

## Integrated Analytics of SAP CRM Sales and ERP-SD

Ru Ma<sup>1, a+</sup> and Ronghui Zhou<sup>1, b</sup>

<sup>1</sup> College of Information Science and Technolog, Southwest Jiaotong University  
Chengdu, China

**Abstract.** SAP CRM Sales application supports Lead and Opportunity (LO) management, whereas, LO management tracks the processing and the status of business LO in the presales phase. SAP ERP Sales and Distribution (SD) module provides the functionalities of Quotation and Sales Order (QSO) management in the sales phase, which fulfills the business process followed by CRM LO management. In the recent SAP CRM7.0 release, the integration of ERP QSO is available and can be created through CRM User Interface (UI) but the analytics of CRM LO is still separated from that of the ERP QSO. This study provides the solution of integrating CRM Analytics of LO with the ERP Analytics of QSO. Being a decision-maker, one wants to have a clear insight into sales cycle in a single integrated scenario rather than in two separate scenarios. Integrating CRM Sales InfoProviders (InfoP) and ERP SD InfoP in Business Warehouse (BW) is a lean solution, which makes CRM Sales to get queries directly from the seamless integrated InfoP with Infoobjects from both CRM and ERP BW application areas. To overcome this problem, a set of dashboards have been created with the merged data from both CRM and ERP to show opportunity, quotations and orders in the same chart.

**Keywords:** CRM, BW, ERP-SD, Integration, Data Flow, Transformation

### 1. Introduction

SAP CRM Sales opportunity tool manages sales projects from the beginning and tracks their progress to the end. ERP QSO management creates quotes for customers as well as creates sales orders [1].

In sales cycle, the sales representative discovers opportunity through marketing campaign or other kind of activity to make the opportunity qualified and creates ERP quotation for the customer. If customer accepts the quotation and creates customer order then the sales representative will close the opportunity and creates ERP sales order [2]. This activity can be referred as a successful conversion of quotation into sales order. ERP QSO can be created through CRM WebClient UI. ERP supplies data to data warehousing of CRM, CRM feeds back the information of sales analysis and forecasting to ERP [3][4]. However, the constraint is that the decision-makers needs to use CRM and ERP reports together to get the whole picture of the sales cycle because of analysis layer, the CRM opportunity and ERP QSO are separately stored in different InfoP in BW. These data have different data flows and having inconsistence data structures in BW.

It is a challenging work to combine analytics of CRM Sales opportunity and ERP QSOs together. Integrating ERP QSO to CRM Sales opportunity in BW is the main theme of our paper. In order to objectively quantify the success of the proposed data load option, we propose a new metric, i.e. Conversion Ratio ( $R_c$ ). The  $R_c$  is defined as the ratio of conversion quotation to sales order. The range of value for  $R_c$  is between 0 and 1, which be seen from SAP CRM sales opportunity report.

$$R_c = Q_{ord} / Q_{quo} \quad (1)$$

where;  $Q_{quo}$ : the total number of quotations that created in ERP SD,

---

<sup>+</sup> Corresponding author  
E-mail address: <sup>a</sup>grainrain2005@163.com, <sup>b</sup>rhzhou@home.swjtu.edu.cn

$Q_{ord}$ : the total number of ERP sales orders that converted from ERP quotations.

As a solution, following are the two options presented below to implement the BW integration of the CRM and SD content to get all the dashboards working.

**Option 1.** In the query layer, we can create a multi-provider with the CRM and SD InfoP [5]. Followed by creating a new query with all the necessary fields and form a new dashboard component linked with all the new queries.

**Option 2.** In the data load, we mapped the SD data directly into the CRM InfoP as part of the data load process.

In comparison, a set of dashboards have been created and we don't need to create a new query and a new dashboard component in BW. Here, we choose option 2 and by using the existing queries and dashboards components, the reports in CRM Sales scenario will show quotations and orders related information to the decision-makers.

