



SAP C4C Introduction and Data Workbench– Part 2

Deepak Kumar

Wilmington, USA
Deepak3830@gmail.com

ABSTRACT

SAP C4C, also known as SAP Cloud for Customer, is essentially a cloud-based suite of customer relationship management (CRM) software provided by SAP. It is designed to help businesses manage their customer-related activities more efficiently across various touchpoints, including sales, marketing, service, and commerce. SAP C4C provides a unified platform for organizations to interact with their customers, analyze customer data, and drive engagement throughout the customer lifecycle. It offers features such as lead and opportunity management, marketing campaign automation, customer service ticketing, e-commerce capabilities, and analytics for better insights into customer behavior. SAP C4C is known for its scalability, flexibility, and integration capabilities with other SAP solutions and third-party applications. SAP C4C encompasses various modules and features to streamline customer relationship management processes: Sales, Marketing, Service, Commerce, and Analytics. SAP C4C is designed to integrate seamlessly with other SAP solutions such as SAP ERP, SAP S/4HANA, and SAP CRM, as well as with third-party applications. Integration enables a unified view of customer data across the organization and ensures data consistency and accuracy. SAP C4C is available as a cloud-based solution, offering benefits such as scalability, flexibility, and reduced infrastructure costs. It can be accessed via web browsers or mobile devices, allowing users to work from anywhere with an internet connection. SAP C4C focuses on improving the overall customer experience by providing tools for personalized engagement, omnichannel communication, and customer journey orchestration. It helps organizations build stronger relationships with their customers and drive customer loyalty and advocacy.

Key words: SAP, SAP C4C, SAP CRM, SAP S/4HANA, SAP Sales/Service Cloud

INTRODUCTION

Data Migration Workbench – The SAP C4C Data Migration Workbench is a powerful tool designed to simplify and streamline the process of migrating data into the SAP Cloud for Customer (C4C) system.

ETL – The ETL process, which stands for Extract, Transform, Load, is a crucial step in data warehousing, migration, and analytics. It plays a key role in integrating, consolidating, and analyzing data, allowing organizations to gain insights, make informed decisions, and drive business outcomes based on their data assets. ETL tools and platforms automate and streamline data extraction, transformation, loading, scheduling, monitoring, and error-handling processes.

Webservice Monitor – The C4C Web Service Monitor in SAP Cloud for Customer (C4C) enables users to monitor and manage web service communication between SAP C4C and external systems. It provides real-time monitoring of web service calls to and from SAP C4C, allowing users to track the status of these calls for successful completion.

Code List Mapping – Code list mapping in SAP Cloud for Customer (C4C) is a feature that enables the mapping of code values between SAP C4C and external systems to ensure data consistency during integration.

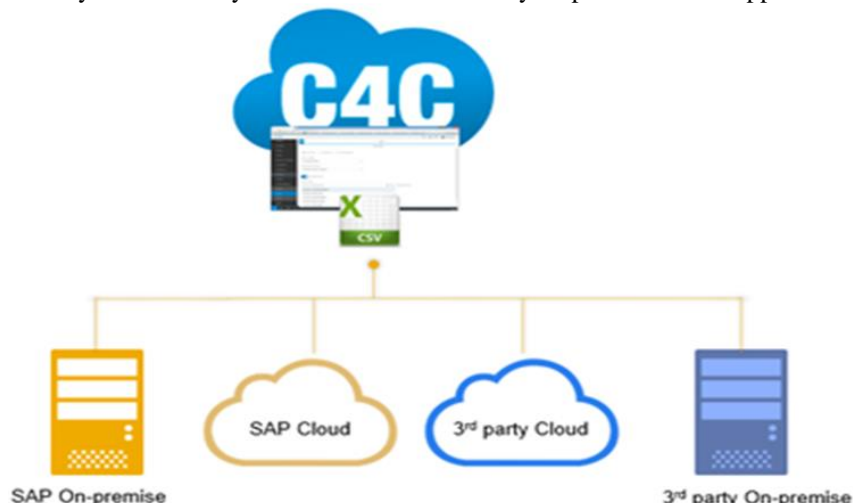
Pre-requisite: To understand this paper thoroughly prerequisite is SAP Cloud Integration – SAP C4C Introduction and Data Workbench– PART 1

