SD Billing Document Consolidation and Splitting

Technical Solution Guide

The Smith Consulting Group, Inc.
PO Box 703
Flanders, NJ 07836-0703
973-713-5846
SAPtechsolutions.com

SAP and R/3 are the trademarks or registered trademarks of SAP AG in Germany and in several other countries. Copyright © 2005 The Smith Consulting Group, Inc. All Rights Reserved.
SD Billing Document Consolidation and Splitting

Consolidating or Splitting Billing Documents ......................................................... 3
Creating Billing Documents .................................................................................. 3
Relevant OSS Notes ............................................................................................... 3
Standard Combination Criteria ............................................................................. 4
Data Transfer Routines .......................................................................................... 10
  Forcing a Split ...................................................................................................... 10
  Preventing a Split ............................................................................................... 10
  Standard Billing Document Data Transfer Routine (001) ...................................... 11
Implementing a new Data Transfer Routine .......................................................... 12
  Step 1 Clone the standard routine ..................................................................... 12
  Step 2 Activate the new routine .......................................................................... 13
  Step 3 Assign the new routine in copy control .................................................. 14
Example 1 Prevent an Invoice Split by Ship Condition ........................................... 15
  Business Requirement ....................................................................................... 15
  Solution .............................................................................................................. 15
  Step 1 Functionality Prior to Changes ............................................................... 16
  Step 2 Coding the Data Transfer Routine Change ........................................... 20
  Step 3 Testing the Change .................................................................................. 21
Example 2 Billing Document Split by Plant ............................................................. 23
  Business Requirement ....................................................................................... 23
  Solution .............................................................................................................. 23
  Step 1 Functionality Prior to Changes ............................................................... 24
  Step 2 Coding the Data Transfer Routine Change ........................................... 27
  Step 3 Testing the Change .................................................................................. 28
Example 3 Consolidated Invoicing by Customer .................................................... 31
  Business Requirement ....................................................................................... 31
  Solution .............................................................................................................. 31
  Step 1 Define an Indicator in the Customer Master ............................................ 32
  Step 2 Define the Values for KATR7 ............................................................... 33
  Step 3 Make the KATR7 Field Available to the Data Transfer Routine ............ 34
  Step 4 Coding the Data Transfer Routine Change ........................................... 36
  Step 5 Test1 (Create Separate Billing Documents) .......................................... 37
  Step 6 Test2 (Create a consolidated Billing Document) .................................... 41
Consolidating or Splitting Billing Documents

Most organizations run the billing due list nightly to create billing documents. Quite often there are questions related to how and why certain deliveries or orders combine, or fail to combine, on billing documents. This document will explain how the standard system works and provide examples of how the standard logic can be enhanced.

Creating Billing Documents

Before attempting to alter the processing logic of the billing program, it is wise to understand its basic functionality. Billing documents are creating using function module RV_INVOICE_CREATE. This function module is called from the billing document create transaction (VF01/SAPMV60A) and the billing due list (VF04/SDBILLDL). An internal table is passed to this function that contains one or more source documents for which billing is to occur. These documents are sorted by customer, sales organization and billing type. The result of this sort is several subsets of source documents that are grouped by the sort fields. For each subset, the billing logic attempts to create a billing document. During the creation, the system will populate billing document header and item fields from the source document. R/3 contains configurable routines called Data Transfer Routines that can be developed to alter the way fields are copied from a source document to a destination document (in this case, billing documents). These routines execute during this billing process. The subsequent section ‘Data Transfer Routines’ explains how these routines work in detail. Once the billing fields are populated, the logic compares the fields to the previous record. If the basic fields are equal, the current document will combine with the previous document. If the fields are different, a new billing document will be created. There are several fields in billing documents that will always be different and should not cause a split to occur. The subsequent section ‘Standard Combination Criteria’ explains this logic.

Relevant OSS Notes

The following OSS notes may be useful in understanding this process:

11162 Invoice Split Criteria in Billing Documents
36832 Invoice Split Fields from the Sales Order
308733 Billing Split Due to the Person Number
Standard Combination Criteria

When creating billing documents, the system compares fields from the source documents to determine if splitting should occur. There are fields that must be specifically ignored during this process. For example the document creation time (VBRK-ERZET) will always be different and a split should not occur because of this. To handle this, the main billing program contains a hard coded character string that contains the field names of all fields to ignore during the source document comparison. The following screen shots demonstrate how this internal data string works. We have modified it in the illustration for demonstration purposes only. This should never be done in a real system, since the same result can be obtained using data transfer routines.

