce an XML line item loop for each PO1 loop encountered in the X12 data.
- ___ 2. Map the PO1 loop elements in Table 2, Assigned Identification (Line Number), Quantity, Unit of Measure, and Unit Price. Basis of Unit Price is mapped as an XML attribute.

Step 7- Map the PO1 loop Product/Service IDs

Each of the first three Product/Service ID Qualifiers will need to be inspected to determine whether the qualified Product/Service ID is to be mapped to PART_NUMBER, ITEM_NUMBER, or UPC. *Since the IDs can appear in any order, you will need three If commands, checking for each of the three qualifiers for each Qualifier/ID pair.*

- ___ 1. Insert three *If* command groups within each of the first three Product/Service ID elements, checking for the 'IN', 'MG', and 'UP' qualifiers.
- ___ 2. To compare strings, use the string compare function (StrComp). Syntax: **(StrComp(qualifier-path,'IN')=0)**, where the qualifier-path is dragged from the Product/Service ID Qualifier in the source.
- ___ 3. Insert an assignment command within the *If* command to assign the Product/Service ID to the appropriate element in the target XML.
Note: Be sure to map the PART_NUMBER, ITEM_NUMBER, and UPC elements, not the compound elements.
- ___ 4. Insert a new *If* command after the EndIf. This *If* will check the next qualifier and assign the Product/Service ID based on that value.
- ___ 5. Insert the third *If* and assignment commands to check the third qualifier, assigning the associated Product/Service ID to the appropriate XML element.
- ___ 6. Apply the same three mappings to the second and third Qualifier/ID pairs, checking for 'IN', 'MG', and 'UP' for each. You will create a total of nine *If* statements.

Step 8- Complete the map

- ___ 1. Save your map.
- ___ 2. Compile your map.
- ___ 3. Check for errors and correct problems identified during compilation.
- ___ 4. Produce a printed report of your map.

Notes:

END OF LAB

Appendix A. COBOL Copybook

```

000100 04  PO.
000500*****
000600*  HEADER RECORDS                                     *
000700*****
000800          08  HEADER-RECORD.
000900          10  RECID-HDR                               PIC X(3) .
001000          10  SENDER-QUAL                           PIC X(2) .
001100          10  SENDER-ID                             PIC X(12) .
001200          10  RECEIVER-QUAL                         PIC X(2) .
001300          10  TRADING-PARTNER                       PIC X(17) .
001400          10  PURPOSE-CODE                          PIC X(02) .
001500          10  PO-NUMBER                              PIC X(22) .
001600          10  PO-DATE                               PIC 9(08) .
001700          10  RELEASE-NUMBER                       PIC X(30) .
001800          10  CONTRACT-NUMBER                      PIC X(30) .
007000          08  NAMEADDRESS.
007100          10  RECID-NAM                             PIC X(3) .
007200          10  NAME-INFO.
007300          12  TP-ENTITY-ID                          PIC X(02) .
007400          12  TP-NAME                               PIC X(35) .
007500          12  EDI-TP-ID-QUAL                       PIC X(02) .
007600          12  EDI-TP-ID                            PIC X(17) .
007700          12  ADDITIONAL-NAME                     PIC X(35) .
007800          10  ADDRESS-INFO.
008000          12  ADDR-1                               PIC X(35) .
008100          12  ADDR-2                               PIC X(35) .
008300          12  CITY                                  PIC X(30) .
008400          12  STATE                                PIC X(02) .
008500          12  POSTAL-ZIP                           PIC X(09) .
008600*****
008700*  LINE RECORDS                                     *
008900*****
009000          08  ITEMS.
009100          10  RECID-ITM                             PIC X(3) .
009200          10  ASSIGNED-ID                          PIC X(6) .
009300          10  ORDR-QTY                              PIC 9(09) .
009400          10  UNIT-OF-MEAS                          PIC X(02) .
009500          10  UNIT-PRICE                           PIC 9(10)V9(04) .
009600          10  UNIT-PRICE-BASIS                    PIC X(11) .
009700          10  MFG-PART-NUMBER                     PIC X(30) .
009800          10  BUYERS-ITEM-NUMBER                  PIC X(20) .