DATA WORKBENCH OVERVIEW

Data migration is a key activity when adopting cloud software. We recognize that there can be multiple sources where the data resides, but ultimately, regardless of the source, the data migration tool within the application

needs to be easy to use, intuitive, and high performing. This is why we re-designed the entire data migration experience and introduced Data Workbench. Built from the ground up, Data Workbench is a highly scalable and efficient data migration tool purpose-built for SAP Hybris Cloud for customers.

Use-Cases – Data Workbench can be utilized for any data import activity from SAP on-premises/Cloud or third-party on-premises/Cloud applications. Data can be imported using a CSV format. To make the process easier for users, Data Workbench offers pre-defined templates to eliminate the need for mapping efforts. Alternatively, users have the flexibility to choose any CSV format and manually map it to the C4C application fields.



KEY CAPABILITIES

Simple and Secure: Data Workbench offers a straightforward user interface for business administrators to securely connect to the application for data migration. It provides access to the full range of CRUD (create, read, update, delete) operations, organized around Import, Export, and Monitor functionalities on the user interface. The tool is also available in the latest responsive user interface technology of Cloud for Customer, ensuring ease of use and accessibility.

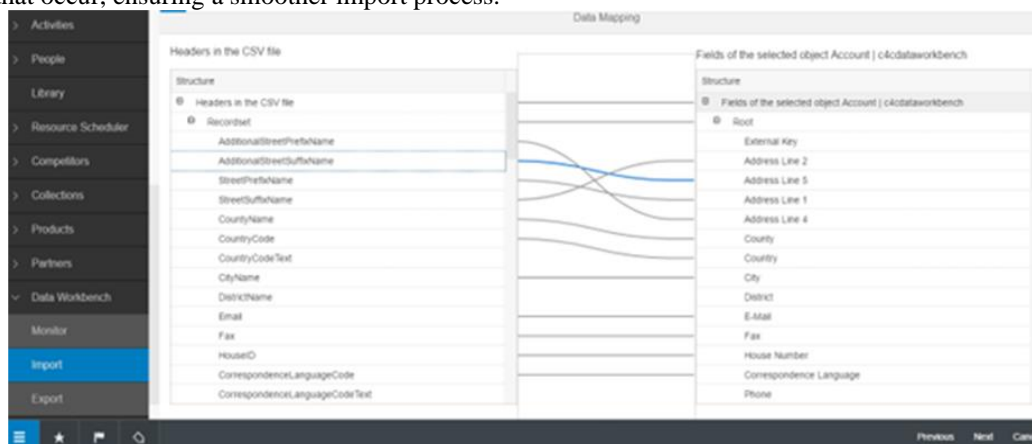
Comprehensive Coverage: The Data Workbench facilitates data migration for a broad range of standard business objects, encompassing everything from core master data to transactional data within the SAP Hybris Cloud for Customer platform. Beyond standard business objects, the tool supports the migration of attachments and custom business objects created using the Key User Tool (KUT) or platform development infrastructure (PDI), as well as extension fields created with KUT.

Intuitive and Intelligent Mapping: Data Workbench leverages the advanced data mapper capabilities of the SAP HANA Cloud Platform to facilitate the mapping and execution of data transformations from CSV sources to the Cloud for Customer application destinations. The data mapper is designed to be intelligent and visual, offering auto-suggestions for fields with matching semantics and syntax, thereby streamlining the mapping process.

Efficient and Flexible: Templates are provided to enhance efficiency in repetitive data loading activities. For instance, if data records are refreshed monthly, you can save your mapping work as a template for future use, eliminating the need to start from scratch each time. Templates also standardize the fields imported across your organization, ensuring data consistency across regions.