### 1.1. Possible Solutions to Data Load Process

There are three different options of loading data in SAP BW. The data sources delivered as part of Business Content which is based on the old data flow technology (7.0 Datasource). To allow for an easy migration path, SAP has provided a technique to use the 3.x Datasource at the start of a new extraction, transfer and load process. The purpose for this is to design and build a new data flow, without migrating to 3.x Datasource immediately. The recommendation (if possible) is to avoid using this technique (3.x Datasource emulation) in productive mode as it meant as design time feature allowing for easy migration of data flows to the new technology [6][7].

### 1.2. Option 1 - New Data Flow (from SD Datasource (DS) to CRM content)

The best solution is to create new transformations from the DS to the CRM InfoCubes (InfoC), here we don't need to load data to SD InfoC, but we need the DSs which are delivered as a part of Business Content based on the new data flow technology. Option 1 is shown in Fig. 1.

### 1.3. Option 2 - Old Data Flow

Another solution is to create the data flow based on the old technology (transfer rules, infosources and update rules), but this data flow will only be valid till the DS migration. Option 2 is shown in Fig. 2.

### 1.4. Option 3 - New Data Flow (from SD InfoP to CRM content)

This solution is to load the data from the SD InfoP to the CRM InfoP. Using this data flow we can use a standard transformation and it will be independent of the DS migration. Option 3 is shown in Fig. 3.

The use of transformations simplifies the maintenance of rules for cleaning and consolidating data. Instead of two rules (transfer rules and update rules), as in the past, only the transformation rules are still in need. The transformation rule can be edited on an interactive GUI. Transformations also provide additional functionalities such as quantity conversion and the option to create an end-routine or expert-routine. As a comparison, the option 3 is selected as a solution to integrate CRM sales opportunity and ERP QSO.

