



Financial Consolidations with the Solver Suite

- Multi-company Consolidations
- Intercompany Eliminations
- Minority Handling
- Currency Conversion
- IFRS to GAAP and Other Adjustments
- Sarbanes Oxley
- Reconciliation
- Allocations
- Workflow
- Modeling Organizational Changes

Updated: Jan/2020

www.solverglobal.com

Solver, Inc. | Copyright © 2020

Table of Contents

Introduction.....	2
Product Summary.....	2
Company Summary.....	3
Consolidation Topics.....	4
Solver Financial Consolidations Overview.....	4
Consolidation Architecture.....	6
Consolidations with Multiple, Different ERP Systems.....	8
Consolidations with Multiple, Different Chart of Accounts.....	8
Consolidation Process and Workflow.....	9
Data Loading and Reconciliation.....	9
Currency Conversion.....	11
Consolidation Adjustments.....	12
IFRS to GAAP Adjustments.....	12
Other Adjustments.....	12
Eliminations.....	13
Minority Interest Calculations.....	13
Allocations.....	14
Consolidated Financial Reports.....	14
Modeling Organizational Changes.....	16
Appendix 1 - IFRS to GAAP Adjustments.....	17
Introduction.....	17
Overview of International Financial Reporting Standards.....	17
Some Major Differences Between U.S. GAAP and IFRS Standards.....	18
IFRS Presentation as a Reporting Task.....	20
Examples of IFRS Presentation Using Solver.....	21
Conclusion.....	25
Citations.....	25
Appendix 2 - Currency.....	27
Introduction.....	27
Currency Setup.....	27
1. Currency Codes.....	27
2. Rate Types.....	28

3.	Monthly Rates	29
4.	Daily Rates.....	29
5.	Rate Configuration.....	29
	Currency Conversion Business Rule(s)	30
	Solver Currency Translation in Practice	31
	Profit & Loss Accounts.....	32
	Balance Sheet Accounts.....	33
	Currency Translation Adjustment.....	34
	Other Translation Options - Currency Translation on Live ERP Data	35
	Appendix 3 - Sarbanes Oxley.....	36
	Summary	36
	Microsoft SQL Azure as a Database Platform	37
	Consolidation Model Specification in Solver	37
	Data and Model Integrity	38
	Solver Implementation of Currency Conversion.....	38
	Advantages Over Manual Spreadsheet-based Consolidation	38
	Audit Trail.....	39
	Access Control.....	39
	Appendix 4 - Typical Steps in the Setup of a Consolidation Model.....	40
	Appendix 5 - Minority Interest and Intercompany Activity – Examples.....	54
	Appendix 6 - Configuring Solver Consolidation.....	57
	Appendix 7 - Additional Solver Information and Resources	59

Introduction

The purpose of this white paper is to provide an overview of Solver. With frequent, automated cloud updates, the solution is continuously being enhanced to drive faster, better decisions across its global customer base. For the latest information or to discuss your specific needs, please contact your local Solver partner, visit Solver's [web-site](#) or email us at info@solverglobal.com.

The Solver suite has robust financial consolidations, eliminations and multi-currency capabilities and the purpose of the white paper is to describe this specific functionality. For other functionality, please review Solver's [web-site](#).

Product Summary

Solver provides a single, cloud-based solution that automates financial reporting and planning processes, and supports faster and better decisions based on key information from across the organization's data sources.

Key benefits that Solver provides include:

- A top-rated Corporate Performance Management (CPM) solution by G2 based on user satisfaction
- Global partner channel with industry expertise to help you whenever and wherever
- Cloud software, support, and upgrades, packaged into a subscription price, providing unmatched ROI over traditional CPM solutions
- Built for business users to manage the entire solution without the need for developers
- Executive and management data from across the organization that is easily accessible in ONE place with Solver's intelligent *Data Warehouse*
- Solver's multi-tenant cloud application provides quick initiation, SOC 2 compliance, automatic software upgrades, and scalability at one's convenience
- Solver provides the power and the familiarity of cloud-connected Excel to solve the most complex formula and layout requirements for reporting and planning template designers
- Easy-to-use, pre-built integration to Power BI, the world's #1 visualization solution
- Fast and cost-effective integrations provided with Solver's wizard-driven CSV, SQL, and prebuilt ERP/CRM Connectors
- Unlimited access to reports and dashboards from secure web portal
- Hybrid cloud option provides customers with real-time cloud reporting capabilities for their on-premise ERP system

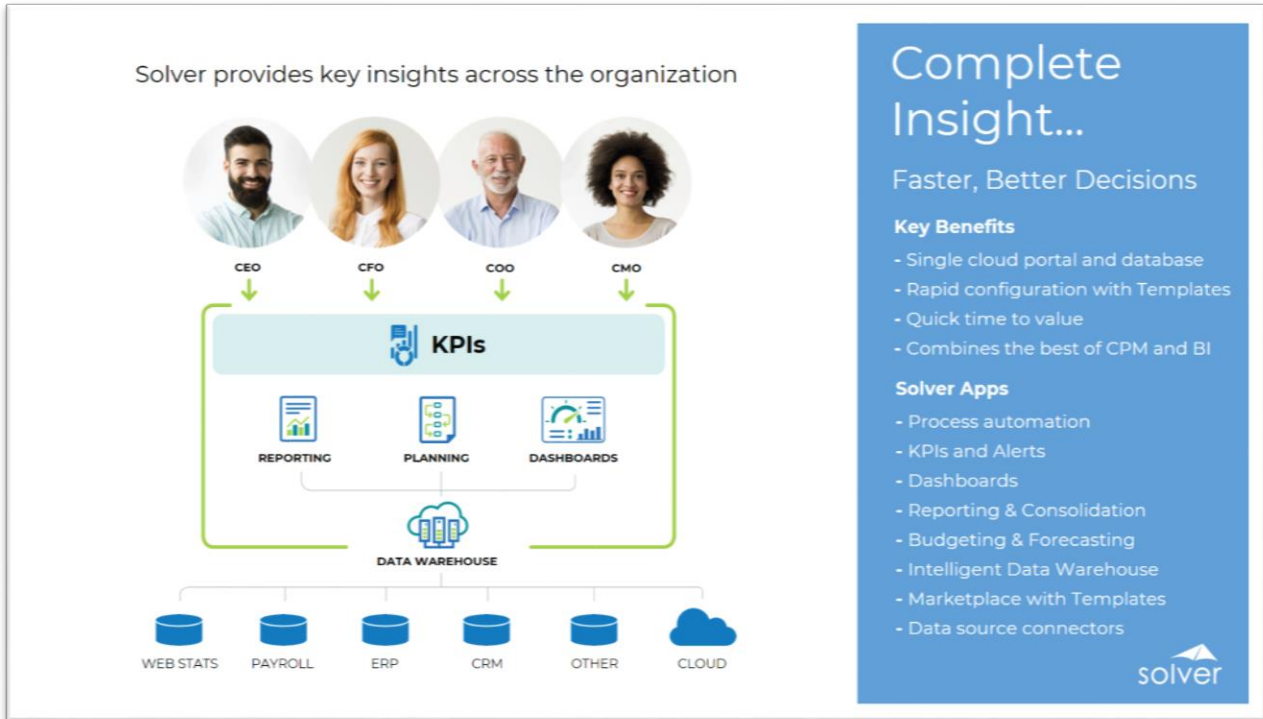


Figure 1. Solver architecture overview

Company Summary

Solver, Inc. is redefining the category of cloud-based reporting and planning. The Solver solution is built to enable faster and better business decisions across the entire organization. Solver combines financial and other key data into a single tool, powered by the most flexible report and planning form designer on the market. Organizations use this solution to automate and streamline financial and operational reports, consolidations, and budgeting and forecasting processes. Solver empowers users with complete insight that drives intelligent decisions and competitive advantages. Headquartered in the United States, Solver, Inc. has more than a dozen offices and hundreds of partners globally that provide local and industry expertise. To learn more, visit www.solverglobal.com.

Consolidation Topics

Depending on organizational complexity and business requirements, companies look to consolidation software to provide one more of the following features (all of these areas are covered in the rest of this white paper):

- Mapping different Chart of Accounts
- Consolidation process (Workflow)
- Data loading
- Reconciliation
- Currency conversions
- IFRS to GAAP adjustments
- Other Consolidation adjustments
- Eliminations of intercompany transactions
- Minority calculations
- Allocations
- Consolidate financial statements
- Consolidate sub-ledger or statistical data
- Sarbanes Oxley (SOX) compliance

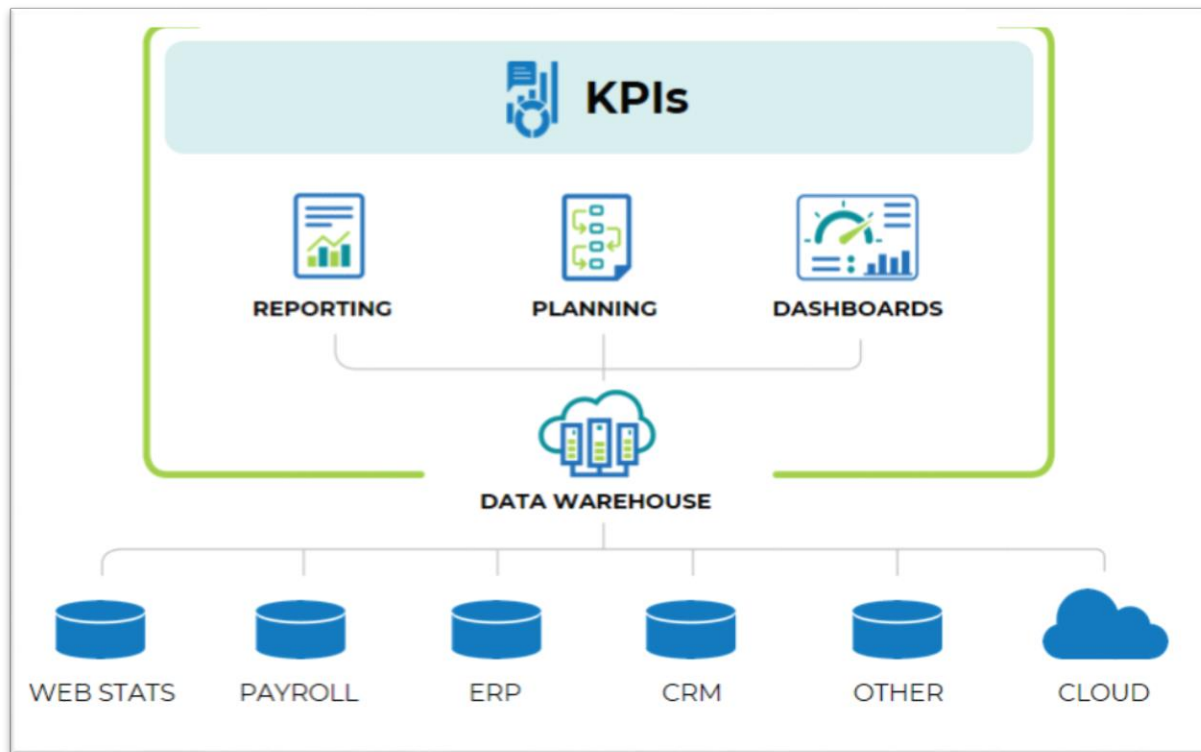
Solver Financial Consolidations Overview

Companies look for modern, automated consolidations solutions for many reasons, such as:

- Move to a cloud-based platform.
- Improve consolidation process and utilize workflow with automated alerts and controls.
- Eliminate manual spreadsheet consolidations.
- Get away from older, legacy reporting & consolidation tools (such as Hyperion, TM1 and other IBM Cognos applications, FRx, etc.) that either are too complex and expensive to maintain, or they don't perform all the tasks expected from modern tools in this area.
- Implement a Sarbanes-Oxley compliant solution.
- Implement a solution that can handle multi-national requirements such as GAAP to IFRS adjustments and currency conversions.
- Implement a modern, user-friendly solution that can be fully managed by the finance team.
- Implement a solution that is more scalable and versatile than traditional consolidation solutions, so that is also can be used for all kinds of other reporting such as operational reporting, statistical reporting, etc.
- Implement a reporting and consolidation solution that is an integral part of a Corporate Performance Management (CPM) suite that also include budgeting, forecasting, modeling, ad-hoc reporting, dashboards (including

integration to 3rd party dashboards like Power BI, Tableau, Qlik, etc.) and data warehousing.

Launched in the Fall of 2009 and re-built with a modern, multi-tenant cloud architecture in 2017, Solver has become one of the most complete and modern Corporate Performance Management (CPM) suites on the market. It allows the finance team to regain control of all aspects of the reporting and consolidation process. Below is a sample architecture slide that shows all the main components of the Solver suite.

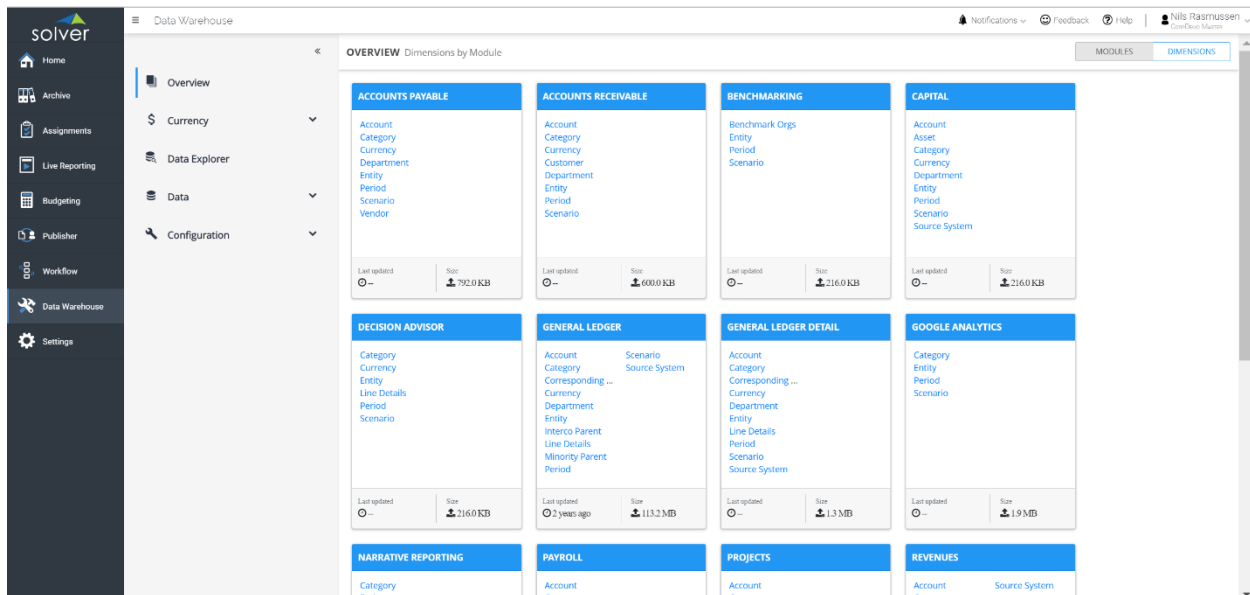


On the following pages you can read about Solver and how it deals with the various areas that often are part of a company's consolidations needs. In some cases there are referrals to additional white papers that cover specific topics in much more detail. If you are interested in any of these white papers, please log into the Solver Support [portal](#) or send an e-mail to info@solverglobal.com. See Appendix 7 for more resources.

Consolidation Architecture

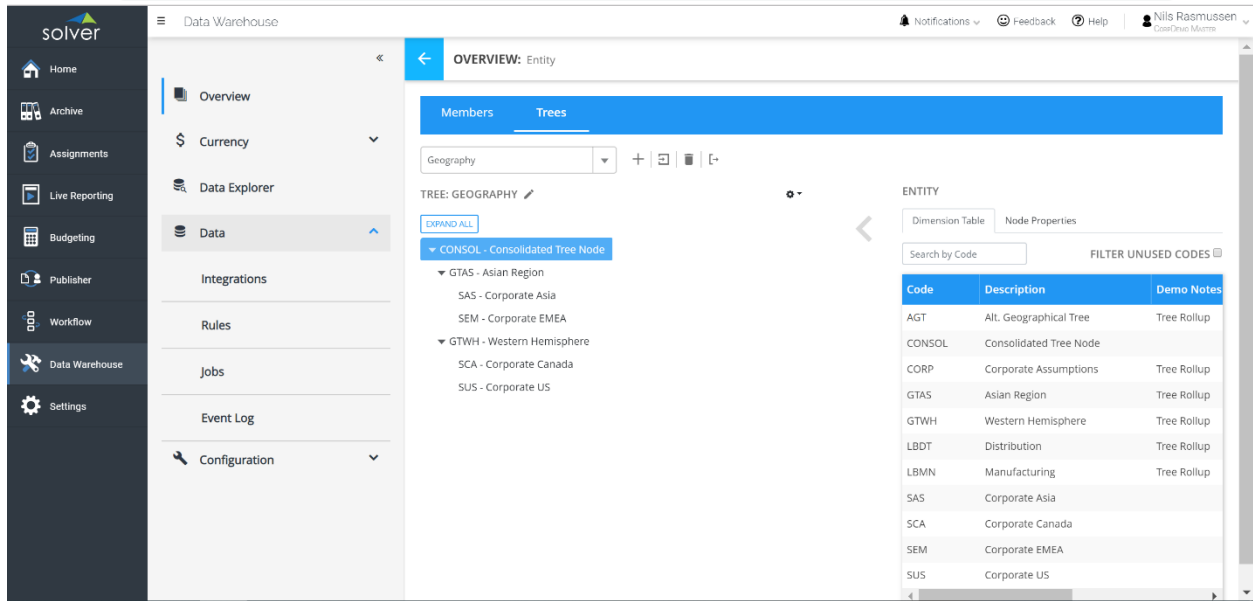
Solver consolidates by populating the Solver Data Warehouse (DW) with data from the ERP system(s). The latter is the way almost all consolidations software work. Below is a more detailed description of this architecture.