```

009900	10	UPC-CODE	PIC X(10) .
010000	10	MONETARY-AMOUNT	PIC 9(13)V9(02) .
010100	10	ITEM-DESC-TYPE	PIC X(01) .
010200	10	ITEM-DESCRIPTION	PIC X(80) .

Appendix B. Application Data Layout Definition

Table 1: Header Record - There will be one header record per PO.

FIELD	DESCRIPTION	DATA TYPE	COLUMNS
RECID-HDR	Record ID - 'HDR'	Character	1-3
SENDER-QUAL	Sender Interchange Qualifier	Character	4-5
SENDER-ID	Sender Interchange ID	Character	6-17
RECEIVER-QUAL	Receiver Interchange Qualifier	Character	18-19
TRADING-PARTNER	Receiver Interchange ID	Character	20-36
PURPOSE-CODE	Transaction Set Purpose Code	Identifier	37-38
PO-NUMBER	Purchase Order Number	Character	39-60
CUST-PO-DATE	Purchase Order Date	Date	61-68
RELEASE	Release Number	Character	69-98
CONTRACT	Contract Number	Character	99-128

Table 2: Reference - There will be three reference records per PO.

FIELD	DESCRIPTION	DATA TYPE	COLUMNS
RECID-REF	Record ID - 'REF'	Character	1-3
REF-QUALIFIER	Qualifier	Character	4-6
REFERENCE-NUMBER	Reference Number	Character	7-26

Table 3: Name and Address - There may be up to 5 name and address records.

FIELD	DESCRIPTION	DATA TYPE	COLUMNS
RECID-NAM	Record ID - 'NAM'	Character	1-3
TP-ENTITY-ID	ID Code	Character	4-5
TP-NAME	Company Name	Character	6-40
EDI-TP-ID-QUAL	ID Qualifier	Character	41-42
EDI-TP-ID	Trading Partner ID	Character	43-59
ADDITIONAL-NAME	Additional Name Information	Character	60-94
ADDR-1	Address Line 1	Character	95-129
ADDR-2	Address Line 2	Character	130-164
CITY	City	Character	165-194
STATE	State or Province Code	Character	195-196
POSTAL-ZIP	Postal Code	Character	197-205

Table 4: Items - There may be any number of line item records.

FIELD	DESCRIPTION	DATA TYPE	COLUMNS
RECID-NAM	Record ID - 'ITM'	Character	1-3
ASSIGNED-ID	Line Number (not used)	Character	4-9
ORDR-QTY	Quantity Ordered	Numeric with 2 decimals implied	10-18
UNIT-OF-MEAS	Unit of Measure	Character	19-20
UNIT-PRICE	Unit Price	Numeric with 4 decimals implied	21-34
UNIT-PRICE-BASIS	Basis of Unit Price	Character	35-45
MFG-PART-NUMBER	Manufacturer's Part Number	Character	46-75
BUYERS-ITEM-NUM	Buyer's Item Number	Character	76-95
UPC-CODE	UPC Code	Character	96-105
MONETARY-AMOUNT	Monetary Amount	Numeric with 2 decimals implied	106-120
ITEM-DESC-TYPE	Item Description Qualifier	ID	121-121
ITEM-DESCRIPTION	Item Description	Character	122-201