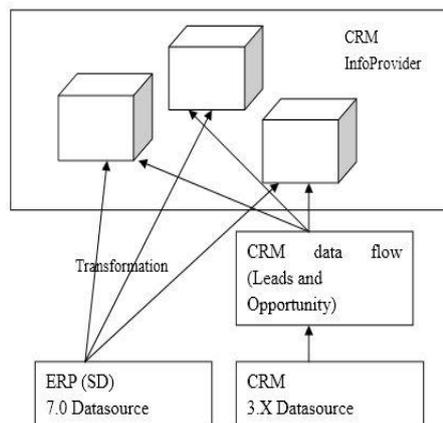


Fig.1 Option 1

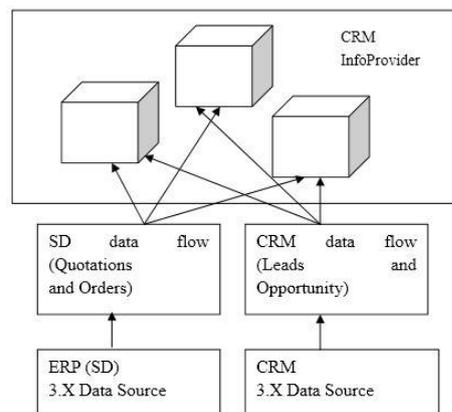


Fig. 2 Option 2

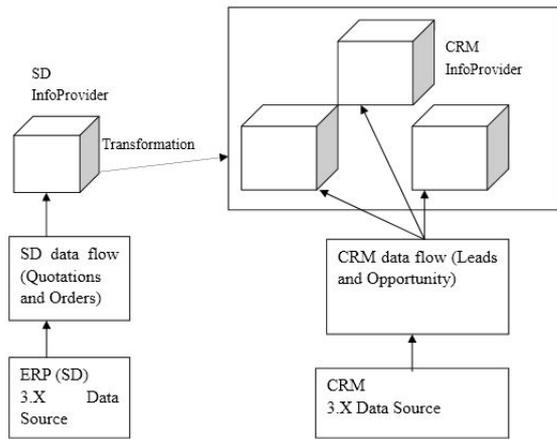


Fig. 3 Option 3

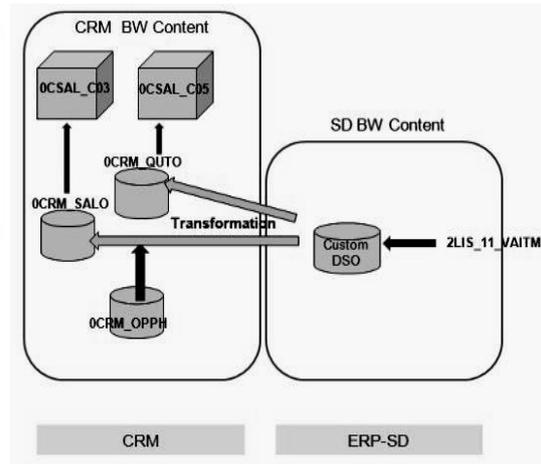


Fig. 4 Data flow from ERP SD to CRM Content

## 2. New Data Flow from ERP SD to CRM Content

The Fig.4 displays the data flow from SD used in order to populate the CRM cubes for SO (0CSAL\_C03) and Quotations from SO (0CSAL\_C05). 0CSAL\_C03 is an InfoC, which delivers information related to SO. It provides data on the quantities and values of SO in total as well as individual items. It enables decision-makers to see status details, such as, open, delivered, billed, or delayed, and thus provides information for pipeline figures as well as incoming and open orders. 0CSAL\_C05 InfoC delivers data related to [quotations](#). Decision-makers can use this data for analyzing what happens to quotations in the sales organization or for certain customers. As well as providing general data, such as quotation validity periods, quantity and value of quotation items, it also enables decision-makers to monitor the progress of quotations by delivering data on quotation statuses.

SD InfoSource (InfoS) 2LIS\_11\_VAITEM needs to be activated in SAP BW. In SAP BW data flow, a custom Data Store Object (DSO) is created. DSO is another primary physical database storage object besides InfoC. DSO is designed to store every detailed (transaction level) records. Most of the time, summarized and aggregated data provided by DSO are needed, while InfoC are the primary objects used to support BW queries for long periods. In Table 1, fields of the custom DSO are listed.

Table 1. Files of Customer DSO

	Description	Info objects
Key Fields	Sales document	0DOC_NUMBER
	Sales document item	0S_ORD_ITEM
	Description	Info objects
Data fields		
	Bill-to party	0BILLTOPRTY
	Billing block in SD document	0BILL_BLOCK
	Company code	0COMP_CODE

By using updated rules, the custom DSO is mapped to InfoS 2LIS\_11\_VAITEM. The key step of integrating ERP SD QSO to CRM sales is the mapping of custom DSO to DSO 0CRM\_SALO and 0CRM\_QUTO through transformations, Table 2 & 3 [8]. In BW, these two DSOs through data transfer process, the integrated data are stored at CRM InfoC 0CSAL\_C03 and 0CSAL\_C05. A set of pre-defined dashboards will show sales cycle with ERP QSO based on two InfoC.

Table 2. Mapping table for transformation between custom DSO to 0CRM\_QUTO

Target fields	Description	Rules Type	Source Fields	Comments
0BP_CONTPER	Contact Persons	Routine	0REFER_DOC	Rule 1

OBP_EMPLO	Responsible Employee	Routine	0SALESEMPLOY	Rule 2
...	...	...	...	...

Table 3. Mapping table for transformation between custom DSO to 0CRM\_SALO

Target fields	Description	Rules Type	Source Fields	Comments
0CRM_SOLDTO	Sold-To Party	Routine	0SOLD_TO	Rule 1
0CRM_SHIPTO	Goods Recipient	Routine	0SHIP_TO	Rule 2
...	...	...	...	...

Below we lists some segments of a transformation which contains three parts: data declaration, select statement and rules.