Using the Solver Data Warehouse (DW), you get a best-of-breed consolidation architecture. You can upload data from an unlimited number of ERPs and/or companies and use the Solver Reporting module to report across and consolidate the companies that were uploaded in the data warehouse. You can consolidate both General Ledger data as well as operational data such as Payables, Receivables and Sales.



The concept of moving data out of the ERP system(s) and into an external database where the consolidated reporting will take place is also used by most other well-known consolidations and reporting tools such as Hyperion (Oracle), TM1 (Cognos), Host Analytics, Prophix, BPC (SAP), and so on.

Using Solver's Gateway to connect to on-premise ERPs or its cloud ERP connectors, data is loaded from the ERP system(s) and into the DW on a daily (or more frequently) basis, either on a schedule or by a person triggering the upload (e.g. after last minute adjustments in the GLs).



Using company attributes (e.g. specifying a roll-up to divisions and HQ) or trees (see screenshot above), an administrator can set up desired roll-up structures within the Solver DW interface.

Consolidating with Solver becomes increasingly beneficial under one or more of the following conditions:

- Moderate to advanced currency requirements (beyond what is done in the ERP system).
- Medium to large number of companies to consolidate.
- Concerns around slower ERP system performance when heavy reports are being executed.
- Need to enter elimination entries or other consolidation adjustments beyond what can easily be performed within the ERP system itself.
- Interest in also consolidating certain operational data (payables, sales, etc.).
- Interest in creating a platform (the Solver DW) for future/additional reports, budgets and dashboards that also bring in data from other data sources than the ERP system.
- Different chart of accounts structure across companies.

Consolidations with Multiple, Different ERP Systems

Some multi-entity companies have different accounting systems in their subsidiaries and this tends to add complexity to a consolidation process compared to a situation where all subsidiaries reside within the same ERP system and use the same chart of accounts.

There are a couple of ways to enable consolidated reporting when there are multiple ERP systems:

1. Upload data from a subsidiary ERP system into a corporate ERP system

This methodology is typical when there is a dominant ERP system within the organization and frequently when there is a long term strategy to put all subsidiaries on the same ERP system. In this case, there is not much work for Solver, as ultimately all the subsidiaries will reside within a single ERP system and thus the consolidation architecture described earlier in this white paper will be utilized.

2. Upload data from each subsidiary ERP system into the Solver Data Warehouse (DW)

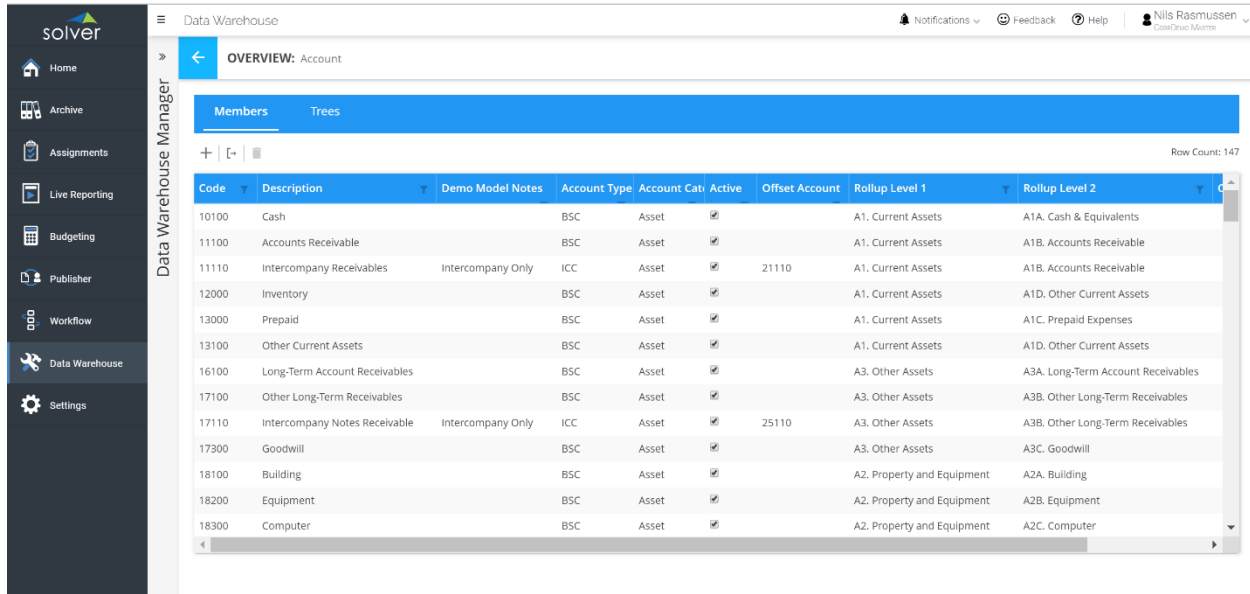
This methodology leaves each ERP system as is and account mapping and loading is taken care of as part of the transfer of data and dimensions into the Solver DW. This is typical when subsidiaries are autonomous; there are frequent acquisitions or other good reasons not to import data from one ERP to another prior to consolidated reporting taking place.

Consolidations with Multiple, Different Chart of Accounts

In situations where there are different Chart of Accounts across various subsidiaries, using the Solver Data Warehouse (DW) is typically the best way to go. The process could look like this:

1. Extract data and GL dimensions (account, division, etc.) from each ERP.
2. Transform/map the local ERP chart of accounts into a corporate/consolidated chart of accounts.
3. Load the converted data (now mapped to the corporate chart of accounts) into the Solver DW.
4. Run consolidation reports.

Alternatively, step #2 above (“Transform/Map...”) can be performed within the Solver DW using attributes in the DW account table to map individual account numbers to a corporate chart of accounts. See screenshot below. Another methodology is to do the account mapping within an account tree in the DW and use the mapped summary nodes when writing reports.



The screenshot shows the Solver Data Warehouse interface. The top navigation bar includes 'Data Warehouse', 'Notifications', 'Feedback', 'Help', and the user 'Nils Rasmussen'. The main content area is titled 'OVERVIEW: Account' and features a 'Members' tab. A table lists 17 rows of account data, including codes, descriptions, demo model notes, account types, categories, active status, offset accounts, and rollup levels.

Code	Description	Demo Model Notes	Account Type	Account Cat.	Active	Offset Account	Rollup Level 1	Rollup Level 2
10100	Cash		BSC	Asset	<input checked="" type="checkbox"/>		A1. Current Assets	A1A. Cash & Equivalents
11100	Accounts Receivable		BSC	Asset	<input checked="" type="checkbox"/>		A1. Current Assets	A1B. Accounts Receivable
11110	Intercompany Receivables	Intercompany Only	ICC	Asset	<input checked="" type="checkbox"/>	21110	A1. Current Assets	A1B. Accounts Receivable
12000	Inventory		BSC	Asset	<input checked="" type="checkbox"/>		A1. Current Assets	A1D. Other Current Assets
13000	Prepaid		BSC	Asset	<input checked="" type="checkbox"/>		A1. Current Assets	A1C. Prepaid Expenses
13100	Other Current Assets		BSC	Asset	<input checked="" type="checkbox"/>		A1. Current Assets	A1D. Other Current Assets
16100	Long-Term Account Receivables		BSC	Asset	<input checked="" type="checkbox"/>		A3. Other Assets	A3A. Long-Term Account Receivables
17100	Other Long-Term Receivables		BSC	Asset	<input checked="" type="checkbox"/>		A3. Other Assets	A3B. Other Long-Term Receivables
17110	Intercompany Notes Receivable	Intercompany Only	ICC	Asset	<input checked="" type="checkbox"/>	25110	A3. Other Assets	A3B. Other Long-Term Receivables
17300	Goodwill		BSC	Asset	<input checked="" type="checkbox"/>		A3. Other Assets	A3C. Goodwill
18100	Building		BSC	Asset	<input checked="" type="checkbox"/>		A2. Property and Equipment	A2A. Building
18200	Equipment		BSC	Asset	<input checked="" type="checkbox"/>		A2. Property and Equipment	A2B. Equipment
18300	Computer		BSC	Asset	<input checked="" type="checkbox"/>		A2. Property and Equipment	A2C. Computer

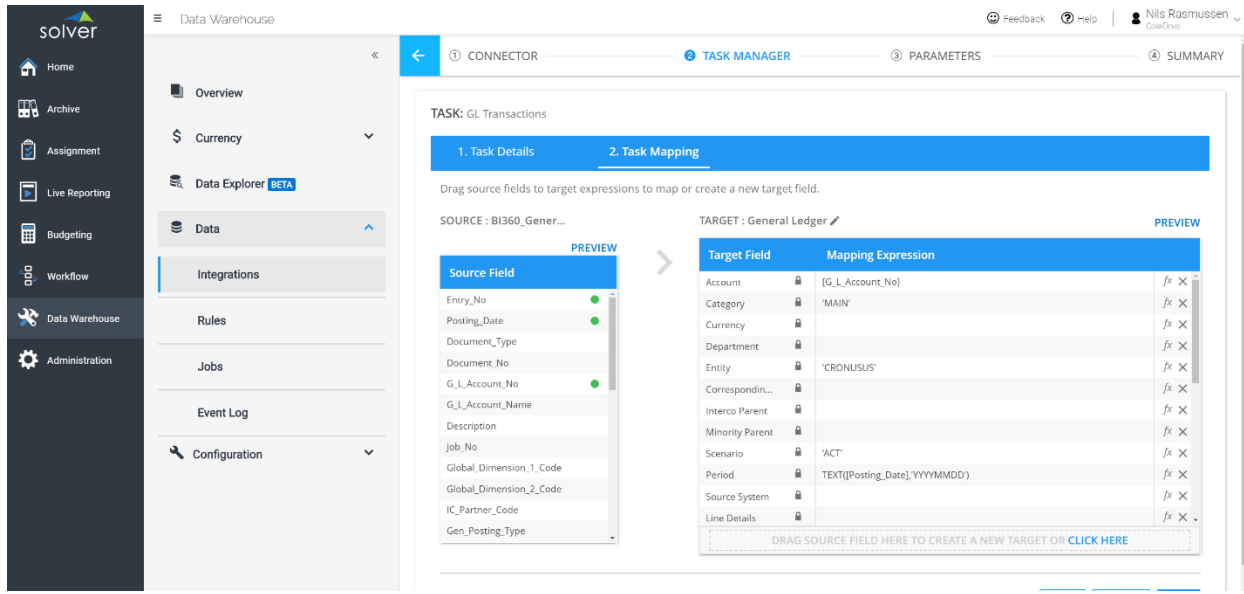
Consolidation Process and Workflow

Depending on how complex your consolidation process is, there are several options for how to organize it.

1. Manage it yourself without any Solver workflow functionality. This should be fine if you have a fairly simple consolidation process.
2. Use the Solver's workflow module. You then have an automated workflow status screen showing where each person is in the monthly consolidations process. You also have e-mail alerts and full discussion functionality.

Data Loading and Reconciliation

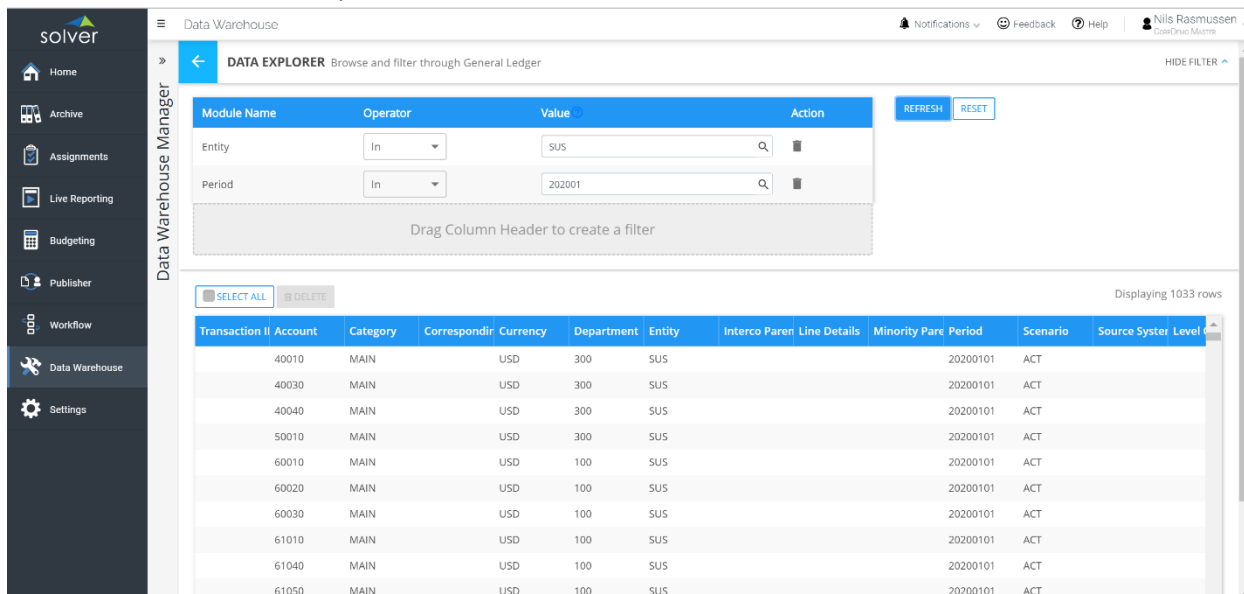
Whenever the Solver Data Warehouse (DW) is used in the consolidations process, data need to be loaded from the ERP system(s) and into the DW first. There are several ways to load data using Solver's native integration tool:



1. Load with Solver's pre-built ERP connectors (such as for all Microsoft Dynamics ERP systems, SAP, Sage, Acumatica, Netsuite and Quickbooks Online).
2. Load from files (CSV format).
3. Load from on-premise data sources using Solver's Gateway and SQL Connector
4. A more unconventional, but fully configurable method to load data into the DW is to use the Solver Planning module and design an input form. You can then either copy and paste or enter data there and save it directly to the DW.

Once data has been loaded to the DW, many organizations have subsidiary staff or headquarter staff reconcile the imported data to ensure everything is correct. There are several ways to perform this reconciliation, including:

1. Use the Data Explorer in the Solver Data Warehouse:



- Design a report tailored to your preferred format using Solver's Report Designer. The advantage with this approach is that you can create any layout you want, including with line item comment input (requires Solver Planning). You can also auto-distribute it to designated users with the Publisher.

 Trial Balance ABC Company Currency:			
		SUS	
		USD	
Account Descriptions	March, 2012 Actual	March, 2012 Comment Input	YTD Actual
10100 Cash	1,059,600		3,138,050
11100 Accounts Receivable	42,400		127,200
13000 Prepaid	22,200		66,825
13100 Other Current Assets	17,800		54,000
16100 Long-Term Account Receivables	121,700		363,950
17100 Other Long-Term Receivables	110,900		332,700
18100 Building	871,100	We updated this amount due to booking error.	2,648,750
18200 Equipment	294,500		889,725
18300 Computer	152,300		458,350
18700 Accumulated Depreciation Building	(162,300)		(491,750)
18800 Accumulated Depreciation Equipme	(54,400)		(163,250)
18900 Accumulated Depreciation Comput	(1,100)		(3,250)
19100 Other Long-Term Assets	451,700		1,346,200
21100 Accounts Payable	(51,500)		(156,000)
23100 Other Short-Term Debt	(901,700)		(2,705,350)
24100 Long-Term Account Payables	(762,700)		(2,273,000)
25100 Other Long-Term Debt	(1,132,100)		(3,374,600)
40010 Product Revenue	(1,373,100)		(4,147,250)

Currency Conversion

As mentioned other places in this document, Solver can perform the currency conversion within the Solver Data Warehouse (DW). There is also a third scenario, which is that the ERP system itself performs the currency conversion and the Solver report writer simply pulls the converted data into reports. Let's briefly cover these methods below:

1. ERP system converts, Solver reports

This methodology is typical when the ERP system has solid currency conversion capabilities and can store data in both local and parent/reporting currencies. In this case, Solver simply loads and reports directly on the converted data and no currency conversion functions need to be performed in Solver prior to producing reports.