Appendix C. Document Type Definition

```

<!ELEMENT PO (HEADER, REF*, NAME_ADDRESS, ITEMS+)>
<!ELEMENT HEADER (TRADING_PARTNER, PURPOSE, PO_NUMBER, PO_DATE, RELEASE,
CONTRACT, REFERENCE)>
<!ELEMENT TRADING_PARTNER (#PCDATA)>
<!ELEMENT PURPOSE (#PCDATA)>
<!ELEMENT PO_NUMBER (#PCDATA)>
<!ELEMENT PO_DATE (#PCDATA)>
<!ELEMENT RELEASE (#PCDATA)>
<!ELEMENT CONTRACT (#PCDATA)>
<!ELEMENT REFERENCE (#PCDATA)>
<!ELEMENT REF (ACCOUNT, CLIENT, CATALOG, TAX_EXEMPT_NUMBER)>
<!ELEMENT NAME_ADDRESS (NAME, ADDRESS)>
<!ELEMENT NAME (ENTITY_ID, CUSTOMER_NAME, CUST_ID, ADDITIONAL_NAME)>
<!ELEMENT ENTITY_ID (#PCDATA)>
<!ELEMENT CUSTOMER_NAME (#PCDATA)>
<!ELEMENT CUST_ID (#PCDATA)>
<!ATTLIST CUST_ID CodeQual CDATA (#REQUIRED)>
<!ELEMENT ADDITIONAL_NAME (#PCDATA)>
<!ELEMENT ADDRESS (LINE+, CITY, STATE, POSTAL_CODE)>
<!ELEMENT LINE (#PCDATA)>
<!ELEMENT CITY (#PCDATA)>
<!ELEMENT STATE (#PCDATA)>
<!ELEMENT POSTAL_CODE (#PCDATA)>
<!ELEMENT ITEMS (LINE_NUMBER, QUANTITY, UNIT_OF_MEASURE, UNIT_PRICE, PART_NUMBER,
ITEM_NUMBER, UPC, AMOUNT, DESCRIPTION)>
<!ELEMENT LINE_NUMBER (#PCDATA)>
<!ELEMENT QUANTITY (#PCDATA)>
<!ELEMENT UNIT_OF_MEASURE (#PCDATA)>
<!ELEMENT UNIT_PRICE (#PCDATA)>
<!ATTLIST UNIT_PRICE Basis CDATA (#IMPLIED)>
<!ELEMENT PART_NUMBER (#PCDATA)>
<!ELEMENT ITEM_NUMBER (#PCDATA)>
<!ELEMENT UPC (#PCDATA)>
<!ELEMENT AMOUNT (#PCDATA)>
<!ELEMENT DESCRIPTION (#PCDATA)>
<!ATTLIST DESCRIPTION CDATA (#IMPLIED)>

```


Appendix D. ANSI X12 850 Implementation Guide

*Sweet Tooth
Limited*

Electronic Data Interchange

Purchase Order

850

Implementation Guide

TRANSACTION SET TABLES o 850 RELEASE o 004010

850 Purchase Order

This Draft Standard for Trial Use contains the format and establishes the data contents of the Purchase Order Transaction Set (850) for use within the context of an Electronic Data Interchange

(EDI) environment. The transaction set can be used to provide for customary and established business and industry practice relative to the placement of purchase orders for goods and services.

This transaction set should not be used to convey purchase order changes or purchase order acknowledgment information.

FUNCTIONAL GROUP=**PO**

Table 1

POS. NO.	NAME	SEG.ID	REQ.DES.	MAX USE	LOOP REPEAT
010	Transaction Set Header	ST	M	1	
020	Beginning Segment for Purchase Order	BEG	M	1	
050	Reference Identification	REF	O	>1	
	LOOP ID - N1				200
310	Name	N1	O	1	
320	Additional Name Information	N2	O	2	
330	Address Information	N3	O	2	
340	Geographic Location	N4	O	>1	

Table 2

POS. NO.	NAME	SEG.ID	REQ.DES.	MAX USE	LOOP REPEAT
	LOOP ID - PO1				100000
010	Baseline Item Data	PO1	M	1	
015	Item Identification	LIN	O	>1	
	LOOP ID - PID				1000
050	Product/Item Description	PID	O	1	
	LOOP ID - AMT				>1
287	Monetary Amount	AMT	O	1	

Table 3

POS. NO.	NAME	SEG.ID	REQ.DES.	MAX USE	LOOP REPEAT
	LOOP ID - CTT				1
010	Transaction Totals	CTT	O	1	
020	Monetary Amount	AMT	O	1	
030	Transaction Set Trailer	SE	M	1	

Transaction Set Header - ST

To indicate the start of a transaction set and to assign a control number

CONTROL SEGMENT

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	143	Transaction Set Identifier Code <i>Contains transaction set ID (850).</i>	ID	3/3	M
02	329	Transaction Set Control Number <i>Incremental number beginning with 000000001 for the first purchase order sent.</i>	AN	4/9	M