Task Name	Type	Object	File Name	Created	Created By	Size	Success	Error	Settings	Di
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee Organizational Unit Assignment	Employee_Organizational_Unit_Assignment...	095...		21,817	21,817	0	0	Fv
Employee_Organizational_Unit_Assignment...	Update Indiv.	Employee Organizational Unit Assignment	LoadTemplateDelete.csv	095...		261	261	0	26	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee Organizational Unit Assignment	Employee_Organizational_Unit_Assignment...	095...		22,078	22,078	0	0	Fv
Employee_Organizational_Unit_Assignment...	Update Indiv.	Employee Organizational Unit Assignment	LoadTemplateDelete.csv	095...		261	261	0	0	Fv
Employee_Organizational_Unit_Assignment...	Update Indiv.	Employee Organizational Unit Assignment	LoadTemplate.csv	095...		261	0	261	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee Organizational Unit Assignment	Employee_Organizational_Unit_Assignment...	095...		21,822	21,822	0	0	Fv
Employee_Organizational_Unit_Assignment...	Update Indiv.	Employee Organizational Unit Assignment	LoadTemplate.csv	095...		422	261	261	225	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee		095...		12,295	12,295	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee		095...		12,135	12,135	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Employee Organizational Unit Assignment	Employee_Organizational_Unit_Assignment...	095...		20,351	20,351	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Organizational Unit Name and Address	Organizational_Unit_Name_and_Address_2...	095...		7,057	7,057	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Product		041...		804,254	804,254	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	ZSPV_SF_CRM(DigitalChannelCollection)		041...		1,698	1,698	0	0	Fv
Employee_Organizational_Unit_Assignment...	Export Indiv.	Contract	Contract_202401131022.csv	041...		42,495	42,495	0	0	Fv

Data Workbench offers flexibility by allowing users to define their own templates and code list mappings, further tailoring the tool to meet specific organizational needs. High Performance, Scalable, and Simulation-Driven Architecture: For optimal performance throughput, it is recommended to import a maximum of 50,000 records per run. This limit helps to manage validation issues that may arise during the import process. The simulation capability is a valuable feature that allows administrators to preview records before they are physically imported into the SAP HANA database. During simulation mode, users can manually adjust any errors that occur, ensuring a smoother import process.

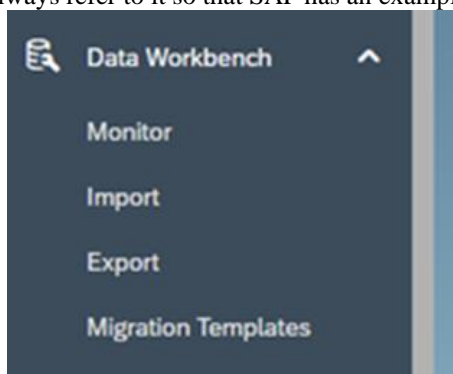


DATA WORKBENCH BASICS

The Data Workbench provides three primary functions to streamline data migration: Monitor, Import, and Export.