2. Solver Data Warehouse converts, Solver reports

This methodology is recommended when more advanced currency conversion is required and there are quite a few currencies to convert. The Solver Data Warehouse (DW) has both rate tables, rate types and a currency conversion engine, and it can perform advanced currency conversion on a scheduled basis, e.g. right after scheduled data loads have taken place from the ERP databases (s). Once currency conversion has taken place, the Solver report writer simply reports on the local currency and/or converted data.

Account Type	Description
BSC	Balance Sheet Conversion
CSC	Common Stock Conversion
ICC	Interco Balance Sheet Conversion
PLC	Income Stmt Conversion
REC	Retained Earnings Conversion
STAT	Statistics - No Conversion

Scenario	Rate Type
ACT	CLS
BUD	BUD
FCST	BUD
OBA	CLS
OBB	BUD

You can read more about currency conversion in Appendix 2.

Consolidation Adjustments

IFRS to GAAP Adjustments

Multinational companies are increasingly in need of a safe, easy way to create IFRS to GAAP (or the other way around) adjustments in order to comply with domestic and international accounting rules. Sometimes this role is performed by the corporate ERP system and Solver simply reports on the adjusted data, while other times companies want the consolidation and reporting tool to handle the IFRS/GAAP adjustments. In the latter case, the Solver Data Warehouse (DW) is an excellent option. Using simple web-based input forms built with the Solver Planning module, users can enter Inventory adjustments and other required entries, and store them directly to the DW. The DW will store entries with user ID and date stamps for audit purposes. Once this is done, it is a simple task for the Solver report writer to access the imported GL data as well as the entered adjustments to produce consolidated reports as well as any required audit trail reports.

You can read more about IFRS to GAAP Adjustments in Appendix 1.

Other Adjustments

Depending on the company and its requirements, there can be several other situations where a corporate controller needs to post consolidation-related adjustment entries. Including currency-related adjustments, temporary correction of erroneous data from a subsidiary, etc. This can be done rather elegantly by using Solver Planning to design a user-friendly input form(s) where such transactions can be entered and stored in the Solver Data Warehouse. By default, entered transactions

will be tracked with user id and time/data stamps. You can also enter comments to explain the reason for the adjustment entries.

Eliminations

There are several ways to perform eliminations of intercompany transactions:

1. ERP system offers elimination functionality

Many ERP systems either provide the facilities to enter elimination entries into elimination companies or they provide functionality to perform auto-eliminations. In either case, the Solver report writer can report on this data and does not need any special intercompany elimination functions beyond that.

2. Eliminations done by the Solver Reports/Forms running on the Solver Data Warehouse

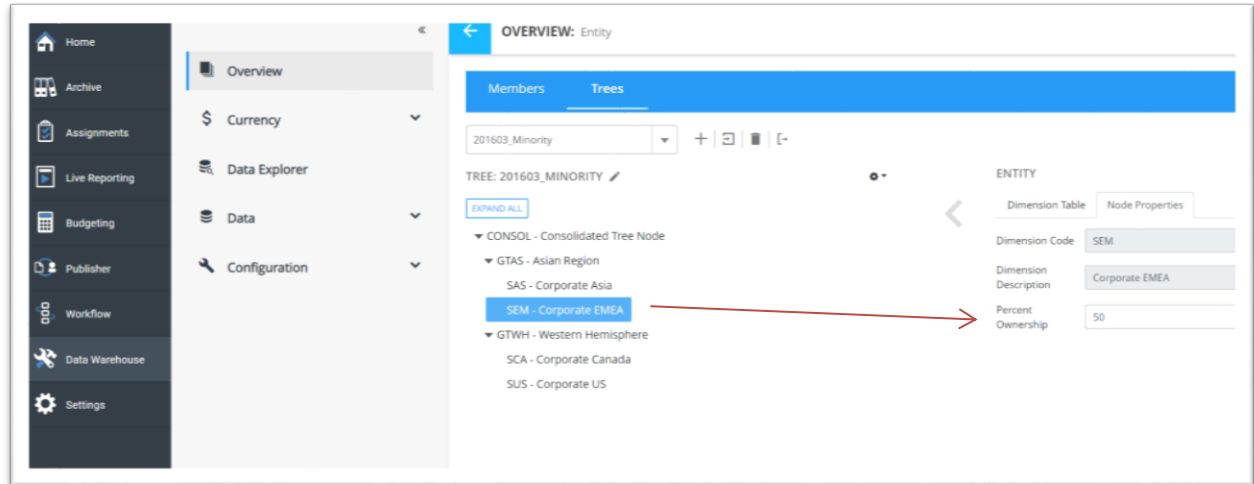
The Solver Planning module offers fully customizable input forms that can be used for manual elimination entries. Furthermore, Solver's reporting module in combination with the Planning module's write-back functionality can perform automatic elimination calculations and store these to the Solver DW for use in consolidation reports.

3. Eliminations done within the Solver Data Warehouse (DW)

The Solver DW also offers an elimination process that can be run automatically after data has been loaded from the ERP systems and into the DW. This functionality will automatically create and post elimination entries in the DW based on inter-company transactions and roll-up trees (hierarchies). These elimination transactions are then available for the Solver report writer to be used in consolidation reports, inter-company matching reports, etc.

Minority Interest Calculations

Solver manages the consolidation entries necessary for organizations that have direct and indirect interests in multiple organizations and complex cross-ownership situations through organization hierarchies and predefined business rules. In addition, the process of determining effective ownership, ultimate percent control, and proper consolidation method is done automatically based on hierarchies and business rules in the Solver Data Warehouse.



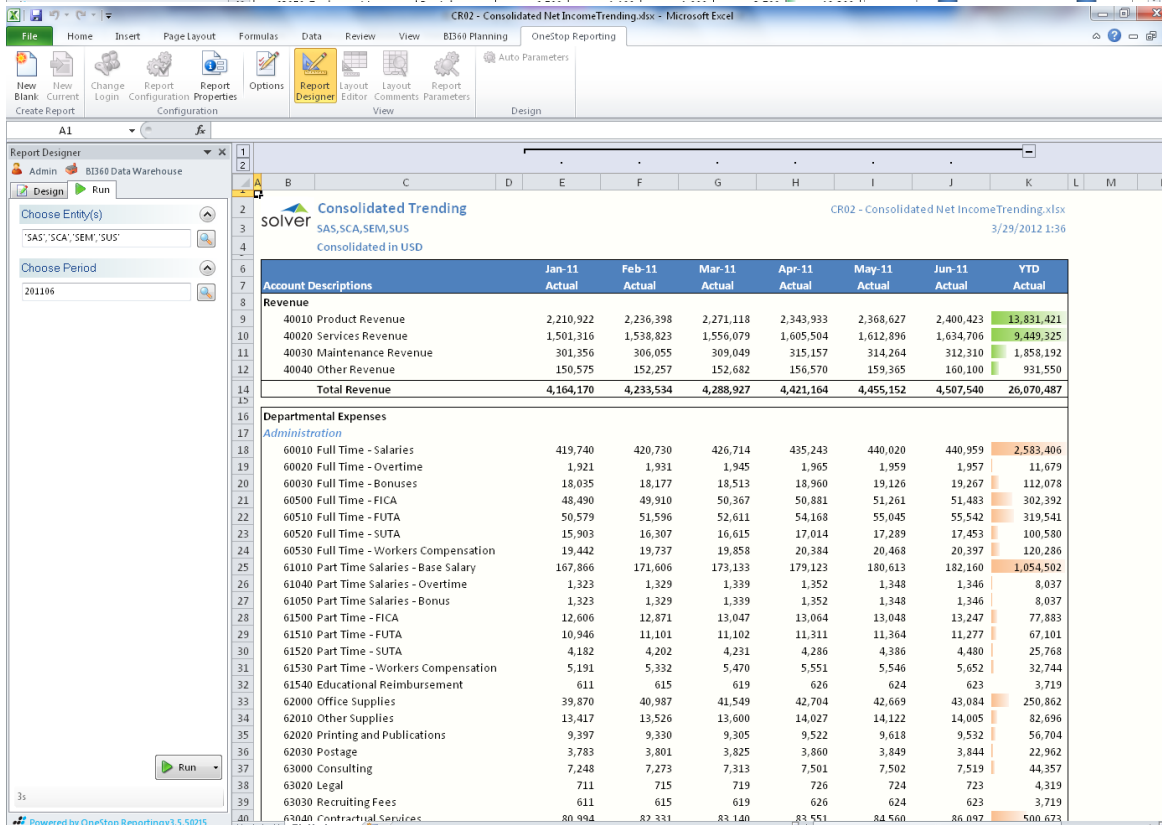
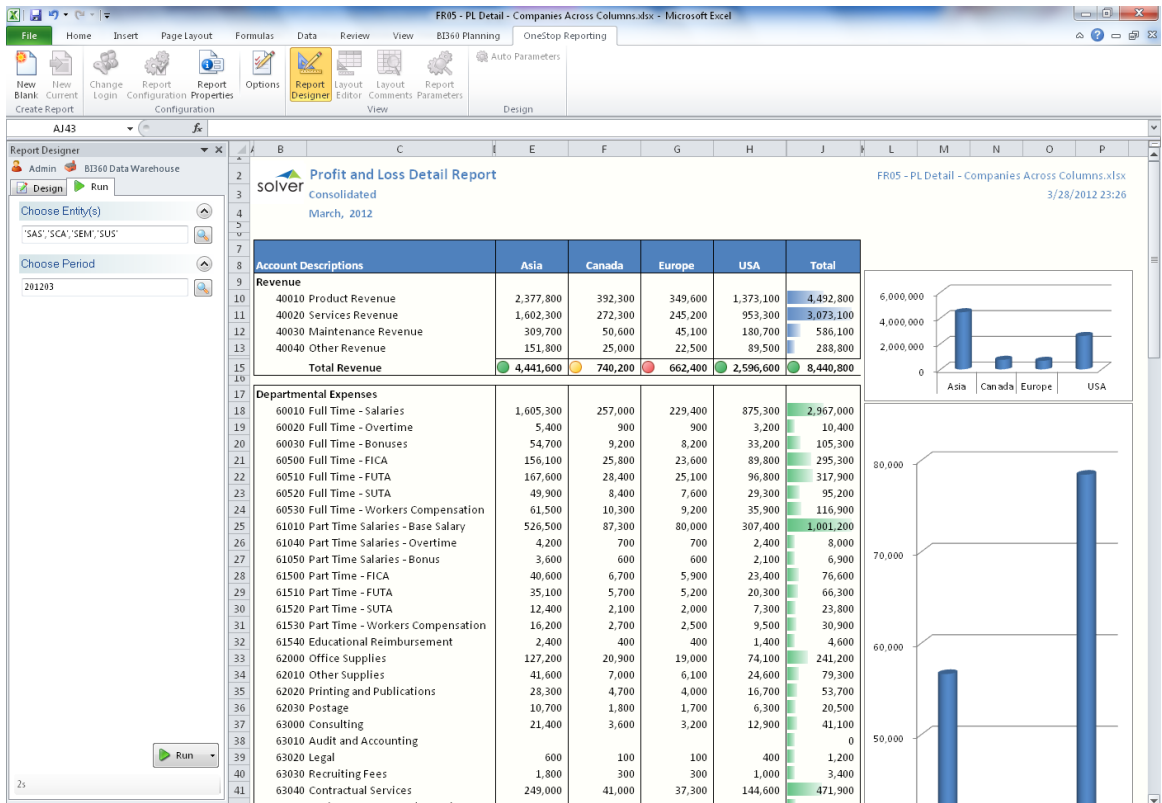
Allocations

Some corporations also need to perform allocations as part of their monthly consolidation process. For example, allocating corporate overhead expenses down to divisions and/or subsidiaries. Unless these allocations are already performed within the ERP system and are just part of the ordinary data loading to Solver, you can design simple or highly sophisticated allocation reports that calculates and saves allocations into the Solver Data Warehouse (DW). This requires Solver Planning for the write-back of the allocations. Because the resulting allocations become real transactions in the Solver DW, if desirable, you can later export these back to the ERP system as well. In essence, using Solver as your allocation engine.

Consolidated Financial Reports

In a full consolidation scenario, at the point when data loading, account mapping, reconciliation, currency conversion, adjustments, and elimination processes have been completed you are ready to produce your consolidated reports with Solver's report writer. Reports can roll-up companies and display them in an almost unlimited number of report layouts, such as:

- Consolidated reports (companies are consolidated into single columns of e.g. actual, budget and variance figures):



- Consolidating reports (companies are listed side by side with a consolidated column on the right or left side of the report):

- Multi-sheet reports (different sheets shows report consolidated and for each entity).

Consolidated P & L Variance CR30 - Consolidated PL with Navigation Tree.xlsx
 Saturday, March 31, 2012 3/29/2012 1:44
 Converted to USD

Account Descriptions	Actual	March, 2012 Budget	Variance
Revenue			
40010 Product Revenue	2,522,974	2,396,826	126,148
40020 Services Revenue	1,748,594	1,818,538	(69,944)
40030 Maintenance Revenue	329,410	332,705	(3,295)
40040 Other Revenue	163,104	161,473	1,631
Total Revenue	4,764,083	4,709,542	54,541
Departmental Expenses			
<i>Administration</i>			
60010 Full Time - Salaries	476,211	495,259	19,048
60020 Full Time - Overtime	1,920	1,862	(58)
60030 Full Time - Bonuses	20,409	21,225	816
60500 Full Time - FICA	54,326	54,870	544
60510 Full Time - FUTA	59,210	62,170	2,960
60520 Full Time - SUTA	18,059	17,698	(361)
60530 Full Time - Workers Compensation	21,348	22,202	854
61010 Part Time Salaries - Base Salary	187,182	189,054	1,872
61040 Part Time Salaries - Overtime	1,313	1,300	(13)
61050 Part Time Salaries - Bonus	1,313	1,353	40
61500 Part Time - FICA	13,951	13,951	(0)
61510 Part Time - FUTA	11,878	11,759	(119)
61520 Part Time - SUTA	4,402	4,412	(90)
61530 Part Time - Workers Compensation	5,841	5,549	(292)
61540 Educational Reimbursement	607	619	12
62000 Office Supplies	45,630	45,174	(456)
62010 Other Supplies	1,884	14,437	(4447)
62020 Printing and Publications	9,736	10,029	293
62030 Postage	3,713	3,719	(76)
63000 Consulting	7,835	7,835	(0)
63020 Legal	707	721	14
63030 Printing	607	631	24
63040 Contractual Services	88,617	90,389	1,772
63050 Equipment Lease and Rental	2,482	2,432	(50)

Consolidated report on DW:
 The report automatically repeats the report template for each division and subsidiary, with the end result being an automatically generated workbook with one sheet per business unit.

Modeling Organizational Changes

When you need to see the impact of acquisitions, divestitures, or internal reorganizations, using the Solver Data Warehouse you can easily copy and change an unlimited number of corporate hierarchies ("trees") to help you model the to-be roll-up. You can then use the Solver Reporting module to consolidate based on the before-and after hierarchies to evaluate alternatives. With Solver it is easy to model organizational changes to answer questions like "What will the net tax impact be of changes in my legal structure?" or "What will trends be on my profitability with and without acquired or discontinued operations?"

Appendix 1 - IFRS to GAAP Adjustments

Introduction

After reading this appendix, readers should:

- Understand the basis for International Financial Reporting Standards (IFRS).
- Have a basic acquaintance with the differences between IFRS and U.S. Generally Accepted Accounting Principles (US GAAP), as well as with some of the challenges resulting from multiple financial rule sets.
- Appreciate how the *Solver* corporate performance management suite can be employed to manage the presentation of simultaneous financial statements and supporting reports under IFRS and U.S. GAAP.

Overview of International Financial Reporting Standards

International Financial Reporting Standards (IFRS) are an integrated set of authoritative accounting pronouncements promulgated by the International Accounting Standards Board (IASB). The IASB is an independent standard-setting body organized to “develop a single set of high quality, understandable, enforceable and globally accepted International Financial Reporting Standards (IFRS).”¹

Among the advantages of a globally applied set of high-quality accounting standards are the following:

- Increased comparability of company results and transparency in financial reporting.
- Improved access to capital, as investors are not required to be well-versed in varying local Generally Accepted Accounting Principles (GAAP) to evaluate investment candidates. Also, financial statements will be acceptable to different national exchanges without restatement.
- Simplified financial reporting for multinational organizations since subsidiary statements will no longer require restatement from local GAAP prior to consolidation.
- Lowered cost of financial reporting as a worldwide accounting staff may be flexibly assigned.