In the following example, we have selected two deliveries for the same customer, with different shipping conditions. The fact that the shipping conditions are different will cause a split to occur.
SD Billing Document Consolidation and Splitting

The billing due list has split the deliveries into two billing documents. The Split analysis button can be pressed to see which fields caused the split.
SD Billing Document Consolidation and Splitting

In this example, a split occurs due to differences in three fields. One of these fields is the shipping conditions.
Program SAPMV60A contains a hard coded list of fields that are excluded from consideration in the splitting logic. The following screen displays these fields as they are coded in the TOP include (MV60ATOP). This subset of fields may differ depending on the R/3 release.
To illustrate how the AUSNAHME_TAB string controls splitting, we have added VSBED (Shipping conditions) to the list. Changing this list is not recommended, we have done it here temporarily to demonstrate the functionality of the standard logic.
SD Billing Document Consolidation and Splitting

The same two invoices are processed and the shipping condition is no longer causing a split.
Data Transfer Routines
The correct way to control billing document consolidation and splitting is via Data Transfer Routines. These routines are created using transaction VOFM and assigned in the Copy Control configuration. R/3 contains several standard routines and you can create your own by cloning one of the standard routines. The main purpose of data transfer routines is to populate the fields of the document being created with data from the related preceding document.

Forcing a Split
The billing document header table (VBRK) contains a special field that is used to force a split to occur. The ZUKRI field is a character string that contains concatenated fields from the preceding documents. By adjusting the contents of this string within a data transfer routine, you can force a split to occur.

Preventing a Split
To prevent a split, the fields that cause a split to occur can be modified within a data transfer routine to contain the same value. For example, two deliveries that contain different shipping conditions will split because the shipping conditions are copied to the invoice header (VBRK). If the field is cleared for each invoice, the split will no longer occur.
**Standard Billing Document Data Transfer Routine (001)**

The data transfer routine below is one of the standard R/3 billing document routines. In this logic, the ZUK string is defined and populated with the distribution channel and division from the sales order header table. Additional fields can be added to this string and filled with values from any of the data structures listed in the comments section. The concatenated ZUK string then moved to the ZUKRI field of the billing document header (VBRK).

```
* Data transfer for delivery related billing

* FORM DATEN_KOPIEREN_001

* --> VBAK Order header  KUVEV View Sold-to
* VBAK Order item  KUVEV View Payee
* VBAK Business data order  KUVEV View Bill-to
* LKPF Delivery header  KUVEV View Ship-to
* LIPS Delivery item

FORM DATEN_KOPIEREN_001.

* Header data
  VBRK-xxxxx = ............

* item data
  VBRK-xxxxx = ............

* Additional split criteria
  DATA BEGIN OF ZUK,
    MODUL(3) VALUE 'BD1',
    VTB6 LIKE VBAK-VTB6,
    SPART LIKE VBAK-SPART,
  END OF ZUK;
  ZUK-SPART = VBAK-SPART;
  ZUK-VTB6 = VBAK-VTB6;
  VBRK-ZUKRI = ZUK;
```
Implementing a new Data Transfer Routine

Implementing a new routine requires both development and configuration. The routine is created using transaction VOFM. The routine is then assigned via copy control configuration. The easiest method used to create a new routine is to clone one of the standard routines. The following steps illustrate this procedure.

Step 1  Clone the standard routine

Using transaction VOFM, navigate to the data transfer routines for billing documents. The easiest way to create a new routine is to type the new routine number over one of the existing routines and press enter. The system will create the new routine as a clone of the one that was over typed.
Step 2  **Activate the new routine**

VOFM routines need to be activated before they can be used.
Step 3  Assign the new routine in copy control

Billing data transfer routines are assigned in copy control at the item category level.
Example 1  Prevent an Invoice Split by Ship Condition
The following example demonstrates how to prevent billing document splits for a specific field.

Business Requirement
The billing due list in standard R/3 creates multiple billing documents for deliveries that contain different shipping conditions. The client wants these deliveries to combine into a single billing document.

Solution
To solve this problem, we will create a custom Data Transfer Routine. In this routine, we will clear the shipping conditions field. By clearing the field, it will contain the same value for all deliveries and will no longer cause a billing document split. The side effect of this change is that the billing documents will no longer contain a shipping condition.
Step 1  Functionality Prior to Changes

Below is the custom data transfer routine before making any changes. This routine was cloned from the standard routine 001.

```
* Data transfer for delivery related billing

* FORM DATEN_KOPIEREN_000

* ----> VBAK Order Header KURAV View Sold-to
* VBAK Order item KURAV View Payee
* VBAK Business data order KURAV View Bill-to
* LIPS Delivery Header KURAV View Ship-to
* LIPS Delivery item

FORM daten_kopieren_000 .
* Additional split criteria
DATA: ZUKR OF ZUK .
  mod1(3) VALUE '001',
  VBAK-like LIKE vba - vtaeg ,
  VBAK-spart LIKE vba - sport ,
  END OF ZUK ,
  ZUK - spart = VBAK - spart ,
  ZUK - vtaeg = VBAK - vtaeg ,
  VBAK - zukr = ZUK .
ENDFORM
```
We have identified two deliveries for the same customer, on the same day, with different shipping conditions. The following screens display the functionality of the standard billing due list logic prior to our change.