Beginning Segment for Purchase Order - BEG

To indicate the beginning of the Purchase Order Transaction Set and transmit identifying numbers and dates

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	353	Transaction Set Purpose Code <i>00 – Original Purchase Order 04 – Change 05 – Replacement</i>	ID	2/2	M
02	92	Purchase Order Type Code <i>NE – New Order</i>	ID	2/2	M
03	324	Purchase Order Number	AN	1/22	M
04	328	Release Number	AN	1/30	O
05	373	Date <i>Purchase Order Date in Format 'CCYYMMDD'</i>	DT	8/8	M
06	367	Contract Number	AN	1/30	O

Reference Identification - REF

To specify identifying information

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	128	Reference Identification Qualifier <i>11 – Account Number 23 – Client Number 2S – Catalog TX – Tax Exempt Number</i>	ID	2/3	M
02	127	Reference Identification <i>Account Number, Client Number, Catalog, or Tax Exempt Number</i>	AN	1/30	X
03	352	Description <i>The Literal Value Special</i>	AN	1/80	X

Name - N1

To identify a party by type of organization, name, and code

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	98	Entity Identifier Code	ID	2/3	M
02	93	Name	AN	1/60	X
03	66	Identification Code Qualifier	ID	1/2	X
04	67	Identification Code	AN	2/80	X

Additional Name Information - N2

To specify additional names or those longer than 35 characters in length

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	93	Name	AN	1/60	M
02	93	Name	AN	1/60	O

Address Information - N3

To specify the location of the named party

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	166	Address Information	AN	1/55	M
02	166	Address Information	AN	1/55	O

Geographic Location - N4

To specify the geographic place of the named party

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	19	City Name	AN	2/30	O
02	156	State or Province Code	ID	2/2	O
03	116	Postal Code	ID	3/15	O
04	26	Country Code USA	ID	2/3	O

Baseline Item Data - PO1

To specify basic and most frequently used line item data

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	350	Assigned Identification <i>Purchase Order Line Number</i>	AN	1/20	O
02	330	Quantity Ordered	R	1/15	X
03	355	Unit or Basis for Measurement Code	ID	2/2	O
04	212	Unit Price	R	1/17	X
05	639	Basis of Unit Price Code	ID	2/2	O
06	235	Product/Service ID Qualifier IN – Buyer's Item Number MG – Manufacturer's Part Number UP – UPC Code	ID	2/2	X
07	234	Product/Service ID	AN	1/48	X
08	235	Product/Service ID Qualifier IN – Buyer's Item Number MG – Manufacturer's Part Number UP – UPC Code	ID	2/2	X
09	234	Product/Service ID	AN	1/48	X
10	235	Product/Service ID Qualifier IN – Buyer's Item Number MG – Manufacturer's Part Number UP – UPC Code	ID	2/2	X
11	234	Product/Service ID	AN	1/48	X

Product/Item Description - PID

To describe a product or process in coded or free-form format

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	349	Item Description Type	ID	1/1	M
02	750	Product/Process Characteristic Code Not used	ID	2/3	O
03	559	Agency Qualifier Code Not used	ID	2/2	X
04	751	Product Description Code Not used	AN	1/12	X
05	352	Description	AN	1/80	X

Transaction Totals - CTT

To transmit a hash total for a specific element in the transaction set

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	354	Number of Line Items	N0	1/6	M
02	347	Hash Total <i>Sum of the Line Item Quantity Fields</i>	R	1/10	O

Monetary Amount - AMT

To indicate the total monetary amount

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	522	Amount Qualifier Code <i>1 – Line Item Total</i>	ID	1/3	M
02	782	Monetary Amount	R	1/18	M

Transaction Set Trailer - SE

To indicate the end of the transaction set and provide the count of the transmitted segments (including the beginning (ST) and ending (SE) segments)

CONTROL SEGMENT

REF	ELE ID	NAME	TYPE	LENGTH	REQ. DES.
01	96	Number of Included Segments	N0	1/10	M
02	329	Transaction Set Control Number <i>Same as ST02</i>	AN	4/9	M