IFRS has substantial global momentum. Since 2001, almost 120 countries have required or permitted the use of IFRS. In the figure below, blue areas indicate countries that require or permit reporting under IFRS as of 2010; grey areas indicate countries seeking convergence with or pursuing adoption of IFRS.²

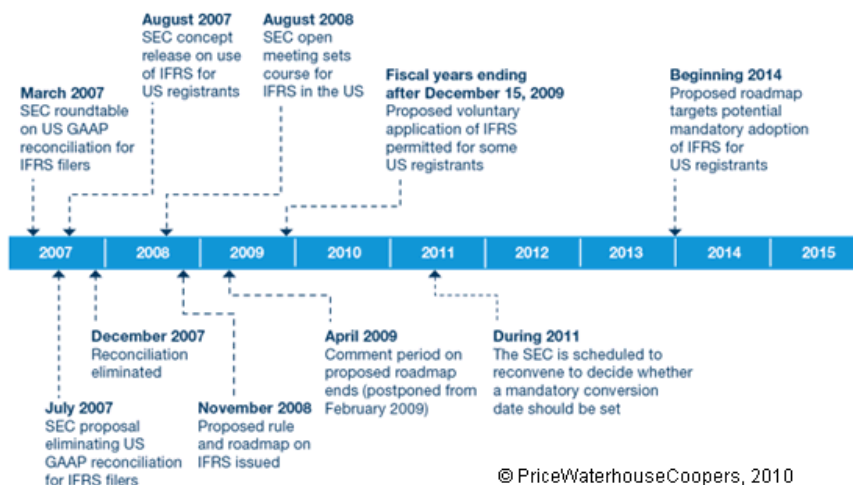


© 2010 International Accounting Standards Committee Foundation

IFRS represents an integrated body of accounting rules. The impact of moving from local GAAP to IFRS will vary by jurisdiction. Further, different business organizations within the same jurisdiction will be variously affected as their business operations expose them to different IFRS pronouncements. IFRS adoption can materially affect reported results. A study by the Institute of Chartered Accountants in England and Wales (ICAEW) determined 52% of United Kingdom companies reported materially different profits as a result of IFRS reporting. Of those, 32% reported profits higher than those that would have been reported under UK GAAP.³

Some Major Differences Between U.S. GAAP and IFRS Standards

In 2002 the U.S. Financial Accounting Standards Board (FASB) signed a memorandum of understanding with the IASB, establishing U.S. GAAP/IFRS convergence as a goal. IFRS adoption in the U.S. is being driven as well by the Securities and Exchange Commission (SEC). In 2008 the SEC published a “roadmap” to IFRS adoption with phased implementation culminating in registered companies reporting under IFRS by 2014:



© PriceWaterhouseCoopers, 2010

The SEC is currently reviewing letters received from interested parties during the public comment period. Deloitte surveyed 150 Chief Financial Officers and other finance professionals in October 2009 and found that 70% supported the adoption of IFRS based on the roadmap.⁵

A detailed discussion of the differences between U.S. GAAP and IFRS is well beyond the scope of this paper. However, two general theoretical distinctions can be stated. First, IFRS tends to be *principle-based* while U.S. GAAP is more *rule-based*. U.S. GAAP guidance most often relies on precise definitions and thresholds, with deviations discouraged. IFRS pronouncements are more frequently based on suggested standards with various optional presentations based on context. Under IFRS, choices of presentation based on the preparers informed judgment should be supported by documentation of the reasoning behind the judgment. This type of referential documentation is less important under U.S. GAAP so long as the rules are followed.

Second, while U.S. GAAP favors historical valuations when available, IFRS supports fair-value carriage. This can introduce added volatility into reported profitability since the fluctuations in fair-values are generally reflected in the income statement. Debt covenants drafted under the auspices of U.S. GAAP could be breached as a direct result, or as a consequence of debt-equity ratio effects.

Determining the specific requirements for an individual firm for presentation under IFRS will be a major effort, requiring the attention of the finance and accounting function, auditors, specialist advisors and tax preparers. Some major areas which will affect many firms include the following:

- *Revenue Recognition*: For multi-period revenue contracts, U.S. GAAP is generally more conservative in allowing revenue to be recognized in prior periods compared to IFRS.
- *Inventory*: Under U.S. GAAP, either the *Last In, First Out (LIFO)* or *First In, First Out (FIFO)* computation may be elected. IFRS does not allow LIFO, which will create additional reported income (and cash tax payments) for most U.S. firms that hold inventory. This is a significant area of controversy.⁶ In addition, inventory write-downs under U.S. GAAP are permanent; while IFRS inventory write-downs are reversible.
- *Leases*: U.S. GAAP provides detailed technical guidance for classification of leases. These rules in turn allow the possibility of “synthetic” leases, which critics claim can create misleading balance sheets by inappropriately excluding liabilities. IFRS takes a more conceptual approach by classifying leases based on the substance of the agreement.
- *Consolidation*: U.S. GAAP uses an *economic benefit* test to determine whether an entity should be consolidated. IFRS favors a control model to determine consolidation status.⁷ Therefore, *Variable Interest Entities (VIE's)* and other units consolidated under U.S. GAAP may be presented separately under IFRS or vice versa.

- *Owner's Equity.* Various differences exist, for example U.S. GAAP allows shares with the *put option* feature to be carried in equity, while IFRS suggests a liability classification.

Most jurisdictions adopting IFRS have dictated a period of reconciled parallel presentation, including both local GAAP and IFRS financial statements. A similar requirement will probably be a part of any U.S. transition.

IFRS Presentation as a Reporting Task

Generally speaking, IFRS presentation – or GAAP presentation for an entity whose books of original entry are maintained in IFRS – is primarily a financial reporting challenge. Typically, the books of original entry are maintained persistently using the local GAAP methods with adjustments performed to produce IFRS statements. Eventually, when the requirements for IFRS presentation have been completely digested and the necessity for comparative books has passed, then the books of original entry are converted to IFRS and the adjustments are discontinued. During the “dual book” period, reconciling reports are often a crucial requirement.

Three predominant methods are used to maintain parallel books:

1. Spreadsheet-based models,
2. Enterprise Resource Planning (ERP) systems with support for multiple financial ledgers
3. Dedicated financial reporting systems.

The first method, spreadsheet-based solutions, will tend to rapidly break down under the number of adjustments needed. At a recent conference panel, a consultant recalled a client who discovered over 500 spreadsheets were required each period to produce IFRS financial statements. Auditing and maintaining links between that many worksheets was quickly deemed impractical for a critical function.⁸

The second method, multiple ledgers in the firm's ERP systems, is a more viable option since all entries are maintained within the system database; however, not all ERP systems include this feature. An ERP system's ability to produce complex rules-based entries in a secondary ledger based on data from the primary ledger is an important consideration when evaluating this method. Also, the capacity of the ERP's reporting module to flexibly address both ledgers simultaneously is important for reconciliation and comparative reports. This method may also be impractical if not all business entities use the same ERP system.

The final method, the use of dedicated financial reporting software, will often provide the best results. These systems are generally designed to provide flexible presentations based on an optimized financial database. Thus, these systems have the ability to maintain and address the various adjustments required to present financial results based on multiple accounting standards. Additionally, these products typically

allow creation of forms which include data from the base accounting methodology as well as input from users. This capability can both streamline and standardize the adjustments required for the presentation of financial statements under the alternative policies. However, the cost for this added functionality is that transactions in the ERP system must be loaded into the reporting package's database.

Although they are beyond the scope of this paper, other business functions in addition to accounting and financial reporting will be affected by any transition between accounting methodologies. For example, compliance systems based on superseded rules will require adjustment or complete replacement. For example, consider compliance testing for leases. If a system is based on definite specifications used with U.S. GAAP "bright line" rules, and these rules are replaced by conceptual principles under IFRS, significant revisions will be needed.⁹ Many business function revisions will require support from information technology staff, so always consider the potential impact these revisions will have on other IT projects as well.

Examples of IFRS Presentation Using Solver

Solver is a corporate performance management solution well suited to produce financial statements in multiple accounting standards.⁹ Solver's relevant features include:

- Cloud-based deployment for 24/7 uptime, global availability and monthly updates.
- A cloud-connected, Excel-based form and report designer which allows for flexible template design without compromises, highly professional formatting and powerful business logic. Users run the same reports in the Solver web portal with no Excel required.
- Web portal for easy access and management of the overall Solver application.
- A dedicated relational Data Warehouse. The Data Warehouse is preconfigured with separate modules including for general ledger data and it offers 99 additional modules.
- A dimensional storage model for entries to the Data Warehouse fact table, including an unlimited number of transaction *categories*, which allows for different ways of classifying data. In addition to the preconfigured dimensions, the Data Warehouse supports up to 100 user-defined dimensions as well.
- Automated currency and consolidation technology.

In the following example, a hypothetical organization requires two types of recurring adjustments each period to restate U.S. GAAP results to IFRS. First, revenue recognition must be adjusted to reflect the different principles under IFRS. This adjustment will affect a *sales revenue account*, with an automated offsetting entry affecting *accounts receivable*. Second, inventory must be adjusted to reflect differences between the two standards. This adjustment will affect a specific *inventory account*, with the offsetting entry affecting *cost of goods sold*. Each adjustment must include a supporting note to explain the reason for the adjustment. Here is an

example of a form which accomplishes these requirements, as it would appear to the user:

IFRS Adjustments Form		
Entity:	Corporate US	
Department:	Administration	
Period:	January, 2011	
Scenario:	Actual Data	
Currency:	US Dollar	

Revenue Recognition Adjustments		
Entry No.	Amount	Description
01	(20,000)	Reversal of % of completion adjustment - Cust. AARON0001
02	25,000	Recognition of revenues previously reversed - Cust. CENTR0001
Total:	5,000	

Inventory Valuation Adjustments		
Entry No.	Amount	Description
01	35,000	Reversal of previous inventory writedown
02	25,000	Adjustment of inventory sales from LIFO to FIFO
Total:	60,000	

This form has been designed using a *category* dimension code "IFRS" for these adjustments. In the example above, the form has been executed for company "Corporate US" for January 2011. The adjustments entered will be consistently booked across the firm and across periods since the same form definition is executed for any combination of entity and period. For the example above the effective journal entries are:

Debit Entry		Credit Entry	
Accounts Receivable	5,000	Sales	5,000
Inventory	60,000	Cost of Sales	60,000

It is straightforward to write a trial balance format reconciling report that isolates these adjustments as they have been entered in a specific transaction *category* (IFRS):

IFRS Reconciliation Report

Entity: Corporate US

Periods Through: January 2011

Account	Account Description	USGAAP Balances	IFRS Adjustments	IFRS Balances
10100	Cash	13,445,850		13,445,850
11100	Accounts Receivable	501,100	5,000	506,100
12000	Inventory	330,000	60,000	390,000
13000	Prepaid	265,025		265,025
13100	Other Current Assets	224,700		224,700
16100	Long-Term Account Receivables	1,474,750		1,474,750
17100	Other Long-Term Receivables	1,390,700		1,390,700
17300	Goodwill	0		0
18100	Building	10,776,150		10,776,150
18200	Equipment	3,570,325		3,570,325
18300	Computer	1,884,050		1,884,050
18700	Accumulated Depreciation Building	(1,984,250)		(1,984,250)
18800	Accumulated Depreciation Equipment	(685,950)		(685,950)
18900	Accumulated Depreciation Computer	(14,250)		(14,250)
19100	Other Long-Term Assets	5,513,300		5,513,300
21100	Accounts Payable	(1,957,500)		(1,957,500)
23100	Other Short-Term Debt	(11,384,950)		(11,384,950)
24100	Long-Term Account Payables	(9,701,600)		(9,701,600)
25100	Other Long-Term Debt	(14,215,800)		(14,215,800)
30000	Currency Translation Adjustment	0		0
31000	Retained Earnings	(318,200)		(318,200)
40010	Product Revenue	(1,401,050)	(5,000)	(1,406,050)
40020	Services Revenue	(944,300)		(944,300)
40030	Maintenance Revenue	(177,100)		(177,100)
40040	Other Revenue	(88,550)		(88,550)
50010	COGS - Product Sales	980,000	(60,000)	920,000
60010	Salaries	874,800		874,800
<hr/>				
68130	Gift and donations	1,050		1,050
68140	Special events	1,050		1,050
68150	Bank charges	1,050		1,050
68180	Miscellaneous expenses	46,200		46,200
68190	Bad Debt Expense	98,350		98,350
68200	Taxes	103,800		103,800
	Grand Total	0	0	0

It is equally straightforward to write a consolidating statement of operations that separates these adjustments into a separate column (in this example no USD-translated transactions have been generated in either the Asia or EMEA entities, hence those columns have no amounts):

IFRS Statement of Operations
 Consolidating Version
 Currency: US Dollar
 January, 2011

Account Descriptions	Corporate Asia	Corporate EMEA	Corporate US	IFRS Adjustments	IFRS Total
Revenue					
40010 Product Revenue	0	0	1,401,050	5,000	5,000
40020 Services Revenue	0	0	944,300		0
40030 Maintenance Revenue	0	0	177,100		0
40040 Other Revenue	0	0	88,550		0
Total Revenue	0	0	2,611,000	5,000	5,000
Departmental Expenses					
50010 COGS - Product Sales			980,000	(60,000)	(60,000)
60010 Salaries			874,800		0
60020 Overtime			3,150		0
60030 Bonuses			32,200		0
60500 FICA			91,000		0
60010 Other Expenses			0		0

Solver also allows entries in the database to be associated with user-defined dimensions. These dimensions are available to identify transactions in the database in any way needed. In our example of the IFRS adjustments form, a user-defined dimension has been used to specify the revenue adjustments separately from the inventory adjustments. This simplifies definition of a report which only includes data for a specific adjustment type. Here is an example of a reconciling report which displays only the adjustments to inventory, grouped by period, including the explanations entered in the form for the entries:

Inventory Reconciliation - US GAAP to IFRS
 Entity: Corporate US
 Currency: US Dollar
 Periods Through: March 2011

Inventory Per US GAAP	\$ 395,000
January	
Adjustment of inventory sales from LIFO to FIFO	25,000
Reversal of previous inventory writedown	35,000
Total For January	60,000
February	
Adjustment of inventory sales from LIFO to FIFO	45,000
Total For February	45,000
March	
Adjustment of inventory sales from LIFO to FIFO	15,000
Total For March	15,000
Total IFRS Adjustments	120,000
Inventory Per IFRS	\$ 515,000

The examples above are expository only and a real-world USGAAP/IFRS conversion model could of course be much more complex; the forms and reports might need to reflect more challenging business rules. The Solver Reporting form/report writer and the *Solver Budgeting* (think of it here as an input and calculation storage module)

data storage are both very flexible however and can accommodate such rules. The underlying Excel functionality is a significant benefit for complex implementations. Also, because Solver's reports and forms are designed with a modern cloud-connected Excel add-in, any existing IFRS spreadsheet models created for the organization may be adapted. This capability may reduce to level of effort to move to a database backed IFRS solution. Equally important, adapting proven computational workbooks may be more acceptable from a compliance and risk perspective.

Conclusion

The journey between two different sets of authoritative guidance for accounting presentation is a task that will cut across many disciplines and generally include both internal staff and trusted advisors. Even with solid planning and execution it will be a daunting task, particularly for the finance and accounting functions who will be most closely involved. Having available a suitable and flexible integrated tool such as the Solver reporting suite can be an important part of a successful transition strategy.

Citations

¹ IASB Website. <<http://www.iasb.org/The+organisation/IASCF+and+IASB.htm>>, viewed 01/20/2010.

² IASB Website. <<http://www.iasb.org/Use+around+the+world/Use+around+the+world.htm>>, viewed 01/21/2010.

³ EU Implementation of IFRS And The Fair Value Directive. Institute of Chartered Accountants in English and Wales (October 2007)

⁴ Securities and Exchange Commission, "Roadmap for The Potential Use Of Financial Statements Prepared In Accordance With International Financial Reporting Standards By U.S. Issuers." (November 14, 2008)

Johnson, Sarah. "IFRS: No Longer If, but When." CFO 8 Feb., 2008 <<http://www.cfo.com/article.cfm/14460972>>, viewed 01/18/2010

Leone, Marie. "SEC: No IFRS Yet." CFO 9 Dec., 2009 <<http://www.cfo.com/article.cfm/14460972>>, viewed 01/20/2010

Anonymous. "SEC Action on IFRS Could Come Early in 2010." Journal of Accountancy (website) 9 Dec., 2009 <<http://www.journalofaccountancy.com/Web/20092412.htm>> viewed 01/21/2010

⁵ Bloom, Robert and Cenker, William J. "The Death of LIFO?" Journal of Accountancy January 2009 <<http://www.journalofaccountancy.com/Issues/2009/Jan/DeathOfLIFO.htm>> viewed 01/23/2010

⁶ WebCPA Staff. “Companies Want SEC to Approve IFRS Roadmap.” <<http://www.webcpa.com/news/Companies-Want-SEC-Approve-IFRS-Roadmap-51991-1.html>> viewed 01/23/2010

⁷ IFRS Accounting Website. “Combinations.” <<http://www.ifrsaccounting.com/ifrs-combinations.html>> viewed 01/22/2010

⁸ “IFRS COMPLIANCE IN CANADA: Managing the Transition to 2011.” The Economist Group; September 23rd, 2008; Toronto, Canada.

⁹ Kim, Jim. “Debate: The impact of IFRS on Sarbanes-Oxley.” FierceComplianceIT Website <<http://www.fiercecomplianceit.com/story/debate-impact-ifrs-sarbanes-oxley/2008-07-03>> viewed 01/20/2010.