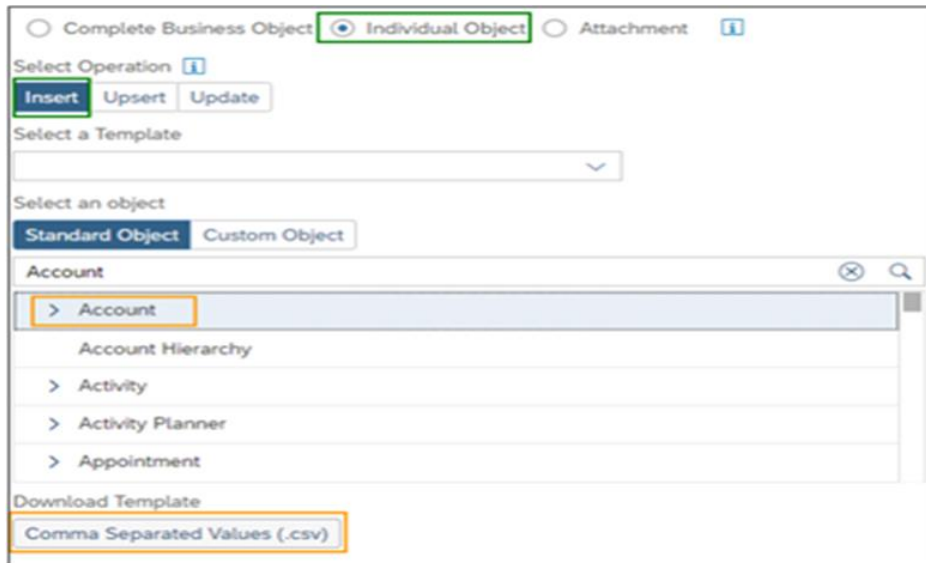
Monitor: The Monitor function provides an overview table of all Imports and Exports made. It contains information such as the type, object, created-on date, number of errors, status, and more. There are two statuses you'll find in the Monitor: finished and interrupted. Note that finished does not mean finished without errors. Interrupted means that the import/export did not work at all. If errors occur, they can be downloaded as an Excel export by clicking on the number under "Errors."

In addition to errors, the Monitor also displays warnings. Warnings can be downloaded the same way as errors by clicking on the number under "Warnings." Warnings indicate issues to look at but do not prevent the import from going through. All imported and exported files can be downloaded by clicking on the file name, which contains a hyperlink for downloading a CSV file. The Task Name is useful when reporting a problem with the Data Workbench in an incident. Always refer to it so that SAP has an example to work with.

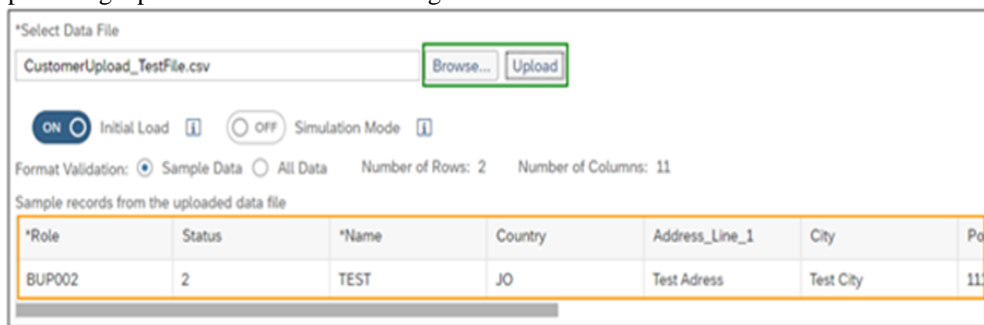


Import: The import function primarily serves to create new objects or update existing ones within the Data Workbench. While there are additional capabilities like uploading attachments, I'll focus on the main functions here. Other scenarios will be covered separately.

Here are some important points to note: all Excel files intended for import must be saved as CSV files and encoded in UTF-8 format. After saving the Excel file, open it in a text editor to verify and convert it to UTF-8 if necessary. To create new objects, navigate to the Import section, select "Individual Object," and then "Insert." Choose the specific object you wish to upload, for instance, Accounts. Once selected, templates will be available for download, including Excel sheets with all fields of the object and another sheet detailing field definitions.