<table>
<thead>
<tr>
<th>S</th>
<th>Billing SSeq</th>
<th>Billing date</th>
<th>Sold to pl BILL</th>
<th>Dest</th>
<th>Document</th>
<th>DCh</th>
<th>Dev</th>
<th>DocCal Address</th>
<th>Sold to party</th>
<th>Sort term</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>L</td>
<td>05052005</td>
<td>58172 F2</td>
<td>US</td>
<td>60237609</td>
<td>01</td>
<td>01</td>
<td>50542 ABC Company</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>L</td>
<td>05052005</td>
<td>58172 F2</td>
<td>US</td>
<td>60237701</td>
<td>01</td>
<td>01</td>
<td>50542 ABC Company</td>
<td>T</td>
<td></td>
</tr>
</tbody>
</table>
Running the simulation, we have selected the two invoices and executed the split analysis.
The result of the split analysis is a split based on the shipping condition.
**Step 2  Coding the Data Transfer Routine Change**

In the custom data transfer routine, a single line of code is added that clears the shipping conditions.

```plaintext
* Data transfer for delivery related billing

* FORM DATEN_KOPIEREN_080

* --> VKM1 Order Header VKMV View Sold-to
* VKM1 Order item VKMV View Payer
* VKMD Business data order VKREV View Bill-to
* LIPS Delivery Header VKREV View Ship-to

*---------------------------------------------------------------------*

Issue: 881
* Date: 06/30/2002
* Author: Randy Smith
* Desc: Clear VKM1-VSMS to prevent invoice split.

FORM datenkopiieren_080.

* Additional split criteria
DATA: BEGIN OF zuk,
    vtseg VALUE '081',
    vbrk-sport LIKE vbaa-sport,
    vbrk-zukri = zuk.
END OF zuk.

CLEAR vbrk-vsmed.
ENDFORM
```

**Active object generated**
Step 3  Testing the Change

Using the same two deliveries, we execute the billing due list again after changing the routine in simulation mode.
Because there was no split, the invoice detail screen appears with items from each delivery.
Example 2  Billing Document Split by Plant

The following example demonstrates how to force a billing document split based on a specific field.

Business Requirement
The Billing Due List processes multiple deliveries for customers on the same day. If a customer has shipments from multiple plants, they are to appear on separate billing documents.

Solution
To solve this problem, we will create a custom Data Transfer Routine. In this routine, we will add the plant (WERKS) field to the Combination Criteria field (VBRK-ZUKRI) field. This will cause a billing document split by plant.
Step 1  Functionality Prior to Changes

Below is our custom data transfer routine before making any changes. This routine was cloned from the standard routine 001.

```abap
* Data transfer for delivery related billing

FORM DATEN_KOPIEREN_900
* Additional split criteria
DATA: BEGIN OF zuk,
  vtr,eg LIKE ybak-vtr,eg,
  spart LIKE ybak-spart,
  END OF zuk.
zuk-spart = ybak-spart.
zuk-vtr,eg = ybak-vtr,eg.
vbrk-zuk1 = zuk.

ENDFORM
```
We have identified two deliveries for the same customer, on the same day, with different plants. The following screens display the functionality of the standard billing due list logic prior to our change.
Because there was no split, the invoice detail screen appears with items from each delivery.
Step 2  Coding the Data Transfer Routine Change

In the custom data transfer routine, the plant field (WERKS) is added to the combination criteria field definition (VBRK-ZUKRI). In addition, logic is added to populate the field with the plant contained in the delivery item (LIPS-WERKS). This will cause the VBRK-ZUKRI field to differ when multiple plants are processed forcing the split to occur.
Step 3  Testing the Change

Using the same two deliveries, we execute the billing due list again after changing the routine in simulation mode.
Running the simulation, we have selected the two invoices and executed the split analysis.
The result of the split analysis is a split based on the combination criteria field (ZUKRI). The field contains a string that is the concatenation of the value ‘001’, distribution channel, division and plant.
Example 3   Consolidated Invoicing by Customer

The following example demonstrates how to consolidate/split billing documents using a custom indicator on the Customer Master.