Appendix 2 - Currency

Introduction

This Appendix mainly focuses on Solver users deploying the Solver Data Warehouse(DW). It will also briefly cover currency conversion for companies only using Solver's cloud solution as a live report writer on their ERP database.

Users of Solver DW requiring multiple currency reporting are supported in two fashions:

- 1) There is a complete currency translation process built into the Solver Data Warehouse user interface. This translation requires some initial setup and then it will use business rules to automatically convert each foreign currency. The process generates new transactions in the target currency and both original- and these converted transactions can be used in reports.
- 2) For very simple currency needs, since the Solver DW currency tables are exposed to the Solver report writer, reports can bring the native currency transaction data and the FX rates into a report then perform the currency conversion in the report itself using formulas native to its Excel add-in. See the end of this Appendix for more information.

Currency Setup

The main items that need to be configured for a multi-currency model in Solver DW are accessed from the *Currency* section of the Solver Data Warehouse interface.

1. Currency Codes

Currency codes (for example, USD for US Dollars) must be initialized for any currency which will be reported on. A good practice is to use the widely-recognized three character ISO 4217 codes. *Currency codes* can be manually entered, imported from a file (CSV or Excel files), or imported via Solver's integration tool. The *currency codes* will then also be available in the Entity (company) dimension in the currency field.

Code	Description	Demo Notes	Currency Cod	Active	Rollup Division
AGT	Alt. Geographical Tree	Tree Rollup	USD	<input checked="" type="checkbox"/>	
CONSOL	Consolidated Tree Node			<input checked="" type="checkbox"/>	
CORP	Corporate Assumptions	Tree Rollup	USD	<input checked="" type="checkbox"/>	
GTAS	Asian Region	Tree Rollup	HKD	<input checked="" type="checkbox"/>	
GTWH	Western Hemisphere	Tree Rollup	USD	<input checked="" type="checkbox"/>	
LBDT	Distribution	Tree Rollup	USD	<input checked="" type="checkbox"/>	
LBMN	Manufacturing	Tree Rollup	USD	<input checked="" type="checkbox"/>	
SAS	Corporate Asia		HKD	<input checked="" type="checkbox"/>	DivB
SCA	Corporate Canada		CAD	<input checked="" type="checkbox"/>	DivA
SEM	Corporate EMEA		EUR	<input checked="" type="checkbox"/>	DivB
SUS	Corporate US		USD	<input checked="" type="checkbox"/>	DivA

2. Rate Types

Rate Types define the nature of FX rate. Common rate types are:

- Average (AVG): Typically used for the profit & loss accounts, applied by period.
- Closing (CLS): Typically used for the balance sheet accounts, applied to period ending balances.
- Budget (BUD): Typically used for all accounts for budgets.
- Statistical (STAT): Typically used for non-financial accounts not subject to currency translation.

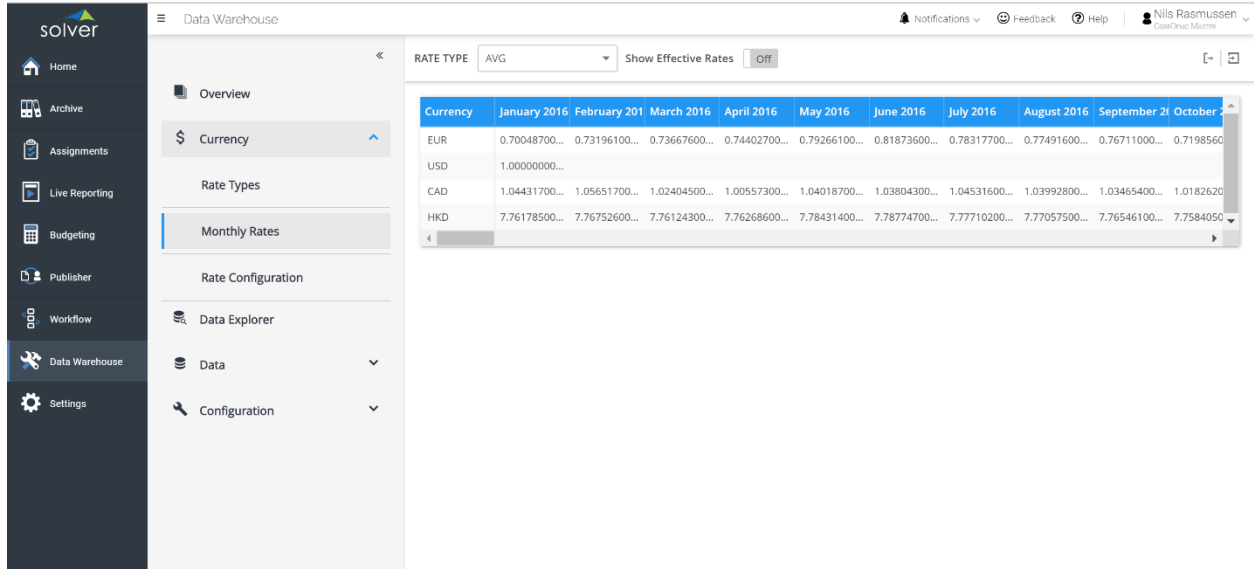
Rate Type	Description	Multiple Entities
AVG	Average	<input type="checkbox"/>
CLS	Closing	<input type="checkbox"/>
STAT	Statistical No Conversion	<input type="checkbox"/>
BUD	Budget	<input type="checkbox"/>
REOBA	Retained Earnings OBA	<input checked="" type="checkbox"/>
CSACT	Common Stock Activity	<input checked="" type="checkbox"/>
CSOBA	Common Stock OBA	<input checked="" type="checkbox"/>
ICOBA	Interco Balance Sheet OBA	<input checked="" type="checkbox"/>
ICACT	Interco Balance Sheet Activity	<input type="checkbox"/>

Other rate types may be set up as needed. Another common rate type is the historical rate which results in the translated amount always being the same as

the date/period in which the translation was initially booked. Typically used for historical asset evaluation, etc.

3. Monthly Rates

These can either be entered manually or loaded to the Solver DW as part of an automated ETL process:



Currency	January 2016	February 2016	March 2016	April 2016	May 2016	June 2016	July 2016	August 2016	September 2016	October 2016
EUR	0.70048700...	0.73196100...	0.73667600...	0.74402700...	0.79266100...	0.81873600...	0.78317700...	0.77491600...	0.76711000...	0.71985600...
USD	1.00000000...									
CAD	1.04431700...	1.05651700...	1.02404500...	1.00557300...	1.04018700...	1.03804300...	1.04531600...	1.03992800...	1.03465400...	1.01826200...
HKD	7.76178500...	7.76752600...	7.76124300...	7.76268600...	7.78431400...	7.78774700...	7.77710200...	7.77057500...	7.76546100...	7.75840500...

These are the rates which are invoked when the Currency Conversion process is executed (see “Currency Conversion Business Rule” section below).

4. Daily Rates

Daily spot rates can be imported into the warehouse in the *Daily FX Rate* tables. The source for the daily rates is typically the ERP system or other external database. *Daily FX Rates* can be directly imported or imported via SSIS integration. Daily rates cannot be manually entered or adjusted. Should you choose to load daily rates, Solver can also automatically convert these to monthly rates.

5. Rate Configuration

Rate Configurations are used to determine which *Monthly FX Rates* are applied to which transactions when the *Currency Conversion Business Rule* is executed. The *Rate Configuration* maps the following fields:

- *Account Type* (i.e., balance sheet).
- *Scenario* (i.e., actual or budget).
- *Rate Type* (i.e., closing rate).

This mapping table controls the calculations used to generate the translated currency transactions (see the next section “Currency Conversion Business Rule”).

Account Type	Description
BSC	Balance Sheet Conversion
CSC	Common Stock Conversion
ICC	Interco Balance Sheet Conversion
PLC	Income Stmt Conversion
REC	Retained Earnings Conversion
STAT	Statistics - No Conversion

Scenario	Rate Type
ACT	CLS
BUD	BUD
PCST	BUD
OBA	CLS
OBB	BUD

Account Types may be created on the fly in the *Rate Configuration* interface; these *Account Types* are then available as a lookup in the *Accounts* table. However, the *Scenario* and *Rate Type* are lookups in the *Scenario* and *Currency Rate Type* dimension tables; therefore, the members must be entered before the *Rate Configuration* can be completed.

Currency Conversion Business Rule(s)

The *Currency Conversion* process creates additional translation transactions with an *Amount* value which reflects the appropriate rate from the *Monthly Rates* table. The *Currency Conversion* is accessed from the *Rules* section Solver Data Warehouse menu:

Name	Module	Status	Last run	Modified By	Last Modified
CopyVersions	General Ledger			Demo User	3/30/2018 11:10 AM
Currency_Translation	General Ledger			Demo User	3/30/2018 11:10 AM
BI360_MinorityElim	General Ledger			Demo User	3/30/2018 11:10 AM
BI360_Interco_Elim_Trans	General Ledger			Demo User	3/30/2018 11:10 AM

The following dimension settings determine which transactions will be selected for translation:

- *Scenario* (also used for the translation transactions).
- *Entity* (also used for the translation transactions).
- *Period(s)* (also used for the translation transactions).
- *Source Category*

The following dimension settings determine two dimensions which are used for the target transactions:

- *Destination Currency*.

The appropriate *Monthly FX Rate* is determined by the settings in the *Rate Configuration* and the *Account* interface in the *Dimensions* for the *General Ledger* module in the Solver DW. Here is a sample:

Rate Configuration				
Account Type	Scenario	Rate Type	Description	
Δa	Δa	Δa	Δa	
BLC	ACTUAL	CLS		
BLC	BUDGET	BUD		
PLC	ACTUAL	AVG		
PLC	BUDGET	BUD		
STAT	ACTUAL	STAT		
STAT	BUDGET	STAT		

Account Dimension				
dimCode	Description	dimAlias	AccountType	Deb
25100	Other Long-Term Debt		BSC	
30000	Currency Translation Adjustment		BSC	
31000	Retained Earnings		BSC	
40010	Product Revenue		PLC	
40020	Services Revenue		PLC	
40030	Maintenance Revenue		PLC	

In this case, a transaction for account 40010 with the *Scenario* ACTUAL, which is associated with *AccountType* PLC, would be translated using the AVG *Rate Type* for transactions. However, a transaction for account 40010 with the *Scenario* BUDGET would be translated using the BUD *Rate Type*.

The *Currency Conversion* process can be executed by the user on-demand. It can also be scheduled to run at a specific time, e.g. directly after each time data is loaded from the General Ledger and into the Solver DW.

In the next section you will find a currency translation example.

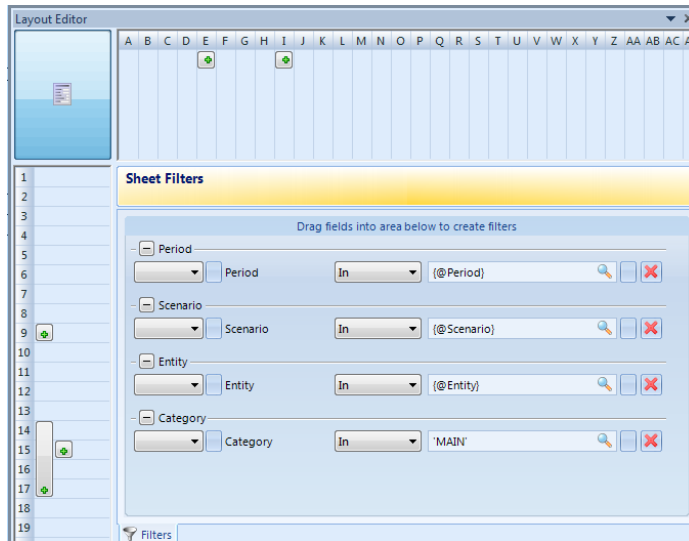
Solver Currency Translation in Practice

This section shows how the currency translation functionality in Solver may be used in a typical real world situation. Many possibilities exist for designing multicurrency financial reports using Solver, but the following examples should provide inspiration to design reports to fit your business needs. The examples below assume the “current rate” translation rules most commonly used in U.S. GAAP.

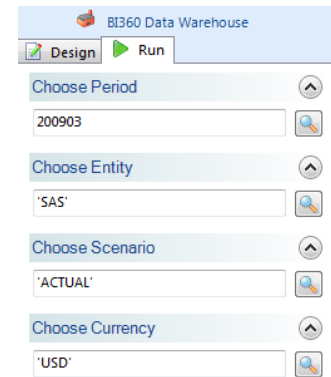
Profit & Loss Accounts

To create Profit & Loss financial statements with accounts with amounts in the target currency is very straightforward in Solver. As we saw in the last section, the translated transactions are created on a period-wise basis, using the rates in place in the *Monthly FX Rates* table. So assuming that the *Rate Configuration* settings are appropriate, the transactions may be brought into Solver Reporting by simply identifying the *Destination currency*. To return to the previous example, here is the revenue section of a Profit & Loss report which uses the transactions created in the last section:

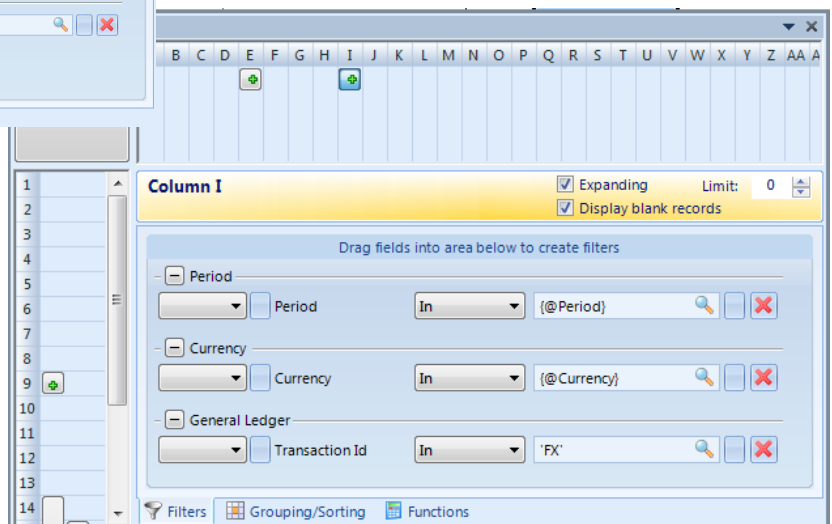
Report Sheet-level definition:



Parameters:



Report Column-level definition:



Here is the executed report converted to USD in column E and in local currency in column I:

Profit and Loss Detail Report			Local
Corporate Asia			HKD
USD			Mar, 2009
Account Descriptions	Mar, 2009 Actual	Total	Actual
Revenue			
40010 Product Revenue	268,860	268,860	2,084,500
40020 Services Revenue	182,998	182,998	1,418,800
40030 Maintenance Revenue	38,346	38,346	297,300
40040 Other Revenue	17,528	17,528	135,900
Total Revenue	507,732	507,732	3,936,500

Balance Sheet Accounts

Creating a Balance Sheet is similar to creating a Profit and Loss statement. However, with the Balance Sheet; the **Value2** field should be used to capture the YTD translated amounts. Because the translation occurs within the business rule and stores within the warehouse, there are no additional steps required to show multi-entity historic rates.

Balance Sheet Report	Local	
	HKD	USD
	March, 2009	March, 2009
ASSETS		
<i>Current Assets</i>		
Cash & Equivalents	4,175,300	538,614
Accounts Receivable	188,300	24,291
Prepaid Expenses	100,000	12,900
Other Current Assets	80,800	10,423
Total Current Assets	4,544,400	586,228
<i>Property & Equipment</i>		
Building	4,229,700	528,713
Equipment	1,391,900	179,555
Computer	707,400	91,255
Accumulated Depreciation	(982,200)	(126,704)
Net Property & Equipment	5,346,800	672,818
Long-Term Account Receivables	585,100	75,478
Other Long-Term Receivables	533,100	68,770
Goodwill	0	0
Other Long-Term Assets	2,098,900	270,758
TOTAL ASSETS	13,108,300	1,674,052

Currency Translation Adjustment

Currency translation adjustment is the result of translating different portions of the balance sheet using different rates. In this example, the P&L accounts use a different rate (month average rate) from the Balance Sheet accounts. This difference is almost always carried as a separate line in the equity section of the Balance Sheet identified as, for example, Currency Translation Difference (CTD) or Accumulated Comprehensive Income (ACI). In this case, the amount of CTD will be determined as the difference between the Net Income translated using the period Average Rate versus translating the ending balance for Net Income at the Closing Rate.