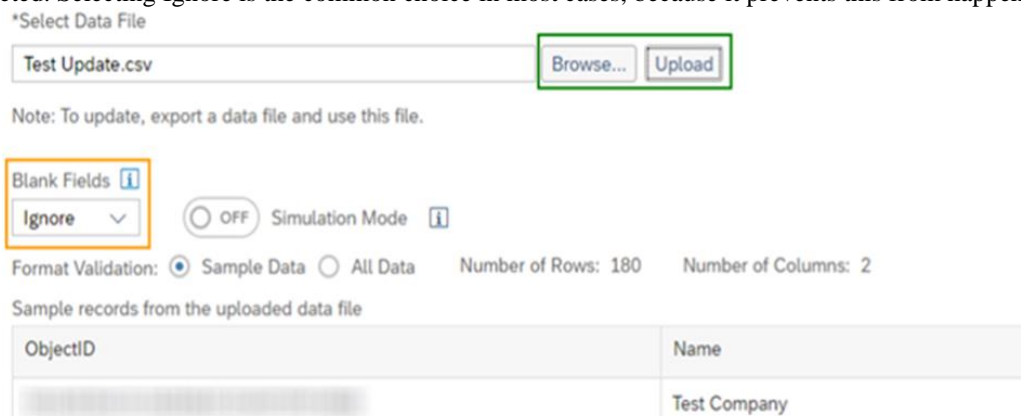


In the subsequent screen, you'll need to upload the CSV file you intend to use by clicking the Browse button. Remember, the file must be in CSV format encoded in UTF-8 to avoid errors during upload. After selecting the file, click Upload, and a small overview table will appear. This table displays a sample of the data from your CSV file, providing a preview rather than showing all data at once.



We continue by clicking Next in the bottom right of the screen. On the next page, the mapping from the fields in the CSV file to the fields in CRM has to be checked and confirmed by again selecting Next, the following screen can be skipped. At last click Import on the bottom right of the last screen, switch to the Monitor, and wait for your upload to finish.

Updating objects works very similarly to creating new ones. First, select Update under Select Operation as shown above, then again select the object. From there on it's pretty much the same as uploading objects, but with fewer steps. Upload your CSV file, check the overview table, click on next and in the following screen the Import can already be started. Regarding Blank fields, there are the options are Ignore and Update. If Update is selected, blank fields from the CSV are translated to CRM, so in case there was any information in the CRM it gets deleted. Selecting Ignore is the common choice in most cases, because it prevents this from happening.



Here can also be specified which fields shall be downloaded, so if e.g. only the ObjectID is required only put the checkmark behind ObjectID. Once the export has been started, once again head over to the monitor and wait for the export to finish. Then download your Excel file as described above.

NOTATION OF DATA TYPES VIA THE DATA WORKBENCH

When using the Data Workbench, it is important to understand how the syntax of each data type is structured. In this chapter, the individual data types and their properties are explained.

Amount: An amount always consists of three components in the Data Workbench. The amount itself, the currency as code, and the currency as text. To import amount data types, the amount and the currency as code are sufficient. In ISO 4217 you will find all currency codes.

Date/Time: The Date data type consists of the year (Y), month(M), and day(D) without the time. The Date data type consists of the year, month, day, and time. The time consists of Hours (H), minutes (M), and seconds (S). The Date and the Time are separated by a capitalized T. The long-time T format specifier. It simply separates the Date and with Time. Z stands for Zero Hour Offset (00:00) – also known as Zulu Time. The time zone for a specific Business Object is noted in a separate data field. **Decimal Number:** Is a number without a unit, which can be used with or without decimal digits.

Email: Every email address consists of three components: the local part, the @ symbol, and the domain name. Since special characters can occur in an email address, always use quotation marks at the beginning and end of the email address for secure upload with Data Workbench.

ID: An ID always includes a unique object number from the SAP Sales Cloud. This object number may be an employee, a contact person, a customer, etc.

Indicator: An indicator is a Boolean that has only two states: True or False. Write these values either completely in upper case (TRUE/FALSE) or completely in lower case (true/false).

List: A list consists of several entries, and the Business User can only select one entry in the system. Each entry in turn consists of a code and a description. In the Data Workbench, you will therefore always find these two entries for this data type. Here, too, it is always recommended to work with the code, since this can be interpreted unambiguously by the system. In the figure below you can find a data field of type List. In the left column you can find the Code and in the right column the Description. Below you will find the appropriate translation per custom system language.