**Business Requirement**

Many customers place multiple sales orders per day. This results in multiple goods issues and billing documents per day also. Some customers want all shipments that occur on the same day, from the same plant to appear on a single invoice. Other customers want a separate invoice for each shipment.

**Solution**

To solve this problem, we will create a custom Data Transfer Routine. This routine will determine if deliveries should be combined into a single billing document or split based on a custom indicator added to the Customer Master. To accomplish this, the order number will be added to the Combination Criteria field (VBRK-ZUKRI). The order number will be moved into this field only if splitting is required. If billing consolidation is required, the order number will be null causing the consolidation to occur.
Step 1  **Define an Indicator in the Customer Master**

An indicator in the Customer Master is needed to drive the consolidation logic. Standard R/3 contains ten additional attributes on KNA1 that can be used for any purpose. For this project, we will use KATR7.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>KATR8</td>
<td>Consolidated invoice</td>
</tr>
<tr>
<td>KATR9</td>
<td>National/Regional acct</td>
</tr>
<tr>
<td>KATR10</td>
<td>Bonus pay period</td>
</tr>
<tr>
<td>KATR11</td>
<td>Salesman type</td>
</tr>
<tr>
<td>TKZM</td>
<td>Indicator is business partner</td>
</tr>
<tr>
<td>UMCA</td>
<td>Annual sales</td>
</tr>
<tr>
<td>TXCD</td>
<td>Jurisdiction for tax calc</td>
</tr>
<tr>
<td>FERIV</td>
<td>Fiscal year variant</td>
</tr>
<tr>
<td>HKMV</td>
<td>Usage indicator</td>
</tr>
</tbody>
</table>

It is a good practice to change the data element description to an appropriate description. For KATR7, we have changed the description to ‘Consolidated invoice’.
Step 2  Define the Values for KATR7

Using SM30, we have defined the following two values for the new field.
Step 3  

Make the KATR7 Field Available to the Data Transfer Routine.

The Data Transfer Routine will interrogate the KATR7 field to determine whether or not to consolidate documents. Structure KUAGV contains the Sold-to customer master data and this structure is passed to the routine. The structure contains include KUAGVZ which can be used to specify customer specific fields. The functions that read the customer master tables and populate the structures use MOVE-CORRESPONDING statements. Therefore, simply inserting KATR7 into the user include will cause the field to be read and populated. There is no need to specifically select the field from the table.
Field KATR7 is added to the structure.
Step 4  Coding the Data Transfer Routine Change

In the custom data transfer routine, the order number field (VBELN) is added to the combination criteria field definition (VBRK-ZUKRI). In addition, logic is added to populate the field with the sales order number based on the new indicator added to the customer master. If the indicator is set (denoting that consolidation should occur), the order number field will be empty. If the indicator is not set (denoting that splitting should occur), the field will be filled. This will cause the VBRK-ZUKRI field to differ when multiple orders are processed forcing the split to occur.

```
\* Coding the data transfer routine change
\*-------------------------------------------------------------
\* FORM DATEN_KOPIEREN_990
\*-------------------------------------------------------------
\* \* Data transfer for delivery related billing
\* \*-------------------------------------------------------------
\* \* Author: Randy Smith
\* \* Desc: Split the billing document by sales order number based
\* \* on a flag added to the customer master
\* \*-------------------------------------------------------------
\* DATA: BEGIN OF zuk,
\* model(3) VALUE '991',
\* vteg LIKE vbaa-vteg,
\* sport LIKE vbaa-sport,
\* wers LIKE tips-wers,
\* vbeln LIKE vbaa-vbeln,
\* END OF zuk.
\* zuk-spart = vbaa-spart.
\* zuk-vteag = vbaa-vteag.
\* zuk-wers = tips-wers.
\* IF kuuvg-katr7 IS INITIAL.
\*  zuk-vbeln = vbaa-vbeln.
\* ENDIF
\* vbrk-zukri = zuk.
\* ENDFORM
```
Step 5  Test1 (Create Separate Billing Documents)

The indicator on the customer master is set so that separate billing documents are created.
Execute the billing due list using two deliveries for the same customer on the same day. These deliveries are related to different sales orders.
Running the simulation, we have selected the two invoices and executed the split analysis.
The result of the split analysis is a split based on the combination criteria field (ZUKRI). The field contains a string that is the concatenation of the value ‘001’, distribution channel, division, plant and sales order number. In this example, the sales order numbers are different.
Step 6  Test2 (Create a consolidated Billing Document)
The indicator on the customer master is set so that billing document consolidation occurs.
Using the same two deliveries, we execute the billing due list again.
Because there was no split, the invoice detail screen appears with items from each delivery.