Here is a summarized Balance Sheet in presented in native currency:

SAS - Corporate Asia		
February, 2011		
HKD		
Assets		65,336,400
Liabilities		64,516,500
Owners' Equity:		
Retained Earnings		638,000
Net Income		181,900
	Total Owners' Equity	819,900
	Total Liabilities And Owners Equity	65,336,400

Here is the same Balance Sheet, presented in the translated currency. To achieve this, the P&L accounts are presented with the Average Rate on one row and the Closing Rate on the second row. Row 13 and 14 can be hidden for presentation purposes:

1			
2	SAS - Corporate Asia		
3	February, 2011		
4	US Dollar		
5			
6			
7	Assets	8,386,907	
8			
9	Liabilities	8,281,661	
10			
11	Owners' Equity:	Amount	
12	31000 Retained Earnings	81,897	
13	Net Income	23,366	
14	Net Income @ Closing Rate	23,350	
15	Accumulated Comprehensive Income	(17)	
16		Total Owners' Equity	105,246
17			
18		Total Liabilities And Owners Equity	8,386,907
19			
20			

Other sources of currency translation adjustment are historical or computed rates, for example for investments or retained earnings respectively. While these rate types have not been discussed in this document, they would be handled exactly the same way as Net Income. That is, the difference between translation using the historical/calculated rate and the closing rate would be an additional row on the Balance Sheet, etc.

Other Translation Options - Currency Translation on Live ERP Data

Solver can be also used for multicurrency reporting directly on the ERP database, without the data warehouse. In the case where the ERP system itself performs and stores the converted amounts, Solver's report writer does not have to do anything but report on the numbers.

For simple currency conversion needs, reports you design with the Solver report writer, can read the native currency transaction data from the ERP database as well as the exchange rates (or these can be entered/maintained in the report definition) and the report then performs the currency conversion using standard Excel formulas Solver's report designer.

An executed report could for example look like the below where the displayed rates have been multiplied with the local currency amounts and the converted amounts are showing. For demonstration purposes the rates (pulled in automatically from the ERP database) are shown on row 7 above each month.

Multi-Company Report with Multi-Currencies										
Exchange Rate										
Fabrikam, Inc.										
Solver, Inc.										
Solverkam, Inc.										
Account	201401	201402	201403	201401	201402	201403	201401	201402	201403	
4110 - US Sales - Finished Goods	52,899.13	60,833.99	0.00	84,638.61	189.66	0.00	42,319.31	94.83	0.00	
4110 - US Sales - Retail/Parts	956,425.39	1,099,889.20	0.00	1,530,280.62	1,759,822.71	0.00	765,140.31	879,911.36	0.00	
4111 - Canadian Sales - Retail/Parts	42,383.02	48,740.47	0.00	67,812.83	77,984.75	0.00	33,906.41	38,992.37	0.00	
4112 - AustralAsian Sales - Finished Goods	5,697.48	6,782.11	0.00	9,435.98	10,851.37	0.00	4,717.99	5,425.69	0.00	
4112 - AustralAsian Sales - Retail/Parts	90,878.03	104,509.74	0.00	145,404.86	167,215.58	0.00	72,702.43	83,607.79	0.00	
4114 - Germany Sales - Retail/Parts	0.00	5,514.33	0.00	0.00	8,822.93	0.00	0.00	4,411.46	0.00	
4115 - United Kingdom Sales - Finished Goods	6,133.24	7,053.22	0.00	9,813.18	11,285.16	0.00	4,906.59	5,642.58	0.00	
4115 - United Kingdom Sales - Retail/Parts	838.24	963.97	0.00	1,341.18	1,542.36	0.00	670.59	771.18	0.00	
4116 - South Africa - Retail/Parts	4,719.68	5,427.64	0.00	7,551.50	8,684.22	0.00	3,775.75	4,342.11	0.00	
4117 - Singapore Sales - Finished Goods	1,587.49	1,825.61	0.00	2,539.98	2,920.98	0.00	1,269.99	1,460.49	0.00	
4117 - Singapore Sales - Retail/Parts	1,587.49	1,825.61	0.00	2,539.98	2,920.98	0.00	1,269.99	1,460.49	0.00	
4120 - US Sales - Service Plans	156,463.63	179,933.18	0.00	250,341.81	287,893.08	0.00	125,170.91	143,946.54	0.00	
4122 - AustralAsian Sales - Service Plans	11,718.75	13,476.56	0.00	18,750.00	21,562.50	0.00	9,375.00	10,781.25	0.00	
4130 - US Sales - Installation Charges	198,513.54	228,290.58	0.00	317,621.67	365,264.92	0.00	158,810.84	182,632.46	0.00	
4132 - AustralAsian Sales - Installation Charge	10,457.43	12,026.04	0.00	16,731.89	19,241.67	0.00	8,365.94	9,620.83	0.00	
4140 - US Sales - Repair Charges	77,297.05	88,891.61	0.00	123,675.29	142,226.58	0.00	61,837.64	71,113.29	0.00	
4141 - Canadian Sales - Repair Charges	4,538.68	5,219.48	0.00	7,261.89	8,351.17	0.00	3,630.95	4,175.59	0.00	
4142 - AustralAsian Sales - Repair Charges	4,086.94	4,699.98	0.00	6,539.10	7,519.97	0.00	3,269.55	3,759.98	0.00	
Total Revenue	\$ 1,626,425.21	\$ 1,875,903.31	\$ -	\$ 2,602,280.34	\$ 2,904,300.58	\$ -	\$ 1,301,140.17	\$ 1,452,150.29	\$ -	
5100 - Salaries and Wages	80,611.30	31,815.37	28,041.14	128,978.09	50,904.59	44,865.83	64,489.04	25,452.30	22,432.91	
5110 - Overtime Pay - Consulting/Training US	11,728.00	13,487.20		18,764.81	21,579.53		9,382.40	10,789.76		
5130 - Commissions - Sales	47,659.98	3.56		76,255.97	5.69		38,127.98	2.85		
5150 - Employee Benefits - Administration	2,831.11	1,530.20	1,331.09	4,529.78	2,448.33	2,129.75	2,264.89	1,224.16	1,064.87	
5170 - Payroll Taxes - Accounting	4,884.85	1,907.22	1,681.75	7,815.77	3,051.56	2,690.81	3,907.88	1,525.78	1,345.40	
5170 - Payroll Taxes - Administration	1,142.45	446.02	393.33	1,827.92	713.63	629.33	913.96	356.82	314.66	
5600 - Contract Services - Consulting/Training	35,343.75	40,645.31		56,550.00	65,032.50		28,275.00	32,516.25		
5600 - Contract Services - Service/Installation	317,391.42	366,929.60		507,826.28	587,087.36		253,913.14	293,543.68		
6100 - Training - Accounting	468.75	539.06		750.00	862.50		375.00	431.25		
6100 - Training - Administration	1,406.25	1,617.19		2,250.00	2,587.50		1,125.00	1,293.75		
6100 - Training - Sales	1,425.00	1,638.75		2,280.00	2,622.00		1,140.00	1,311.00		
6100 - Training - Service/Installation	3,346.88	3,868.91		5,355.00	6,158.75		2,677.50	3,079.13		

Appendix 3 - Sarbanes Oxley

Summary

Solver cloud platform provides a rigorous solution for the consolidation of financial statement information originating from one or multiple ERP sources. Solver runs on a multidimensional model to identify all reportable general ledger entries, based on the leading Microsoft SQL Azure database. Solver separates the business logic for consolidation models from the source data. Complete segregation is maintained between source data, which cannot be overwritten after import, consolidation entries, and the consolidation model, thus providing a transparent audit trail from the subsidiary books through final consolidation. Additional strengths of Solver include:

- User access rights definable with complete granularity, enforced by the *SQL Azure* database engine and offered with the leading Microsoft Azure Active Directory (AAD) standard as well as multi-factor authentication (MFA).
- Entries are explicitly identifiable by user and date/time.
- Model specifications saved in database tables as well as the data, promoting data integrity by allowing for a complete, seamless backup/restore regimen using standard technologies.
- Explicit currency conversion rules definable by business unit and reporting period.

The advantages of Solver as a tool for complex financial statement consolidation are especially evident when compared to manual spreadsheet-based consolidation routines.

Microsoft SQL Azure as a Database Platform

The foundation of Solver's capabilities as a tool for flexible and secure consolidations is the SQL Azure database. This provides a robust and highly scalable platform for transaction storage, as well as state-of-the-art security control. The method by which *Solver* takes advantage of the *MS SQL* security framework is described further in the Data Integrity section below. Both the consolidation logic and data reside in *SQL Azure*, allowing for automated backup and high availability as part of Solver's multi-tenant cloud architecture. *Solver* stamps all entries into the *SQL Azure* database with time/date and user identification to further solidify the audit trail. The date and user that *created* a transaction as well as date and user that *changed* a transaction is tracked on every single transaction record and made available in audit reports.

Consolidation Model Specification in Solver

Solver uses a multidimensional database model to store reportable transactions, with transactions typically defined as trial balance level entries. Note: If desirable, journal Entry level detail can also be loaded into the Solver database. This technology results in a clear separation of the individual entities' data from the business logic required for the consolidation, and from the resulting consolidated data. Transactions included in the *Solver* database as reportable events are identified on five mandatory dimensions:

- Business Unit ("Entity") Code
- Reporting Period Code
- Transaction Type ("Scenario") Code. E.g.: Budget, Actual, etc.
- Transaction ("Category") Code. E.g. General Ledger entry, Consolidation Eliminating entry, etc.
- General Ledger Account Code.

Additionally, there are a large number of user defined dimensions and dimension attributes which can be used (in addition to the five mandatory dimensions) to capture additional characteristics of a transaction. Typical uses of user defined dimensions would be to capture market segment, project data or product data.

Any consolidation model requires the use of all five mandatory dimensions to specify an entry to be included; consolidating items are included whenever all five explicitly identifying codes within the database are present (if user defined dimensions have been used to identify a transaction, the appropriate values for these dimensions are required as well).

To reiterate: Since the business logic in consolidation models is defined and maintained separately from any subsidiary data brought into the Solver database, there results a transparent, precisely delineated and auditable trail from the subsidiary data through to the final consolidation.

Data and Model Integrity

Integrity of the data during the consolidation process begins with granular, precise control over User Access Rights. Solver passwords restricts access to transactions, accounts and reports by individual user or inherited Azure Active Directory group membership. These restrictions are enforced by the *SQL Azure* database engine based on the security settings configured in Solver.

Integration of multiple data sources to be consolidated also protects data integrity. Subsidiary entity data is integrated into the *Solver* database either via Solver's native integration tool. The data is locked once imported/uploaded, and protected from subsequent modification; deletion of integrated or uploaded data may be restricted subject to defined user access rules.

The integrity of the consolidation models, as well as the underlying data, is secured in Solver. The business logic in the reports is only available to be altered by administrators/power users with specific rights and a Report Designer license. Thus, the same access control and unified backup/restore process which protect the data are available to secure the consolidation framework as well.

Solver Implementation of Currency Conversion

The data specification mechanism described above provides *Solver* with a robust ability to apply currency conversion rules in compliance with national or international generally acceptable accounting principles. Moreover, different conversion rules may be defined and applied to the same transaction, for example if native currency and consolidated currency statements, or different levels of consolidation, are needed. The building blocks of currency conversion in Solver are:

- Currency identification specific to Business Units.
- Translation rules specific to General Ledger Accounts.
- Conversion rates specific to Reporting Period.

The default translation rules for a given Account may be overridden in specific consolidation models. Taken together, these elements provide for both complete flexibility and a solid audit trail in multiple currency environments.

Advantages Over Manual Spreadsheet-based Consolidation

The strengths of Solver as a tool for complex, multi-entity consolidations can be better understood by comparison to consolidations based on manual spreadsheet models.

Audit Trail

Typically, data and business logic are combined in spreadsheet-based consolidation models. Manipulations of the consolidation model can inadvertently affect the data, and vice-versa. Attempts to prevent this possibility must rely on ad-hoc protection of ranges, which are complicated and difficult to maintain. Moreover, these approaches are often poorly documented, and thus tend to degrade over time. Solver, on the other hand, provides a rigorous, auditable back trail to source data via an explicitly defined model.

Currency conversion with multiple international subsidiaries exemplifies the difficulties with auditing spreadsheet-based consolidation models. A firm with multiple subsidiaries operating in several currencies with different conversion rules for nominal and balance sheet accounts may easily have thousands of cells with dependent relationships to periodic conversion rates. While effectively tracing precedent and antecedent links on this scale is impractical, the currency conversion regime in Solver is based on transparent, explicit, data base-driven rules subject to ready verification.

Access Control

It is usually difficult to audit who added data in complex consolidation spreadsheet models maintained by multiple users. Spreadsheets are not by nature designed to support multiple users, and access controls often represent a workaround at best. Because *Solver* is designed as a multi-user reporting environment, controls are executed using the same controls available in other accounting software. In addition to enforced user access rights restrictions, *Solver* stamps all transactions in database with user identification. Thus, in the case where a control failure does occur, the problem may be isolated and addressed in a timely fashion; a similar problem in a spreadsheet model might be intractable due to an inability to pin down the source.

In summation, spreadsheet consolidation models rely on ad-hoc, difficult-to-audit controls and relationships. Solver's multidimensional, SQL Azure-based model implements a control regime using rules-based models which can minimize the control risks in complex consolidations.

Appendix 4 - Typical Steps in the Setup of a Consolidation Model

The purpose of this appendix is to provide Power Users/Administrators with an idea of the major steps in setting up and managing Solver for consolidations.

Note: This appendix is not meant as a “training manual” for any of the Solver modules, but rather it is meant to describe specific activities related to Financial Consolidations. Before you begin, please download the Solver Data Warehouse manual. Please visit support.solverglobal.com for user manuals, white papers and training videos for the different Solver modules.

Key Solver Modules for Consolidations

For consolidation models, the key Solver modules are:

1. **Solver Data Warehouse** -Interface to manage database, transactions, rates, scripts, etc.
2. **Solver Reporting** - For designing and running reports.
3. **Solver Planning** - For input of data like adjustments, manual eliminations, comments, etc. This module is only needed if your consolidation process requires manual data entry or storing of data calculated in reports, such as allocations.

Getting Ready to Set Up Solver for Consolidations

Here are some tips for items you want to have ready before you start setting up Solver as a Financial Consolidation solution:

1. Decide on Your Chart of Accounts:

- a. Do you have a single chart of accounts for all companies?
- b. Or...do you have different chart of accounts in your subsidiaries and require mapping them into a Corporate (or “consolidated”) chart of accounts? If so, then prepare (e.g. in an Excel spreadsheet) the exact mapping of accounts from subsidiaries into Corporate chart of accounts you plan to use in Solver.

2. Review other Dimension Codes:

If you have other dimension codes that you do not consider to be part of your “Chart of Accounts” (such as departments, companies, etc.), will they remain the same in Solver as in your ERP system or do they need mapping to “Corporate dimensions” used in your consolidation reports? If so, then prepare (e.g. in an Excel spreadsheet) the exact mapping of accounts from subsidiaries into Corporate chart of accounts you plan to use in Solver.

3. Document Your Consolidation Process:

- a. Do you have CLEARLY defined consolidation process? If so, have this documented and ready.
- b. If not, write it down in detail. If you plan to make changes to this process when you implement Solver, please describe your ideal process and consult with a Solver expert if this process can be replicated in Solver or it needs to be changed.

4. Data Integration:

- a. Do you know exactly where your General Ledger data is coming from (database server and GL tables within that database) and if this data source(s) is available of direct integration to the Solver Data Warehouse or it requires a file export/import process?
- b. Will you only be bringing Monthly Trial Balances into the Solver Data Warehouse or also GL Journal Entry level detail transactions?

5. User Security:

- a. Make a list of all users that will be logging into Solver
- b. For each user, write down what they will have access to. For example:
 - i. Which companies?
 - ii. Design reports or just run reports?
 - iii. Enter data (like manual eliminations)?
 - iv. Manage Solver Data Warehouse (trees, exchange rates, elimination processes, etc.)?

6. Preparing for Report Design:

- a. Make a list of all the reports required in your consolidation process
- b. Group these reports into “must have” and “nice to have” reports
- c. Gather examples or screenshots (or mock up in Excel) the desired report layouts
- d. For each report layout, specify the business rule (i.e. account ranges or calculation) for each row in the report. Excel is excellent for this, if you already have your desired report layouts mocked up in Excel.

The purpose of the steps above is to make sure that, PRIOR TO THE Solver IMPLEMENTATION START, you and your finance team have discussed, selected and documented the reports you need for consolidation in Solver, so that when you or your consultants start

implementing Solver, you don't have delays, confusion or re-work due to lack of good instructions/guidelines.

7. Write up a Project Plan

Depending on who is responsible for your Solver implementation, write up a project plan so all involved personal know what the forthcoming activities are, who are responsible and related deadlines.

1. Configuring the Solver Data Warehouse (Solver DW)

Before you can put any type of data in the Solver DW, you need to configure the DW. This is a completely non-technical task that you do using the Solver DW user interface. In short, this is where you decide which DW modules to use (such as the GL module), which fiscal/calendar year concept to use for your consolidation, which dimensions to use in a module (i.e. in the GL module), which rate types (if you will use currency conversion) to use, etc. See the Solver Data Warehouse user manual for more information.

2. Configuring the Consolidated Chart of Accounts

After Solver has been installed, a typical first step in the actual implementation is to configure the Chart of Accounts in the Solver Data Warehouse. There are several methodologies and options when it comes to the chart of accounts that companies use for consolidations (sometimes also referred to as the "Corporate chart of Accounts"):

Single chart of accounts used across all subsidiaries

This is the easiest situation. If all of your subsidiaries use the same chart of accounts, you will likely also want to use this same chart of accounts in the Solver DW. In this case, you either include the chart of accounts as part of the automated data upload (ETL) to the Solver DW or you import it from a file, or you enter it directly in the Solver DW Manager interface.