Multivalued List: A Multivalued List is basically like a list. The difference here is that the Business User can select multiple entries. Consequently, you will also find several comma-separated entries in the data column in the Data Workbench. In the syntax of a CSV file, you must mark these entries with apostrophes so that they count as a single entry.

Code	Description	Deactivated	Action
101	Price	<input type="checkbox"/>	Deactivate
111	Delivery Time	<input type="checkbox"/>	
121	Relation	<input type="checkbox"/>	
131	Standard Vendor	<input type="checkbox"/>	

Language	Description	Action
English	Relation	
German	Beziehung	

Quantity: A quantity always consists of three components in the Data Workbench. A decimal number, a unit as code, and the unit as a text. To import quantity data types, the decimal number and the unit as code are sufficient. The Unit could be length, weight, etc.

Unit Code	Unit Text	Unit Code	Unit Text	Unit Code	Unit Text	Unit Code	Unit Text
5B	Batch	GLL	Gallon (US)	MMK	Square millimeter	TNE	Ton (metric ton)
ACT	Activity	GRM	Gram	MMT	Millimeter	WEE	Week
ANN	Year	HUR	Hour(s)	MON	Month	XBG	Bag
CMK	Square centimeter	INH	Inch	MTK	Square meter	XBO	Bottle, non-protected, cylindrical
CMT	Centimeter	KGM	Kilogram	MTQ	Cubic meter	XBX	Box
DAY	Day(s)	KMT	Kilometer	MTR	Meter	XCI	Canister
DZN	Dozen	KT	Kit	ONZ	Ounce	XCR	Crate
E49	Working day(s)	LBR	Pound	P1	Percent	XCS	Case
EA	Each	LTN	Tonne (UK) or long ton (US)	PR	Pair	XCT	Carton
FOT	Foot	LTR	Liter	SEC	Second [unit of time]	XPX	Package
FTQ	Cubic	MIN	Minute [unit of time]	SMI	Mile (statute mile)	XPX	Pallet
GLI	Gallon (UK)	MLT	Milliliter	STN	Ton (US) or short ton (UK/US)	XSX	Set

Web Address: Every web address consists of at least two components: the scheme (e.g. https, http, etc.) and the domain name. Since special characters can occur in a web address, always use quotation marks at the beginning and end of the web address for secure upload with Data Workbench.

CONCLUSION

In this white paper on SAP Cloud for Customer (C4C), we have explored the Data Workbench in detail, covering its overview, key capabilities, and fundamental operations. The Data Workbench is an essential tool in C4C that facilitates the efficient import, export, and update of large volumes of data. Key capabilities of the Data Workbench include its user-friendly interface, support for multiple data formats, and robust error-handling mechanisms. These features ensure that data migration and management tasks are streamlined and accurate, reducing the risk of errors and enhancing data integrity. We also delved into the basics of using the Data Workbench, including the step-by-step processes for data import and export. This foundational knowledge is crucial for users to effectively leverage the tool and optimize their data management practices. Lastly, we discussed the notation of data types within the Data Workbench, highlighting the importance of understanding how different data types are represented and processed. This knowledge is vital for ensuring that data is correctly interpreted and manipulated within the system.

Overall, the Data Workbench in SAP C4C is a powerful and versatile tool that significantly enhances the efficiency and reliability of data management processes. By understanding its capabilities and functionalities, organizations can better manage their customer-related data and drive more effective business operations.

Declarations

Ethics approval and consent to participate: Not Applicable

Consent for publication: All authors have consent to submit this paper to the Journal of Cloud Computing. Also, we confirm that this paper or any part of this paper was not submitted anywhere.

Availability of data and materials: Not Applicable

Competing interests: Not Applicable

Funding: Not Applicable

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