Data declaration	Select statement
<pre>TYPES: BEGIN OF ty_organit, organit TYPE /bi0/oiorganit, crmsalorgx TYPE /bi0/oicrmsalorgx, crmsalgrp TYPE /bi0/oicrmsalgrp, crmsaloffx TYPE /bi0/oicrmsaloffx, crm_salorg TYPE /bi0/oicrm_salorg, crm_salgrp TYPE /bi0/oicrm_salgrp, crm_saloff TYPE /bi0/oicrm_saloff, salesorg TYPE /bi0/oisalesorg, END OF ty_organit.</pre>	<pre>SELECT organit crmsalorgx salorg salesorg FROM /bi0/qorganit INTO CORRESPONDING FIELDS OF TABLE gt_organit FOR ALL ENTRIES IN SOURCE_PACKAGE WHERE salesorg = SOURCE_PACKAGE-salesorg AND objvers = 'A' AND dateto &gt;= SOURCE_PACKAGE-createdon AND datefrom &lt;= SOURCE_PACKAGE-createdo</pre>
<pre>Rule 1 READ TABLE gt_crm_opp INTO gs_crm_opp WITH KEY crm_obj_id = SOURCE_FIELDS- REFER_DOC BINARY SEARCH. IF sy-subrc = 0. RESULT = gs_crm_opp- bp_contper. ENDIF.</pre>	<pre>Rule 2 READ TABLE gt_employee INTO gs_employee WITH KEY person = SOURCE_FIELDS-salesemply. IF sy-subrc = 0. wa_person = gs_employee-employee. SELECT SINGLE bpartner FROM /bi0/p bpartner INTO wa_bpartner WHERE customer = wa_person AND objvers = 'A'. ENDIF.</pre>

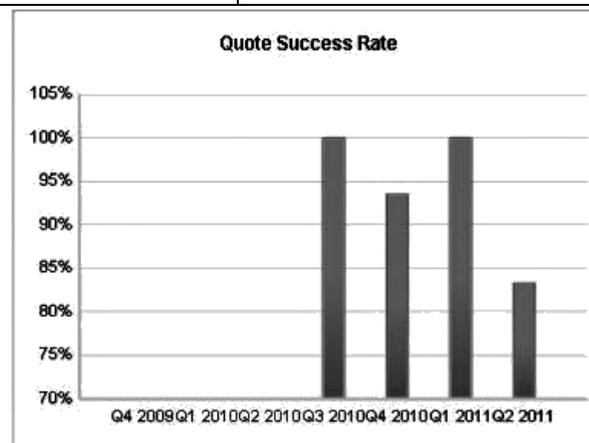


Fig. 5 The sales cycle report with quotation rate

### 3. Summary

To test our proposed solutions in SAP CRM WebClient UI, we have created numbers of opportunities with business partner and estimated closing dates for the sales cycle. After an opportunity is created, we need to maintain the opportunity with data collected during identify an opportunity. Then we create numbers of ERP quotations, in which, some of the ERP quotations are transferred into ERP SO. We can view the CRM opportunity report from CRM WebClient UI and ERP QSOs report from ERP WebClient UI. The following action can test whether our solution has taken effect or not. In BW, we first activate the DS 2LIS\_11\_VAITM, and then load the created data from ERP into BW according to the proposed solution mapping to ERP SD module data to CRM sales application data. Later, the related queries and dashboards in SAP BW are activated. Then from CRM WebClient UI we can view the R<sub>c</sub> of ERP quotations from sales orders, shown in Fig.5. The newly created InfoP with transformation realizes proper integration of ERP SD transaction data (SO) with CRM sales application data (opportunity) in BW.

### 4. References

- [1] G.C. Williams: *Implementing SAP ERP Sales & Distribution* (McGraw-Hill Osborne Media, Vol. 1 March 21, 2008).
- [2] K. Sharma, A. Mutsaddi, in: *Configure SAP ERP Sales and Distribution* (Wiley Publishing Inc. Apr 12, 2010).
- [3] A. Macdonald, D. Beavis, in: *Seize the Moment [Supply Chain Integration]*, Journal of Manufacturing Engineer Vol. 80 (2002), pp.175-178
- [4] Y. Shanlin, L. Hongyan, in: *On the Integration of ERP and CRM Based on Collaborative E-business*, Journal of Hefei University of Technology Vol. 27 e/d I (2004) pp. 1-4
- [5] G. Oberniedermaier, T. Sell-Jander: *Sales and Distribution with SAP: Making SAP SD Work for Your Business* (GWV-Vieweg, e/d 1, December 2, 2003).
- [6] T. Zurek, in: *SAP Business Information Warehouse-from data warehousing to an e-business platform*, Proceedings of 17<sup>th</sup> International Conference on Data Engineering, (2001) pp. 1-3
- [7] Information on <http://help.sap.com>
- [8] Mutsaddi, Ashutosh: *Configuring SAP ERP Sales and Distribution* (SYBEX INC, 2010).