Different chart of accounts used by subsidiaries

If this is your situation, you have several options for how you want to handle this in Solver, all depending on what you think is easiest to manage by your staff:

- a. Set up subsidiary to parent chart of accounts mapping inside the ETL tool
 - i. Pros:
 - All mapping is in a single integration file/process.
 - ii. Cons:
 - Most ETL tools (including Microsoft SSIS) are relatively technical and if there are new accounts in the subsidiaries that don't fit any of the mapping rules that was set up in the ETL tool, then you need to have ETL expert update the ETL tool for you before data again can be correctly loaded to the Solver DW.
- b. Set up subsidiary to parent chart of accounts mapping in Excel

With this option you set up a simple mapping schema in Excel (i.e. the first Excel column is the parent list of accounts and the next two columns list

“From” and “To” accounts from the subsidiary. For example, in the parent column you list account 1010 and in the “From” and “To” columns you list account 00014 and 01150. This means that all accounts from 00014 to account 01150 should be aggregated into account 1010 in the Solver DW and that will be the lowest level of detail for this item in your consolidated financial reports.

Solver’s integration tool can then point to the Excel mapping file(s) as it loads a subsidiary’s GL data into the Solver DW and handle the mapping as data is loaded into the Solver DW.

i. Pros:

- Very easy for non-technical staff to manage account mapping since it is in Excel. Also, easy to push mapping process out to subsidiaries since they best know their own, local chart of accounts.
- You keep the consolidated chart of accounts in the Solver DW very simple and clean since you only will deal with one, single, chart of accounts in the DW, which also means that reports will be easier to write and faster than if you brought in all kinds of detailed accounts from each subsidiary.

ii. Cons:

- You need to be aware of- and manage - the Excel files(s) so they are always in the same location on the server and always updated.

c. Set up subsidiary to parent chart of accounts mapping inside the Solver DW

This means that you would load the chart of accounts from each of your subsidiaries into the Solver DW, and manage the mapping inside Solver using either attributes on the account dimension or Account Trees, where you drag and drop each subsidiary account up under each relevant consolidated account. In each case, whether you use account attributes or account trees for your mapping, you will be referring to these when you design Solver reports.

i. Pros:

- Nice, non-technical interface (account attributes or trees) in the Solver DW manager where a business user can configure the account mapping.

ii. Cons:

- If you have a large number of different subsidiary chart of accounts, the account table in the Solver can become very large (e.g. thousands of accounts) and thus the person responsible for the account mapping has to manage a large number of mappings (attributes or trees) and reports will run somewhat slower than if you had performed the mapping before (see two options for this above) the data is loaded into the Solver DW.

3. Data Loading and Validation

There are generally three types of data that is loaded to the Solver DW:

a. Transactions

- GL Summary (Trial balances) per department or per Subsidiary – this is obviously required data in order to create financial consolidation reports
- GL Detail (Journal Entry level GL transactions) – this is optional and typically only done by companies that want drill down in reports to go all the way to journal entries.

b. Exchange rates

- Monthly Average Rates
- Month End rates

You can have as many rate types (Average, Closing, Budget, etc.) as you want in Solver. You can also load/enter monthly rates for the same currency that are different for different companies in that currency. Read the Solver DW user manual for more information on this.

c. Dimensions

- Dimension codes and descriptions (such as account codes/descriptions, company codes/descriptions).
- Trees
 - i. These are usually not imported as it is usually quick and easy to design the trees inside the Solver DW.
 - ii. However, imports from files is supported, and may be convenient in some cases. For example, large account trees which roll up multiple local charts of accounts into a single corporate chart of accounts may be easier to maintain in Excel then upload into Solver.

There are three different ways you can populate the Solver DW with data:

- 1) Set up automated import directly from the data source using Solver's integration tool.
- 2) Import data from files using Solver's integration tool. In some cases, especially with proprietary data sources or for one-time import of historical data, this method is sometimes the quickest and easiest. I.e. if some of your data only needs to be loaded once or such as for history from an old ERP system or budgets from a third-party budget system that only is updated once per year. Other reason to use file importing is if you are only creating a test or pilot model in the Solver DW.

- 3) Enter data directly in the DW user interface (available for Dimensions, Exchange Rates and Trees, transactional data. For the latter you use the Solver Planning module to set up Web input forms in the Solver portal where users enter the data.

4. Set up Account Dimension Attributes and Trees

Once your dimension data (see prior paragraph) has been loaded into Solver, decide to use Account attributes or Account Trees (or both) to manage and simplify things like:

- a. Mapping of subsidiary to parent accounts (discussed earlier in this document)
- b. Grouping of accounts (e.g. grouping all Short-Term asset accounts into a group called “Short Term Assets”). This will make reports faster to build, faster to run and require less or no maintenance in a report when you have new accounts in the future.
- c. Creating consolidation trees for your companies (these will later be used in your consolidation reports. *Entity trees must be configured if you are going to utilize Solver’s automated elimination or minority scripts.* This is discussed in greater detail later in this document).

See the Solver Data Warehouse User Manual for currency setup details and instructions on importing and running Process rules.

5. Solver Consolidation Rules

In Solver, rules are data handling procedures that are run from the Processes section of the Data Warehouse Manager. There are three Solver consolidation rules: currency conversion, minority interest eliminations and intercompany activity eliminations. Running (or scheduling to run automatically) these rules in the Solver DW creates transactions which can be used to create consolidated financial statements. These transactions are described in the following sections. To guarantee integrity in your Solver Data Warehouse, the automated Solver scripts must be executed in the following sequence:

- 1) Currency conversion.
This script will delete any minority interest and intercompany activity transactions as well as any existing currency translation transactions in the selected periods.
- 2) Minority interest elimination calculation.
This script will delete intercompany activity elimination transactions as well as any existing minority interest eliminations in the selected periods.
- 3) Intercompany activity elimination calculation.
This script will only delete any existing intercompany activity elimination transactions in the selected periods.

- 4) Additional information regarding setup of the consolidation rules is contained in Appendix 2: Enabling Solver Consolidation.

6. Setup Currency Conversion

This setup is only required if you need Solver to perform currency conversion. There are five steps to currency conversion setup:

- 1) Set up the Rate Types in the Currency section of the Solver DW user interface.
- 2) Set up the Account Types and assign them to account codes in the account dimension in the Solver DW user interface. As many Account Types as required may be created to map to the various types of accounts requiring translation (e.g., income statement accounts, balance sheet accounts, retained earnings accounts, historical rate accounts).
- 3) Map Rate Types and Scenarios in the Currency section of the Solver DW user interface.
- 4) Loading or entering exchange rates (discussed earlier in this document) into the Currency section of the Solver DW user interface.
- 5) Import the appropriate currency translation rule(s) into the Processes section of the Solver Data Warehouse user interface. There are two standard rules available for Solver.
 - The first supports the general requirements for US GAAP and similar accounting standards. The data for all accounts is loaded with opening balances and periodic activity.
 - The second supports IFRS requirements. The data for all accounts is loaded with ending balances for the period.

This currency translation rule is available for download at support.solverglobal.com at

<https://support.solverglobal.com/index.php?/Knowledgebase/Article/View/489> .

Additional information regarding setup of the consolidation rules is contained in “Appendix 2: Configuring Solver Consolidation.”

See the Solver Data Warehouse User Manual for currency setup details and instructions on importing Process rules.

7. Setup Minority Interest Elimination

This setup is only necessary if there are entities which are less than 100% owned (or controlled) by the parent. There are three steps to prepare for minority interest elimination calculations:

- 1) Set up an entity tree (or trees) in the Data Warehouse user interface that have nodes set to less than 100% ownership. Minority interest eliminations

are only calculated for transactions with entities represented in entity tree nodes with Percent Ownership set to less than 100%.

- 2) Enable the Tree and Minority Parent dimensions for the GL Summary module in the Data Warehouse user interface.
- 3) Import the minority interest elimination rule into the Processes section of the Solver DW user interface. The rule is available for download at support.solverglobal.com at <https://support.solverglobal.com/index.php?/Knowledgebase/Article/View/489>.

Note: See the Solver Data Warehouse User Manual for tree setup details and instructions on creating trees and importing Process rules. Additional information regarding setup of the consolidation rules is contained in “Appendix 6: Configuring Solver Consolidation.”

8. Setup Intercompany Activity Elimination

This setup is only necessary if there are entities within the organization which conduct business with each other that needs to be eliminated for consolidated reporting. There are four steps to prepare for intercompany activity elimination calculations:

- 1) Set up an entity tree (or trees) in the Data Warehouse user interface. Intercompany elimination transactions are only calculated for transactions with both entity and corresponding entity.
- 2) Enable the Tree and Interco Parent dimensions for the GL Summary module in the Data Warehouse Manager.
- 3) Create or import transactions with the corresponding entity degenerate dimension populated. Corresponding entity identifies the counterparty entity in the organization for the transaction. For example, say that company A makes a loan to company B, and both company A and company B are subsidiaries in the same organization. Company A would book a loan receivable transaction with corresponding entity = B. Company B would book a loan payable with corresponding entity = A. When possible, the corresponding entity field should be populated when the base transactions are created in the data warehouse. If this is not practical, then a form can be used to populate corresponding entity.
- 4) Import the intercompany activity elimination rule into the Processes section of the Solver Data Warehouse. The rule is available for download at support.solverglobal.com at <https://support.solverglobal.com/index.php?/Knowledgebase/Article/View/489>.

See the Solver Data Warehouse User Manual for tree setup details and instructions on creating trees and importing Process rules. Additional

information regarding setup of the consolidation rules is contained in “Appendix 2: Configuring Solver Consolidation.”

9. Currency Translation Process

The consolidation process is initiated by executing the Currency Translation rule in the Processes section of the Data Warehouse user interface. The output of the rule are transactions that reflect the rate types and rates set up in the mapping described above in section 6, “Set up Currency Conversion.” The output is also limited by several parameters:

- 1) Entities.
- 2) Scenario.
- 3) Category.
- 4) Destination currencies.
- 5) Periods.

Multicurrency organizations usually create consolidated reports restricted to the translated amounts. There are two primary filters used to limit reports to data generated by the currency rule:

- 1) Category codes begin with FX (FX is appended to the beginning of the category code of the native currency transaction).
- 2) The Row Comment attribute is FX (if the transaction currency is different from the native currency) or FC (if the transaction currency is the same as the native currency).

Aside from these filters there are no special requirements to create reports using currency translation transactions. For more information on report syntax please see the Solver Report Designer User Guide.

Currency translation adjustment:

When a balance sheet or other financial statement contains accounts that are translated at various rates a currency translation adjustment amount must be calculated based and presented on the differences. The currency translation rule for US GAAP provides special support for calculating currency translation adjustment. For accounts which are mapped to either the average or closing rate type, all of the year-to-date native currency periodic activity in the Monthly Amount fields is totaled and translated at the closing rate for the report date in the Annual Amount field. These are generally the correct amounts for balance sheet accounts. This amount is stored in the Value2 – YTDTotal – field. Net income (based on the income statement accounts) on the other hand should generally be presented on the balance sheet as the sum of each period separately translated at the average rate for that period. This is consistent with the presentation in the profit and loss statement. If the Account Types are configured correctly, then these translated amounts are stored in the Value1 –

Monthly Amount – fields. Taking the difference between the net income thus calculated vs. the net income from the Annual Amount field for the income statement accounts provides the required amount for currency translation adjustment.

If there are other accounts requiring translation (e.g., retained earnings, historical rate accounts translated at specific identification rates) then additional steps need to be taken to calculate the associated currency translation adjustment. These are outlined in a white paper available on the Solver support website.

10. Minority Interest Elimination Process

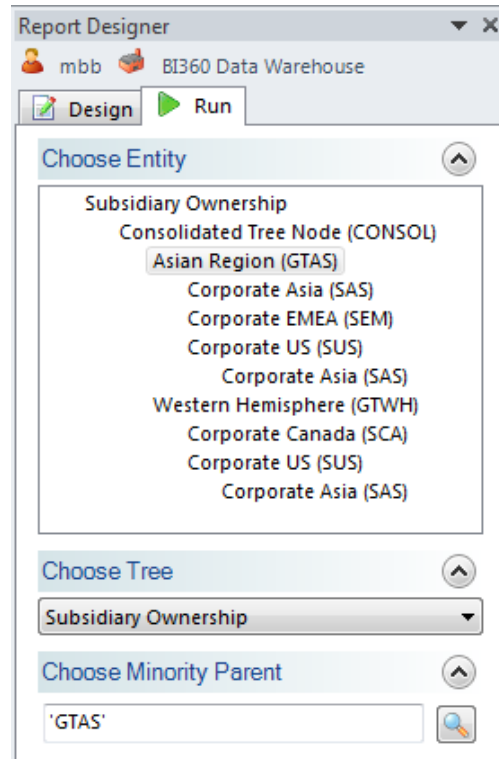
The creation of minority interest elimination transactions is initiated by executing the Minority Elimination rule in the Processes section of the Data Warehouse user interface. The minority interest elimination process is based on the entity tree structures created in the Data Warehouse. If there are no nodes in any entity tree with Percent Ownership set to less than 100% then no minority interest elimination takes place.

Minority interest eliminations have exactly the same transaction structure as the original transaction on which they are based EXCEPT that they have two additional dimensions:

- 1) Tree – Identifies the entity tree which is driving the elimination.
- 2) Minority Parent – identifies the branch in the tree which is driving the elimination.

Examples of base transactions and the related minority interest eliminations may be seen in Appendix 1 below. Note that there can be many more minority elimination transactions than original transactions since each tree will require a minority elimination transaction at each level where there is minority elimination required.

Building consolidated or consolidating reports so that the filters for entity tree and entity tree node are matched to the filters for the tree dimension and minority parent dimension will fetch results which properly match the base transaction(s) and appropriate minority interest elimination transaction(s). If the filter for entity tree and entity tree node is driven from a tree-style parameter, then sheet-per-value functionality with proper eliminations is available as well. This is a screenshot of typical parameters with properly matched selections for a consolidated report with minority eliminations:



Aside from the requirement to match the filters for the tree and the minority parent to the entity tree/entity tree node, there is no fundamental difference in syntax or practice for the tree and minority parent dimensions versus any other dimensions. For more information on report syntax please see the Solver Report Designer User Guide.

11. Intercompany Activity Elimination Process

The creation of intercompany activity elimination transactions is initiated by executing the Interco rule in the Processes section of the Data Warehouse user interface. The intercompany activity elimination process is based on the entity tree structures created in the Data Warehouse. If transactions have both an entity code and corresponding entity code that are members of a branch of an entity tree, then an intercompany activity elimination entry is created.

Intercompany activity eliminations have exactly the same transaction structure as the original transaction on which they are based EXCEPT that they have two additional dimensions:

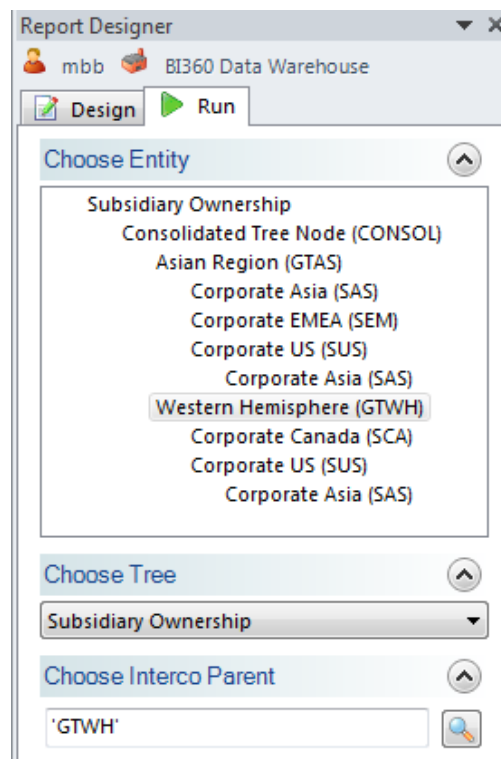
- 1) Tree – Identifies the entity tree which is driving the elimination.
- 2) Interco Parent – identifies the branch in the entity tree which is driving the elimination.

Amounts for intercompany activity eliminations are integrated with any minority interest elimination from the same base transaction for the same tree and the same parent. For example, if there is minority interest elimination required equal to 40% of the base transaction amount, then the intercompany

activity elimination would be equal to 60% of the base transaction amount. If there is no associated minority interest elimination, then the intercompany activity elimination is equal to 100% of the amount of the base transaction.

Examples of base transactions and the related minority interest and intercompany activity eliminations may be seen in Appendix 1 below. As with minority interest elimination transactions, there can be many more intercompany activity elimination transactions than original transactions.

Building consolidated or consolidating reports so that the filters for entity tree and entity tree node are matched to the filters for the tree dimension and interco parent dimension (and minority parent dimension if minority interests are present in entity trees) will fetch results which properly match the base transaction(s) and appropriate intercompany and minority interest elimination transaction(s). If the filter for entity tree and entity tree node is driven from a tree-style parameter, then sheet-per-value functionality with proper eliminations is available as well. This is a screenshot of typical parameters with properly matched selections for a consolidated report with intercompany activity eliminations:



It is not currently possible for the tree and interco parent selections to be inherited from the selection for the entity tree/entity node. However, it is possible to have a user's selection of a Interco Parent be inherited by the Minority Parent parameter (or vice versa); specific instructions for this technique are available [here](#).

Aside from the requirement to match the tree/interco parent filters to the entity tree/entity tree node, there is no fundamental difference in syntax or practice for the tree and minority parent dimensions versus any other dimensions. For more information on report syntax please see the Solver Report Designer User Guide.

12. Manual Input Forms for Eliminations and Adjustments

It may be beneficial to set up data entry forms in Solver so users can input data such as:

- Assignment of corresponding entity codes.
- Elimination transactions (that for whatever reason would not be automatic eliminations).
- Other consolidation adjustments (i.e. for reclassification of data that came in wrong/incomplete from a subsidiary or currency adjustments).
- IFRS to local GAAP adjustments.

You can use the Solver Planning module to create highly user-friendly input forms either for use with the Solver Web Portal.

Such manual entries are typically (you decide when you set up the input form) stored to a separate Category (this is a dimension in the Solver DW) code(s) so you later can include and exclude your adjustments with your imported GL data and also you can break out the adjustments in separate columns in your consolidation reports.

The Solver DW has full audit trail (i.e. for Sarbanes Oxley and other audit reasons) that automatically will track who enters and changes the adjustment transactions and at what date and time. It can also include text comments to explain what the adjustments where needed for.

See the Solver Planning User Manual for more information about Form design.

13. Design Reports and Distribution

Once the Solver DW is set up and populated, processes for currency conversion and eliminations have been run, and any manual adjustments have been entered, it is time to design your financial consolidation reports. For most companies, these types of reports will include:

- a. Trail balance report
- b. Consolidated and Consolidating Profit & Loss
- c. Consolidated and Consolidating Balance Sheet
- d. Consolidated and Consolidating Cash Flow

Many companies desire to automatically compile the same report across sheets in a single report workbook, starting with a consolidated version of the report on the first sheet and then replicating the same report format on the next sheets according to a consolidation tree set up in the Solver DW. This is a powerful feature in the Solver Report Designer. However, if you have more than 75-100 sheets in the same workbook it will significantly slow down the report execution and it might be better to consider on-demand execution or running the report in separate reports per company.

Of course, any number of other reports can also be created. In short, you use the Solver Report Designer to set up the reports you desire. Then you have three ways of running these reports:

- a. Run reports in the Solver Web Portal.
- b. Run reports and distribute (or print) automatically with the Solver Publisher module.
- c. Run reports in the Solver cloud-connected Excel add-in.

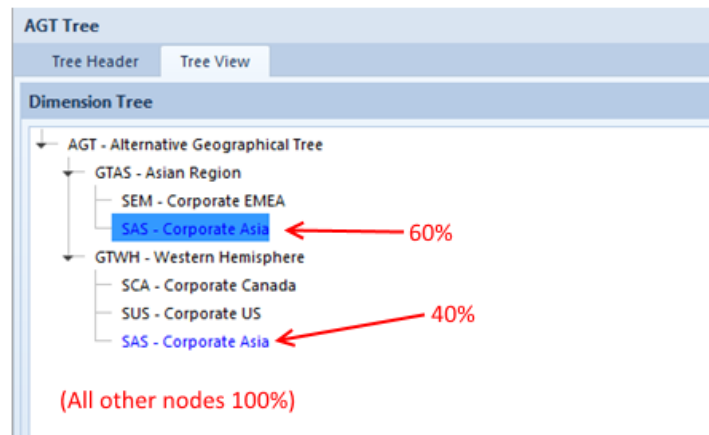
See the Solver Report Designer User Manual for more information about report design.

14. Testing and Validation

Once you have completed all the steps above, make sure you set aside time to test both your data and your reports before you go live.

Appendix 5 - Minority Interest and Intercompany Activity – Examples.

Tree with simple structure



- Example 1 based on simple tree: Entity=SAS/EntityCorr=SUS/Tree=AGT/Parent=GTAS
 Minority elim = $100\% - (100\% * 60\%) = 40\%$
 Entity and EntityCorr are not both in the GTAS branch, so no interco elimination.

Account	Category	Currency	Department	Entity	EntityCorr	Intercor Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS		GTAS	ACTUAL	20140101	139,825.81	MinorElimTrans	AGT	-40.00%
11110	IN	HKD	000	SAS	SUS		GTAS	ACTUAL	20140101	139,825.81	MinorElimTrans	AGT	-40.00%

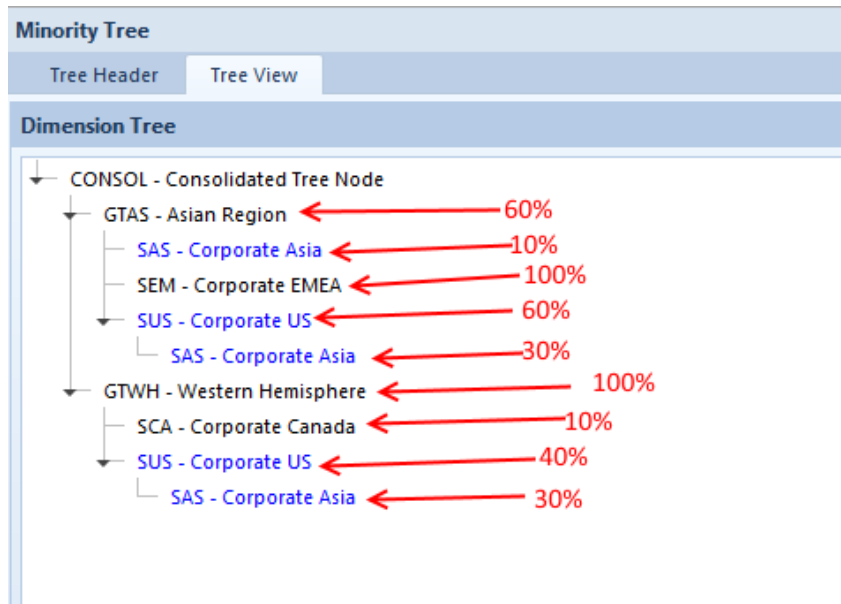
- Example 2 based on simple tree:
 Entity=SAS/EntityCorr=SUS/Tree=AGT/Parent=GTWH
 Minority elim = $100\% - (100\% * 40\%) = 60\%$
 Entity and EntityCorr are both in the GTWH branch, so remaining interco elimination = 40%.

Account	Category	Currency	Department	Entity	EntityCorr	Intercor Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS		GTWH	ACTUAL	20140101	209,738.71	MinorElimTrans	AGT	-60.00%
11110	MAIN	HKD	000	SAS	SUS		GTWH	ACTUAL	20140101	209,738.71	MinorElimTrans	AGT	-60.00%
11110	MAIN	HKD	000	SAS	SUS	GTWH		ACTUAL	20140101	139,825.81	IntercorElimTrans	AGT	-40.00%
11110	MAIN	HKD	000	SAS	SUS	GTWH		ACTUAL	20140101	139,825.81	IntercorElimTrans	AGT	-40.00%

- Example 3 based on simple tree:
 Entity=SAS/EntityCorr=SUS/Tree=AGT/Parent=AGT
 Minority elim = $100\% - (100\% * 60\%) - (100\% * 40\%) = 0\%$
 Entity and EntityCorr are both in the AGT branch, so interco elimination = 100%.

C	D	E	F	I	J	K	L	M	N	O	Y	AE	AF
Account	Category	Currency	Department	Entity	EntityCorr	Interco Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS	AGT		ACTUAL	20140101	349,564.52	IntercoElimTrans	AGT	-100.00%
11110	MIN	HKD	000	SAS	SUS	AGT		ACTUAL	20140101	349,564.52	IntercoElimTrans	AGT	-100.00%

Tree With Complex Structure



Note that this tree has cascading minority ownership levels. For example, in the GTWH branch SUS is 40% owned, while SAS is 30% owned by SUS. Therefore the effective ownership of SAS in the GTWH branch is:

$$40\% * 30\% = 12\%$$

- Example 1 based on complex tree:
 Entity=SAS/EntityCorr=SUS/Tree=GT/Parent=SUS
 Minority elim = 100%-30% = 70%
 Entity and EntityCorr are both in the SUS branch, so remaining 30% is interco elimination.

C	D	E	F	I	J	K	L	M	N	O	Y	AE	AF
Account	Category	Currency	Department	Entity	EntityCorr	Interco Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100%
11110	MAIN	HKD	000	SAS	SUS		SUS	ACTUAL	20140101	244,695.16	MinorElimTrans	GT	-70%
11110	MIN	HKD	000	SAS	SUS		SUS	ACTUAL	20140101	244,695.16	MinorElimTrans	GT	-70%
11110	MAIN	HKD	000	SAS	SUS	SUS		ACTUAL	20140101	104,869.36	IntercoElimTrans	GT	-30%
11110	MAIN	HKD	000	SAS	SUS	SUS		ACTUAL	20140101	104,869.36	IntercoElimTrans	GT	-30%

- Example 2 based on complex tree:
 Entity=SAS/EntityCorr=SUS/Tree=GT/Parent=GTAS
 Minority elim = 100%- 10%-(60%*30%) = 72%

Entity and EntityCorr are both in the GTAS branch, so remaining 28% is interco elimination.

Category	Currency	Department	Entity	EntityCorr	Interco Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100%
MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100%
MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	251,686.45	MinorElimTrans	GT	-72%
MAIN	HKD	000	SAS	SUS		GTAS	ACTUAL	20140101	251,686.45	MinorElimTrans	GT	-72%
MAIN	HKD	000	SAS	SUS	GTAS		ACTUAL	20140101	97,878.07	IntercoElimTrans	GT	-28%
MAIN	HKD	000	SAS	SUS	GTAS		ACTUAL	20140101	97,878.07	IntercoElimTrans	GT	-28%

3. Example 3 based on complex tree:

Entity=SAS/EntityCorr=SUS/Tree=GT/Parent=GT

Minority elim = $100\% - (60\% * 10\%) - (60\% * 60\% * 30\%) - (100\% * 40\% * 30\%) = 71.2\%$

Entity and EntityCorr are both in the GT branch, so remaining 28.8% is interco elimination.

Account	Category	Currency	Department	Entity	EntityCorr	Interco Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS		GT	ACTUAL	20140101	248,889.94	MinorElimTrans	GT	-71.20%
11110	MAIN	HKD	000	SAS	SUS		GT	ACTUAL	20140101	248,889.94	MinorElimTrans	GT	-71.20%
11110	MAIN	HKD	000	SAS	SUS	GT		ACTUAL	20140101	100,674.58	IntercoElimTrans	GT	-28.80%
11110	MAIN	HKD	000	SAS	SUS	GT		ACTUAL	20140101	100,674.58	IntercoElimTrans	GT	-28.80%

4. Example 4 based on complex tree:

Entity=SAS/EntityCorr=SUS/Tree=GT/Parent=GTWH

Minority elim = $100\% - (40\% * 30\%) = 88\%$

Entity and EntityCorr are both in the GTWH branch, so remaining 12% is interco elimination.

Account	Category	Currency	Department	Entity	EntityCorr	Interco Parent	Minority Parent	Scenario	Period	Amount	Source	Tree	% of base
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS			ACTUAL	20140101	-349,564.52			100.00%
11110	MAIN	HKD	000	SAS	SUS		GTWH	ACTUAL	20140101	307,616.78	MinorElimTrans	GT	-88.00%
11110	MAIN	HKD	000	SAS	SUS		GTWH	ACTUAL	20140101	307,616.78	MinorElimTrans	GT	-88.00%
11110	MAIN	HKD	000	SAS	SUS	GTWH		ACTUAL	20140101	41,947.74	IntercoElimTrans	GT	-12.00%
11110	MAIN	HKD	000	SAS	SUS	GTWH		ACTUAL	20140101	41,947.74	IntercoElimTrans	GT	-12.00%

Appendix 6 - Configuring Solver Consolidation

General information about the setup of Solver for consolidations has been covered earlier in this document:

Setup of Currency Conversion

Setup of Minority Interest Elimination

Setup of Intercompany Activity Elimination

The purpose of this appendix is to provide more specific configuration instructions.

Installing the consolidation process rules:

The current versions of the consolidation rules are available on the Solver support site: <https://support.solverglobal.com/index.php?Knowledgebase/Article/View/489>.

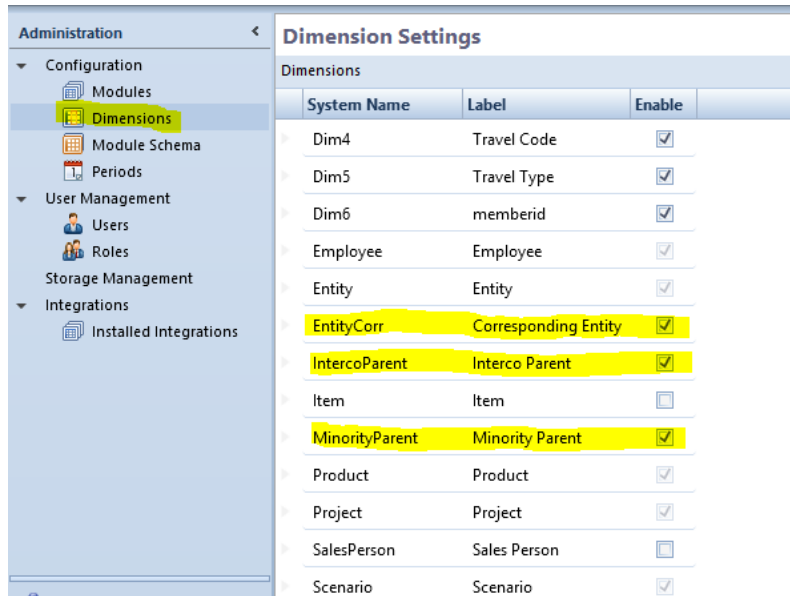
There are 3 separate rules for currency translation, minority interest eliminations and intercompany transaction eliminations. Only install the rules required for the particular consolidation environment:

- If all consolidations are in a single native currency, then the currency translation rule is unnecessary.
- If all entities are 100% owned, then the minority interest elimination rule is unnecessary.
- If no intercompany transactions need to be eliminated in consolidation, then the intercompany elimination rule is unnecessary.

As described in the body of the user guide, any of the three rules present must be executed in this order (currency, minority interest, intercompany transactions).

Configuring dimensions for Solver consolidation:

Several dimensions must be enabled from Administration in the Data Warehouse user interface for the Solver minority interest and intercompany transaction elimination rules to function. These dimensions should be mapped to the GL Summary module:



Dimension Settings		
Dimensions		
System Name	Label	Enable
Dim4	Travel Code	<input checked="" type="checkbox"/>
Dim5	Travel Type	<input checked="" type="checkbox"/>
Dim6	memberid	<input checked="" type="checkbox"/>
Employee	Employee	<input checked="" type="checkbox"/>
Entity	Entity	<input checked="" type="checkbox"/>
EntityCorr	Corresponding Entity	<input checked="" type="checkbox"/>
IntercoParent	Interco Parent	<input checked="" type="checkbox"/>
Item	Item	<input type="checkbox"/>
MinorityParent	Minority Parent	<input checked="" type="checkbox"/>
Product	Product	<input checked="" type="checkbox"/>
Project	Project	<input checked="" type="checkbox"/>
SalesPerson	Sales Person	<input type="checkbox"/>
Scenario	Scenario	<input checked="" type="checkbox"/>

- The above dimensions (when enabled) are only available on the GL Summary module; hence they should only be mapped to GL Summary in the Module Schema interface of the Data Warehouse Manager.
- All three dimensions reference the d_Entity table.
- When enabling the IntercoParent and/or MinorityParent dimensions another column is created on the GL table called Tree. This column references the tree-Header table.
- These dimensions are not required for currency translation only.
- For general instructions on maintaining dimensions, please see the Solver Data Warehouse Users Guide.

Appendix 7 - Additional Solver Information and Resources

Solver Reference Documents: <https://www.solverglobal.com/products/documents>

Any other information you need: Request from info@solverglobal.com or your partner

Solver Customer Case Studies: <https://www.solverglobal.com/products/customers>

Solver customer portal, on-demand videos and webinars:

- Webinars <https://www.solverglobal.com/products/webinars/>
- Examples by industry: <https://www.solverglobal.com/products/solutions/>
- **On-demand videos of Solver**
 - Solver site: <https://www.solverglobal.com/products/experience-bi360/>
- **Customer portal** gives access to rich and valuable Solver information including – **Solver University, Solver forum, Solver Blog, various Solver whitepapers, training videos**, etc. See preview here - <https://support.solverglobal.com/>
- **Visit our website** for a host of information: <http://www.solverglobal.com>